A novel lean briefing process for effective design management

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A Novel Lean Briefing Process for Effective Design Management

By

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A Doctoral Thesis submitted in partial fulfilment of the requirements for the award of
Doctor of Philosophy of Loughborough University

September 2015

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ABSTRACT

Construction projects experience design changes and much time and effort is put into trying to address fluctuations in client and project requirements; however, in many cases, insufficient value is delivered to the client. The successful use of Lean Management in the construction stage has opened up the possibility of using it in the design stage – thus helping to establish a systematic approach to managing construction projects and business. Attention is turning towards Lean Design Management to address deficiencies in the design phases that many would argue should have been dealt with in the early project delivery stages. Aspects of ineffective briefing process practice have been shown to have negative consequences and implications for the efficient performance of design management. The client is asked to provide requirements without ensuring that they have established sufficient knowledge of the project to do so. These requirements, most likely, will change then over time, because in most cases the initial decision was not made based on sufficient project knowledge or a well-established vision. The client needs to be made smarter and to learn about the building early on in the project, long before the architect sketches the concept design.

A review of the Lean Design Management literature revealed that no publications have addressed briefing. Similarly, reviewing the briefing literature revealed that there is a major knowledge gap in the field, as it is striking to note how little attention has been given to resolving the original sources of inefficiency in briefing practices. There is a fundamental problem in the practices around the briefing process in the UK which makes it inadequate for carrying out design tasks efficiently. It appears from the literature and from the author’s earlier study that the existing conflict with regard to divergent briefing mechanism practices (static and dynamic) represents the basis from which the inefficiency of briefing practice could be resolved. However, neither concept has the strong theoretical basis that would make it supportive of effective design management. Hence, the importance of this research lies in its attempt to fill this gap in knowledge and contribute to the literature on briefing, as well as on Lean Design Management implementations.

The focus of this research was to address the question of how implementing Lean Management principles in the briefing process could support delivering a design value-added project brief. An in-depth empirical research was carried out to investigate current briefing practice in order to better understand the situation and identify room for enhancing its
practice in the context of Lean Design Management implementation. A grounded theory research method was adopted in order to achieve the research aim. The interpretive research perspective suggests a more inductive approach to theory building. Thus, more emphasis was placed on using a qualitative paradigm. In the early phase, unstructured interviews were used to collect primary data from construction industry practitioners working in design companies and construction organisations. These targeted practitioners were mainly based in the UK, but additional data was also collected from Libya in order to select some lessons from good practices in the briefing process. Similarly, in the later phase of this research, semi-structured interviews and focus group were conducted with Lean experts from the construction industry and practitioners from the UK construction industry, and these supported and validated the practicality, clarity and appropriateness of the newly developed Lean Briefing perspective in principle.

This research provides a valuable insight into the briefing process and helps in confirming the value of the Project Brief in relation to design management. It further confirms the limitations of current briefing practices reported in the literature and explores and identifies the original source of this inefficiency that contributes waste to the design process. In this research, industry-wide agreement on the brief concept and a formal briefing process was explored, as it is crucial to address briefing process value stream elements on a strategic level (i.e. a design value-added project brief delivery). Existing approaches to the briefing process have been shown to be divergent and frequently lacking a coherent theoretical basis. This discovery helped in diagnosing where to improve and led to the contributions to the philosophical perspective and methodological practice of briefing.

Unlike anything that has been proposed before, this research has helped in generating a novel and innovative Lean Briefing concept based on construction industry practitioners’ firm agreement on the brief concept, and the main idea of the Lean philosophy "Do it Right the First Time", hence helping to reduce uncertainty in the design phases and improve performance. Lean Briefing views the brief as a capturing of client and project requirements through learning, understanding and value definition and representation. It is a learning exchange application (bi-directional) which should occur at the front-end of a project in order to develop a project-related knowledge base at the right time, early on, and explore several possible solutions in order to (i) minimise process waste resulting from the lack of a knowledge base, and consequently (ii) ensure the precise capture of client and project
requirements. The new perspective extends the vision of the briefing process as not only a process of compiling and processing information concerning client requirements, but also a process of exploring, understanding, and generating client and project requirements, and then processing the emerged information.

This has further helped in planning and developing an alternative, unique, Lean Briefing methodological practice approach based on Lean Management principles and, most importantly, for industry-wide consistency, an Overlay to the RIBA Plan of Work official Project Brief requirements. This research has developed a Lean Briefing Process Operational Roadmap that explains how to carry out the Lean Briefing process in detail, from start to finish, to deliver and monitor the project brief. While realising these aims, the research offers further and innovative help to the Architecture, Engineering and Construction (AEC) industry by delivering a novel Lean Briefing Management Framework to advise practice strategy. This is a flexible and adaptable framework that is applicable to different types of projects, organisations and business contexts.

This research provides unique insights into the briefing process and contributes new aspects to the theoretical understanding and practical implementation of Lean Design Management in AEC. It is believed that the learning perspective will bring a radical change to the perception of the briefing process, and that the Lean approach has the appropriate theoretical basis to improve the briefing process practice. The author argues that this new Lean Briefing perspective will enhance project brief delivery and therefore support delivering design for assembling and production as a means of Lean Design Management. The outcomes of the Lean Briefing research reveal that it could be utilised as an effective initiative to respond to Egan and Latham's recommendations for creating a better industry.

KEYWORDS: Project Brief; Design Brief; Briefing Practices; Client and Project Requirements; Lean Briefing Process; Lean Design Management
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I owe my sincere and earnest thankfulness to Allah for the gift of my entire life, for all the blessings I have received, and for giving me the health and strength to carry out this doctoral research work. However, the Prophet Mohammed, peace be upon him, said: “he who does not thank people, does not thank Allah”. To complete doctoral research work of this magnitude requires a network of support, and I am indebted to many people; I regret that I will probably miss out some of them.

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Lastly, but not least, I offer my kindest regards and blessings to all of those who supported me in any way during the completion of this doctoral research work.
This Doctoral Thesis is dedicated to

My wife, Fatma and my children, Aesha & Mostafa

I am deeply sorry for the time I spent apart from you.
PUBLICATIONS

➢ Refereed Conferences


➢ Refereed Journal


El.Reifi M. H., Emmitt, S., and Ruikar, K. (Under revision), ‘Exploring perceptions of design briefing processes’, has been submitted and reviewed for publication in the Architectural Engineering and Design Management Journal.

➢ Handbook

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<table>
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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
</tr>
<tr>
<td>ADePT</td>
<td>Analytical Design Planning Technique</td>
</tr>
<tr>
<td>AEC</td>
<td>Architecture, Engineering and Construction</td>
</tr>
<tr>
<td>AEDM</td>
<td>Architectural Engineering and Design Management Journal</td>
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<tr>
<td>BPF</td>
<td>British Property Federations</td>
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<tr>
<td>BIM</td>
<td>Building Information Modelling</td>
</tr>
<tr>
<td>CPDT</td>
<td>Client Project Definition Tool</td>
</tr>
<tr>
<td>CRPM</td>
<td>Client Requirements Processing Model</td>
</tr>
<tr>
<td>CAD</td>
<td>Computer Aided Design</td>
</tr>
<tr>
<td>CIB</td>
<td>Construction Industry Board</td>
</tr>
<tr>
<td>CPD(s)</td>
<td>Continuous Professional Development Program(s)</td>
</tr>
<tr>
<td>DM</td>
<td>Design Management</td>
</tr>
<tr>
<td>DMI</td>
<td>Design Management Institute</td>
</tr>
<tr>
<td>DSM</td>
<td>Design Structure Matrix</td>
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<tr>
<td>PhD</td>
<td>Doctor of Philosophy</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>FM</td>
<td>Facilities Management</td>
</tr>
<tr>
<td>HoQ</td>
<td>House of Quality</td>
</tr>
<tr>
<td>IICC</td>
<td>Information, Communication, and Collaboration</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>IGLC</td>
<td>International Group for Lean Construction</td>
</tr>
<tr>
<td>IPA</td>
<td>Interpretative phenomenological analysis</td>
</tr>
<tr>
<td>IPD</td>
<td>Integrated Project Delivery</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>KM</td>
<td>Knowledge Management</td>
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<tr>
<td>LBP</td>
<td>Lean Briefing Process</td>
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<td>LDM</td>
<td>Lean Design Management</td>
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<td>LPD</td>
<td>Lean Product Development</td>
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<tr>
<td>LPMM</td>
<td>Lean Project Management Model</td>
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<tr>
<td>PDCA cycle</td>
<td>Plan, Do, Check, Act, Cycle</td>
</tr>
<tr>
<td>POE</td>
<td>Post Occupancy Evaluation</td>
</tr>
<tr>
<td>QDA</td>
<td>Qualitative Data Analysis</td>
</tr>
<tr>
<td>QFD</td>
<td>Quality Functional Deployment</td>
</tr>
<tr>
<td>RIBA</td>
<td>Royal Institute of British Architects</td>
</tr>
<tr>
<td>SBD</td>
<td>Set-Based Design</td>
</tr>
<tr>
<td>S-BIM</td>
<td>Structural Building Information Modelling</td>
</tr>
<tr>
<td>TVD</td>
<td>Target Value Design</td>
</tr>
<tr>
<td>TQM</td>
<td>Total Quality Management</td>
</tr>
<tr>
<td>TPDS</td>
<td>Toyota Product Development System</td>
</tr>
<tr>
<td>TPS</td>
<td>Toyota Production System</td>
</tr>
<tr>
<td>UK</td>
<td>The United Kingdom</td>
</tr>
<tr>
<td>USA</td>
<td>The United States of America</td>
</tr>
<tr>
<td>VM</td>
<td>Value Management</td>
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<tr>
<td>VSM</td>
<td>Value stream mapping</td>
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<tr>
<td>WIP</td>
<td>Work in progress</td>
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DEFINITION OF TERMS

This section lists definition of terms used in this research where, the author considered they may have more than one meaning among knowledgeable peers in the construction discipline.

In this research, the terms are used as follows:

- **Brief Team** - a new term used to represent professionals within the building organisation who are responsible for carrying out the briefing task by means of identifying client and project requirements in collaboration with the Project Design Team.
- **Briefing** - a term used to refer to the briefing process as a whole.
- **Client** - an organisation that embarks, or plans to embark, on the process of commissioning a building project. Clients frequently include a number of diverse stakeholders, whose conflicting interests and needs need to be understood and identified before any brief can be finalised.
- **Databank** - a new term used to represent the set of data to be set up within the organisation to support the learning application while performing Lean Briefing.
- **Lean Briefing** - a new term used to represent the new proposed briefing perspective. It is an up-front shared understanding platform that works as a learning exchange exercise (application), between client and design team, to develop the project knowledge base early on by means of minimising potential waste that might be caused later as a result of lack of project knowledge, and ensuring the identification and representation of the precise client and project requirements (e.g. client value).
- **Organisation** – a term used to represent all building professionals who get the commission from the client and are responsible for designing, designing and consulting, or designing and constructing the project. The terms ‘company’ and ‘design practice’ are also used to mean the same.
- **Project Brief** - the official term according to the RIBA Plan of Work (2013) used in this research to represent what is also known as the 'Design Brief' in UK practice. This is a set of documents/requirements.

**Strategic Definition** - the official term according to the RIBA Plan of Work (2013) and used in this research to represent what is known as the 'Client Brief' in UK practice.
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1.1 Overview

The purpose of this introductory chapter is to provide an overview of the PhD research project. It begins by discussing the research context, followed by a statement of the research problem together with the research justification based on the literature gap analysis. Then, the research aim and its objectives are stated, followed by an outline of the primary research questions to be addressed by the research. Following this, an overview of the research design and the adopted methodology is given. Next, the research scope and assumptions are defined. Then the significance of this research is highlighted. The thesis structure is described at the end of this introductory chapter, followed by definitions of some terms used in this research.

1.2 Research Context

Many construction projects suffer from delays and uncertainty in terms of cost, with the result that, in many cases, the customer or client is not satisfied with the final product (Latham, 1994; Egan, 1998, 2003; Tillmann et al., 2012a; Do et al., 2014; Kaushik et al., 2014). Egan (1998) emphasised that a great deal of time and effort is spent on site in trying to make designs work. However, in many cases, insufficient value is delivered to the client (Koskela et al., 1997; Emmitt et al., 2004; Tilley, 2005; Thyssen et al., 2008; Ballard, 2008; Ballard and Tommelein, 2012; Brito and Fornoso, 2014; Fornoso et al., 2015). Despite this, much research effort has been, and continues to be, expended on the construction phases, with initiatives such as Lean Construction trying to deal with such challenges that many would argue should have been dealt with in the early project delivery stages (Koskela et al., 1997; Ballarad and Howell, 2003; Ballard and Reiser, 2004; Macober et al., 2005; Tilley, 2005; Jørgensen and Emmitt, 2008; Mossman, 2009; Pasquire and Garrido, 2011; Zimina et al., 2012; Ballard, 2012; Macomber et al., 2012; Denerolle, 2013; Do et al., 2014; Gomes Miron et al., 2015).
The construction industry is a competitive environment which requires the employment of the best and most efficient practices in order to sustain competitive advantage in the market. Hence, there is no doubt that the construction industry needs to improve its performance at every stage of the construction project delivery stages in order to enhance construction project performance and target the changing trends in the private and public construction sector (Tang and Ogunlana, 2003; Atkinson 2003; Han et al., 2011; Oliva and Granja, 2013; Arayici et al., 2011b; Kaushik et al, 2014; Taggart et al., 2014b).

Martin (2004) indicated that the magnitude of investment in the construction industry encouraged different governments to undertake initiatives to improve the performance of construction projects and the construction industry overall. Recent research has highlighted the importance of the earlier design phases in helping to reduce such mentioned uncertainty and improve quality; thus, the importance of managing the design phases effectively and efficiently has been made clear (Green, 1996a; Bowen et al., 1997; Hansen and Vanegas, 2003; Tilley, 2005; Tunstall, 2006; Emmitt, 2007; Ballard, 2008; Han et al., 2011; Kemmer et al., 11; Kroll and Koskela, 2012; Koskela and Ballard, 2013; Ballard and Koskela, 2013; Koskela et al., 2014; Khan and Tzortzopoulos, 2014; Wesz et al., 2014; Khan and Tzortzopoulos, 2015). Effective design management is important for the success of the construction process as a whole (Latham, 1994; Bibby et al., 2003; Pikas et al., 2015b), while the efficiency of any construction project is affected by the efficiency of the design process in one way or another (Bowen et al., 1997; Hansen and Vanegas, 2003; Emmitt et al., 2004; Tilley, 2005; Tunstall, 2006; Emmitt, 2007; Jorgensen and Emmitt, 2009). Hence, developing an efficient design management system for the design of construction projects is very important for the overall performance of this industry.

However, the complexity of the relationship between the fundamental principles of project management, lack of coordination and the transformation model/theory of production work result in obstacles which hinder the process of finding effective solutions to failures to manage the design process (Tilley, 2005; Jorgensen and Emmitt, 2008). Such issues have prompted experts within the construction industry to think seriously about managing the early design stages in order to discover better ways of managing projects more efficiently. Emmitt (1999) stated that “design management is not so much about the management of people as the management of the process, the better the framework for management the process the better the result”. The successful use of Lean Management in the construction
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stage (using principles largely developed by Toyota) has opened up the possibility of using Lean Management in the design stage – thus helping to establish a systematic approach to managing construction projects and business (Ballard, 2000; Ballard and Howell, 2003; Ballard, 2008; Kemmer et al., 2011; Ballard and Tommelein, 2012; Dave et al., 2013; Azari et al., 2014). Attention is turning towards Lean Design Management to improve design process.

1.2.1 Lean Design Management

Lean Management can be defined briefly as maximising value for external bodies (i.e. clients or customers) while, at the same time, minimising waste for an internal body (i.e. an organisation) (Womack et al., 1990; Womack and Jones, 1996). Lean Management has been successfully applied in many industrial fields, such as car manufacture and construction work. The implementation of Lean concepts in construction projects helps to adjust the way in which problems are managed and maintained, even though optimum management of construction projects has not yet been achieved. Previous studies have reported that this failure is a result of the construction industry not giving full consideration to applying Lean thinking to the early design stage, whereas, in the manufacturing industry, Lean thinking is considered in both the production and design stages. Egan (1998) stated, "Lean production is a generic version of the Toyota production system, recognised as the most efficient system in the world today. Lean thinking describes the core principles underlying this system that can be also applied to every other business activity from designing new products and working with suppliers to processing orders from customers". Thus, in order to achieve more efficient and better quality outcomes, Lean Design Management (LDM), (or the introduction of ‘Lean production’ principles to the process of design), has been promoted as a new approach.

Since then, several research projects have been conducted to interpret and apply Lean Design Management in the construction industry (e.g. Koskela et al., 1997; Tilley, 2005; Tribelsky and Sacks, 2011; Sayer and Anderson, 2012; Rybkowski et al., 2013; Saurin et al., 2013; Sjögren Leong et al., 2015), together with some Lean Design implementations (e.g. Target Value Design (TVD) (Ballard and Reiser, 2004; Lichtig, 2005; Macober et al., 2005; Ballard, 2008; Ballard, 2011; Sayer and Anderson, 2012; Macomber et al., 2012; Ballard, 2012; Denerolle, 2013; Oliva and Granja, 2013; Pishdad-Bozorgi et al., 2013; Do et al., 2014; Kaushik et al., 2014; Gomes Miron et al., 2015; Melo et al., 2015); Set-Based Design (SBD)
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This has provided advantageous to design management in some specific project cases; however, a clear definition of what is meant by Lean Design Management has remained debatable. Jørgensen and Emmitt (2008) stated that: "Some ‘back to basics’ discussion on what is meant and implied by the terms ‘lean construction’ and ‘customer value’ would be helpful in establishing greater clarity. In particular, the role of designers and the effect of early design decisions on construction activities require further research". Correspondingly, the author of the present research explored the interpretation and application of Lean Design Management in the UK construction industry within the architecture, engineering and construction (AEC) context. This was throughout an earlier study, conducted to accomplish his Master’s degree (at Loughborough University, 2010). The study outcomes which provided the point of inspiration for the present research were published in the CIB-W096 Proceedings of the Architectural Management in the Digital Arena conference, Vienna (El. Reifi and Emmitt, 2011), and in the Architectural Engineering and Design Management journal (El. Reifi and Emmitt, 2013).

The outcome of El. Reifi and Emmitt’s (2011) study was based on empirical research. This involved 125 questionnaires being completed by industry practitioners working in the UK: 17 architects, 15 design managers, 38 project managers, 5 coordinators, 28 engineers, 12 quantity surveyors, and a further 10 people in construction-related roles varying from a key account director, marketing manager, managing director and director of architecture. The study helped to establish that this field had not been well explored to date, despite being a topical issue. This was in line with similar prior studies which claimed that a clear definition of what is meant by Lean Design is still debatable (Brookefield et al., 2004; Walker, 2008; Jørgensen and Emmitt, 2009; Ballard and Tommelein, 2012; Rybkowski et al., 2013; Saurin et al., 2013; Sjögren Leong et al., 2015). The main study findings in general revealed that there are a number of shortcomings in design management processes and practices in the UK construction industry. Those shortcomings were traced back to inefficiencies in the design process in the construction business. This finding is in line with
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the results of prior similar studies which claimed that delays in projects, budget overspends and, in many cases, less value being delivered to the client, are related to the early design phases (Hansen and Vanegas, 2003; Tilley, 2005; Jørgensen and Emmitt, 2008; Ballard, 2012; Macomber et al., 2012; Denerolle, 2013; Do et al., 2014; Gomes Miron et al., 2015). El Reifi and Emmitt (2011) found that inefficiencies exist in the design process because of the nature of the process itself and the ways in which it is managed; these inefficiencies generate waste that must be eliminated. This waste results from the human activity and current applications of the design process. According to the study, the waste that is often experienced in the design process is mainly generated because of an inadequate brief and creeping escalation in a project’s scope (El Reifi and Emmitt, 2011; 2013). Broadening the distribution of value to different stakeholders may therefore be achieved by gaining a better understanding of a client’s complexity (Bertelsen and Emmitt, 2005; Sfandyarifard and Tzortzopoulos, 201; Brito and Formoso, 2014). Further waste is generated through poor design management (e.g. the lack of an efficient flow of information and overly complex designs, design teams often do not appreciate that many clients are inexperienced, the brief may be poorly interpreted, the construction strategy might not be communicated early enough, and too many design alternatives might be offered, etc.) (El Reifi and Emmitt, 2011; 2013). Emmitt, (2007) highlighted the importance of mapping and understanding the information flows within the design management process, and understanding the waste associated with in this context. Similarly, in the mentioned author’s earlier study (El Reifi and Emmitt, 2011; 2013), it was agreed that time invested in the pre-construction stage would reduce waste generated in the later project stages (because of an inadequate brief), eliminate cost overruns, and allow both efficient construction and high-quality production (El Reifi and Emmitt, 2011; 2013). This is also in line with prior similar studies which emphasised the importance of managing the early design stage effectively and efficiently (e.g. Green, 1996a; Bowen et al., 1997; Hansen and Vanegas, 2003; Tilley, 2005; Tunstall, 2006; Emmitt, 2007; Ballard, 2008; Ballard, 2012; Macomber et al., 2012; Denerolle, 2013; Do et al., 2014; Gomes Miron et al., 2015).

The study clearly suggested that an inadequate brief has a negative impact on the design process and consequently greatly hinders effective design management (El Reifi and Emmitt, 2011; 2013). Clients are asked to put forward all of their requirements early on
without ensuring sufficient background project knowledge; as a result, clients are directed, in some way or other, to make assumptions and therefore designs are worked out based on soft assumptions that are liable to change. Perhaps, in such a case, inefficiency needs to be appreciated and not claimed. Hudson (1999) stated, “Briefing is of great importance as it is the means by which the client makes the building’s intended functions known to the architect”. However, it is questionable whether the client has sufficient background project knowledge to do this. It is furthermore more important to question whether current briefing process practice is adequate to support client in doing so.

1.2.2 Briefing Process

According to the RIBA Plan of Work (2013), the brief is developed between Stage 1 (Preparation and Brief) and Stage 2 (Concept Design) and should not be altered after this point (Final Project Brief). Generally, the development of the brief through Stages 1 to 2 is divided into two major stages: The Initial Project Brief at the end of Stage 1 and the Final Project Brief at the end of Stage 2. The Final Project Brief is developed from the Initial Project Brief and the design is planned to be developed from this. Emmitt (1999) stated, “good design comes from a well-managed brief. Vague briefs waste time because additional effort is required to define the problem further down the line, leading to the possibility of an unsuitable design which in itself will need time to resolve”. Ensuring that requirements are clearly identified early in the briefing process results in avoiding change and the effect of mistakes and omissions, as well as significant improvements in product quality, better client relations, and savings in terms of both time and cost (Hansen and Vanegas, 2003; Emmitt, 2007).

However, the existence of inadequate briefs in the UK construction industry has suggested inefficiency in briefing process practices. Reviewing the briefing literature highlighted that there is no formal education of professionals in briefing, and there are no general accepted methods and procedures. Barrett and Stanley (1999) undertook a major empirical investigation of briefing in the UK, and observed that briefing is conducted in many different ways dependent on the experience of the individual professional. Additionally, the literature revealed two main schools of thought on briefing process mechanism practices in the UK construction industry. The first school believes that the brief should be static, where the client requirements and all other relevant information about the
project are established, collected, identified, agreed, fixed and eventually delivered in the form of a briefing document before the design commences (e.g. Barrett and Stanley, 1999; Kamara and Anumba, 2001). The other school sees the brief as a dynamic process where an on-going activity starts with project inception develops through the design stage and eventually needs to be finished before the construction stage (e.g. Nutt, 1993; Salisbury, 1998; Yu et al., 2007; Blyth and Worthington, 2010). Emmitt (1999) claimed that “Having a static brief is a practical policy from a management and client relation perspective as it limits the evolving of client requirements and reduces the problems that come because of the communication gap between client and the project team”. However, at the same time he admitted that “this ignores the reality of design creativity and innovation in the construction industry”. Conversely, Blyth and Worthington (2010) stated that, “to provide both inspiration to client and a framework for design and construction practitioners, the process of briefing must be seen as an iterative, creative process, a journey to support the client, design and construction teams in achieving the users’ expectations”. The earlier study by the author of this research revealed the existence of these two divergent schools of thought in current briefing practices in the UK (El-Reifi and Emmitt, 2011; 2013).

There have been calls on the UK construction industry to apply more effort and resources to the definition and articulation of project requirements and to the understanding of the client’s needs, thereby realising maximum value for all clients (end-users and stakeholders) (Latham, 1994; Egan, 2003). Accordingly, the briefing literature has reported alternative views, remedies and suggestions for improving construction briefing (e.g. empowering the client (Barrett and Stanley, 1999); the application of automation and IT support tools (Kamara et al., 1999; Bouchlaghem et al., 2000; Cheong et al., 2003); the value management methodology, facilities management and risk management approaches (Green, 1996a; Kelly et al., 2005; Othman, 2005; Kiviniemi, 2005; Jallow, 2011); applying Quality Functional Deployment (QFD) and the House of Quality (HoQ) (Kamara et al., 2002); an organisational knowledge-creation perspective during project definition (Kao, 2004); and a framework for achieving the whole live value of the healthcare sector during project definition (Sengonzi, 2011). However, despite all that, the issues around briefs mentioned above; e.g. the concern with static and dynamic process views, and evolution in client requirements, have remained unresolved and have continued to present challenges to the
construction delivery process and the effectiveness of the briefing (El.Reifi and Emmitt, 2011; 2013).

Brown (2001) stated that, "expectation and goals may change throughout the project, as the knowledge base develops and additional contributors join the project". In what is categorised as static briefing, the process drives the indirect evolution of the requirements throughout the design process and in most cases even over the construction stage. This is because the client is asked to provide requirements without ensuring that they have established sufficient knowledge of the project to do so. Similarly, in what is regarded as dynamic briefing, the process is left too flexible and there are space or drivers for requirements to evolve and change throughout the design process. However, the client still cannot make all of their decisions at the design stage for the same reason as in the static practice. In both cases, design and construction are allowed to proceed based on inappropriate decisions. Those decisions, most likely, will change over time because in most cases the decision is not made based on sufficient project knowledge or a well-established vision (Brown, 2001; Kiviniemi, 2005).

Ries (2012) stated, “we must learn what customers really want, not what they say they want or what we think they should want”. With regard to effective design management, the briefing process requires clear and adequate understanding of the requirements at the very early stages and is always referred to in the design development process. Unfortunately, none of the mentioned schools of briefing processes facilitate this. There is a need to dig out a system that truly helps the client to articulate their conscious and hidden requirements and builds a shared understanding of what value is and how it needs to be delivered; a need to reinvent a method that helps the client to make the right decisions comfortably by establishing the necessary bases to support that. The client needs to be made smarter and learn about the building early on in the project, long before the architect sketches the concept design.

1.3 Statement of the Research Problem

Briefing is the process by which client and project requirements are captured, and through which project value is identified. It occurs at the front end of the design stage. It initiates the design and controls it throughout the design process. Inefficiency in the briefing process
leads to the creation of inappropriate design deliverables. It has a consequence implication on the efficiency performance of design management. From a Lean Management perspective, it is clear that large chunk of waste in the design management process come from inefficiency in the briefing practice (El-Reifi and Emmitt, 2011; 2013). This waste contributes, directly or indirectly, to the waste experienced in both the design and construction phases. This will undoubtedly be extended into post-occupancy. The inefficiency in the current briefing process has been well established in previous research (e.g. Green, 1996a; Smith et al., 1998; Barrett and Stanley, 1999; Bouchlaghem et al, 2000; Tunstall, 2006; Emmitt, 2007; Yu et al, 2007; Mogers et al, 2008; Han et al, 2011; Sfandyarifard and Tzortzopoulos, 2011; Tillmann et al., 2012a; Koskela et al, 2012; Viana et al, 2012; Koskela et al., 2013; Brito and Formoso, 2014; Mryyian and Tzortzopoulos, 2014; Formoso et al., 2015; Pikas et al., 2015a). Hence, improving brief process practices is essential in order to better capture client and project requirements for effective design management.

A review of the Lean Design Management literature (e.g. Koskela et al., 1997; Ballard and Reiser, 2004; Lichtig, 2005; Macober et al, 2005; Tilley, 2005; Ballard, 2008; Tribesky and Sacks, 2011; Forbes and Ahmed, 2011; Ballard, 2011; Pennanen et al., 2011; Kemmer et al., 2011; Formoso et al., 2011; Tezel et al., 2011; Tillmann et al., 2012b; Sayer and Anderson, 2012; Lee et al., 2012a; Lee et al., 2012b; Ballard, 2012; Macomber et al., 2012; Ballard and Tommelein, 2012; Denerolle, 2013; Dave et al., 2013; Oliva and Granja, 2013; Pishdad-Bozorgi et al., 2013; Ballard and Pennanen, 2013; Do et al., 2014; Kaushik et al., 2014; Melo et al., 2014; Khan and Tzortzopoulos, 2014; Taggart et al., 2014a; Wesz et al., 2014; Arroyo et al., 2015; Pikas et al., 2015a; Gomes Miron et al., 2015; Melo et al., 2015; Khan and Tzortzopoulos, 2015) revealed that no publications have addressed briefing. What if we found ourselves building something that nobody wanted? In that case it would not matter even if we did it on time and on budget. Ries (2012) stated that, “what matters is not setting quantitative goals but fixing method by which those goals are attained”. Similarly, reviewing the briefing literature revealed that there is a major knowledge gap in the field, as it is striking to note how little attention has been given to resolving the original sources of inefficiency in briefing practices. Most previous approaches and research regarding briefing have focused on how better to manage the consequences of inefficiency in the briefing process and mitigating the risk of its result, and/or for a specific client through the
introduction and employment of different tools or approaches to the current briefing processes. None of them try to deal with the origin or source of the problem and why it occurs, hence the importance of this research, which is trying to address the problem at its point of origin.

There is a fundamental problem in the practices around the briefing process in the UK which makes it inadequate for carrying out design tasks efficiently. It appears from the literature and from the author’s earlier study that the existing conflict with regard to the divergent briefing mechanism practices (static or dynamic) represents the basis from which the inefficiency in briefing practice could be resolved. The two opposing notions need to be appreciated as both judgements are reasonable. However, neither concept has a strong theoretical basis that would make it supportive of effective design management. Barrett and Stanley (1999) indicated that much of the practice advice has been provided based upon a perspective of the construction process being purely rational, and thus appears to have had little impact on briefing practices.

The best way to understand waste is to explore the ways in which processes and people interact and discover how and why people have had to adopt and work around or leave the process (Terry and Smith, 2011). Waste elimination requires a deep understanding of the system of value creation and measurement of steps and/or actions against the definitions of value and waste. Ries (2012) stated, “Information is the designers’ raw material, what is missing is the process that controls the raw material into a real world”. Rethinking the briefing process and developing a new one that can address both views regarding its practice (fixed and dynamic) is essential, as failure to achieve an adequate brief will lead to the project going off the rails. An ideal solution may be found by using a systematic approach at a strategic level. However, Ballard and Howell (2003) advised that “the LPDS [Lean Project Delivery System] is far from a completed work as much remains to be done in the development of lean principles and techniques for the design, operation and improvement of project-based production systems”. Thus, the far greater challenge for the implementation of Lean Design Management lies in developing a new alternative briefing perspective using Lean Management principles. This could help in establishing a systematic approach to managing the brief based on the main ideas of the Lean philosophy, "Do it Right the First Time", helping to reduce uncertainty in the design phases and hence improve performance.
This PhD project represents an attempt to fill this gap in knowledge and contribute to the literature on briefing, as well as on Lean Design Management implementation. Accordingly, the challenge at the heart of this research was to identify the best means through which to deliver effective project briefs through focusing on enhancing briefing process practices using Lean Management principles.

1.4 Research Aim and Objectives

The research aim is to generate a novel Lean Briefing Process for effective design management and to explore its validity within AEC projects by looking at Lean theory and the application of Lean Design Management. In this context, the project’s validity refers to the contributors’ businesses’ and customers’ satisfaction with the final product. This will be achieved via a set of objectives which are:

- **Objective 1**: Establish the importance (function and value) of the brief in relation to the project, and the influence of its process on design management efficiency.
- **Objective 2**: Develop a conceptual Lean Briefing process model.
- **Objective 3**: Generate the Lean Briefing concept.
- **Objective 4**: Design, develop, and validate a Lean Briefing concept and approach.

The new Lean Briefing perspective (concept and approach) is meant for construction organisations in the UK and is aimed at enhancing briefing process practice, and consequently delivering a project brief which adds value to the design.

1.5 Primary Research Questions

The focus of this research was to address the question of how implementing Lean Management principles in the briefing process could support delivering a design value-added project brief and therefore effective design management in the UK construction industry. However, based upon Maxwell's (1996) three types of questions for qualitative research, the key research questions were developed in terms of three types of understanding of the briefing process:

- Descriptive questions:
  - How is the briefing process carried out in current practice?
CHAPTER ONE

RESEARCH INTRODUCTION

- How does the process work, is it efficient?
- What are the bad briefing practices, as well as the good practices?

- Interpretive questions:
  - What is the general understanding of the brief concept from the practitioners’ perspective?
  - What is the deficiency in the briefing and what is its negative impact on design management?
  - What are the possible ideas towards improving its practice?

- Theoretical questions:
  - How can the briefing concept be understood from an alternative new perspective developed from the theory of Lean Management?
  - How can the briefing approach be improved using Lean Management principles?
  - What is the potential consequence of employing Lean Management principles in the briefing process?

1.6 Overview of the Research Methodology

Statements of the overall research aim and objectives were achieved through processing the research into seven major sequenced phases as shown in Figure 1.1: (i) conducting a comprehensive literature review, (ii) developing a conceptual Lean Briefing model, (iii) carrying out empirical research to investigate the briefing process, (iv) generating the Lean Briefing concept, (v) developing and designing the Lean Briefing approach (i.e. a management framework and an operational roadmap), (vi) verifying and validating the Lean Briefing concept and approach, and (vii) improving and presenting the final version of the Lean Briefing process.

As mentioned in Section 1.3, this research was developed from the author’s dissertation for Master’s degree (at Loughborough University, 2010) which explored the interpretation and application of Lean Design Management in the UK construction industry. The study outcomes (El.Reifi and Emmitt, 2011; 2013) which inspired this research pointed out a potential research problem (i.e. waste in design management is generated from ineffective project brief delivery). The present research, as a continuous development of the previous study, was based on both secondary and primary data. Secondary data was required to provide further insight into the research problem and to frame it in the context of the
literature related to the subject of the research problem. This was helpful because it provided a solid foundation for this research. An extensive literature review on the design process, briefing (architectural programming), design management, and Lean Management, together with its implementations, was conducted by accessing relevant texts, books, professional journals and publications. This helped in gaining a deep understanding of the research focus area, discovering the latest developments, and therefore confirming the knowledge gaps with respect to this topic and the importance of improving briefing process practices in the UK construction industry. This provided essential background knowledge prior to conducting the empirical investigation. It helped to establish problem statements, set up the research aim and objectives, develop the research questions, and inform the research design and methodology for collecting primary data and accomplishing the stipulated objectives.

![Figure 1.1 Research phases](image)

The literature review led to the author concluding that there was a need to conduct an in-depth investigation into briefing practices in order to better understand the situation and identify room for enhancing its practice in the context of Lean Design Management.
implementations. Accordingly, reviewing the research design and different research methodologies (see Chapter 4) helped in planning the research design and choosing the methodology. The research design and the adopted methodology were chosen to address these research questions and consequently respond to the aim and objectives of the research. The key methodology adopted in this research was a combined approach to data collection and analysis that was question-driven. The adopted philosophical position of this research was located within the relativist/constructivist ontology, interpretive epistemology, and value-laden axiology. However, ethical issues concerning data interpretation were considered alongside the whole research process, starting with the proper referencing of others’ work, including honest reporting of the research procedures and incidents, and ending with managing anonymity where it was required or requested.

A grounded theory research method was adopted in this research in order to achieve the research aim. The criterion of a good theory is understanding of meaning and intentions rather than deductive explanation. The interpretive research perspective suggests a more inductive approach to theory building. Similarly, the qualitative research paradigm allows scholarship and practice to come together. The researcher studied the situation in the industry via interaction with practitioners in construction organisations to explore briefing practice based on their experience and views. Thus, more emphasis was placed on using a qualitative paradigm; methodology premise.

Interviews and Focus group were used to collect primary data. In the early phase of this research, fifteen unstructured interviews supported exploring current briefing process practices, gaining a deeper understanding of the process across a range of construction industry practitioners’ experience and views, and identifying deficiencies in its practice and room for improvement as well as mapping good practices (see Chapter 5). Similarly, at the later phase of this research, six semi-structured interviews with experienced lean practitioners from the construction industry, together with one focus group and a semi-structured interview with practitioners form the UK construction industry supported exploring the implications of Lean Management principles on the briefing process, as well as validating the newly developed Lean Briefing perspective (see Chapter 7).

The primary data was collected from construction industry practitioners working in design companies and construction organisations. Those targeted practitioners from both
categories were mainly based in the UK, but additional data was also collected in this research from other geographical areas (i.e. Libya) by means of selecting some lessons from good practices in the briefing process. The main approach used to analyse the raw qualitative data generated from the interviews was the Interpretative Phenomenological Analysis approach. However, some other approaches were needed to support the main approach in achieving a robust research outcome. Thus, the Hermeneutics, and Series of Events and Critical incidents approaches were also used. Additionally, NVivo software was used as a data managing tool to organise and manage the qualitative data generated.

Chapter Four explains in detail the research design and the careful selection and justification of its methodology. This included critical appraisal to decide on which philosophical assumptions, research methods, research data collection techniques, and research data analysis approach were best to support answering the research questions, and achieving the aim and objectives of the research.

1.7 Research Scope and Assumptions

The scope of the research was predominantly confined to address deficiencies in briefing process practices within the UK construction industry context. Consideration focused on the pre-design stages of the RIBA Plan of Work project delivery stages (i.e. Stage 1, Preparation and Brief; and Stage 2, Concept Design), which are concerned with the understanding and identification of the client and project requirements. Particular attention was given to briefing process practice by means of achieving a design value-added project brief from a Lean Design Management implementation perspective. Therefore, issues relating to the project’s Strategic Definition were excluded from the scope of this research. However, although this research was intended to address deficiencies in briefing process practices within the UK construction industry context, investigating briefing process practice in other geographical areas by means of selecting lessons from good briefing practices was considered where it was accessible.

It was assumed that the chosen research design and the adopted methodology were the best possible strategy and tools for solving the research problem. It was also intended that primary data would be collected from construction industry practitioners representing a wide range of briefing practice experience and views. Thus, it was assumed that, the research
outcome would be based on the experience and views of those who chose to participate in the research, provided that the collected data reached its saturation level where no more new information continually emerged. It was further assumed that participants would be highly qualified and respond openly, honestly and accurately to the interview questions based on their personal experience and their individual abilities.

Last but not least, the research context was dictated partly by a general dearth of academic research specific to addressing waste in briefing process practices. Therefore, the research needed to investigate briefing practices in order to explore and identify the original source of waste in briefing process practices. It was assumed that having this identified would make it tangible, and then thus possible to address.

1.8 Significance of the Research

Lean Construction emerged as one of the essential approaches for driving the construction project improvement wheel and may in the near future become one of the key sources of efficiency in the UK construction industry, resulting in optimum practice performance and maximum competitive advantage. However, although the concept of Lean is well established in the construction stage (i.e. Lean Construction), this PhD research project represents an attempt to explore the concept of Lean in the briefing process as an alternative new perspective to address briefing practice deficiencies at their point of origin. Hence, the importance of this research lies in its attempt to fill this gap in knowledge and contribute to the literature on briefing, as well as on Lean Design Management implementations.

The outcomes of the research will help offering a deep understanding of the problematic issues connected with design management, the current processes and practices of the brief, and interfaces between Lean Management principles and the briefing process. Consequently, this will ease the implementation of Lean Management strategies within the design process. Furthermore, it is hoped that this research will also contribute to the theoretical understanding of Lean Design Management in AEC. It is hoped a that number of guidelines can be established to help better guide industry practitioners.
1.9 Thesis Structure

The research project encompasses two parts. Part one aims to build theoretical propositions through an extensive review of the existing literature on the briefing process in the UK construction industry and the associated inefficiency in its practice (Chapter 2); with a focus on potential practice improvement through the use of Lean Management principles in the briefing process within the context of Lean Design Management implementation (Chapter 3). Part two includes the empirical studies of briefing practices investigation and the identification of a potential briefing practice from a Lean Management perspective. The structure of this thesis was planned and organised in eight main chapters besides references and appendixes, as illustrated in Figure 1.2.
CHAPTER ONE RESEARCH INTRODUCTION

- RESEARCH INTRODUCTION
  - Research Context (Lean Design - Management) - Briefing Process
  - Research Problem - Aim and Objectives - Primary Research Questions
  - Overview of the Research Methodology - Research Scope and Assumptions
  - Significance of the Research - Thesis Structure - Definition of Terms

- BRIEFING FOR DESIGN
  - The Brief - Briefing Process (Forecast - Rehearsal) - Briefing and Design
  - Design Management
  - Lean Design Management
  - Inefficiency in the Design Process (Waste)
  - Understanding Value for Overall Project Value

- LEAN BRIEFING START-UP
  - Lean Briefing for Effective Design Management
  - Lean Management Theory - How Does One Apply Lean Thinking?
  - Limitations of the Current Briefing Process Practice
  - Rationale for Lean Briefing Process
  - Lean Briefing Process Conceptual Model

- RESEARCH DESIGN AND METHODOLOGY
  - Research Design - Philosophical Assumptions - Research Methods
  - Data Collection Techniques
  - Qualitative Data Analysis Approach & Technique
  - Research Design Roadmap

- DATA ANALYSIS AND DISCUSSION
  - Rationale for the Empirical Research
  - Empirical Research Preparation: - Interviews Survey
  - Analysis of the Interview Survey Data
  - Findings - Discussion of the Major Findings

- LEAN BRIEFING PERSPECTIVE
  - Rationale of the Lean Briefing Perception
  - Generating Lean Briefing concept
  - Developing a Lean Briefing approach
    (Management Framework and Operational Roadmap)
  - Lean Briefing Implementation - Lean Briefing value

- VALIDATION AND VERIFICATION
  - Lean Briefing Process (LBP) First Round Validation Phase
    (Interviews)
  - Lean Briefing Process (LBP) Second Round Validation Phase
    (Focus Group + Interviews)

- CONCLUSIONS AND RECOMMENDATIONS
  - Major Outcomes of the Research
  - Lean Briefing Process (LBP) for Effective Design Management
  - Achievement of Research Aims and Objectives
  - Research Originality and Contributions to Knowledge
  - Research Accuracy - Research Limitations - Research Recommendations

Figure 1.2 Thesis Structure
CHAPTER TWO

BRIEFING FOR DESIGN
CHAPTER TWO

2 BRIEFING FOR DESIGN

2.1 Overview

This chapter presents the literature review which was conducted in order to find more about the briefing and find gaps that needed further research. Several types of sources, including books, journals and accredited websites, were utilised to gain a deep understanding of the research subject. The comprehensive literature review involves two main phases. The first phase aims to understand the briefing process. The second phase turns the discussion to the implications of ineffective project delivery. First, the brief, its forms and contents, and briefing process perspectives and mechanisms are reviewed, followed by a review of the Project Brief in the context of the design delivery stages according to the RIBA Plan of Work, and design management in the construction industry. Next, ineffective project brief delivery is discussed in the context of the critical debate on Lean Design Management. Inefficient Project Brief delivery hinders effective design management within the construction industry by leading to ineffective design deliverables and therefore waste in the design process. This will be reviewed deeply in terms of the value and significance of understanding and identifying value early on in the front-end of the project delivery stages through the briefing process. The briefing process is the process by which value is defined and represented by means of precisely capturing client and project requirements in the Project Brief. Effective Project Brief delivery will positively contribute to value realisation over both the design and construction phases, and consequently to value capture at the end of the project delivery stages and over the project lifecycle.

This literature review helped in formulating the research problem and led to the next chapter where the researcher looks for an opportunity to improve the briefing process using Lean Management Theory to enhance its practice for effective design management, by means of Lean Design Management implementation. This chapter provides a background discussion regarding the need for a Lean Briefing Start Up.
2.2 What is the Brief?

In the construction industry, a client’s needs and requirements are normally presented in form of a “brief”, a document produced as an output of the briefing process. According to BS 7832 (1995), the Brief is “a working document which specifies at any point in time:

- The relevant needs and aims;
- The resources of the client and user;
- The context of the project; and
- Any appropriate design requirements

Within which subsequent briefing (when needed) and designing can take place”.

Kelly (2002) defined the Brief as “the first tangible step in any facility’s lifecycle. It is one of the most important because it sets the agenda for the remainder of the facility’s lifecycle from inception through to completion and use/operation, even perhaps its disposal”. It is the statement of requirements that should ideally contain everything a designer needs to know about the client’s project (Hansen and Vanegas, 2003).

2.3 What is the Briefing Process?

The briefing process (known as architectural programming in the USA) is the first and most important process in the conception process since it plays the vital role of presenting and communicating the client’s requirements to the design team. It constitutes the process by which the requirements of the client are identified and defined, and is also the process by which the client, either formally or informally, informs others of their needs and desires. In other words, it sets out, in detail, the client’s requirements (Construction Industry Board (CIB), 1997; Barrett and Stanley, 1999) and thus constitutes the formal method used for communication in the construction business. Briefing is a staged process, consisting of a sequence of clear and separate steps, with each stage having specific tasks and activities that need to be carried out in order to identify the client’s requirements. It is assumed that client requirements can be identified by passing through these sequential stages and fulfilling the predetermined tasks.
The briefing process comprises two main stages: the “Strategic Brief” and the “Project Brief” or “Design Brief” (Construction Industry Board (CIB), 1997; Green and Simister, 1999; Kelly, 2002; Kamara et al., 2002; CABE 2002; RIBA, 2007, 2013a). Figures 2.1 and 2.2 represent the key phases in the briefing process. The starting point of the first stage can be difficult to determine (Ryd, 2004) and it may not include designers or external consultants. However, the Strategic Brief stage is concerned with the client’s strategic goals and needs. It takes a long-term view of the project while also considering the project’s short-term needs and the operational requirements of the completed building. Ryd and Fristedt (2007) suggested that the “Strategic Brief springs from the current operational needs, but also takes a longer perspective and focuses on the operation’s strategic development plans, its prospects, and the building’s potential for adaptation for other uses”. In response to the Strategic Brief, the Project Brief stage (i.e. the Design Brief) of the briefing process constitutes the designers’ initial translation of the brief into technical design requirements. This stage allows the client’s requirements to be investigated, developed, communicated and translated into what forms the basis for a design. Pena and Parshall (2001) observed that a “construction briefing is a process leading to the statement of an architectural problem and the requirements to be met in offering a solution”. It is often argued that, since the briefing process sets the stage for a design and everything that then follows, it is of vital importance to client value creation (e.g. Smith et al., 1998; Yu et al., 2007).

**Figure 2.1 Development of the Brief (Source: Kamara and Anumba, 1999)**
CIB (1997) offered an overview of the activities that it considered fundamental to a successful project (Figure 2.3). In this chart, the strategic briefing process is divided into two key stages: Getting Started; Stage 1 and Defining the Project; Stage 2. The detailed project or design brief, however, is planned as part of Designing and Construction; Stage 4.

Figure 2.2 Levels and Timing of Briefs (Source: Blyth and Worthington, 2001)

Figure 2.3 Overview of the Activities Fundamental to a Successful Project (Source: CIB, 1997)
Similarly, Atkin and Flanagan (1995) proposed an eight-stage briefing process in which the briefing process overlaps with the design process. They suggested that the initial three stages which involve strategic briefing (i.e. Stage 1, Strategic Analysis; Stage 2, Client Analysis; Stage 3, Facilities Analysis) should be completed before moving on to the remaining five stages, which cover the project briefing (i.e. Stage 4, Statement of Need; Stage 5, Confirming the Need; Stage 6, Functional Brief; Stage 7, Concept Design; and Stage 8, Scheme Design).

Equally, Blyth and Worthington (2010) divided the briefing process into three principal stages: The Pre-project concerns the Strategic Brief; the Project concerns the Functional Brief, which translates the client’s requirements elicited in the Strategic Brief into building terms, thus establishing functional relationships, initial sizes, areas and volumes, and quality and image issues (Chung et al., 2009); and the Post-Project Phase feedback stage.

Ryd (2004) emphasised the importance of giving verbal explanations during the briefing process, while Yu et al. (2007) found that many practitioners believe that workshops are importance to establish effective communication between the client and design team. According to an industry survey carried out by Kamara et al. (2002), a variety of methods can be used in practice to collect information. These include discussions with stakeholders, examinations of initial client briefs, interviews, questionnaires, workshops, observation of clients and/or end-users at work, inspections of existing facilities, visits to similar facilities, and feedback from Post Occupancy Evaluations (POE). However, Blyth and Worthington (2001) categorised a list of methods (e.g. interviews and building visits at the pre-project stage, workshops and simulations at the project stage that can be applied depending on the stage of the process and the sources of required information.

During the briefing process, the initial set of requirements is seen as a first step in a series of interpretations of the client’s needs (Zeiler et al., 2006). Blyth and Worthington (2010) defined a briefing as “the process by which options are reviewed and requirements articulated with the brief as the product of that process”. They went on to describe the construction briefing as an evolving process which seeks to understand an organisation’s needs and resources in order to match these to the desired objectives and mission. In summary, the briefing process involves gathering, analysing and synthesising the
information required for the building process and then using it to inform decision-making and implementation (Kelly, 2002).

2.4 Briefing Formats

Literature on the briefing process was reviewed in detail and it was found that the information-processing perspective dominates the current literature in this field. However, two main briefing format approaches were identified in the construction industry. In the first, the briefing may be completed by the client’s organisation and presented to the designer in the form of general checklists and tables; these can then be used to develop a possible design solution. In the second format approach, the briefing is regarded as consisting of certain standard procedural stages which are followed to structure the process.

The first format, the checklist format, is examined first. The primary concept of briefings of this format consists of a standard set of topics and headings with key questions. These ensure that all the necessary information is collected and collated into briefing documents to be used as the outputs of each briefing stage. A number of published guides on the briefing process in the form of checklists and matrix formats have been proposed. These guide the client and the consultant through the briefing process which finally results in the production of a briefing document. For example, Salisbury (1998) offered a checklist to assist in the various stages of a brief as it develops and to cover the entire content of the final brief. Alternatively, based upon the Construction Industry Board CIB's (1997) briefing outputs for each stage, Hyams (2001) proposed four detailed checklists for different types of brief.

Matrix frameworks were developed as an advanced form of checklist and proposed as a primary briefing tool to ensure that all the necessary information is collected. In particular, based upon the assumption that a client’s requirements can be classified into several specific elements, the matrix framework identifies and categorises the required information in a hierarchical and prioritised structure. For example, Kumlin (1995) used the term 'matrix framework' to review three briefing tools proposed by Palmer (1981), Peña et al. (1977) and Duerk (1993), and proposed a 'branching diagram'. Alternatively, Leaman (2002) offered a detailed matrix called the 'targeted briefing' method which could be used to carry out a briefing service to a client in practice. In this system, a number of main headings and sub-
headings that need to be explored during the briefing are listed in a matrix structure with several key checklist questions. This aims to identify a client’s requirements in terms of assumptions and needs and expectations, while especially including 'outcomes' for POE consideration.

Similar to the assumption made by the matrix approach that briefing is an information-processing activity, brief formulation has been further advanced through the implementation of information management using Quality Function Deployment (QFD) and Information Technology (IT). QFD was advocated as a way of improving briefing using two requirements processing models. The first model, the Client Requirements Processing Model (CRPM) proposed by Kamara et al. (2002), focuses on a solution-neutral formulation of a client’s requirements, while the second model, the Client Project Definition Tool (CPDT) proposed by Fisher et al. (2000), focuses on capturing users’ requirements for buildings. QFD is defined as a method used in manufacturing industries for reconciling customers' needs and the business objectives of product development. Specifically, an advanced matrix chart called the House of Quality (HoQ) (see Figure 2.4) was put forward to support the first stage of QFD, while CRPM and CPDT were proposed for use as a support system to formulate a client’s requirements using a combination of a high-level matrix structure and a computer’s calculation function. The application of QFD, according to Fisher et al. (2000), not only allows all the necessary information to be checked by filling in all the charts, but also facilitates communication amongst team members. However, Bjornofoy and Bakken (2013), in a more recent study aimed at gauging the use of QFD in construction, asserted that although QFD can bridge the gap between a customer’s requirements and technical design, it does not take into account the human factor, illustrating the gap between the social sciences and the world of engineering.

Client requirements are assumed to be explicitly identified by converting the collected information (the inputs) into the brief (the output), where IT can be utilised to enhance the management of the information concerning these requirements. Thus, within the briefing context, IT is regarded as an enabler in managing the often huge amount of information electronically and efficiently (Yusuf, 1997). In short, the application of IT has been defined as “data capture, storage, manipulation and transmission” (Atkin et al., 1996).
Based upon the principles of QFD, both CRPM and CPDT interpret the briefing procedure in a similar way by applying the HoQ tool to the briefing process with different applications. For example, Kamara and Anumba (2001) argued that current briefing problems result often from inadequate involvement in the design process. They asserted that design is a subjective and solution-orientated activity that uses the briefing process to ascertain objectively the client’s requirements. In this regard, they advocated that these requirements should be defined separately and distinctly from other project requirements (e.g., site, environmental and regulatory requirements); they should also be non-solution focused and traceable (i.e., they should not rely on sketches and drawings) so that an objective prioritisation of the client’s requirements can be achieved and client satisfaction maintained. Based on this assumption, CRPM was proposed as a three-stage model: Stage 1, Define client requirements; Stage 2, Analyse client requirements; Stage 3, Translate client requirements into solution.

According to CRPM, the QFD matrix is required in the final stage to translate the client requirements into solution-neutral design specifications. Generally, CRPM serves as an interface between the client’s business needs and design requirements; it is therefore performed before any formal design development is undertaken (Kamara et al., 2002). From this point of view, briefing is a system-engineering process which ensures that a client’s requirements are established neutrally and objectively with the aid of the QFD matrix, and
without any design activities being involved. Kamara et al. (2002) also developed a computer-based application called 'ClientPro' to enhance the function of CRPM.

Correspondingly, the Client Project Definition Tool (CPDT) was proposed by Fisher et al. (2000) as a seven-stage briefing procedure within the context of the construction process as a whole. As with the procedural stages of briefing, the briefing process is divided into seven independent stages: Stage 1, User Research; Stage 2, Evaluation; Stage 3, Analysis and Measurement; Stage 4, Implementation; Stage 5, Specification; Stage 6, Verification; Stage 7, Review. Each stage involves specific activities intended to capture the user's requirements. In the CPDT model, the first three stages involve the collection of data concerning these requirements in order to establish the QFD matrix at Stage 4. The user's requirements are perceived as explicit forms of data and information that are then allocated to and stored in the 'boxes' of the charts in the QFD matrix, so, in this respect, CPDT is based upon the same ideas and assumptions as the conventional briefing matrix.

However, the proposed IT tools have tended to computerise the current briefing guidelines with the underlying assumptions of IT applications being still the same as conformist perceptions but in an electronic environment. The assumptions are that, firstly, the information required at every stage of the briefing is identifiable and can be generalised universally in advance; secondly, the relationships between these specific items of information are measurable and traceable. Kamara et al. (2001) acknowledged that while requirements may change over time, a clear statement of requirements and QFD is, nonetheless, necessary in order to map and manage these changes.

In its second format approach, briefing is regarded as following standard procedural stages to structure its process. Briefing has been defined as a process that consists of a set of identifiable and sequential stages, with each stage having specific tasks. The assumption here is based upon the notion that a client's requirements can be clearly identified by working through these sequential stages and completing the predetermined tasks. On this basis, briefing has been described as starting at the pre-project stage in order to set up the project strategy before any formal design action (e.g. strategic briefing) takes place. It is then on-going through the project stage (e.g. project briefing in parallel with the design stages) and eventually includes the POE. It has been concluded that the overall function of this approach is to review and monitor the progress of the briefing process. The process then
becomes manageable, since a clear procedural structure is imposed and each stage in the series is signed off. The stages of the procedure vary according to the approach adopted to manage and control the project.

One such approach is the RIBA Plan of Work (RIBA, 2007; 2013a). This is a sequential process which starts with the receipt of the client’s instructions and culminates in a detailed fixed or ‘static’ project brief before the design development commences. Figure 2.5 and Figure 2.6 show the briefing process in relation to the design development with reference to the stages of the RIBA Plan of Work (RIBA, 2007; 2013a). Other familiar briefing approaches include, for example, the Generic Design and Construction Process Protocol (Kagioglou et al., 1998) and British Property Federation (BPF, 1983).

![Figure 2.5 Briefing Process in Relation to Design Process (Extracted from RIBA, 2007)](image-url)

The procedural stages of a project briefing mainly focus upon the output of brief reports for each stage, rather than explaining the process itself. The briefing procedure is regarded as aiding the information-gathering activities by using checklists to encompass the outputs of each stage. It is assumed that both the briefing and design processes can be conducted systematically through a sequence of pre-set stages.
In addition, some experienced client groups who are positioned within relatively stable businesses or service environments (e.g. frequent property developers, supermarket chains, retail stores, the National Health Service, etc.) have tended to develop their own standardised brief formats for their projects (Green, 1996a).

![Figure 2.6 Briefing Process in Relation to Design Process (Extracted from RIBA, 2013)](image)

2.5 Brief Contents

The brief contains information for project implementation and should cover BS 7832 (1995):

1. The background, purpose, content and desired outcome of the project.
2. The function of the intended facilities and the relationship between them.
3. Cost and time target.
4. Instruction on procurement and organisation of the project.
5. Site and environmental conditions, safety, interested third parties and other factors which are likely to influence the design and construction of the facilities.

The Environmental Impact Assessment (EIA) associated with sustainable design is another essential element of the briefing process that needs to be assembled by the architect at the briefing stage (RIBA, 2013a). Architects have the responsibility to educate their clients about or at least draw their attention to sustainable design issues. In line with that, the project lifecycle as well as the maintenance system needs to be considered and identified in
the briefing stage so that support for the finished project’s planned life can be budgeted and considered throughout the design stages (Emmitt, 1999).

The international standard BS 7832: 1995 described the contents of a brief for building design. It provided a checklist for briefing contents in the form of three informative annexes on project identification, project context, aims and resources, and project design and performance. Each annex lists some objectives that need to be addressed (e.g. project scope, purpose, participants, etc. are identified in the project definition; project management, standards, etc. are identified in project context, aims and resources; site, space, etc. are identified in project design and performance). Eventually, these objectives in total form the brief. It is better explained in the BS 7832: 1995 performance standards in building: checklist of briefing; contents of brief for building design.

However, Schön (1983) found that architects commonly use conversation simultaneously with drawings as their method of communication; Eaton (1998) called this ‘speech-drawing’ communication in the briefing process. In this way, the results of the briefing process (i.e. the Project Brief) can be presented, not only in a formal written format, but also as figurative illustrations. For example, besides the written report, Hyams (2001) suggested five techniques to present the products of the briefing process: flow diagrams, relationship matrices, relationship diagrams, spreadsheet charts, and size visualisations.

2.6 Briefing Process Mechanism Practices

There are two schools of thought about briefing process mechanism practices in the construction industry. The first believes that the brief should be clear and should be fixed (static) at a specific point early in the project to allow the construction team to do its job. In this approach, client requirements and all other relevant information about the project are established, collected, identified, agreed, fixed and eventually delivered in a form of briefing document before the design commences (Kelly et al., 1993; Cherry, 1998; Barrett and Stanley, 1999; Pena and Parshall, 2001). This approach considers the brief, which should be frozen at a certain period, as an entity in itself, (Yu et al., 2006; Chung et al., 2009). Thus, briefing in this school of thought is seen as a one-off inception stage where the client’s requirements are identified in advance in order to guide the design and construction processes. Here, the main purpose of briefing is establishing the project’s objectives at the
outset before any formal action in terms of the design and construction processes are undertaken. For example, O'Reilly (1987) broadly divided the construction process into six stages: project initiation, the development of the brief, the design, gaining approvals, the construction, and the completion; to address the inceptive function of the briefing process.

However, in such cases, the client is seen as a single entity and a single point of contact to define the project’s requirements and to evaluate it upon its completion. Later on, it has been recognised that, in larger organisations, there are many relevant voices and a range of different needs. Moreover, very often there is a distinction between the owners and the occupiers of buildings, blurring the idea of who is the client (Newcombe, 2003). In practice, the client is often multi-faceted, comprising several different interest groups, with different and perhaps conflicting objectives (Green, 1996a). Boyd and Chinyio (2006) argued that because projects often take lengthy periods of time to complete, stakeholders can change; this is a challenge for the brief in attempting to meet their needs. Thus, this approach has limitations because of the inevitability of changes occurring during a project (Gray and Hughes, 2001), where changes which are made later during a project can lead to discrepancies and disputes in the longer term (Kamara et al., 2002). The main limitation of the one-off briefing process was recognised by Blyth and Worthington (2001) as not allowing options to be kept open to reflect changing circumstances during the project’s development.

Since this earlier view of the brief as a static document presented challenges to the construction delivery process, and because the effectiveness of briefings has remained problematic (Shen et al., 2004), an alternative approach has been proposed: the dynamic process. This school of thought views the brief as a dynamic process or an on-going activity which starts at the project’s inception and develops through the design stage and perhaps even to the construction stage, in order to support on-going discussion and to allow the clarification of requirements (e.g. Salisbury, 1998; Othman et al., 2004a; London et al., 2005; Yu et al., 2007; Blyth and Worthington, 2010). Accordingly, a design issue-based approach was proposed by Kumlin (1995), offering advanced procedural stages for the briefing process. This approach regards briefing as a continual process; it involves frequent interactions among the stakeholders as far as the construction stage (Barrett and Stanley, 1999; Blyth and Worthington, 2010). Barrett and Stanley (1999) defined dynamic briefing as
“the process running through the construction project by which means the client’s requirements are progressively captured and translated into effect”. In this respect, it suggests that the briefing process should be extended into the project stage, especially the design process, since it argues that briefing should be developed continuously alongside the design process. In addition, the briefing process is integrated with a set of design stages, while the design is developed sequentially (Salisbury, 1998; Blyth and Worthington, 2010).

In the design issue-based approach, the purpose of briefing is not to complete all the necessary information once and for all. Instead, the briefing is developed parallel with the design, with both processes being iterative and interdependent. Here, briefing is described as what needs to be done before subsequently conducting the design, which is described as how to do it. Briefing is developed alongside a series of design work stages in order to prepare briefs for the development of the design, so each stage has its own specific output. The function of briefing, therefore, is to set up the agenda or tasks for each design stage in order to establish the formal course of design actions. Thus, the purpose of briefing is to provide a documentary record of the decisions made and the conclusions of each stage of the design process in order to inform the detailed design activities which follow. Also, this approach emphasises the need to produce explicit and comprehensive briefs at an early stage, and then to adhere to them as closely as possible. Generally, because it is based upon a hierarchical approach to design, the design issues-based approach links briefing and design by identifying a set of issues, objectives and concepts for design. Both the briefing and design activities start with the same considerations, as the briefing process is able to inversely reflect the design process: this resolves the problem of information overload and information sufficiency caused by the matrix approach.

The first school of thought (i.e. static briefing) was predominant in the 1980s, while the second (i.e. dynamic briefing) gained more support in the 1990s (Green, 1996a) and becomes the predominant trend in the literature (Ryd, 2004). However, from a project management point of view, each stage should be completed and approved before moving on to the next (Kwakye, 1997). Similarly, in the field of building design management, the briefing stage is also regarded as providing a clear method of communicating the design tasks and objectives between one stage and the next (Gray et al., 1994). All of the decisions
made at the briefing stage guide the later design activities. In this respect, project objectives are supposed to be identified fully at the outset of the project.

Emmitt (1999) claimed that, “Having a static brief is a practical policy from a management and client relation perspective as it limits the evolving of client requirements and reduces the problems that come because of the communication gap between the client and the design team. However, this ignores the reality of design creativity and innovation in the construction industry”. With dynamic briefing, there is a great deal of collaboration between the design team and the client; this reduces the chance of the client’s requirements being misinterpreted (Emmitt, 2007). Thompson (2006) further argued that dynamic briefing helps to capture a client’s values because the client is very much involved. Yu et al. (2007) described the project brief as a change management document, while Othman (2004, 2005) proposed dynamic briefing via the techniques of value management and risk management. Their approaches seem to revolve around more structured decision-making in relation to change, where value and risk are considered systematically (via value and risk management techniques). Moreover, experiences are documented throughout the project lifecycle (including the post-completion stage) to improve future briefing processes. These value and risk management techniques allow the brief to be tested against the priorities and objectives set out in the strategic brief (Thompson, 2006). A value management review enables a clear understanding to be reached by clients, users and designers (Thompson, 2006).

Hudson (1999) stated: “Briefing is of great importance as it is the means by which the client makes the building’s intended functions known to the architect”. The design team is responsible for creating a physical model of the client’s concept. To do this, they combine the client’s requirements with their own skills, knowledge and experience. Thus, an effective briefing process has an important role in ensuring that the project is delivered according to the client’s requirements, since it bridges the communication gap between the client and the design team. Emmitt (1999) stated, “Good design comes from a well-managed brief. A vague brief wastes time because additional effort is required to define the problem further down the line, leading to the possibility of an unsuitable design which in itself will need time to resolve”. Blyth and Worthington (2010) advised keeping options (decision-making) open for as long as possible, while effective communication and active listening in the briefing process allow communications to be free-flowing (Yu et al., 2007). It is clear that client
satisfaction cannot be achieved at the end of the project if the main concept has not been fulfilled, and so good briefing practice clearly states what has been agreed and what is still to be agreed by a certain time; wrong decisions are often made at the wrong time (Emmitt, 1999; Blyth and Worthington, 2010). However, it is questionable whether current briefing practices serve this purpose.

2.7 Briefing Process and Design Process

Lawson (1997) stated: “Design is both a noun and a verb. It can refer either to the end product or the process”. Designs (i.e. as a noun) in construction differ from one to another as they represent the different requirements or needs of different stakeholders; they also express the thinking and ideas of different architects whose ideas are, in turn, affected by factors such as their culture, education, etc. Design (i.e. as a verb) in construction is a problem-solving process which is considered to be endless, since there is an infinite number of design solutions and no single solution is likely to be the best option for all stakeholders. However, because of the reality of project timeframes in construction, a design needs to be developed through three key elements: imagining, presenting and testing (Koskela et al., 1997; Kroll and Koskela, 2012; Koskela and Ballard, 2013; Koskela et al., 2014).

Hansen and Vanegas (2003) claimed that it is necessary to have a base to work from in judging and evaluating designs at the end, and they listed the following design performance measures (DPMs) as judgement and evaluation factors:

- Flexibility: upgradeability, adaptability, expandability.
- Aesthetics: character, human comfort/security, proportion and scale, material palette, lighting, landscaping.
- High level of engineering performance: showcase, HPS components.
- Environmental friendliness: impact on the environment, energy efficiency, material flow, choice of materials.
- Accessibility: ease of entry, multiple circulation paths, controlled access, location of space, communication.
- Constructability: construction efficiency, low impact.
- Maintainability: clean ability, reparability and site maintenance.
The client, architects, engineers, quantity surveyors, design manager and project managers are involved in the design process, each having their own task. The project's first call comes from the client to the architect, who then calls for project managers, design manager, engineers and quantity surveyors. Client needs and requirements play a vital role in decision-making, since they are the basis upon which clients judge their satisfaction with project outcomes. O'Reilly (1987) noted, “Defining client requirements as well as communicating them to other stakeholders are key to the successful delivery of a project”. Hence, in order to ensure that client needs are met and satisfied, it is important that they are understood at the very early briefing stages and always referred to in the project development process. It represents a cornerstone for achieving client satisfaction (Othman, 2004b).

As already mentioned there are several frameworks for the design process in the construction industry that set up the briefing and design stages in a sequence process. However, as the most popular is the RIBA Plan of Work, and as it is of interest to this research, the focus will be on the RIBA design process. According to RIBA (2013a), the briefing and design process within construction is defined over the first five stages of the overall project delivery cycle. The objectives of each of these stages are explained in the RIBA Plan of Work 2013. Within these stages, the briefing process is divided into the first three stages - Stage 0 Strategic Definition, Stage 1 Preparation and Brief, and Stage 3 Concept Design - of the entire seven work stages for the project process. Generally, the development of the brief from Stages 0 to 2 is divided into two major stages: Strategic Briefing and Project Briefing. The Strategic Brief is when the client’s needs are developed into an agreed output specification, while the Project Brief is when the strategic brief is developed into a detailed design brief from which the design can proceed (CIB, 1997; Kelly, 2002; Kamara et al., 2002; CABE 2002; Yu et al., 2006; RIBA, 2007, 2013). The project brief, according to the RIBA Outline Plan of Work 2013 is developed between Stage 1 (Preparation and Brief) and Stage 2 (Concept Design), and should not be altered after this point (Final Project Brief). However, to start the Project Brief stage of the briefing process, a Strategic Brief is needed from the client side at Stage 0, the Strategic Definition. Hansen and Vanegas (2003) defined the strategic brief as, “A statement of requirements that ideally should contain everything a designer needs to know about a client’s proposed project. It anticipates functionality, aesthetics, project costs, schedule, quality, safety, etc. It also sets
the tone for communication among project participants”. Briefing and design overlap at Stage 2 Concept Design, but it is suggested that briefing must cease finally before Stage 3 Developed Design. It is argued that no change should occur to the brief after Stage 3.

The design process from inception and feasibility stage to scheme design stage was outlined by Tzortzopoulos and Formose (1999) (see Figure 2.7). They further described (Figure 2.8) the required input for achieving the output associated with both delivering design alternatives and evaluating these alternative activities.

![Flowchart Outline Design Stage](Source: Tzortzopoulos and Formose, 1999)
However, the function of the briefing process, in terms of its relation to the design process, may be diverse because of the design methodology perspective. Briefing is most commonly viewed as a process for defining design problems. Most building design problems are described as ill-defined or wicked in a number of respects (Rittel and Webber, 1973; Simon, 1973a; Rowe, 1987; Lawson, 1997; 2006; Kroll and Koskela, 2012; Ballard and Koskela, 2013; Koskela and Ballard, 2013; Koskela et al., 2014). For example, Lawson (2006), from his empirical studies in architectural design practice, identified three key characteristics of wicked design problems. Firstly, design problems require subjective interpretations; they cannot be comprehensively stated because a variety of participants with different interests and perceptions of design problems are involved. Secondly, many components of design problems do not emerge until some solutions have been generated through attempts to solve them. Thirdly, identifying design problems depends upon three functions: the approaches the designer adopts, the time that is available, and the nature of the working relationship between the client and the designer. This recognises not only the subjective nature of perceptions about building design problems, but also the importance of developing interactive working relationships in identifying such problems (Ballard and Koskela, 2013).

Green (1996b) reported two contrasting paradigms regarding design methodologies: the rational paradigm and the learning paradigm. These make distinct assumptions about the nature of building design problems, and therefore have different perceptions of briefing in relation to the design process. The rational paradigm proposes the earliest building design methodologies as following a prescriptive model, where designers are guided as to how the design should be carried out: it has a focus on problem-solving (Green, 1996b). Similarly, Lawson (2006) used the term route maps of the design process to describe the rational design
model, which is assumed to consist of a sequence of distinct and identifiable activities, which occur in some predictable and identifiable logical order. The most obvious example of this can be found in the RIBA Sequential Design Phases, which all follow each other sequentially but with a loop of unpredictable jumps (Lawson, 2006). The design process outlined by RIBA focuses mainly on what must be produced by the architect. So, in a sense, is architect-lead project management, but it lacks a description of the design process itself (Lawson, 2006, RIBA; 2007, 2013a; 2013b; 2013c; 2013d). Thus, in the rational paradigm, briefing is seen to be in a sequential relation to the design process and it is assumed that the briefing process will take place independently before the design process commences. So, while briefing is defined as the process of analysis to define the design problems, design is viewed as the process of synthesis which solves these problems sequentially (Koskela and Ballard, 2013). For example, Peña et al. (1977) argued that programming (briefing) is a problem-seeking process (analysis), in contrast to design, which is a problem-solving (synthesis) one. They emphasised that briefing is not design, as briefing may be regarded purely as a process of defining design problems before any design effort is commenced. In this regard, Peña et al. (1977) defined the briefing process to include the following characteristics:

- Briefing is an organised process based on standard procedures, which need a rational framework to analyse and classify the information, and to set the priorities.
- Through communication with clients collectively, briefing is processing raw data into useful information to inspire clients to make decisions.
- The decisions made during the briefing process can minimise the number of alternative design solutions in order to save time and money consequently.
- The end product of briefing is the statement of the problems, which serves as the first step in design.

Similarly, Cherry (1998) applied system thinking to distinguish between briefing and the design process, defining briefing as a process to achieve a complete performance specification. According to Cherry (1998), having a separate briefing process offers the opportunity for issues, prejudices, and conflicts to be revealed at an early stage so that they can be resolved before the design process commences, as most conflicts and issues can be examined and reconciled at the briefing stage, which is before the design stage begins. Also,
White (1991) suggested that one of the main functions of briefing is to launch the design, acting as a benchmark for both generating and checking the design. In this regard, the briefing is an independent stage which sets up the criteria which will be used to evaluate and guide the design process.

From another point of view, separating the briefing and design processes has been proposed to resolve the problems that occur in current briefing practice. For example, it has been suggested that the designers who will carry out the sequential design work should not be involved in the briefing, in order to avoid preconceived solutions being offered for problems (Bowen et al., 1999; Kamara and Anumba, 2001). Kamara and Anumba (2001) argued that involving designers can limit the effectiveness of the briefing in terms of identifying a client’s requirements. They proposed separating the briefing from the design in order to prevent problems in the briefing. Preiser et al. (1993) also pointed out that conflicts of vested interests might arise when the professional carrying out the briefing also carries out the design and construction. The possibility of supposed conflicts of interest is another justification for separating the briefing and the design.

In contrast to the rational paradigm, Green (1996b) asserted that the learning paradigm is primarily concerned with problem-framing rather than problem solving and helps the different participants to understand the different problem-frames by learning. Since building design problems are ill-defined or wicked in nature, defining such problems is no longer seen as a clear and thorough formulation process; instead, it is viewed as an interdependent and dynamic process that takes place alongside the development of design solutions. Furthermore, as Lawson (2006) suggested, identifying design problems depends upon the interactions of the designer’s approach, the time that is available, and the nature of the working relationship between client and designer. In this regard, defining design problems can be seen as a process of social understanding or learning which is based upon the working relationship between participants (Ballard and Koskela, 2013).

Classified within the learning paradigm, Darke (1979) identified a design process called the primary generator. This is a process of generator, conjecture and analysis instead of analysis, synthesis and evaluation. According to Darke (1979), architects tend to 'generate' a relatively simple idea (the initial solution) at a very early stage in the design process. This idea stems from their own preconceptions of the problems that will need to be solved and
their knowledge of previous solutions; they use these in order to narrow down the range of possible solutions. Then, this initial solution is examined as a conjecture in order to explore the problem further, while analysis is used to construct and test a scheme. In other words, designers often envisage design problems early, along with their pre-conceptualised solutions, before any rational analysis of data has been undertaken. Because of the ill-defined or ill-structured nature of design problems, their preconceived solutions may offer designers an opportunity to explore and understand design problems. Moreover, some experiments with regard to the building design process (e.g. Easterman, 1970; Koskela and Ballard, 2013) have found that in practice there is no meaningful division between analysis and synthesis in building design. Analysis is considered to be part of all the phases of the design process and synthesis can be seen to begin very early on.

Schön (1983) offered further insight into architectural design practice. He observed that, in order to formulate a design problem, an architect first tends to frame a design situation (i.e. setting boundaries, selecting particular aspects for attention, etc.), which normally cannot be worked out completely at the start of the design process. Schön (1983) argued that designing triggers an awareness of new design criteria but problem-solving triggers problem-setting. This notion of the design process not only demonstrates that the design process is inevitably subjective, it also changes the focus from being a problemsolving process to a problem-framing one. From this viewpoint, briefing can be seen as a process to establish a common platform for understanding what the problems are during the design process.

In contrast, Lawson (2006) described the design process as a negotiation which seeks to define the design problems and then generate solutions by a dynamic interaction between analyses, synthesis and evaluation (see Figure 2.9). According to Lawson (2006), the design process includes finding problems as well as solving problems, noting that design solutions create design problems.

Defining design problems and generating design solutions are considered, within the learning design paradigm, to be two on-going and interdependent processes. On the assumption that briefing is a process in which design problems are defined, briefing can therefore be regarded as intermingling with the design process. Under the learning design paradigm, therefore, rather than being separated from it, briefing is incorporated
interdependently with the design process in order to define the design problems with regard to the client’s requirements, because it is difficult to analyse design problems neutrally in the absence of any preconceived solutions. Lawson (2006) found that a brief is obtained through an on-going relationship between what is possible in architecture and what you want to do. Thus, briefing can be said to be an analytical process, in which everything you do will modify your idea of what is possible. Lawson (2006) further argued that, in practice, designing does not start with a brief directly, because a complete and comprehensive brief is difficult to achieve in isolation from the design process. Similarly, Blyth and Worthington (2001) concluded that “briefing is design, and briefing relies on design”.

![Figure 2.9 Problem and Solution Negotiation in Design (Source: Lawson, 2006)](image)

Therefore, it is difficult to identify clearly the boundary between the briefing and design processes within the learning paradigm, because it does not clearly and explicitly distinguish between the functions of the briefing and the design processes. From this point of view, the briefing is no longer an objective process of information collection and analysis, but is instead a subjective process of exploring and interpreting a client’s requirements; these requirements are then constructed and managed in order to facilitate an effective design process.

### 2.8 Design Management

Design management is an emergent field of research in Architecture, Engineering and Construction (AEC), with its roots going back to the 1960s and the early work of RIBA in the UK which aimed to promote better design management practices to architects. Parallel to this was the separate growth of generic design management literature that covered subjects such as industrial, product and fashion design. Within the construction literature, the subject started to be addressed in the early 1980s by Gray et al. (1994) and more recently within the...
covers of the AEDM journal (e.g Kpamma and Adjei-Kumi, 2011; Pasquire and Garrido, 2011). According to DMI (2012), “Design management encompasses the on-going processes, business decisions, and strategies that enable innovation and create effectively-designed products, services, communications, environments, and brands that enhance our quality of life and provide organizational success”. Design management simply manages design, people, technology, communication, and the flow of information between the various project participants through project stages (Gray and Hughes, 2001; Emmitt, 2007). In other words, it manages the design resources required for delivering the design as product (noun). Healthy design management leads to better building design development, and timely, better decision-making. However, Emmitt (1999) stated, “design management is not so much about the management of people as the management of the process, the better the framework for management the process the better the result”.

Plan, action, review, and feedback are the basic features of the framework for managing the design process without regard to the complexity and team size of the project (Sawczuk, 1992). Koskela et al. (1997) stated, “managing the design process to create a more solid conceptual foundation of design and engineering requires a framework in which three different views are considered: (1) design as a conversion of inputs to outputs; (2) design as a flow of information; (3) design as a value generation process for the clients”. However, Freire and Alarcón (2002) claimed that the design process in construction should be considered as a flow and value model rather than a conversion model (see Figure 2.10).

![Figure 2.10 Design Diagnosis and Evaluation Model (Adapted from: Freire and Alarcón, 2002)](image)

Sawczuk (1992) outlined the development of design management within the organisation and linked this development to the age and growth of the organisation. In the
early years of the organisation’s establishment, the founder plays all roles associated with the project, designing and maintaining the relationship and communication with the client (Figure 2.11/a). As the organisation grows and matures, it becomes difficult for the founder to play both roles, so putting in place a management system is essential for maintaining multiple projects. This management system works as mediator between the client and designer (Figure 2.11/b) for each project. With the further growth and maturity of the organisation, the need to assign a design management role, which manages and maintains the relationship between the management system and the design, is raised (Figure 2.11/c).

According to Sawczuk (1992), growth and maturity are linked with handling more work in the organisation. However, it should be stated that not only ‘more work’ in terms of more projects but the projects’ size is also an important factor controlling the development of design management within the organisation.

![Diagram](image1)

**Figure 2.11 Development of Design Management (Source: Sawczuk, 1992)**

Traditional methods of project management are used to manage the design process, but in using these, the complexity of the relationships between the fundamental principles of project management and the transformation model/theory of production work as obstacles which hinder the process of finding effective solutions to failures to manage the design process; this can result in poor levels of performance (Gray and Hughes, 2001; Bibby et al., 2003; Emmitt et al., 2004; Tilley, 2005; Emmitt, 2007; Han et al., 2011; Kemmer et al., 2011; Ballard and Tommelein, 2012; Koskela et al., 2012; Viana et al., 2012; Koskela et al., 2013; Sarhan et al., 2014; Taggart et al., 2014a; Formoso et al., 2015; Pikas et al., 2015b). The project management approach also needs to be sufficiently flexible and constantly changing.
Effective design management is important for the success of the construction process as a whole (Bibby et al., 2003), while the efficiency of any construction project is affected by the efficiency of the design process in one way or another. Egan (1998) emphasised that a great deal of time and effort is spent on site in trying to make designs work. However, in many cases, insufficient value is delivered to the client. Such problems have made experts within the construction industry think seriously about such issues in order to discover better ways of managing projects more efficiently, as time invested in the pre-construction stage would reduce waste, eliminate cost overruns and allow both efficient construction and high-quality production. Previous research has indicated that material and information flows and the generation of good value for customers and end-users may be achieved effectively using Lean design management to reduce waste (Bibby et al., 2003; McCarron, 2006; Tilley, 2005; Bagley and Lewis, 2008; Tribelsky and Sacks, 2011; Thyssen, 2011; Sfandyari-fard and Tzortzopoulos, 2011; Salvatierra-Garrido and Pasquire, 2011; Kemmer et al., 2011; Tillmann et al., 2012b; Ballard and Tommelein, 2012; Hentschke et al., 2014; Brito and Formoso, 2014; Khan and Tzortzopoulos, 2015). Hence, developing an efficient design management system for the design of construction projects is very important for the overall performance of this industry. Latham (1994) also noted that effective design management is crucial to the success of a project.

Thus, in order to achieve more efficient and better quality outcomes, Lean Design Management (LDM), (or the introduction of ‘Lean Production’ principles to the process of design), has been promoted as a new approach. Moreover, these principles can be used to manage the development and production of documents which become more and more detailed, until they reach a stage where they are suitable for use in planning, budgeting, estimating and eventually constructing (Koskela, 2004; Tilley, 2005; Kemmer et al., 2011; Rybkowski et al., 2013; Ballard and Tommelein, 2012; Khan and Tzortzopoulos, 2015).
2.9 Lean Design Management

Many construction projects suffer from delays and uncertainty in terms of cost because of mistakes and changes in the projects' drawings and documents, and the need to then amend them, which may resulted in rework and, in many cases, the customer or client not being satisfied with the final product (Latham, 1994; Egan, 1998, 2003; Tillmann et al., 2012a; Do et al., 2014; Kaushik et al., 2014). The importance of managing the early design phases effectively and efficiently to reduce uncertainty and improve quality has been relatively well appreciated and highlighted in previous research, although it is not so clear as to how best to do this (Bowen et al., 1997; Green, 1996a; Hansen and Vanegas, 2003; Tilley, 2005; Bertelsen and Emmitt, 2005; Tunstall, 2006; Ballard, 2008; Ballard, 2012; Macomber et al., 2012; Denerolle, 2013; Do et al., 2014; Gomes Miron et al., 2015). Despite this, much effort has been, and continues to be, expended on the construction phases, with initiatives such as Lean Construction trying to deal with challenges that many would argue should have been dealt with in design.

The early stages of a project lifecycle in a construction project consist of briefing and design; delays in many construction projects have been linked to deficiencies in their process practices. Ineffective information flow, communication and decision-making in the design phase are the cause of many of the problems that then have to be tackled later in the construction phase (Green, 1996a; Barrett and Stanley, 1999; Tunstall, 2006; Emmitt, 2007; Han et al., 2011; Sfandyarifard and Tzortzopoulos, 2011; Tillmann et al., 2012a; Koskela et al., 2012; Viana et al., 2012; Koskela et al., 2013; Brito and Formoso, 2014; Mryyian and Tzortzopoulos, 2014; Formoso et al., 2015; Pikas et al., 2015a). Project management deficiencies have also been shown to have a negative impact on the efficiency of the construction process in terms of the waste generated and contract variations occurring during construction, while the success of a project and the value realised are highly dependent on the decisions made during the very earliest stages of a project’s development (Emmitt et al., 2004; Tilley, 2005; Thyssen et al., 2008; Salvatierra-Garrido and Pasquire, 2011; Sfandyarifard and Tzortzopoulos, 2011, Tillmann et al., 2012a; Tillmann et al., 2012b; Brito and Formoso, 2014). There have been calls on the UK construction industry to apply more effort and resources to the definition and articulation of project requirements and to the
understanding of the client’s needs, thereby realising maximum value for all clients (end-users and stakeholders) (Latham, 1994; Egan, 2003).

Ensuring that client and project requirements are right early on through firm control of briefing, design and efficient design management results in avoiding the effects of mistakes and omissions, as well as significant improvements in product quality, better client relations and time and cost savings (Hansen and Vanegas, 2003; Emmitt, 2007; Han et al., 2011; Mryyian and Tzortzopoulos, 2014). The concept of the Total Quality Management (TQM) rule better articulates the impact of reworking at different stages of a project. The rule indicates that the cost of defect identification goes up exponentially with each phase of development. It costs a factor of 1 in requirements: 10 in development: 100 in quality assurance, and 1,000 in production (Kanji, 1996; Oakland, 2000).

Improving the integration of project processes, design and construction has also been identified as a key to the successful outcome and performance of a project, as design cannot be considered completely separately from the construction process (Bogus et al., 2000; Brookefield et al., 2004; Jørgensen and Emmitt, 2009; Ballard and Tommelein, 2012; Tillmann et al., 2012b; Azari et al., 2014). Glenn Ballard (2000) proposed the Lean Project Delivery System (LPDS), which provides a means of addressing those shortcomings and improving the whole design and construction process. Ballard and Howell (2003) developed the Lean Project Management Model (Figure 2.1). This differs from traditional project management not only in the goals, but also in the structure of its phases, the relationship between phases and the participants in each phase. The LPMM comprises a number of phases that are similar to the traditional project phases, but organised in such a manner as to apply production system design principles to enhance the delivery of the whole project from predesign to completion and use. These phases are:

- Project definition
- Lean design
- Lean supply
- Lean assembly
- Use/completion
The phases are represented in the LPMM model as a series of overlapping triangles and influence each other, as shown in the figure.

![Lean Project Management Model (LPMM)](source)

However, according to Ballard and Howell (2003), "the LPMM is far from a completed work as much remains to be done in the development of lean principles and techniques for the design, operation and improvement of project-based production systems". With the assistance of Lean Project Consulting, Shutter Health developed the ‘Five Big Ideas’ approach (Figure 2.13), which is an attempt to coherently address each level of the project delivery system (Lichtig 2005). The observation of the Five Big Ideas facilitates the integration of Lean Design and Construction.

![Five Big Ideas](source)
The LPDS improves project delivery throughout the following characteristics identified by Forbes and Ahmed (2011):

- Downstream stakeholders are involved in front-end planning and design through cross-functional teams.
- Project control has the job of execution as opposed to reliance on after-the-fact variance detection.
- Pull techniques are used to govern the flow of material and information through network of cooperating specialists.
- Capacity and inventory buffers are used to absorb variability.
- Feedback loops are incorporated at every level, dedicated to rapid system adjustment (learning).

Applying Lean only within the construction phase makes it difficult to address the waste and value designed into the project. Lean Design has received little attention in the construction industry compared to research and applications of Lean in site production (Jørgensen, 2006). The LPDS was updated further to include additional concepts and methods drawn from the Toyota Product Development System, with the main interest towards the ‘value creation perspective’ and some propositions of applying QFD (e.g. Huovila et al., 1997a; Koskela et al., 2002; Lima et al., 2008), Target Costing and Design to Target Cost\(^1\) (Ballard and Reiser, 2004; Macober et al., 2005; Ballard, 2006, 2008; Pennanen et al., 2011; Zimina et al., 2012; Ballard and Pennanen, 2013; Melo et al., 2014) and Set-based Design\(^2\) (e.g. Ballard, 2000; Parrish et al, 2008; Lee et al., 2012a; Lee et al., 2012b).

Similarly, techniques such as the Design Structure Matrix\(^3\) (DSM) and the Last Planner System of Production Control for coordinating and scheduling design tasks have been promoted in several publications (e.g. Huovila et al., 1997b, Koskela et al., 1997, 1998, 1999).

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\(^1\) Target Costing and Design to Target Cost are both aimed at increasing value by improving product functionality without raising costs. However, the two approaches assume different points of view, which are the result of contextual differences: the Design to Target Cost approach was directed at reducing maintenance and operational costs, whereas the Target Costing approach was to produce profit management considering all costs and revenues that occur during the manufacturing lifecycle only (Jacomiti and Granja, 2011).

\(^2\) Set based Design is about the concurrent development of product solutions through the creation and explicit communication of sets (or ranges) of alternatives, which are all kept ‘open’ until the ‘last responsible moment’ (Ballard et al., 2007; Ballard, 2008).

\(^3\) The idea of DSM is basically to: (i) list all design activities in a matrix; (ii) identify interdependencies; and (iii) restructure the sequence of activities (through a mathematical algorithm) according to interdependencies and groups of coupled activities that produce information in a combined cycle, where the first activity needs information from the last activity and therefore must be solved in an iterative manner.
Hammond et al., 2000, Koskela et al., 2002; Hansen and Vanegas, 2003; Khan and Tzortzopoulos, 2014; Wesz et al., 2014; Khan and Tzortzopoulos, 2015). Also, the use of Process Protocols (Formoso et al., 1998; Tzortzopoulos and Formoso, 1999) and Value Stream Mapping\(^4\) (Freire and Alarcón, 2002) have been suggested as means for increased efficiency in the design phase. More recently, Building Information Modelling (BIM) has received more attention as a Lean enabler in Lean Design Management (e.g. Sacks et al., 2010; Forbes and Ahmed, 2011; Arayici et al., 2011a; Liu et al., 2011; Sayer and Anderson, 2012; Khan and Tzortzopoulos, 2014). However, a clear definition of what is meant by Lean Design is still being debated (Jørgensen and Emmitt, 2009; Alves, Milberg and Walsh, 2012; Rybkowski et al., 2013; Saurin et al., 2013; Sjögren Leong et al., 2015), a point further highlighted in the special edition of AEDM on ‘Lean Design Management’ (Vol. 7:2, 2011).

Similarly, focusing only on the design process may be equally problematic, given that Lean is a whole-system approach which aims to optimise the entire process, not parts of it (see e.g. Ballard, 2000, 2008; Ballard and Howell, 2003; Forbes and Ahmed, 2011; Ballard and Tommelein, 2012; Azari et al., 2014). Jørgensen and Emmitt (2008) stated, “Some ‘back to basics’ discussion on what is meant and implied by the terms ‘Lean Construction’ and ‘Customer Value’ would be helpful in establishing greater clarity. In particular, the role of designers and the effect of early design decisions on construction activities require further research”. However, given that the earlier design stages are under-researched compared with the construction phase within the Lean literature (see e.g. Ballard and Reiser, 2004; Lichtig, 2005; Macomber et al., 2005; Sacks, Koskela et al., 2010; Arayici et al., 2011a; Ballard, 2011; Jacomit and Granja, 2011; Han et al., 2011; Formoso et al., 2011; Pennanen et al., 2011; Kenmer et al., 2011; Liu et al., 2011; Zimina et al., 2012; Lee et al., 2012a; Ballard, 2012; Macomber et al., 2012; Lee et al., 2012b; Denerolle, 2013; Koskela et al., 2013; Oliva and Granja, 2013; Pishdad-Bozorgi et al., 2013; Ballard and Pennanen, 2013; Do et al., 2014; Kaushik et al., 2014; Brito and Formoso, 2014; Wesz et al., 2014; Melo et al., 2014; Mryyan and Tzortzopoulos, 2014; Khan and Tzortzopoulos, 2014; Gomes Miron et al., 2015; Melo et al., 2015; Khan and Tzortzopoulos, 2015; Pikas et al., 2015a), it is an area that would benefit from more attention, a point demonstrated by Thyssen et al., (2008) in their work on front-end loading in construction projects. Thus, the need to interpret and apply

\(^4\) Value stream mapping (VSM) is basically a mapping of existing processes and subsequent identification of wasteful activities (moving, waiting, etc.), and accordingly a reconfiguration of the (design) process via a process protocol. Its application is, however, most suitable to recurring/observable practices (which can be mapped) within, for example, a design company.
Lean Design Management has become an essential part of the Lean Project Delivery System (Ballarad and Howell, 2003; Hansen and Vanegas, 2003; Bertelsen and Emmitt, 2005; Tilley, 2005; Ballard, 2008; Rybkowski et al., 2013; Saurin et al., 2013; Sjögren Leong et al., 2015). There is need to obtain a deep understanding of the problematic issues connected with the current processes and practices in design management by identifying interfaces between Lean Management principles and the design process.

### 2.10 Interfaces between Lean Management Principles and the Design Process

The overall project’s final outcome depends on managerial control in the earliest phases in order to avoid the effect of mistakes and omissions. This involves effective information flow, clear design briefs, good communication and informed decision-making, avoiding poor design, and ensuring good quality documentation. Failure to do this often leads to higher costs, increased litigation and schedule delays in the construction phase, often leading to lower quality of the constructed artefact (Hansen and Vanegas, 2003; Tilley, 2005; Ballard, 2008; Formoso et al., 2011; Koskela et al., 2012; Viana et al., 2012; Koskela et al., 2013; Do et al., 2014; Formoso et al., 2015). Ensuring that requirements are right early on results in significant improvements to product quality, better client relations, and time and cost savings (Hansen and Vanegas, 2003; Emmitt, 2007; Salvatierra-Garrido and Pasquire, 2011; Sfandyarifard and Tzortzopoulos, 2011; Brito and Formoso, 2014; Hentschke et al., 2014).

Previous research has highlighted the importance of the early design phases in helping to reduce uncertainty and improve quality, and the importance of managing this stage effectively and efficiently has been made clear (Green, 1996a; Bowen et al., 1997; Hansen and Vanegas, 2003; Tilley, 2005; Tunstall, 2006; Emmitt, 2007; Ballard, 2008; Han et al., 2011; Kemmer et al., 2011; Kroll and Koskela, 2012; Koskela and Ballard, 2013; Ballard and Koskela, 2013; Koskela et al., 2014; Khan and Tzortzopoulos, 2014; Wesz et al., 2014; Khan and Tzortzopoulos, 2015). Management deficiencies have been shown to have a positive impact on the efficiency of the construction process in terms of the waste generated and contract variations occurring during construction, while the success of a project and the value realised are highly dependent on the decisions made during the earliest stages of a project’s development (Emmitt et al., 2004; Thyssen et al., 2008; Salvatierra-Garrido and Pasquire, 2011; Sfandyarifard and Tzortzopoulos, 2011, Tillmann et al., 2012a ; Tillmann et al., 2012b ; Brito and Formoso, 2014). Poor control of the early (brief and design) stages has
been identified as a major factor in reducing the overall performance and efficiency of construction projects (Hansen and Vanegas, 2003; Han et al., 2011; Sfandyarifarid and Tzortzopoulos, 2011; Tillmann et al., 2012a; Koskela et al., 2012; Viana et al., 2012; Koskela et al., 2013; Brito and Formoso, 2014; Mryyian and Tzortzopoulos, 2014; Formoso et al., 2015; Pikas et al., 2015a), often leading to lower quality of the constructed artefact (Hansen and Vanegas, 2003; Tilley, 2005; Ballard, 2008; Formoso et al., 2011; Tillmann et al., 2012a). Attention is turning towards this phase in order to address deficiencies.

Construction is a competitive environment which requires the employment of the best and most efficient practices in order to sustain competitive advantage in the market. The successful use of Lean Management in the construction stage, using principles largely developed by Toyota (Womack and Jones, 1996), has opened up the possibility of using them in the early design phases to enhance the whole system approach. This may help in establishing a systematic and consistent approach for managing construction projects in their entirety, helping to reduce inefficiencies (waste) and improve performance (value) (Thyssen, 2011) based on the main idea of Lean Philosophy: "Do it Right the First Time".

Research has indicated that material and information flows and the generation of good value for the customers and end-users, as well as transformations of inputs into outputs, may be achieved effectively using a Lean Design Management approach (Bibby et al., 2003; Tilley, 2005; McCarron, 2006; Bagley and Lewis, 2008; Tribelsky and Sacks, 2011; Kemmer et al., 2011; Ballard and Tommelein, 2012; Dave et al., 2013; Azari et al., 2014). From a technological perspective, Lean Design has its own characteristics, including modularity, platform derivative design, case of assembly, rationalisation of components, reduction of component part counts and reduced complexity (Brookefield et al., 2004). However, there is a need to consider the creative nature of design and whether design development can be considered as part of production when considering the concept of Lean Design Management.

Egan (1998) stated, "Lean production is a generic version of the Toyota production system, recognized as the most efficient system in the world today. Lean thinking describes the core principles underlying this system that can be also applied to every other business activity from designing new products and working with suppliers to processing orders from customers". However, El-Reifi and Emmitt, (2011, 2013) explored design management
processes and practices, as well as interfaces between Lean Management principles and the
design process, Lean Design Management appears valid for implementation in the
construction industry, but only if the concept of customising its application is considered.
This depends on the client’s requirements, whether something is needed urgently, or if the
project is a showpiece with few limitations in terms of time. In other words, Lean Design
Management needs to be customised in terms of the value of the desired project.

However, Bagley and Lewis (2008) stated: "There are plenty of examples, including
our own experience with clients, which show that lean principles can be successfully applied
in practice, with benefits that include faster response times, exceeding targets, reductions in
waste and unnecessary work". A familiar, although one might argue ‘narrow’, approach (see
Liker 2004) to ‘thinking Lean’ is to define waste and establish exactly what is of value to the
client organisation; that is, precisely what activities and resources are needed (Womack,
Jones and Roos, 1990; Womack and Jones, 1996; Poppendieck, 2002). However, waste
cannot be defined without first defining value and what constitutes value for all of the people
involved in the process. One way of dealing with different views is to discuss and try to
agree some common definitions for a specific project context at the outset (see Thyssen,
2011). Therefore, in theory, there is no absolute definition of waste; it is all relative (Bogus
et al., 2000; Mossman, 2009; Fernández-Solis and Rybkowski, 2012; Koskela et al., 2012;
Viana et al., 2012; Koskela et al., 2013; Formoso et al., 2015). More focus is needed on
identifying waste in the design process, together with reasons why it occurs, thus, to explore
the interpretation and application of Lean Design Management in AEC. There is a need to
obtain a deep understanding of the problematic issues connected with the current processes
and practices in design management, as well as interfaces between Lean Management
principles and the design process.

2.10.1 Inefficiency in the Design Process (Waste)

It cannot be denied that design management processes often suffer from poor design and
documentation, changes, reworking, and iterations in project documents and drawings due to
deficiencies in the management of the design process; unclear briefs, fluctuations in demand
and delays in clients responding may also contribute. Construction delays and variations in
requirements are also often caused by a lack of detailed information in project documents
and drawings. Architects may argue that this is due to a lack of communication between the
client and design team while others assert that the time allowed and design fees are also factors which cause problems. The actual time taken to design a project is very small when compared to the total time taken to complete the final product (the building). However, currently, more time is spent in the production of drawings and documents than it should be (Tilley, 2005). This is because a jam occurs of unnecessary information which is delivered earlier than it should be. Usually, these are applicable to changes that are made throughout the project, then drawings and documents are reproduced because of those changes, taking more time. A stable design information flow, with small batches, frequent transactions and lower occurrence of flow interruption phenomena leads to higher-quality design documents. Emmitt, (2007) highlighted the importance of mapping and understanding the information flows within the design management process, and understanding the waste associated with in this context. According to Tribelsky and Sacks (2011), information is the designer’s raw material, and unpredictable project outcomes are due to unstable flows of information. An inefficient flow of information results in forms of waste such as reworking as new information become available, designers moving their attention to other projects and over-design. Tribelsky and Sacks (2011) posited that design managers can reduce waste and improve value by paying attention to the characteristics of information flow and sharing of information (using Lean principles). All these issues result in making many projects less valuable to the clients/customers and end-users (Brookefield et al., 2004; Jørgensen and Emmitt, 2009).

The Toyota Production System identified seven types of manufacturing waste (Womack and Jones, 1996): Overproduction, Inventory, Extra Processing Steps, Motion, Defects, Waiting and Transportation. These can generally be identified by considering two symptoms (Poppendieck, 2002):

- If something does not directly add value, it is waste.
- If there is a way to do without it, it is waste.

Bearing this in mind and considering the design process will result in a clearer understanding of some of the issues regarding waste. For example, overproduction and defects can be viewed as the extra work that comes from the lack of briefing and iterations of drawings often experienced in the design process, while a delayed response from a client to a proposed solution or alternative can be seen as waiting.
Beyond this, the following factors have been observed as problematic (Koskela et al., 1997):

- Blocks of coupled tasks; the needed iteration has to be started with incomplete information.
- Lack of or delayed input from the client in terms of requirements, decisions, etc.
- Changes in design objectives or criteria.
- Unbalanced design resources (especially in a block of coupled tasks; some disciplines may form a bottleneck).
- Late engagement of a design party.
- Earlier decisions or intentions not being taken into account in a later task.

To summarise, waste in a process is anything that adds nothing for the owner, client or end-user. In searching for a solution to reduce waste in a process and create value, the only way is to focus on that value which the customer or end-user wants and is willing to pay for. Thus, waste and value can be seen as elements that exist in one equation. In other words, waste can only be recognised by first knowing value and therefore, in theory at least, there is no absolute definition of waste; it is all relative (Bogus et al., 2000; Mossman, 2009; Salvatierra-Garrido and Pasquire, 2011; Viana et al., 2012; Fernández-Solis and Rybkowski, 2012; Koskela et al., 2012; Koskela et al., 2013). The waste elimination cycle, illustrated in Figure 2.14, offers a perspective of the process which waste goes through in order to eliminate it (Mossman, 2009).

![Figure 2.14 Waste Elimination Cycle (Source: Mossman, 2009)](image)

El-Reifi and Emmitt (2011) stated that, “Inefficiencies existed in the design process because of the nature of the process itself and the ways the design process is managed”.
They claimed that these inefficiencies generate waste that must be mitigated, or preferably eliminated. This waste results from human activity and current applications of design management. El-Reifi and Emmitt (2013) found in their survey of design process practices that the waste experienced in design processes is generated due to client complexity (e.g. creeping escalation of a project’s scope associated with securing client approval, vagueness in the content of the client’s brief and difficulties). This could be referred back to the significant lack of clarity regarding the realisable benefits that could be secured from the client’s investment. Clients have also been criticised for failing to appreciate the negative affect of some changes during the design stage, and the huge benefit that could be brought to the project by the early involvement of the whole team, including the client. Different views put forward by diverse stakeholders and side commissioners within the client team are another issue of possible waste. Indeed, some current remedies, such as Value Management Workshops (VM), Quality Functional Deployment (QFD) and the Client Requirements Processing Model (CRPM), do assist in understanding a client’s needs, as they enhance communication. However, an ideal solution may be found by using a systematic approach at a strategic level, instead of using an individual tool to tackle a single feature of the problem. This is in line with previous studies that highlight the necessity of integrating these tools into one systematic approach (Freire and Alarcón, 2002).

Obtaining a healthy design early on and then sticking with it enables the programme to be maintained; furthermore, work packages are finalised more quickly, cost planning is improved and, with it, project delivery. Emmitt et al. (2005) stated, “The ‘thinking’ of values in the process method reflects the client complexity and provides the background for further investigation of the client complexity”. To deliver better value, the client needs to be more flexible and to take part in the stages of the project, as their involvement in the design process through communication will help to overcome problems (Sfandyarifard and Tzortzopoulos, 2011; Ballard and Koskela, 2013; Brito and Formoso, 2014). Clients, as a key part of the construction business, have to be aware of their duty in terms of what information needs to be delivered and when (El.Reifi and Emmitt, 2011; 2013). Tools such as workshops and collaboration in addition to interviews and modelling do eliminate waste generated from client complexity, as they help in drawing out clients’ requirements and aspirations, eventually leading to the development of a clear brief for clients who do not know what is wanted, are unable to communicate what they want, or have little previous
experience of procuring a building. Broadening the distribution of value to different stakeholders may therefore be achieved through a better understanding of client complexity (Bertelsen and Emmitt, 2005; Tilley, 2005; Emmitt et al., 2005; Tzortzopoulos and Cooper, 2007; Salvatierra-Garrido and Pasquire, 2011).

Further waste is generated through poor design management (e.g. a lack of an efficient flow of information and overly complex designs) (El-Reifi and Emmitt, 2011; Han et al, 2011; Mryyian and Tzortzopoulos, 2014). Design teams are also blamed for offering too many design alternatives, for sometimes being unwilling to submit a detailed design at the appropriate time and for not communicating the construction strategy early enough. Too much design work is left as ‘contractor designed packages’ which cannot begin until the contactor is appointed (El-Reifi and Emmitt, 2011). This leads to changes when they eventually come on board. Waste is also generated by the inability to understand fully the sometimes complex goals of clients; de-motivation due to design changes; and commitments to other projects (El-Reifi and Emmitt, 2013; Mryyian and Tzortzopoulos, 2014).

A lack of contractor engagement in the early stages of a design and the form of procurement methods also cause waste. An effective partnering approach in procurement is helpful in reducing the communication gap by keeping close contact with all parties. However, El-Reifi and Emmitt, (2011) noted a claim in regard to procurement methods from their survey: early design work is poor due to the fact that Design and Build picks up responsibility as it may encourage some early design issues to be ignored. This is mainly due to the general belief that the design and build procurement will allow uncertainty to be addressed later during the project construction phase; this lack of accuracy, with the hope that ambiguity will be addressed at a later point, also hinders the application of Lean Construction Management.

According to El-Reifi and Emmitt, (2011), the critical path method is used to plan design activities in most cases, and very few carry out procedures in line with the process, such as peer design review workshops, where design team members work out all the interdependencies in order to ensure that all parties know what they are delivering, to whom, and when. This means, in most cases, that design time is allocated based on experience. This approach, without doubt, contributes to inefficiency in the design management process, as the time for design activities is guessed instead of being accurately allocated. However,
design time is controlled by several parameters, such as the business case (the procurement method), the complexity of the project, the project’s value, legislation and planning permission, deadlines imposed by clients and the ability of the client to participate in the process. It is necessary to employ a combined approach, because design is different from production (El-Reifi and Emmitt, 2011; 2013). Design is iterative, not linear, and therefore requires flexibility in allowing the consideration of various options, together with development based on assumption. The design management process is a chain of activity, but there is a need to allow ‘loops’ within the process to allow for the review and evaluation of different proposals and alternatives. The reality of project timeframes requires that a design should be developed through three key elements: imagining, presenting and testing (Koskela et al., 1997; Kroll and Koskela, 2012; Koskela and Ballard, 2013; Koskela et al., 2014).

However, it must be stated that design time can be only estimated or guessed within the concept design stage, as this is a creative stage based on mental activity which cannot be measured. At this point, design ideas can still be played with to develop alternatives, unlike in other design stages where the ideas are prepared for execution and the process depends on people’s ability and the resources available. In recent years, many computer-aided program design tools such as AutoCAD and Autodesk Revit have been introduced to the construction industry, as well as tools such as Analytical Design Planning Technique (ADePT) (e.g. Austin et al., 2000), a system by which a design process is structured, which should help in saving time required for carrying out design tasks and planning design activity. The issue is not always about having sufficient time for the design, as the time is available, but that it is often badly used; it is more important that the design stages should be carried out efficiently (El-Reifi and Emmitt, 2011).

The brief may also contribute to reducing the overall performance and efficiency of a construction project; it may even be responsible for all of the rework, although, in most cases, the need for reworking in a design reflects the level of coherence of the decisions that have been made regarding the design’s development. For example, Ryd (2004) found in a case study that ‘incomplete’ requirements were difficult to criticise, gave room for innovation and encouraged commitment. He hinted that this ultimately had a positive impact on the different parties’ perception of the end-product. Ryd (2007) further argued that ambiguous statements
of requirements ‘united’ the project participants, because there was room for individual interpretations and sense-making in accordance with the actors’ differing preferences. Different interfaces exist among the main players involved, as shown in Figure 2.15, and the quality and development of the proposed design depends on this interface between the developing brief and product detailing, as well as cooperation and communication among the participants (Mesquita et al., 2002).

**Figure 2.15 Interfaces of the Conception and Design (Source: Mesquita et al, 2002)**

El-Reifi and Emmitt (2011) noted that the brief may be poorly interpreted, and designers often ignore the brief, being called back to rework the design only just before the tender, when the client realises that the design is not affordable, the construction strategy might not be communicated early enough, and too many design alternatives might be offered. Many architects have indicated that in daily practice, briefing documents are not as useful as they should be. Project briefs are often inadequate and not sufficiently clear, especially when dealing with inexperienced clients; thus, they may not truly reflect a client’s requirements. Architects argue that the brief is a vital document, so if an appropriate brief and/or direct communication are lacking, this causes problems, because it limits their creativity and encourages assumption-making, which might not satisfy the client.

However, the briefing process cannot be effective without the aid of communication tools such as face-to-face meetings, workshops, visualisations, emails, phone calls, etc.; these play an important role in establishing effective communication. They allow discussion that might offer access to other ideas that did not exist at the start of the process and which were, at this point, unknown to both the architect and the client (Barrett and Stanley, 1999; Yu et al., 2006; Bogers et al., 2008). A useful explanation of this is shown in the ‘Johari
Window’ in Figure 2.16. The Johari Window concept was proposed by Luft (1970) to analyse the process of communication involved in the briefing process. This concept not only recognises that client requirements contain an area ‘unknown’ to both the client and the consultant at the outset of the project, but also highlights the importance of encouraging disclosure and providing feedback between the client and the consultant to discover and understand the client’s requirements. In addition, from another point of view, this analysis indicates potential knowledge gaps in the briefing process to show how knowledge may be withheld or simply unknown to either the client or the designer (Brown, 2001). Therefore, in the briefing process, it becomes important to ensure the maximum disclosure of client requirements, and also to allow the identification of areas of knowledge deficiency on the part of the client and the designer.

However, although satisfactory design solutions result from direct communication between the client and the architect (Barrett and Stanley, 1999; Emmitt, 1999; Brown, 2001), clients claim that they are often under pressure of time and therefore need to rely on a professional advisor to interpret their needs. Moreover, the saying “the project is the architect’s task and a good architect should use their experience and intelligence to manage missing information” is still valid. Clients tend to think that the brief restricts creativity and that it might be better for an architect to work with less information (Bogers et al., 2008).

Conversely, some inexperienced clients cannot produce their own brief and so tend to get help from a consultant brief writer, who might not make ‘good’ use of published briefing
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guides and prefer to rely on their own experience. This can result in a weak brief, as the writer may be an expert in only one field, and there is also the possibility of missing out vital information that is relevant to other professionals (Barrett et al., 1999). Clients know their business best, so they are more likely to be better at producing their own brief. However, it might be better to produce a brief through a collaborative process between the client and the design team.

Another problem an architect may encounter is conflict between the client and end-user, as, in many cases; the paying client is not necessarily the end-user. On such occasions, the task becomes more of a challenge, as satisfying the end-user is not easy with the existence of a paying client in between; in such cases, the gap between the architect and the end-user should be bridged by the paying client. Architects may find it difficult to fulfil the needs of both parties, even for the design of a small house, as a client may have a spouse and children whose needs may be conflicting (Barrett and Stanley, 1999).

Far more waste is generated through briefing because of the inadequacy of the brief documents and uncertainty surrounding when to freeze the briefing process and whether it needs to be frozen (El.Reifi and Emmitt, 2011; 2013). This is in line with the results of previous studies that criticised the practice of freezing the brief. The studies argued this should not happen if the communication between the client and the architect needs to be maintained throughout the design process (e.g. Green, 1996a; Barrett and Stanley, 1999; Tunstall, 2006; Emmitt, 2007). The client in a construction project is an integral participant in the design process, unlike in product design or manufacturing. What is more, clients are asked to put forward all of their requirements early on; as a result, clients are directed to make assumptions and therefore, designs are worked out based on soft assumptions that are liable to change. However, making processes too flexible can cause problems, as successful design requires the solid foundation of clear client requirements. Static briefing acknowledges changes in terms of both budget and time, as it acts as a benchmark against which the design is judged. What is more, having briefing as a continuous process might lead to a failure to concentrate on some early key issues. The key is to freeze information (the brief) at the right time, when the right information is there. Two main objects were stressed by El.Reifi and Emmitt (2013): first, having a clear initial (strategic) client brief to
give a project a strong start; and, second, organising briefings in phases, in line with the early design development (Design Brief).

However, there should be a base from which to judge the project later and whether it is delivered according to perceived value or not (Bogers et al., 2008; El-Reifi and Emmitt, 2011; 2013). So, information should be frozen at gateways to phases; changes in the frozen information should not be allowed beyond these points. Hudson (1999) stated, “Briefing is of great importance as it is the means by which the client makes the building’s intended functions known to the architect”. However, it should be stated that necessitating changes results in a better product (i.e. building) in terms of more value to the client, but in less value for the construction or design companies. However, it is questionable whether the client is able to do this.

Hansen and Olsson (2011) opined, “The approach of do it right the first time, which an important slogan in production, should be applied with caution in design, as design freeze may be postponed until the last responsible moment”. Thus, there clearly should be space for some flexibility that enhances project value over time (Smith et al., 1998). To enable flexibility, a concept with layered decisions should be introduced into the decision-making process, where a decision should not be made until it has to be made (Hansen and Olsson, 2011). Clients actually need the architect’s sketches and drawings to find out what their accommodation needs really are, whereas the design team aim to finalise the design early to control time and cost. This reflects the conflict in the concept of the construction business between the supply and demand sides.

Briefing documents are also often copied from earlier projects and may not be customised to fit the unique nature of a project; many of them are vague (Bouchlaghem et al., 2000). Shen et al. (2004) stated, “Existing briefing guides were criticised as being too general and implicit to offer real assistance to clients and designers, which show what should be done without explaining how things can be done”. Classifications and checklists are helpful in conceptualising what a brief is and what it should include. However, by definition, they are generic and cannot make allowances for the unique nature of each project. A large project may require more information, whereas a smaller project requires less, which might actually make a small project more complicated, as an architect may get lost because of unnecessary information being included in the brief. In many cases, small/medium
enterprises (SMEs) perform non-value added tasks in their process because they use managerial systems mainly tailored for large contractors (Emmitt et al., 2011). Moreover, the current state of practice is mainly paper-based and so there can be huge amounts of documents associated with a project, especially a large one, which may include minutes of meetings, emails, letters and sketches, all of which are managed manually. These documents are often stored in files, soft or hard, which may be lost or forgotten when needed; there is no proper mechanism for tracking and sharing this information.

Clients are buying something that they cannot see until it is finished. They cannot read the drawings, but offering photographs and visits to existing buildings is also helpful (Barrett and Stanley, 1999). Images can be produced using digital modelling software such as 3Dmax, 3D Studio, Google Sketch up and BIM. These can illustrate requirements that are difficult to express in words. Different people will have different visualisations of terms such as ‘open’, so making use of images will make these concepts clearer (Bogers et al., 2008). A shared understanding between clients/users and designers and a well-structured brief will aid communication. Educating both designers and clients on the preparation of a clear brief and what this will look like is essential for improving the quality of the brief (El Reifi and Emmitt, 2011, 2013).

2.10.2 Understanding Value for Overall Project Value

The main approach of any Lean Design Management strategy should be to maximise the overall value for clients and end-users of the project, as well as for society (Emmitt et al., 2005; Pasquire and Garrido, 2011), while maintaining a high level of design process performance. El Reifi and Emmitt, (2011) argued that the development of design value was thought to be most hindered by the client’s brief, and more time should be allowed for the early project stages; more specifically, the briefing and concept design stages. They stressed that most project value is added through these early stages, as they are critical in exploring all options. These develop a strong basis for the later design stages and therefore avoid unforeseen issues that may arise and cause changes later. Most importantly, they are the stages where value is defined and represented, as illustrated by the System “V” Diagram of Four-Phase Project Delivery developed by Christian et al. (2014) (Figure 2.17). However, the issue is not always about having sufficient time for the design, as sometimes time is available but is often badly used; it is more important that these stages are carried out
efficiently. Performing these stages effectively would help in delivering the right project, and hence delivering the project right (Christian et al., 2014).

**Figure 2.17 System ‘V’ Diagram of Four-Phase Project Delivery (Source: Christian et al., 2014)**

Previous studies have further urged the need to understand each element of value, as minimising waste alone does not guarantee the overall success of a project (Bertelsen and Emmitt, 2005; Emmitt et al., 2005; Thyssen et al., 2008; Salvatierra-Garrido and Pasquire, 2011). For example, careful thought and selection of the individuals contributing to the temporary project organisation is one element, to ensure effective cross-functional collaboration and working (e.g. Sebastian, 2006; Taggart et al., 2014b; Sarhun et al., 2014). Emmitt et al. (2011) stated that interaction helps project members to understand each other and to think differently about the way in which they perform the work. In traditional thinking, the client, and only the client, is the customer for the whole project cycle; the project delivery team is not considered. Applying the concept of the next customer order embedded in Lean Management in the project delivery chain without neglecting the client will result in better outcomes. This should arrive at a new perspective by considering the design team as another customer alongside the client (Koskela et al., 1997; Tzortzopoulos and Formoso, 1999; Bogus et al., 2000; Tillmann et al., 2012b). Jørgensen and Emmitt (2009) found that the successful application of Lean was highly dependent upon the individuals involved and their ability to apply Lean to the various aspects of projects. It could be argued that a Lean culture must be embedded within an organisation before it can apply the principles to its project portfolio (Mann, 2010; Santorella, 2011; Emmitt et al., 2012).
Project stakeholders are another element of value to consider. In general, it is the buyer who decides what is of value, but, within a building project, both the customer and the delivery team add value and therefore both should be recognised from their own perspectives in order to understand value at its most fundamental level as early as possible (Emmitt et al., 2005; Sfandiarifard and Tzortzopoulos, 2011; Brito and Formoso, 2014). However, within the design process, there are multiple stakeholders as well as the design team; these all represent the key element of people who add value in the early project delivery stages (Caixeta et al., 2013; Tillmann et al., 2013; Taggart et al., 2014b). Realising value becomes more complicated, especially when it is thought of as a matter of personal opinion, which can and does change over time. This scenario could generate waste, and to avoid that, there is a need for a perfect process, where steps are taken efficiently, to help in achieving the overall customer’s desired value (Emmitt et al., 2004; Bertelsen and Emmitt, 2005; McCarron, 2006; Han et al., 2011). In a perfect process, every step adds value, is capable (i.e. produces a good result every time), is available (produces the desired output, not just the desired quality, every time), is adequate (does not cause delay), is flexible, and is linked in a continuous flow. If one of these factors fails, it results in waste (Emmitt et al., 2004; Bertelsen and Emmitt, 2005; McCarron, 2006). Hence, it is important for the client to be more flexible and take part in the stages of the project, as their involvement in brief and design process, with the accompanying interpersonal communication helps both client and professionals to explore values and consequently better value delivery (Emmitt et al., 2005; Pasquire and Garrido, 2011).

Beauty, functionality, durability, suitability, sustainability and buildability are the six key areas of value which constitute the basic values for building design (Emmitt et al, 2005). However, El Reifi and Emmitt, (2011) argued that the AEC sector suffers from a lack of awareness of the diverse nature of value and the importance of managing three-dimensional construction value; (i.e. the value to different clients or stakeholders, end-users and the project team). Value differs from client- to- client and from organisation- to- organisation. Value for a client could equate to cost, time, function, sustainability or aesthetics, while value for an organisation could be time, profit, repeat business or being well known. Value also differs from project to project: e.g. value for a showpiece project is not the same as for service or trade projects. A Project Definition Matrix to evaluate design options has been developed over time and has been used successfully in workshop settings with industrial
clients. According to Hansen and Vanegas (2003), “This three-dimensional model is based on six layers of stakeholder perspectives (owner, vendor/suppliers, construction, design, user/operator and external parties); 12 performance parameters (contextual compatibility and response, functional performance, physical performance, cost, time, quality/reliability, safety/security, risk, constructability, maintainability, health and sustainability); and six types of internal and external influences (project characteristics, project objectives, project scope, physical context of the project, non-physical context of the project, and project risks). These largely qualitative considerations assist in aligning the expectations of both the client and the designer”.

However, identifying what the perceived project value is for different stakeholders requires linking them to the building process so that it is clear what is of value to whom, when it is to be delivered, when it is time to construct, and when it is time to use, demolish and/or recycle it. Figure 2.18 shows different levels of value through the project cycle (Emmitt et al., 2004; Emmitt et al., 2005). It is also important to distinguish between value and values. Value represents the customer’s desire in terms of their product whereas values are the moral and ideological evidence that represent the value system of an individual, or society as whole (Pasquire and Garrido, 2011). Emmitt et al. (2005) proposed society as a potential customer, but they accepted that individual interests still dominate over social issues; similarly, Pasquire and Garrido (2011) introduced the concept of first and last value in order to evaluate social issues in design management. First value expresses societal goals and is high-level, politically led and somewhat intangible, whereas last value can be commonly understood by the supply chain as what customers will pay for products or services. They further suggested that it is not necessary for every construction project to achieve first value, but all projects must fulfil last value.

![Figure 2.18 Value-Based Building Process (Source: NIRAS Cited in Emmitt et al, 2005)](image-url)
From a Lean perspective and for effective management, processes and methods are crucial to the integration of construction design and production (see Figure 2.19) (Jørgensen and Emmitt, 2009). It is the design manager’s task to ensure that all parties with appropriate knowledge are engaged in the process at the right time. For example, alongside the client, the design team is considered as the one who adds value in the early design stages of a construction project. They are responsible for creating the physical model of the client’s concept by making use of the client’s requirements, but also by using their own skills, knowledge and experience. Client satisfaction cannot be achieved at the end of the project if the main concept is not delivered. However, Pasquire and Garrido (2011) argued that knowing and owning the aspects of first and last value is considered huge for one person to know and own. Hence, the amount of their contributions in terms of the information required at each stage of the project needs to be identified in the value stream map to get the most value. However, to develop the design process into an ideal value stream, it is essential to release value exactly when it is required, rather than striving to complete stages early. Identifying design process value streams such as the one shown in Figure 2.20, and using tools, such as the intranet, interactive coordination, checklists before and after the design, and training will help to achieve this. The fundamental aspects of the design process value stream shown in Figure 2.20 are claimed as to eliminate inventories and allow a flow of products in the process (Freire and Alarcón, 2002; Tilley, 2005).

![Figure 2.19 Lean A Perspective: Processes and Methods (Source: Jørgensen and Emmitt, 2009)](image)

**Figure 2.19 Lean A Perspective: Processes and Methods (Source: Jørgensen and Emmitt, 2009)**
Thus, to ensure the success of the overall project, there is a need to understand each element of value within the process by mapping its value stream, as minimising waste alone does not guarantee the success of the overall project if, for example, the client’s value is not fully understood within the process (Bertelsen and Emmitt, 2005; Emmitt et al., 2005; Thyssen et al., 2008). This is explored further in Chapter 3.

2.11 Summary

The comprehensive literature review in this chapter included a review of briefing process and practices in the context of design management. The review conducted in two main phases; the first phase explored the briefing process in the context of the design process and design management of the construction project delivery stages. The second phase explored the implications of ineffective project brief delivery and defined its negative impact on design deliverables, design management and consequently construction project delivery. In the context of Lean Design Management, this was reviewed deeply based on critical debate of the process waste and the significance of understanding and identifying value early on in the front-end of the project delivery stages through the briefing process.

The review helped to establish the importance (function and value) of the project brief in relation to the project, and its influence on design management efficiency. The brief was identified as the place where the definition and representation of project value occurs. Ensuring efficient project brief delivery (i.e. effective identification and capturing of client
and project requirements in the project brief) would have a positive influence on value delivery (i.e. project delivery) and value capture (i.e. project success and customer satisfaction with the final product).

The review further helped gaining a deep understanding of the briefing process in the context of the design process and highlighted the associated inefficiency of its practice. Inefficient Project Brief delivery hinders effective design management within the construction industry by leading to ineffective design deliverables and therefore waste in the design process. The review let to the author concluding that there was a need to conduct an in-depth investigation into briefing practices in order to better understand the situation and identify room for enhancing its practice in the context of Lean Design Management implementations. This helped in formulating the research problem and led to the next chapter where the researcher looks for an opportunity to improve the briefing process using Lean Management Theory to enhance its practice for effective design management. This review chapter provided the background discussion regarding the need for a Lean Briefing Start Up, and encouraged the conduction of an empirical research to investigate current briefing practice and define the source of waste in its practice to seek answers.
CHAPTER THREE

3 LEAN BRIEFING START-UP

3.1 Overview

Based upon the preceding chapter, the main focus of this chapter is on the preliminary exploration of the potential Lean Briefing process perspective. The chapter introduces the literature that has supported Lean Briefing Start-up. It starts with a critical review of the current issues encountered as the result of ineffective project briefs in the context of Lean Design Management and its applications. The role of Lean principles in identifying defects within design stages and processes is discussed. Then, particular attention is given to the Lean Thinking theory and its management principles, as both are argued to provide a theoretically rigorous perspective for briefing practice improvements. The Lean Thinking philosophy, its origins, Lean Management principles, and how to apply Lean thinking will be reviewed to establish a basic belief and theoretical basis concerning the Lean Briefing perspective. The limitations of the current briefing process practice and its notion of practice limitations are then deeply reviewed in conjunction with the previous trials made to improve its practice. Then, the rationale of the Lean Briefing process is discussed. At the end of this chapter, a conceptual Lean Briefing Process Model is proposed, and a guiding vision for the development of a Lean Briefing process is established.

3.2 Lean Briefing for Effective Design Management

Although the concept of Lean Design Management has been proposed as a new, value-driven approach to design management in architecture, engineering and construction (AEC), it is still open to debate and under research in terms of its definition and applications (Ballard and Reiser, 2004; Brookefield et al., 2004; Lichtig, 2005; Macober et al., 2005; Tilley, 2005; Jørgensen, 2006; Jørgensen and Emmitt, 2009; Kpamma and Adjei-Kumi, 2011; Ballard, 2011; Pennanen et al., 2011; Tezel et al., 2011; Alves et al., 2012; Lee et al., 2012a; Ballard, 2012; Macomber et al., 2012; Zimina et al., 2012; Lee et al., 2012b;
Rybkowski et al., 2013; Ballard and Pennanen, 2013; Oliva and Granja, 2013; Pishdad-Bozorgi et al., 2013; Saurin et al., 2013; Denerolle, 2013; Do et al., 2014; Melo et al., 2014; Kaushik et al., 2014; Khan and Tzortzopoulos, 2014; Wesz et al., 2014; Sjögren Leong et al., 2015; Gomes Miron et al., 2015; Melo et al., 2015; Khan and Tzortzopoulos, 2015). The literature review was useful in helping to establish and highlight evolving research when it comes to the understanding of Lean Design Management and its implementations. However, from the review of the small body of literature in the previous chapter, there appears to be a gap in the literature when it comes to the briefing process. Exposing, articulating, understanding, defining and managing client and project requirements play important roles in project initiation, an essential element of design management. This point has been further highlighted in El-Reifi and Emmitt (2013) as one of four dominant themes related mainly to the reduction of waste and the enhancement of value in the current debate regarding Lean Design Management.

It appears there is a fundamental problem deriving from ineffective project briefs, an important element of effective design management, which creates waste. The iterative nature of the design process, and the usually large number of changes made during the process, increase the complexity of the problems in briefing. Although many scholars have proposed that briefing is a critical process for successful construction (e.g. O'Reilly, 1987; Latham, 1994; Egan, 1998; Baldwin and McCaffer, 2000), the relation of briefing to the design process still seems to be debatable. According to Cherry (1998), this remains one of the most controversial aspects of programming (briefing). However, the argument lies in whether this stems from the briefing concept, its process practices or both. This raises a question as to whether current briefing process approaches (fixed or dynamic) are appropriate for effective design management.

From the previous chapter it can be concluded that achieving efficiency in the design stages in the construction industry is complicated and challenging when it comes to Lean Construction because of several factors associated with the design methodology in the construction process. These include the fact that many disciplines participate in the process and clients are external parties in relation to the company. Clients initiate the design process and alongside the process play a role as an integral control element, as they are the business generators and decision-makers, unlike, for example, production, where clients are not
actually involved in the product design as they are not yet, at this stage, truly clients. Their needs or desired value are considered in the design, but they are not directly engaged in the design process; in contrast, design is established from the point of view of different customers with other existing measurements. Customers in production are not decision-makers in the design process.

To date, the important characteristic of Lean Design Management implementation has been made clear as being providing design for manufacturing and assembling, and its positive influence on project delivery has been highlighted. Accordingly, some efforts have been made towards understanding and applying Lean Design Management (see Section 2.9). Implementations such as Target Value Design and Set-Based Design have helped to establish the interaction between Lean Product Development in manufacturing and Lean Design Management in construction. Target Value Design (TVD) was adopted by Sutter Health Systems as a contribution to Lean project delivery (Ballard and Reiser, 2004; Lichtig, 2005; Macober et al., 2005; Ballard, 2008; Ballard, 2011; Sayer and Anderson, 2012; Sayer and Anderson, 2012; Macomber et al., 2012; Ballard, 2012; Denerolle, 2013; Oliva and Granja, 2013; Pishdad-Bozorgi et al., 2013; Do et al., 2014; Kaushik et al., 2014; Gomes Miron et al., 2015; Melo et al., 2015). They took the concept and best features of target costing in manufacturing by make use of the Lean Management philosophy to develop the best possible design that can be constructed for the target cost and realise client value in terms of time and cost. Zimina et al. (2012) implemented this approach and developed a target value design process scheme that revealed the features of TVD practice. However, as cost becomes a criterion in target value design, so the quality and function will be significant challenges. Another effort, most recently tried by Lee et al. (2012a) used the concept of set-based design (SBD), which was introduced and used by Toyota production and relied on the best design solution being a mix of the original design options (Liker et al., 1996). Lee et al. (2012a) proposed that SBD be used in structural building information modelling (S-BIM) to increase the efficiency of the selection of the optimal solution. However, the challenge of set-based design lies in identifying the last responsible moment for converting to a solution, as well as the likely extra time and effort involved in carrying on developing all of the proposed options, which might turn into waste.
Recently, some trials have been conducted using Lean Design Management and the most recent mature intelligent technological aspect of design, Building Information Modelling (BIM). These trials have helped to set up some basic ideas regarding the use of BIM as a Lean enabler (Forbes and Ahmed, 2011; Arayici et al., 2011b; Sayer and Anderson, 2012; Khan and Tzortzopoulos, 2014); Target Costing (Pennanen et al., 2011; Ballard and Pennanen, 2013; Melo et al., 2014). A study by Arayici et al. (2011a) to develop a Lean Design practice through BIM implementation demonstrated that BIM technology should be used with a bottom-up approach rather than a top-down approach for successful change management. Another study was carried out by Sacks et al. (2010), which explored the significant synergy between the areas of BIM and Lean Construction and proposed a research framework for analysing the interaction of the two transformation technologies, BIM and Lean, based on a conceptual understanding of production in construction. Capturing client requirements is highlighted in their framework. However, to date none of them has shaped a practical approach to using BIM and Lean in the briefing process. Similarly, Liu et al. (2011) introduced an integrated information, communication, and collaboration platform for managing sustainable construction (IICC BIM), which formed part of on-going PhD research at Loughborough University that aims to improve sustainable construction waste minimisation by using BIM as a potential platform at the very early design stage. However, the driver of this research is the limited techniques and tools available to assess and support construction waste minimisation in the early design stage.

Despite all this, the impacts of ineffective design management because of the traditional rationale of the design process do exist in the construction industry and hinder comprehensive Lean Design Management implementation in the construction industry. The construction industry has been reported to often rush into projects without an adequate understanding of the importance of the early phases (Emmitt, 2007). The early stages of the construction project lifecycle consist of briefing and design; delays in many construction projects have been linked to deficiencies in these two stages. It is clear that a few Lean Design Management publications have focused on eliminating one or more of the seven types of waste, as well as on value creation. But it is striking to note how little attention has been given to variation and its origins, which are the causes of many problems that have to be tackled later in the construction phase (Green, 1996a; Barrett and Stanley, 1999). Many resources need to be spent in the early project phases, which is referred to as ‘frontloading’
Aspects of design management focus on managing people and the design stages; these are mostly outcome driven instead of focusing on the value of the outcome. An essential element of Lean Design Management is briefing. Briefing is the process by which clients express and articulate their desires, and from which the design team develop their design. From a design management perspective, briefing is a crucial stage in which values are explored and value expressed; and a process that could be better managed to help eliminate uncertainty and waste in the design and construction phases. However, aspects of waste relating to ineffective briefing appear to have been neglected to date.

None of the Lean Design implementations focus on the early project delivery stage (i.e. the briefing process) and look at its effect on the efficiency of the design process, hence the importance of this research, which is trying to address the waste at its origin. What if we found ourselves building something that nobody wanted; in that case what would it matter if we did it on time and on budget? Ries (2012) stated, “what matters is not setting quantitative goals but fixing the method by which those goals are attained”. The best way to understand waste is to explore the ways in which the process and people interact and discover how and why people have to adopt and work around or just work outside the process (Terry and Smith, 2011). Barrett and Stanley (1999) observed that briefing in the UK is done in different ways depending on the experience of the individual professional. This lack of acceptance of structured approaches to briefing as well as the frequent use of drawings may indicate that briefing or programming is traditionally the domain of architects, who are often described as having an estranged relationship towards ‘management’ (Emmitt, 1999). However, from a design management perspective, issues tend to be concerned with the efficiency and consistency (quality) of processes. Eliminating waste requires a deep understanding of the system of value creation and then measuring aspects of the project against the definition of value and waste, which is strongly associated with Lean thinking and, by extension, Lean Design Management (Emmitt et al., 2005; Pasquire and Garrido, 2011; Terry and Smith, 2011; Caixeta et al., 2013).
According to Terry and Smith (2011) it is important to ask the following questions before entering into Lean Start up:

1- Is the process (value stream) producing the desired value?
2- If not, why is the value stream not producing value, which specific process requires fixing?
3- What is about that specific process or task that needs changing?

From the review of design management in AEC via a Lean lens, it appears that a large chunk of waste in the design management process comes from inefficiency in briefing process practice and debates on whether this should be fixed or dynamic throughout the design and construction process (see Section 2.10.1). This waste contributes positively, directly or indirectly, to the waste experienced in both the design and construction phases and post-occupancy. Briefing is the first stage in the project from which the other project stages are derived. Briefing is where value is identified and represented. Effective identification of value in the briefing process will help value realisation at the later stage of project delivery. However, neither existing school of thought on fixed or dynamic briefing nor their mechanisms fit the nature of design in the construction phase. The conflicting notions argued are valid and need to be appreciated equally, as both judgements have true and valid reasons for their defence. Ries (2012) stated, “Information is the designers’ raw material, what is missing is the process that controls the raw material into a real world”. Rethinking in the briefing process and how to develop another one that can combine both the fixed and dynamic views regarding its practice is essential, as failure to achieve effective brief will derail the project. The far greater challenge for Lean Briefing Start-up as a Lean Design implementation lies in developing the briefing process using Lean Management principles. However, further investigation of briefing process practice is needed to in order to explore briefing process deficiencies and their origin. This research investigates current briefing process practices in the UK and whether there is a better way of approaching briefing (from a Lean perspective).

3.3 Lean Management Theory

Lean Management has been applied successfully in many industries, starting in car manufacturing and moving to logistics and distribution, services, retail, healthcare,
construction, maintenance and government (Lean Enterprise Institute, 2009). Lean Management can be defined briefly as maximising value for the client/customer while, at the same time, minimising waste for an organisation. In other words, Lean Management seeks to deliver more value for the client/customer while using fewer resources (Womack et al., 1990; Womack and Jones, 1996).

3.3.1 The Origins of Lean Thinking

‘Lean’ was born in Japan in the 1950s just after World War II when Kiichiro Toyota, Taiichi Ohno and others at Toyota looked at Ford’s original thinking and invented the Toyota Production System (Womack and Jones, 1996). In 1990, Womack and Jones wrote a book entitled The Machine That Changed the World, which reported the story of Lean Production and the movement of automobile manufacturing from craft production to mass production to Lean Production. The book reported how mass production took over from craft production in the car industry as it provided cheaper cars compared to craft production by utilising low-skilled workers and specialised machines. As a result of mass production, costs are lower for customers, but at the expense of indirect labour through production planning, engineering and management. Toyota combined the advantages of both craft and mass production by using a very low inventory and by allocating decision-making to workers on the production line: the ‘Do it Right the First Time’ philosophy. Toyota launched the idea of producing cars of the best quality at the lowest cost and in less time through a system of eliminating waste. Cross-utilisation of standardised components, fast change-over times of machinery and ‘just-in-time’ logistics became key features of the ‘Toyota way’. This system became the object of attention and known as Lean Production or the Toyota Production System (TPS). TPS is often used interchangeably with Lean.

3.3.2 Lean Product Development

Lean Product Development (LPD), a conceptualisation of the Toyota Product Development System (TPDS), is an evolving area of research compared to the massive research on Lean Production (Haque and James-Moore, 2004; Baines et al., 2006; Morgan and Liker, 2006b; Ballard et al., 2007). Although they go together and there are many similarities, the TPDS encompasses methods and techniques that are distinctively different from those associated with Lean Production. It is often emphasised that Lean Product Development is a whole
coherent system, not an application of techniques, and achieving ‘Lean’ is not a state but a continuous journey (Liker et al., 1996; Karlsson and Åhlström, 1996; Sobek II et al., 1999; Ballé and Ballé, 2005; Morgan and Liker, 2006b). Accordingly, Morgan and Liker (2006a) described the TPDS as a framework of (i) process, (ii) people, and (iii) tools and technologies, which is sub-divided into 13 principles as an attempt to describe the system. They claimed that an efficient process cannot stand alone without skilful people, supported by useful tools and technologies. However, in Haque and James-Moore (2004) and Baines et al. (2006), LPD is mostly described as an arrangement of principles and techniques, which should be ‘integrated’, and sometimes guidance is provided on how to order the principles in a practical sequence of application. Liker (2004) argued that the key difference between Toyota and western companies struggling to become Lean is that Lean is defined by western manufacturers through the application of certain tools and techniques, whereas it is defined by Japanese manufacturers as a more of an employment of a certain culture.

In their book entitled *Lean Thinking*, Womack and Jones (1996) identified five Lean principles (see Figure 3.1):

1. Identify the value desired by the customer;
2. Map the value stream for each product;
3. Create flow by allowing the product to flow continuously through the remaining value-added steps;
4. Establish pull between all steps where continuous flow is possible; and
5. Seek perfection so that the number of steps and the amount of time and information needed to serve the customer continually falls.

![Figure 3.1 Lean Principles (Source: Lean Enterprise Institute, 2012)](image-url)
The main reasons for applying Lean principles within a process are the need to eliminate waste to deliver better value to external bodies (i.e. clients or customers) and internal bodies (i.e. the next person(s) in the process) (Womack et al., 1990; Womack and Jones, 1996; Ballard, 2000). Conversely, in his famous book, *The Toyota Way*, Liker (2004) suggested the model of the 4P’s represented in the pyramid shown in Figure 3.2:

Liker (2004) argued that most companies are only addressing the “process part” of the system (i.e. operations management). As opposed to mass production, where focus is limited on the efficiency or operation of each machine or department (assuming that this will optimise the whole) and large batches (inventories) are used to work around misalignment of operations (and quality problems), ‘Lean’ companies focus on the process as a whole; aiming to make the product (or piece of information) ‘flow’ by sequencing and levelling all the steps in the process from the view of the product itself (single-piece flow) with the ideal of producing (1) exactly what the customer needs (2) immediately when they (or the next sub-process) needs it and (3) without (or alternatively minimising) any non-value adding activities (waiting in inventory, rework, unnecessary moving, etc.). Poppendieck (2002) claimed that not all stages in a process always add value, and it is questionable whether steps such as error corrections and waiting add value in a different concept or not. Figure 3.3 is a representation of this.
Figure 3.3 Processes Steps (Source: Audit Commission, Cited in Poppendieck, 2002)

Therefore, the keys to ‘thinking Lean’ and applying Lean principles in a process are defining waste and specifying exactly what is of value within the process: i.e. precisely what activities and resources are needed. It is important to consider only those that are needed, because including others is considered as waste (Poppendieck, 2002; Koskela et al., 2013). It is more important to keep improving through lessons learned (Schmidt et al., 2014). The objective of Lean principles is clear enough; the big question is how to apply Lean thinking.

3.4 How to Apply Lean Thinking

There are two approaches to Lean Start-up: some organisations begin their Lean journey at the firm level by transforming their operations and then adding other Lean aspects to their project or programme as they participate. Another approach is for a firm to start with the programme in a project, and then work backwards to transform its organisation internally upstream into a Lean culture (Tischler, 2006; Łukowski, 2010; Ries, 2012). Experts agree that there is no single correct approach to Lean Start-up.

There are several models of Lean in the literature and practice. The most widely used is the five Lean Management principles model by Womack and Jones (1996):

1. Value: keep asking what our customers value and want.
2. The value stream—maps the flow of the work. Find ways to improve it by reducing waste, WIP and complexity.
3. **Flow**: do the work so it flows through the process smoothly and without interruption.

4. **Pull**: produce only what is wanted, when it is needed (just-in-time approach).

5. **Perfection**: keep improving.

However, all approaches to applying Lean run through a similar set of methods which were introduced by W. Edwards Deming to Japanese manufacturing in the 1950s and it consists of the Plan, Do, Check, Act, Cycle or PDCA cycle (Womack and Jones, 1996; McCarron, 2006; Schmidt et al., 2014) or steering wheel, as it is referred to by Ries (2012). Figure 3.4 shows the implementation of the Lean cycle (Tischler, 2006). It is very similar to flow-charting a system or process in other quality methods. The major difference is that in Lean you not only map each individual process and its order, but you also include processing time, wait time and the amounts of work in progress (WIP) (Forbes and Ahmed, 2011). The main idea is entering into an improvement or recovery systematic cycle which cuts off or minimises as much as possible waste and enhances both customer value and organisation performance. It starts by reviewing the process to which Lean is intended to be applied and creating a value stream map for the process (Tischler, 2006; Forbes and Ahmed, 2011; Sayer and Anderson, 2012), finding out what is the waste, where is the source and how to improve or recap, after which brainstorming or other creative techniques are used to map an ideal value stream, then a recovery system is set up with Lean Management principles built in for continuous improvement until the ideal process is realised.

![Diagram of Lean Cycle](image-url)

**Figure 3.4 Implementing Lean Cycle (Source: Tischler, 2006)**
Poppendieck (2002) illustrated the following steps that need to be maintained in the new Lean system or Lean Start-up:

**Preparation:**

- Choose what to improve and how to go about it.
- Focus on the system, task or work that has the greatest impact on the organisation's goals.
- Make the new plan as a guide to be used as a model in the checking stage.
- Notify both staff and customers of the new system, staff in terms of acting effectively in the new environment and customers regarding being aware of the changes.

**Plan:**

- Identify tasks from a customer perspective.
- Identify outcome specifications and standards.
- Compare the outcome with the approved model in order to differentiate between the value that is delivered and the value that is supposed to be delivered.
- Create a value stream map to distinguish which steps in the process add value, which are supportive, and which are potentially wasteful.

**Do:**

- Identify remedies for faulty steps or tasks.
- Ensure information is available on time.
- Update the flow diagram to check improvements.

**Check:**

- Examine the effectiveness of the new system.
- Implement and update the model so it is available to use in the preparation.
- Have this as a showcase to persuade others to implement it in other tasks or departments.
- Validate the specification and standards created in the plan to ensure they are to the customer’s and organisation’s benefit.
- Spread the improvement wider and develop a monitoring system for future use.

Act:

- Identify lessons learned and develop a plan for spreading the process or system across the organisation in order to use its benefits.
- Approve and have the system ready for use with subsequent customers.

The process mentioned above is designed to eliminate waste. According to Poppendieck (2002) the following steps should be followed in order to improve efficiency of the process:

- Multi-tasking of staff can be introduced by overlapping processes among various services or tasks; and
- Activities can be rescheduled to minimise online processing at peak times.

So, the first step in any Lean Start-up is questioning which activities create value and which are a form of waste. The ‘5 whys technique’, which was developed as a systemic problem-solving tool by Taichi Ohno, the father of the Toyota Production System, can be used to identify the cause of waste (Womack and Jones, 1996; Forbes and Ahmed, 2011). This scientific approach works by repeating why five times at least: this can help in getting to the real cause of the problem and correcting it. Once you understand this distinction you can began to use Lean techniques to systematically drive it out and increase the efficiency of the value-creating activities, bearing in mind that Lean Start-up works it is magic in two ways, as stated by Ries (2012):

- By converting push method to pull (just-in-time production method).
- Reducing batch size.

3.5 Limitations of the Current Briefing Process Practice

Design is, by nature, an iterative process and this is clear to any experienced professional working in the AEC industry. However, the current briefing perspectives and practices are,
in essence, a set of simplified sequences. As discussed in the previous chapter, this increases the complexity of the problems in briefing practices. Design is, by nature, an iterative process and the proposed design solutions often also cause the client’s requirements and expectations to evolve, such as when new business opportunities are exploited (e.g. installing improved technological systems). Furthermore, the project team has to make rapid decisions on how to solve a specific issue, and it is often difficult to note all interdependencies. Thus, a solution which meets one requirement can have a significantly negative effect on another crucial aspect. Brown (2001) stated, “expectation and goals may change throughout the project, as the knowledge base develops and additional contributors join the project”. However, as no arrangements in the current briefing theories are set to develop the project knowledge base early on, change orders are used by the client organisation to facilitate and address the earlier lack of project knowledge throughout the project delivery stages (Kiviniemi, 2005).

Accordingly, many scholars have suggested adopting an open attitude towards change. Such an attitude allows both the designer and the client to acknowledge that some change is inevitable, and this can then be embraced positively (Blyth and Worthington, 2001; Othman et al., 2004a; 2004b; London et al., 2005). Unfortunately, this can result in moving away from the planned goal (see Figures 3.5 and 3.6), with the change being significantly different from the original documented requirements. This does not mean that most buildings end up being badly designed or that they do not fulfil their overall purpose. However, the author of this research would argue that, by adopting a closed attitude to change, some possibilities which the end-users might have preferred can be missed and some important requirements may not be satisfied. Even if the design process is based on agreed-upon changes, differences between the requirements documents and the completed building may lead to doubts about the quality of the design and the construction process. Such aspects are often forgotten by the end of a project, as there is no proper connection between the briefing and design documents (Salisbury, 1998; Kiviniemi, 2005; Mryyian and Tzortzopoulos, 2013). The documentation concerning the requirements is usually not used after the conceptual design stage and any requirements which evolve are often not communicated to the whole project team (Kagioglou et al., 1998) when, if changes need to occur, these need to be recorded on the brief document and then tracked so that is clear why changes have taken place and how their value influences the project. Thus, the process could be significantly
improved if the evolving requirements were limited and the designers could easily find the requirements which are related to the design tasks.

![Figure 3.5 Shifting Away from the Goal](Source: Kiviniemi, 2005)

![Figure 3.6 Adjusting Requirements](Source: Kiviniemi, 2005)

To ensure value-orientated design outcomes, more focus is needed early on in effectively defining the client and project requirements in the briefing process through better understanding and value identification. There is a need to limit the issues that help the client make the right choices in the briefing process by widening their project knowledge to help capture the right project information at the right time early on and therefore help decision-making and design development. Yu et al. (2007) argued that effective decision-making processes are the backbone of effective briefing. When clients’ needs are unclear or unknown, designers tend to make assumptions (Blyth and Worthington, 2010). An effective briefing process may therefore need to deal with the early development and building of the project knowledge base.
An effective briefing process is described generally as revolving around good communication to ensure accurate translation and understanding of the client’s requirements (Marsh, 1999). However, inappropriate communication between the client and the design team in current briefing process practice hinders this. Blyth and Worthington (2001) noted that the primary purpose of communication in the briefing process is defined as being to get information, to get a decision, and more importantly to share understanding. The user’s role in identifying needs must be recognised (Sfandyarifard and Tzortzopoulos, 2011; Tillmann et al., 2012a; Caixeta et al., 2013; Tillmann et al., 2013; Brito and Formoso, 2014). Designers tend to make assumptions about how a user may interact with the building based on their own intuition or beliefs. Invariably, real users think differently and are subject to more pressures exerted by their particular working context (Thomson, 2006). Access to these users, whether or not they have power and representation at the briefing stage, and how their needs can be reflected in the brief are crucial issues of the briefing process (Farbstein, 1993). An effective briefing process perhaps needs to be considered as a team effort between the various participants from both the client group and the design team (Barrett, 1991). The owner, building occupants, and operation and maintenance personnel should be involved to contribute their understanding of how the building and its systems will work for them once they occupy it.

Moreover, from the literature it can be seen there is no formal education of professionals in briefing, and there are no generally accepted methods and procedures. Barrett and Stanley (1999) undertook a major empirical investigation of briefing in the UK, and observed that briefing is done in many different ways depending on the experience of the individual professional. They further identified the following briefing problems:

- Confusion over direction and aims of project within client organisation.
- Inexperienced clients have insufficient knowledge to decide how to proceed.
- Focus of feasibility studies is limited mainly to financial considerations.
- Client organisation not set up to deal with project or consultants.
- Unstructured approach/ lack of focus for whole project.
- Confusion over who is responsible for particular parts of the project.
- Unstructured approach to collecting client requirements.
- Architect begins to design too early, insufficient information on requirements.
- Too much/ irrelevant information collected about user requirements.
- Difficulties of trying to accommodate various needs of all users.
- Lack of management interest, client representative expected to get on with it.
- Underemployment and inappropriate timing of consultants, i.e. too late.
- Briefing information still being given during late design and construction stages.
- Inability of client to read drawings and understand construction terminology.
- Client does not verify final design, so tender information may be incomplete.
- Contractor has no real understanding of client objectives.
- Failure to utilise contractor’s expertise.
- Client changes introduced during construction.
- Disputes over decisions made during project which may lead to litigation.
- On project completion, tend to forget problems, rather than learn from them.
- Difficulty in finding who is responsible for any deviation in the project.
- Because of lack of client involvement in the process from inception to completion, designers end up using their discretion and in the end provide a result different from what the client required.

Similarly, in a UK survey, Kamara et al. (2001) found that formal briefing procedures were used in only 42% of 117 projects while a “structured methodology to analyse and prioritise client requirements” was applied in only 28% of the projects (Kamara et al., 2001). Kamara et al. (2001) noted the common practice of processing requirements by producing sketches and drawings and argued that this was likely to have the following consequences:

- The designers may, to a larger extent, influence the design to their own liking and the client’s requirements may take a lesser priority.
- Drawings may shift focus away from needs and requirements and result in over-emphasis on technical design (drawing) issues.
- Reinforcement of the sequential “over the wall” practice in which drawings, as representations of client requirements, are handed over from one designer to the next (instead of concurrent design based on clear goals and criteria).

Ryd (2004) described how drawings in a case study elicited different interpretations of the level of fixation. Thus, design team members had different views on whether documents were to be regarded as final (technical requirements) or merely as suggestions that could be optimised (function requirements). This may reflect the theory of designing described earlier in the previous chapter (Section 2.7) where problems and solutions were seen as linked
(Lawson, 2006; Koskela and Ballard, 2013; Koskela et al., 2014). Thus, it is, perhaps, inappropriate to have a statement of a client’s ideal requirements since these are likely to be modified in the interaction between a design problem and its solution. Additionally, the literature seems to be dominated by the problem of sequentially translating requirements into design solutions (Smith et al., 1998; Othman et al., 2004b; London et al., 2005). Smith et al. (1998) asserted that, while sequential briefing methods are valuable, they are limited and are unable to replace the skills and experience of a designer in interpreting the needs or requirements that have been communicated.

Briefing in the form of checklists, for example, is seen as useful for information-gathering activities, so that the outputs of each stage can be addressed as required. This type of briefing offers an opportunity to monitor and review the briefing’s progress using pre-set stages or charts. Nonetheless, although it seems to be a transparent method of mapping and monitoring the briefing process, it is actually difficult to recognise clearly what is happening at each stage. In fact, none of the procedural briefing processes that were reviewed provided a real insight into the briefing process itself, as such processes are mainly concerned with the outcomes of each stage; they do not effectively explain what occurs in them.

Moreover, regarding checklist functions, the matrix framework, for example, is intended to collect and organise information from the client, who is assumed to know everything concerning their requirements in advance. Additionally, it is generally assumed that requirements include pre-existing data that can easily be recorded using the matrix. In this way, briefing is a one-sided process involving the consultant collecting information from the client. However, Yusuf (1997) pointed out: (i) the client’s lack of the experience and ability necessary to identify and communicate their actual needs accurately to the briefing consultants, and (ii) the lack of understanding among the briefing participants with regard to the project information. Thus, there is no recognition of the necessity for interactions which explore and interpret the meaning of all the information collected using the matrix approach.

Conversely, the design issues-based approach, which was discussed in the previous chapter, helps to establish a link between the briefing and the design by identifying the design’s issues, objectives and concepts. In this approach, the briefing process reflects the design process and can also resolve the problem of information overload. However, the
limitations of this approach lie mainly in its failure to define the correct interface between briefing and the design stage, as the briefing process cannot be left to continually develop alongside the design stages. If this is the case, what is point of the briefing? Briefing is briefing and design is design. Surely there is a point or stage in the project delivery where there should be interaction, together with a complete switch from briefing to design. From this point of view, there is a need to re-conceptualise the design issues-based briefing approach.

It is also clear that currently perceptions of the briefing process are diverse, as little coherence exists between theory and practice. Although a number of briefing improvements have and are being proposed, most represent little real change with regard to aspects of the processing of information (Kao, 2004). Thus, in the absence of any clear and coherent guiding theory, the current perceptions concerning briefing do not offer a clear or detailed insight into the process, as was made evident in the discussion above. This suggests there is a need to develop an alternative view of briefing that can offer insight into the process and explain clearly what needs to happen in the process. An effective briefing process should involve socialisation and learning interactions between the client and the design team if the client's requirements are to be mutually explored and understood (Cherns and Bryant, 1984; Green, 1996a; Kao, 2004). Perhaps briefing should be thought of as a process in which information is generated and processed. It is also necessary to include within the briefing process an innovation or creation stage (i.e. Concept design), although further research is needed to establish this.

Accordingly, critiques of the current briefing approaches refer largely to the two existing trends, fixed or dynamic briefs, and two the perceptions of design, as a problem-solving activity or a problem-defining and solution activity, which, to some extent, oppose each other. The second distinction, regarding perceptions of design, is reminiscent of Sebastian's (2004) second and third categories of design management, the engineering instrumental approach and the social-psychological approach, while the problem-solving perspective may somewhat narrow. Ryd (2004) questioned how a project's performance might be measured when the brief is continuously changing and so the 'conversation' view may only lead to uncertainty and, as a result, inefficiency.
Lastly, Blyth and Worthington (2001) argued that the client's expertise is their business, not delivering buildings, and thus they rely on the consultant to provide a delivery service that will support their business needs. Hence, the role of the briefing consultant, as a specialist who has special knowledge and skills to deal efficiently with the briefing process, is frequently described as that of an interpreter between the client group and the design team (Kelly et al., 1992; Farbstein, 1993; Gameson, 1996; Blyth and Worthington, 2001; Hyams, 2001). However, in the currently experienced ineffective brief, it is questionable whether the brief consultant has sufficient background building knowledge and experience to do so. In fact, it might be better to think of the briefing consultancy as a service to be provided by the design organisation rather than as an independent service.

3.6 Rationale for Lean Briefing Process

The Accelerating Change Forum (Egan, 2002) suggested that the construction industry devise a process that would help clients describe their needs so that, as a minimum, the project delivers their requirements, thereby realising maximum value for all clients (end-users and stakeholders). To achieve a successful project, it is widely recognised to be of crucial importance for the client's requirements to be understood comprehensively at the very early stages and always referred to in the project development process.

Getting requirements right early results in significant improvements in product quality and client relations and savings of time and budget (see Figure 3.7) (Hansen and Vanegas, 2003; Tunstall, 2006; Emmitt, 2007). The early project stages are briefing and design. Considering this and the fact that in construction business the building (project) is a product however it is delivered, in a simple way, the client is a customer in the construction business seeking a building which is a product in the construction business and this building (product) must fulfil and serve their requirements. Visualising and appreciating this concept would make it easier to understand how central it is to maintain the relationship with the client carefully in order to maintain one’s position in the construction business market. The notion of supply and demand has to be considered the basic foundation of this relationship.
An element of this supply and demand relation is an early and clear understanding of your client’s (customer) demands and needs in order to satisfy them (Bowen et al., 1997; Smith et al., 1998). Since briefing is the inception stage of the project development in the construction business where client (customer) demand and needs are identified, the focus of this research is on the briefing process. Baldwin and McCaffer (2000) highlighted that briefing is identified as one of the priority research topics with respect to improving clients' requirements. Briefing is the process by which a client informs others of their needs, aspirations and desires, either formally or informally; and the brief is the formal document that sets out a client’s requirements in detail (Barrett and Stanley, 1999). From there, an effective briefing process plays an important role in delivering the project according to the client’s requirements, as it bridges the communication gap between the client and design team. Effective communication and collaboration through the briefing process will help achieve client satisfaction (Yu et al., 2007). Hudson (1999) stated that “briefing is of great importance as it is the means by which the client makes the building’s intended functions known to the architect”.

However, according to the discussion earlier in this chapter and the previous chapter, the inefficiency experienced in current briefing process practice lessens the value that is supposed to be added to the design process and deliverables (Green, 1996a; Barrett and Stanley, 1999; Yu et al., 2007; El-Reifi and Emmitt, 2013; Mryyian and Tzortzopoukos, 2013). It further has a negative impact on design management and consequently project delivery. The ineffective project brief as a cause of waste in the design process was identified using the ‘5 whys technique’, (Figure 3.8), proposed as a preliminary tool to identify the cause of process waste (Womack and Jones, 1996).
Alternative views, remedies and suggestions on how to improve briefing process practice, in terms of defining and articulating requirements and consequently client satisfaction have continually been proposed:

- Some advocate for proactive ways of engaging stakeholders, especially the end-users, during the briefing process (e.g. Barrett and Stanley, 1999; Pena and Parshall, 2001; Kamara et al., 2001; Blyth and Worthington, 2010).
- Others advocate for empowering the client (e.g. Barrett and Stanley, 1999; Kamara et al., 2001; Kao, 2004; Blyth and Worthington, 2010; Bogres et al., 2008).
- Some urge better teamwork between the client, designers and/or consultant (e.g. Construction Industry Board, 1997; Kao, 2004).
- Others perceive checklists and standard methodologies to suffice in bringing about needed improvement in the briefing process (e.g. BS 7832/ISO 9699:1994; 1995; Construction Industry Board, 1997; Salisbury, 1998; Hyams, 2001; Leaman, 2002).
- Some advise the application of automation and IT support tools (e.g. Hudson et al., 1990; Atkin et al., 1996; Yusuf, 1997; Barrett et al., 1998; Kamara et al., 1999; Bouchlaghem et al., 2000; Fisher et al., 2000; Hansen and Vanegas, 2003; Chung et al., 2009).
- Some others advocate including strategic, client and facilities analysis in briefing (e.g. Nutt, 1993; Smith et al., 2003; Atkin and Flanagan, 1995; Ryd and Fristede, 2007; Blyth and Worthington, 2010; Sengonzi, 2011).
- Others advocate for a dynamic briefing ideology which posits that, like design, briefing is iterative in nature, and hence question the assumption that the client’s objectives can remain static over time (e.g. Kumlin, 1995; Salisbury, 1995; Luck et
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al., 2001; Blyth and Worthington, 2001; Othman et al., 2004a; London et al., 2005; Prins et al., 2006; Thompson, 2006; Yu et al., 2007; Blyth and Worthington, 2010).

- Some others urge a value management methodology, such as facilities management and risk management approaches (e.g. Green, 1996b; McGregor and Then, 1999; Othman, 2005; Kelly et al., 2005; Thompson, 2006).

- Others advise the application of QFD and the HoQ. QFD originates from the manufacturing industry and is presented as a more advanced and reliable methodology to enable the capture, synthesis, management and translation of clients/user requirements into quality design features, leading to client satisfaction in the finished product or facility (e.g. Fisher et al., 2000; Kamara et al., 1999; Gray and Al Bizri, 2006).

- Others advocate for an open attitude towards change through introducing software tools that help in managing changes in client requirements and mitigating their risk (e.g. Othman, 2004; Kiviniemi, 2005; Jallow, 2011).

- Others advocate for learning from experience: applying systematic feedback to improve the briefing process in construction (LEAF). LEAF is a two-year research project led by the University of Sheffield, with the collaboration of many partners. The theme of the project is the improvement of the client briefing and evaluation process by systematising the gathering and application of feedback to improve industry productivity and user satisfaction (cited in Othman et al., 2004b).

Despite all of this, the issues around the briefing process concerned with static and dynamic process views, client complexity and evolving client requirements, as explained earlier in this and the previous chapter, have continued to present challenges to the construction delivery process, and the effectiveness of briefing has remained problematic and inadequate, lacking an appropriate briefing perspective and approach (Kelly et al., 2003; Shen et al., 2004; Kao, 2004; ElReifi and Emmitt, 2011; 2013).

Briefing initiates the project and influences other project design stages. It further initiates the design and controls it throughout the project process. Briefing is the process by which the most project value is created. Inefficiency in current briefing practice is well established in previous research (Green, 1996a; Smith et al., 1998; Barrett and Stanley, 1999; Bouchlaghem et al., 2000; Shen et al., 2004; Turstall, 2006; Emmitt, 2007; Yu et al., 2007; Bogers et al., 2008; Han et al., 2011; Sfandyarifard and Tzortzopoulos, 2011; Tillmann et al., 2012a; Koskela et al., 2012; Viana et al., 2012; Koskela et al., 2013; Brito
and Formoso, 2014; Mryyian and Tzortzopoulos, 2014; Formoso et al., 2015; Pikas et al., 2015a). However, none of the previous attempts to improve the process tried to deal with the origin or source of the problem and why it occurs, which is the aim of this research project, which aims to create an efficient system for identifying project requirements based on the concept of Lean Management theory (El-Reifi et al., 2013; 2014).

Jørgensen and Emmitt (2009) stated, “The successful application of a Lean approach, with a systemic focus on value and waste and on flows of processes and transformations, was found to be highly dependent on the ability of those charged with managing the various aspects of the projects”. In addition, the strategy should be to improve the manufacturability of a product through paying attention to the coordination of information, achieving an effective flow of information at the outset of the project, and the development of ‘design for production’ solutions for technological, functional and operational requirements. The ways in which the process and people interact, and how and why they must adapt and work around each other need to be explored in the briefing process, so that a new alternative approach to the briefing process can be developed to achieve better design outcomes. Unfortunately, the theoretical principles that lie behind the advocated methods and techniques are rarely made explicit. Most current literature tends to be practice-driven rather than theory-driven. Barrett and Stanley (1999) indicated that much of the best practice advice provided over the last 30 years has been based upon a purely rational perspective of the construction process and thus appears to have had little impact on briefing practice. They further suggested that better briefing requires a flexible and in-depth perspective that is able to reflect actual practice including “the inherent non-rational turbulence of the construction process and the importance of the human dimension”. It is this absence of a guiding theoretical framework that provides the background for this research.

In this research, the briefing process was critically reviewed in terms of its existing perspectives as they are broadly discussed in the literature. The information-processing briefing perspective, together with the lacks of the two schools of thought about briefing process mechanism practice (fixed and dynamic) have been identified as the main limitations of the briefing processes. Current briefing process practice reinforces drivers for change, as the client cannot make the right decisions without a clear and solid project knowledge base. In current practice, clients are directed to make some assumptions and to make
inappropriate decisions. Therefore, designs are worked out based on soft assumptions that are liable to change. By doing this, the designer allows other works whether in design or construction to process and progress; hence, space for changes is allowed and then ways to mitigate this are sought. Arguably, this is not the most efficient approach. The implications of the inadequate briefing process, together with problems concerning the quality and efficiency of its practices is recognised as giving rise to the need for a new alternative perspective on the briefing process.

Ries (2012) stated, “What matters is not setting quantitative goals but fixing the methods by which those goals are attained”. The role of Lean Management theory in enhancing the efficiency of many processes across different industries, including the construction industry (Womack et al., 1990; Womack and Jones, 1996; Ballard and Howell; 2003), inspired the consideration of using it as theoretical basis to improve the quality of the briefing process. Eliminating waste requires a deep understanding of the system of value creation and then measuring aspects of the outcomes against the definitions of value and waste (Emmitt et al., 2005; Pasquire and Garrido, 2011; Terry and Smith, 2011; Caixeta et al., 2013). Hence, rethinking the briefing process and how to develop another approach that can perhaps serve the pros of both views (fixed and dynamic) are essential to better capture client requirements at the right time and bridge the communication gap between the client and design team, so the briefing process is carried out efficiently, which in turn contributes to enhancing design deliverables and achieving effective design management. In this research, revision of the briefing process is reviewed in detail using Lean Management theory.

The main issues that drive the necessity of Lean Briefing Start-up can be summarised below:

1- Inefficiency in the current design management process hinders the performance of the construction industry.
2- Reviewing Lean Design implementation has helped to establish that Lean Design Management is still under debate in terms of its definition and applications. This further helps in highlighting the importance of briefing to Lean Design implementations.
3- Inefficiency in the briefing process is understood as a fundamental factor that drives waste in the design process and contributes to inefficiency in project delivery due to the creation of inappropriate design deliverables. This has suggested an initial hypothesis that Lean Briefing is an essential element of Lean Design Management.

4- A small number of briefing books exist aimed at practitioners, examples being *Briefing your Architect* (Salisbury, 1998) and *Managing the Brief for Better Design* (Blyth and Worthington, 2010). However, there are no generally accepted methods and procedures in terms of practices.

3.7 Lean Briefing Process Conceptual Model

The research exposed limitations with the current approaches to the briefing process and identified the potential for change. Reviewing Lean Management theory and its success in enhancing the efficiency of value delivery processes led to the hypothesis that the briefing process can be truly a design value-added process by applying Lean Management principles. Applying Lean thinking to the briefing process, with the emphasis on value and flow, appears to provide an alternative approach to traditional methods. A comprehensive literature review of Lean Design Management, the briefing process and Lean Management theory helped to establish the Lean Briefing Conceptual Model (El.Reifi et al., 2013) shown in Figure 3.9. A conceptual model is a simplified representation of the key concepts and contexts of a research area (Blaxter et al., 2010). It is a conceptual status of concepts being studied and their relationships (Punch, 2000).

![Figure 3.9 The Conceptual Lean Briefing Process Model (LBP)](image-url)
The idea behind Lean Briefing is to develop a communication structure to help in the identification and representation of client needs and project requirements, providing the basis for better decision-making on requirements, and therefore determining and creating project value in the briefing process. This is intended to be highly reliant on the ability of those charged with managing the process. Some preliminary conceptual ideas that need to be reflected in the development and planning of a Lean Briefing process were explored and identified from the extensive literature review of the research focus area symbolised in the core of the Lean Briefing Conceptual Model shown in Figure 3.9. Implementing Lean Management principles in the briefing process is highly advocated by the author so as to: (i) achieve best value from the briefing process, and (ii) help develop ‘design for production’ solutions. The preliminary Lean features of the intended Lean Briefing process were explored and selected from the Lean Management literature to support the development and planning of Lean Briefing. These included:

1- Lean Briefing process value stream

According to the RIBA Outline Plan of Work (2013a) shown in Figure 2.6 page 29, the brief is developed between Stage 1 (Preparation and Brief) and Stage 2 (Concept Design) and should not be altered after this point (Final Project Brief). The Project Brief is when the initial brief is developed into a detailed project brief (Design Brief) from which the design can develop. Accordingly, the first two main elements of the Lean Briefing process value stream setup are to be planned to first, have a clear initial client brief from Stage 0 (Strategic Definition) to give a project a strong start and, second, to organise the project brief in phases, in line with the official brief stages according to the RIBA Outline Plan of Work 2013.

Additionally, Ballard (2008) sub-divided the ‘project definition’ phase into a Business Planning phase and a Business Plan Validation phase. In the Business Planning phase, the client specifies the allowable costs and duration of the project and makes a risk assessment in order to decide whether to proceed. Next, in the Plan Validation phase, the delivery team explores and challenges the business case in order to validate the feasibility and need for a building project. In relation to this, the Lean Project Management Model corresponds with the RIBA Outline Plan of Work’s notion of the Strategic Brief (which is provided by the client) and the Project Brief, which is a response from the supply side to the client’s
Strategic Brief. Similarly, according to the Lean Project Management Model shown in Figure 2.12 page 47, the interface between the Project Definition phase and the Lean Design phase is the Design Concept. Correspondingly, the RIBA Outline Plan of Work 2013 set up Stage 2 (Concept Design) as the interface between the briefing and design stages. Accordingly, the second element of the Lean Briefing process value stream setup is to be planned so that the interaction between the briefing process and design process needs to occur only at Stage 2 (Concept Design) (see Figure 3.10).

Figure 3.10 Briefing and Design Interface – RIBA Vs LPMM

2- Lean Briefing process standardisation

To ensure quality and speed in the process, the intended Lean Briefing process needs to be standardised. Toyota utilises a comprehensive standardisation system in which processes, engineering skills and design solutions are standardised (Sobek II et al., 1998; Haque and James-Moore, 2004; Morgan and Liker, 2006a). However, it can be claimed that applying process and design standardisation is a non-innovative practice in management and it seems unusual to standardise the skills of highly educated engineers. However, the promoted benefit is a more flexible workforce, where engineers can shift between programs and thereby ‘level’ (Heijunka) the workload (Liker, 2004; Morgan and Liker, 2006a). Also,
employees know what they can expect from each other, which means that less meeting-time
but interaction is necessary (Sobek II et al., 1998). Product and process standardisation
further contributes to enhancing overall process efficiency, but also forms the platform for
learning and process improvement (Morgan and Liker, 2006a).

At Toyota all new solutions must ‘prove themselves’ against the standardised solutions
(Morgan and Liker, 2006a). Standards provide the stepping-stone for process continuous
improvement and organisational learning (Sobek II et al., 1998). This practice is reinforced
by Toyota’s short development cycle, which prevents standards from gathering dust and
becoming too obsolete to employ (Sobek II et al., 1998). In practical life, standardisation is
mostly done by means of simple checklists developed and ‘owned’ by the designers, who are
responsible for keeping them up to date within their area of expertise and passing them on to
new employees (Sobek II et al., 1998; Morgan and Liker, 2006b). Standards can easily
evolve into cumbersome bureaucracy, but according to Sobek II et al. (1998), standards
work well at Toyota because they are simple in format and maintained by those who use
them.

3- Continuous Lean Briefing process improvement

A continuous process improvement concept, grounded in Lean thinking, will be the main
concept of the Lean Briefing process. A procedure for reflection ‘Hansei’ to achieve process
continuous improvement ‘Kaizen’ (Ballé and Ballé, 2005; Morgan and Liker, 2006a) needs
to be implemented in intended Lean Briefing process. Morgan and Liker (2006b) argued that
a key reason for the success of Toyota is its employees’ ability to try out new things and to
apply the Plan-Do-Check-Act learning cycle in every detail of work. Therefore, any
description of Toyota’s techniques and methods will always be inadequate in the sense that
they are constantly changing (Ballard et al., 2007). However, apart from the tangible Lean
methods such as ‘value stream mapping’, ‘pull’, ‘kanban’, ‘visual control’ etc., which makes
this possible, Liker (2004) argued that the true advantage of Toyota lies within its culture,
which builds on long-term thinking and a unique approach to problem-solving and leading
‘people and partners’ towards continuous improvement (‘Kaizen’). Similarly, as noted by
Morgan and Liker (2006b), the term; cultural transformation; is linked to Deming’s (or
Shewhart’s) Plan-Do-Check-Act learning cycle that, according to Morgan and Liker (2006b),
can express the approach through which Toyota has become a ‘humble, learning organisation’. Likewise, London et al. (2005) advocated that briefing should be a formulaic process that is gradually ‘refined’ by incorporating lessons learned from earlier projects. Soft landing⁵ might provide an additional source of learned lessons in some projects. However, London et al. (2005) admitted that some lessons may not be appropriate for unique types of project.

4- Set-based design in the Lean Briefing process

The product solution in Lean Management is developed through merging alternatives in different functional divisions by narrowing down inferior design options (Liker et al., 1996). It is not acceptable to present one single solution for a given task (point-based design). Engineers and designers must present several potential solutions to demonstrate that they have explored the ‘design space’ (Morgan and Liker, 2006a). Set-based design is not aimed only at creating efficiency in coordination, but also stimulates creativity and quality in solutions via considering more than one alternative. Hence, set-based design could be planned in the intended Lean Briefing process so as to deliver several design solution scenarios in the Initial Project Brief, which then needs to be tested through concept design.

5- Pull in Lean Briefing process

‘Pull’ in Lean Management means that each sub-process only produces something when it is requested (via kanban) from the subsequent process (triggered by a down-stream customer demand), as opposed to producing on forecasts and trying to ‘push’ components or products forward in the assembly line to the customers (which often results in inventory) (Liker, 2004). The philosophy of ‘pull’ and just-in-time is applied to information management in Lean Product Design (Browning, 2000; Haque and James-Moore, 2004; Tribelsky and Sacks, 2011; Demian and Walters, 2014). This stimulates the idea of establishing a ‘pull’ principle between the briefing stage and design stage in the intended Lean Briefing process as means to enhance the process by stopping the development of the brief solely through sketches and design.

⁵ Soft landing refers to a strategy adopted to ensure that there is a smooth transition from construction to occupation and this is achieved by a close tie relationship between the design, construction and operation (Facilities Management) teams (BSRIA, 2009).
6- Flexibility in the Lean Briefing process

Clients actually need the architect’s sketches and drawings and sometimes need to experience real space to find out what their accommodation needs really are. Lawson (2006) argued that in practice, design could not start with a brief directly because a complete and comprehensive brief is difficult to achieve in isolation from the design process. Lean Briefing needs to be planned as a creative process to support achieving a design value-added project brief. The new Lean system must help both the client and the design team make the right decisions comfortably by providing the necessary basis and required details to develop a project knowledge base early, alongside considering the importance of the interaction between design and brief. It has to be planned in a way which truly helps the client articulate their conscious and hidden needs in consistent and repeatable ways that build a shared understanding of what value is and how it needs to be delivered. There needs to be as much problem-setting as problem-solving (Schön, 1983). Thus, there clearly should be space for limited flexibility in briefing that enhances value creation, although making processes too flexible can cause problems. Hansen and Olsson (2011) stated, “The approach of do it right the first time, which is an important slogan in production, should be applied with caution in design, as design freeze may be postponed until the last responsible moment”. Effective flexibility can be achieved if the intended Lean Briefing process is planned so as to completely comply with the briefing process and design process interface arrangements in the Lean Project Management Model and the RIBA Outline Plan of Work 2013.

7- Tools to aid the Lean Briefing process

The Lean Briefing cannot be fully effective without the aid of communication tools such as face-to-face meetings and visualisation techniques; these play an important role in establishing effective communication. Face-to-face communication to achieve integration is an important feature of Lean Product Design (Karlsson and Åhlström, 1996). It allows discussion that might offer access to other ideas that did not exist at the start of the process and which are, at this point, unknown to both the design team and the client. So, virtual design technologies such as the Building Information Model (BIM) and Value Management workshops (VM) need to be built into the process and may work as enablers of the intended Lean Briefing process. BIM would help the client and design team to see the existing
conditions and test designs (e.g. predict building energy performance, stimulate construction), which in turn would aid value creation in the briefing process.

- Building Information Model (BIM)

BIM, as Michael Scharge (2000) suggested in his book *Serious Play*, is “a smart simulation that can make a team smarter as people learn what and how to build early on in the project - long before the work begins on site”. Fundamentally, the current development in the use of BIM technology has laid the way for a dramatic improvement in tasks and processes in the AEC industry (Kymmell, 2008; Underwood and Isikdag, 2010; Crotty, 2012). BIM has been recommended as the technological solution for collaboration, communication and information exchange in the AEC industry (Dossick et al., 2009). The alternative route to gain close understanding of a given subject can be approached through visualisation, communication or collaboration (Kymmell, 2008). BIM enables that through simulated visualisation of the project and completely testing and analysing the design prior to construction. It reduces process conflicts, information clashes and information redundancy by exchanging and sharing project information between all who are involved in and/or affected by the project, throughout the entire project lifecycle.

The American Institute of Architects (AIA) defined BIM as “a model-based technology linked with a database of project information”. It is potentially a great technology to support the collaboration required for integrated project delivery (IPD) throughout the lifecycle of a project (from conception to demolition/reuse) (cited in Underwood and Isikdag, 2010). It goes beyond management of information and continues beyond the post-occupancy stage, which makes it a process of knowledge management for future projects (Underwood and Isikdag, 2010) and may contribute in continuous process improvement.

- Value Management (VM)

Dallas (1992) argued that Value Management implementation is essential to deliver projects within the specified time, targeted cost and sought quality and satisfaction for all of the stakeholders. Dale (1992) described Value Management as a function that ‘sandwiches’ accountability, buildability, creativity, coordination, communication and teamwork in a
positive, constructive and organised methodology. Green (1992) argued that Value Management provides a firm’s leader with a framework for effective decision-making.

Value Management requires the full involvement of all of the project parties and a well-defined job plan to identify roles and responsibilities among the different parties (Emmitt, 1999). Lenzer (1992) suggested seven steps as a value management methodology: i) obtaining facts, ii) analysing them, iii) generating ideas, iv) developing these ideas and implementing them, v) continuously reviewing, vi) involving the other stakeholders, and vii) seeking success catalysts. Value Management requires the development of common understanding and effective communication to understand and deliver value (Jensen, 2005; Suurendonk and Den Otter, 2010). This can be achieved through the planning of two stages, value design and value delivery (Christoffersen and Emmitt, 2009), at the firm’s strategic level (Prins, 2009). However, understanding value is believed to be achieved through both briefing and design. Accordingly, Value Management would support value creation in the intended Lean Briefing process.

In addition to the above, some views are of interest to this research and advocated to be considered in the intended Lean Briefing process. These were discussed and selected from the briefing literature as to be considered in the development and planning of Lean Briefing process. They include:

1- Proactive involvement of all stakeholders (Barrett and Stanley, 1999);
2- Closer attention to the Facilities Management function (McGregor and Then, 1999; Ryd and Fristedt, 2007);
3- Briefing as a process of social construction of the meaning of client requirements (Cherns and Bryant, 1984; Green, 1996a; Kao, 2004); and
4- Constant feedback loop (Duerk, 1993; Construction Industry Board, 1997; Blyth and Worthington, 2001) and learning from the successes and failures in building performance for long-term consideration to improve future projects.

However, there are some other concerns in the development and planning of the intended Lean Briefing process such as procurement methods, and details of who manages and controls the Lean Briefing process. These need to be considered and undergo further exploration. Hence, the next step in this research project was to conduct empirical research
in the construction industry to better understand briefing process practice deficiencies and challenges, identify opportunities for improvement, and build a shared understanding of the potential Lean Briefing process idea. This includes reviewing the preliminary thoughts and concerns just discussed.

3.8 Summary

In the context of Lean Design Management and its applications, the chapter reported the preliminary investigation into the application of Lean Management to the briefing process, and explore its potential implications on the briefing process, before embarking on the empirical research. This was conducted based on a critical lean perspective appraisal of the current issues encountered within design stages and processes as the result of ineffective project briefs and the current briefing process practices limitations. It included a review of Lean Thinking philosophy, its principles, implementation, tools, and transformation techniques.

The review findings revealed several briefing problems mainly related to the quality of the client brief, client complexity, process mechanism (static and dynamic, as phrased sometimes or soft and hard in some other studies), and the lack of a based theory methodological briefing guide. However, according to the literature, most previous research has focused mainly on how to manage and handle the problems encountered in inefficient brief delivery, in addition, a very few studies on the quality of the early client brief (i.e. Strategic Definition). None of the research efforts have tried to explore the original source of the problems in briefing practice that lead to ineffective project briefs and why they happen or made an effort towards creating better briefing practice through understanding the briefing process, and then unifying a cohesive practice framework with the aid of a coherent guided theory.

The review further highlighted the increasing adoption of Lean Management in many industrial sectors as a technique for improving process performance and its outcomes. Its positive implications for the construction industry by means of lean construction were highlighted. The review further highlighted the on-going evolution of research on Lean Design Management and some successful Lean Design implementations. The preliminary investigation helped identification of the potential value of implementing Lean Management
to enhance the briefing process and its outcome. This in turn, helped to build rigorous theoretical propositions of Lean Briefing perspective within the context of Lean Design Management implementation, and supported Lean Briefing Start-up by establishing a guiding vision for the development of a Lean Briefing process. A conceptual Lean Briefing process model was successfully developed as a result, and this further encouraged the conduction of an empirical study to investigate briefing process practice from a Lean perspective. However, before starting the empirical research, it was vital to review the research methodology and philosophy to help determining the most appropriate methodology for conducting this empirical research.
CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY
CHAPTER FOUR

4 RESEARCH DESIGN AND METHODOLOGY

4.1 Overview

This chapter explains the research design used in order to achieve the research aim: to generate a novel Lean Briefing Process for effective design management; and to explore its validity within AEC projects. The research investigated and analysed the application of Lean Management principles to the briefing process. The chapter includes a review of the research design and methodology. It starts by introducing research definition and research problem in a general context, followed by a review of the research’s philosophical assumptions. Then, the research methods are reviewed followed by an explanation of data collection techniques. A discussion of data analysis approaches is included at the end of the chapter. Reviewing the research design and methodology, besides giving a clear picture of the research problem, led to the establishment of the research design and methodology. Alongside this review, the chapter provides a detailed examination of the overall research design and methodology employed in undertaking this research to investigate briefing practices in the UK construction industry and explore the implementation of Lean Management principles in the briefing process to enhance its practice. It discusses the philosophical premises of this research and explains the rationale for selecting the most suitable research methods in light of how well they fit the research questions. It further justifies the selected data collection instruments in the context of how they fulfil the research objectives. This chapter also discusses the selection of the data analysis approaches adopted in this research. It finishes with a summary presenting the research work plan and illustrating how each of the research objectives will be achieved.

4.2 Research Definition

According to the Concise Oxford Dictionary (2011), “research is a careful search or inquiry; endeavour to discover new or collate old facts by scientific study of a subject; course of
critical investigation”. However, in a university setting, research is defined as an original investigation undertaken to explore, to explain, to test, to compare, in order to contribute to knowledge and understanding in a particular field (Myers, 2013). Simply, it is a creative activity leading to the production of new knowledge.

To start any research, a research problem needs to be identified, and then move to the next stage, research design. Figure 4.1 illustrates the research problem identification cycle (adapted from Collis and Hussey, 2003).

**Figure 4.1 How to Identify a Research Problem (Adapted from Collis and Hussey, 2003)**

### 4.3 Research Design

The research design is a plan for the entire research project. It is defined as the plan showing the dynamic process for conducting the research; this will enable the researcher to gain a deep understanding of a topic or issue, achieve the set objectives and add knowledge (Creswell, 2005; Fellows, 2008). In other words, it is the paradigm of scientific inquiry, as it provides the basis for the act of performing research and assessing claims that adds knowledge (Nachmias, 2000). The research design comprises all of the steps that guide the researcher from the work’s inception (i.e. the setting of the questions that will be answered),
through the collection, analysis and interpretation of the data, to arriving at a conclusion(s) for generalisation (Nachmias, 2000; Creswell, 2005; Naoum, 2007).

Research design involves specifying the philosophical research assumptions, research method, data collection techniques and approach to data analysis. A research design provides a road map for the entire research project. However, it needs to be flexible and possibly changes as the research progresses. Figure 4.2 represents the research design model.

![Figure 4.2 Research Design Model](image)

### 4.4 Research Philosophical Assumptions

To achieve research objectives pragmatically, all researchers should understand the philosophical assumptions of their knowledge, especially the validity and scope of the knowledge that they obtain (Guba and Lincoln, 1994; Fitzgerald and Howcroft, 1998b). The researcher approaches the world with a set of ideas (ontology) that specifies a set of questions (epistemology) that are then investigated (methodology, analysis) in specific ways (Denzin and Lincoln, 1994; Fitzgerald and Howcroft, 1998b; Hay, 2002; Grix, 2002; Love et al., 2002). The idea is to set a framework of thinking about the relationship between the subject/issue of the research and how it can be researched (Avison and Fitzgerald, 1994; Easterby-Smith et al., 2012, Creswell, 2012). The philosophical assumption (i.e. ontological,
epistemological, methodological, and axiological) influences / guides the research (Burrell and Morgan, 1979; Miles and Huberman, 1994; Pring, 2004). Within each of those philosophical assumptions, there are multiple premises of which one should be chosen and will influence the research outcome (Fitzgerald and Howcroft, 1998b; Dainty, 2008; Arnbor and Bjerke, 2009; Burrell and Morgan, 1979; Guba, 1990). However, careful setting of the philosophical assumptions in the research is important, as the boundaries between premises are soft (Lincoln and Guba, 2000). Accordingly, multiple premises can be combined in one research project (Wilson and Natale, 2001; Walliman, 2006; Bryman and Bell, 2007; Bryman, 2008).

4.4.1 Ontological Assumptions

The first philosophical assumption to start with in research work is ontology (Grix, 2002). Ontology is about existing knowledge and relates to the nature of reality and its characteristics (Blaikie, 1991, 2000; Fitzgerald and Howcroft, 1998b; Walliman, 2006; Grbich, 2007; Creswell, 2012). Grbich (2007) argued that ontology is related to the acquisition of knowledge about the nature of being and reality. In this position, a researcher uses quotes and themes in the words of the participants and therefore seeks to provide evidence of different perspectives and experiences. Bryman (2008) indicated that ontological assumptions are concerned with two positions: objectivism and constructionism. Objectivism emphasises that social phenomena and their meanings depend on an existence independent of social actors (i.e. an objective construct), and can be studied in the same way as the physical world (Outhwaite, 1987; Sayer, 2000). On the other hand, constructionism emphasises that social phenomena and their meanings are continuously being achieved by social actors (i.e. a reflection of human interaction and interpretation). Other researchers have referred to these ontological positions as the realist and the relativist (Fitzgerald and Howcroft, 1998). Fitzgerald and Howcroft (1998a) indicated these two types of ontological position. The realist position perceives the external world as a hard and tangible compound entity that pre-exists independently of an individual’s ability to acquire knowledge about it; it is considered practical and not concerned with an abstract or idealistic view of life. In contrast, the relativist position observes reality as being directed by socially-transmitted terms and varies according to language and culture. It holds to the multiple existences of realities as subjective constructions of the mind. In this view, concepts such as right or
wrong, goodness and badness or truth and falsification could differ from culture to culture and situation to situation.

4.4.2 Epistemological Assumptions

Epistemology refers to assumptions about knowledge and how it can be obtained (Fitzgerald and Howcroft, 1998b; Gabrich, 2007; Bryman, 2008). It determines the relationship between the researcher and the researched object (Blakie, 1991, 2000; Weick et al., 2005; Walliman, 2006; Knight and Turnbull, 2008). Epistemological assumptions can be scaled from positivism to interpretivism at the opposite ends of the scale (Fitzgerald and Howcroft, 1998b; Love et al., 2002; Bryman, 2008; Flick, 2009). The positivist vision emphasises the perspective that there is only one objective truth which can be obtained by independent observation, and must be gained by applying scientific procedures and measurements in order to generalise the findings (Guba and Lincoln, 1994; Laudan, 1996; Sayer, 2000; Smyth and Morris, 2007), whereas the interpretivist vision emphasises the perspective that there are more than one true reality constructed and derived by social actors according to context (Heshusius and Ballard, 1996; Benton and Craib, 2001; Johannessen and Olaisen, 2005). Burrell and Morgan (1979) defined the interpretive paradigm briefly: “It is informed by a concern to understand the world as it is, to understand the fundamental nature of the social world at the level of subjective experience. It seeks explanation within the frame of reference of the participant as opposed to the observer of action”.

4.4.3 Methodological Assumptions

Methodological assumptions inform the research approach (i.e. Inductive or deductive), and form the research data collection paradigm (i.e. quantitative, qualitative or triangulation) (Fitzgerald and Howcroft, 1998b; Bryman and Bell, 2007).

4.4.3.1 Inductive or Deductive Research Approach

The process of the research can take an inductive or a deductive approach (Creswell, 1994; Naoum, 2007; Fellows, 2008). However, deciding which is the most effective approach to use to suit the needs of a particular research project is a controversial issue and there is no hard and fast rule to decide which approach to follow. The nature of the research problem is
an important factor in making such a decision (Creswell, 1994). The deductive approach frequently starts with a hypothesis or a general statement evolving from the literature; it proposes a general relationship between variables. Usually, this approach focuses on measuring or counting; it involves collecting and analysing numerical data and applying statistical tests. An objective position is taken by the researcher, who treats the phenomenon as a visible entity. They will then attempt to test and verify these hypotheses or statements by deciding what to study, asking precise, narrow questions, and carrying out the investigation in an unbiased way (Creswell, 2005). In contrast, in the inductive approach, the research problem needs to be explored; the aim is to make the phenomenon visible to the researcher. It begins with assumptions, as little information exists on the topic and the variables are largely unknown. Here, a subjective position is taken by the researcher, who treats the phenomenon as fuzzy. With this approach, the emphasis is more on generating hypotheses from collected data than on testing a hypothesis (Creswell, 2007). In a deductive research approach, theory is tested, while theory emerges in an inductive research approach (Naoum, 2007).

4.4.3.2 Quantitative and Qualitative Research Paradigms

The techniques of data collection can take on a quantitative, qualitative or triangulation paradigm (Creswell, 1994; Punch, 2005; Naoum, 2007; Fellows, 2008). Again, deciding which is the most effective paradigm to use to suit the needs of a particular research is a controversial issue and there is no hard and fast rule to decide which paradigm to follow. However, the nature of the research problem and the audience are important factors in making such a decision (Creswell, 1994). Quantitative research is a scientific empirical paradigm, and it is best to undertake it if the researcher wants to generalise to a larger population (find trends, patterns, etc.), whereas qualitative research is a naturalistic phenomenological paradigm focusing on text, i.e. what people say (verbally or in written form). Qualitative research is best for studying a particular subject in depth. The data gathered in qualitative research falls into two categories: exploratory and attitudinal (Naoum, 2007).

The inherent bias that comes from using a single paradigm and a single technique of data collection when studying a topic can be neutralised by using triangulation techniques,
for example combining qualitative and quantitative paradigms in the one study, or utilising more than one technique to gather data (Fellows, 2008; Creswell, 1994). The key idea is to look at the same topic but from different angles. This approach is called the triangulation method, which is claimed to be very powerful as it provides the strength to offset the weaknesses of the qualitative and quantitative methods. Patton (2002) stated, “Not everything that can be counted counts and not everything that counts can be counted”. The only negative side to this approach is that it requires a sophisticated knowledge of both paradigms. It is relatively common for qualitative researchers to use the second form of triangulation, less so the first.

The main purposes of the research, besides its ontological and epistemological assumptions, drive the research methodological assumptions. The purpose of research can be exploratory, descriptive, analytical or predictive (Ghauri and Gronhaug; 2005; Naoum, 2007; Fellows, 2008). Research can be exploratory if the aim (or part of the aim) is to diagnose a situation and/or observe patterns, ideas or hypotheses, instead of testing hypotheses when there is little or no referenced information. The focus here is more on understanding the issue with perhaps a notion of carrying out a rigorous investigation later to gain a deeper understanding (Naoum, 2007). Research may also be descriptive if the aim (or part of it) is to consider the characteristics of a particular phenomenon as it exists. Statistical techniques are usually used to summarise the collected data, as they are often quantitative (Fellows, 2008). Research can also be explanatory (analytical) if the aim (or part of the aim) is to move beyond merely describing the characteristics of the phenomenon by providing an analysis and explanation of why or how something is happening. It determines the underlying relations among the characteristics of the phenomenon (Naoum, 2007; Fellows, 2008). Finally, research may be predictive if the aim, or part of it, is to project the likelihood of a similar situation occurring elsewhere, based on an analysis of the phenomenon. This type of research aims to generalise by providing an answer to ‘how’, ‘why’, and ‘where’ concerning a particular phenomenon in situations where ‘What if?’ questions are being asked (Naoum, 2007).
4.4.4 Axiological Assumptions

Axiological assumptions are concerned with how value is interpreted and perceived in research and are set based on the ontological and epistemological research assumptions (Fitzgerald and Howcroft, 1998b; McNamee, 1998; Rescher, 2004). In quantitative research (i.e. objective ontology, positivist epistemology), the researcher should be value-free and unbiased in order to obtain objective knowledge and be able to generalise it (Guba and Lincoln, 1994), whereas, in qualitative research (i.e. constructivist ontology, interpretivist epistemology), the researcher unintentionally leans towards being value-biased in their evaluations (Healy and Perry, 2000). However, despite the axiological assumptions contexts which are derived from ontological and epistemological research assumptions as explained, the researcher perspective towards the value should be transparently explained in both the data analysis and discussion (Denzin and Lincoln, 2005; Creswell, 2012). This in turn should support the research ethics (Rescher, 2004; Saunders et al., 2009).

Fellows (2008) reported, "research ethics refers to the moral principles guiding research, from its inception through to its completion and publication of results and beyond". The researcher has an obligation to respect the rights, values and desires of the participants in terms of their anonymity; to ensure that the results are properly collected; and to report the results of the research fully and honestly, including offering a description of how the data will be used (Nachmis, 2000; Creswell, 2007; Kvale, 2008). According to the Belmont Report (1979) in the USA, cited in Fellows (2008): "Three basic ethical principles should be adopted: respect for persons, beneficence and justice".

4.4.5 Philosophical Premise for this Research

According to the above information, the research philosophical premise is set by deciding on the ontological, epistemological, methodological and axiological assumptions. Each research study is individual and therefore it is essential to decide on the best philosophical premise that will support answering the research questions (Creswell, 1994; Fitzgerald and Howcroft, 1998b; Fellows, 2008). The focus of this research was to answer the question of how implementing Lean Management principles in the briefing process could support delivering a design value-added project brief and therefore effective design management. To answer this question, it was important to;
- Explain inefficiencies in the early design stages (i.e. Project Brief) and define its negative impact on design management and therefore the delivery of construction projects.

- Carry out a rigorous investigation into current briefing practice to explore the briefing process by means of gaining a deeper understanding of the process, and identify deficiencies in its practice as well as good practices.

- Explore the use of Lean Management principles in the briefing process, and explore their implications for the briefing process.

In this sense, the major concern of this research is to understand the briefing process based on different industry practitioners’ experience and interpretations of briefing. As this cannot be achieved through pure and strict scientific procedures and measurements, the research leans towards a relativist/constructivist ontology (see Sub- section 4.4.1). Social reality is socially constructed. Reality and truth are obtained and constructed inter-subjectively, based on each of the involved practitioner’s perspective and experience. Meanwhile, the research is exploring a research topic (i.e. the briefing process) and conceiving a new theory (i.e. Lean Briefing) from knowledge that is created, owned, interpreted and used in several ways by the researcher and participants based on their perception and experience of the world. The interpretive epistemology is the most appropriate to adopt in this research (see Sub- section 4.4.2). Correspondingly, theories are reconstructions of the facts, and the criterion of a good theory is understanding of meaning and intentions rather than deductive explanation. The interpretive research perspective suggests a more inductive approach to theory-building and a methodology premise. The qualitative research paradigm allows scholarship and practice to come together. The researcher is studying real situations in the industry and interacting with practitioners in organisations to explore briefing practice from their experience. Furthermore, the researcher wishes to build a Lean Briefing theory based on the Lean Management theory grounded in the construction phase (i.e. Lean Construction) and other trades (e.g. Lean Manufacturing). Thus, more emphasis was placed on using a qualitative paradigm and methodology premise (see Sub- section 4.4.3).

Additionally, in terms of the axiology premise, the research should lean towards a value-laden axiology as the research is driven by relativist/constructivist ontology and a subjective/interpretive epistemology philosophical assumption (see Sub- section 4.4.4).
However, ethical issues concerning data interpretation were considered alongside the whole research process, starting with the proper referencing of others’ work, including honest reporting of the research procedures and incidents, and ending with managing anonymity where it was required or requested.

4.5 Research Methods

The research method is a strategy of enquiry. Qualitative research methods are designed to help researchers to understand people and what they say and do. They allow a researcher to see and understand the context within which actions and decisions take place. It is the context that helps to ‘explain’ why someone said something or acted in the way they did. In addition, by talking to people, or reading what they have written, we can find out what they are or were thinking. Types of questions used in qualitative research are: (i) What is happening here? (ii) Why is it happening? (iii) How has it come to happen this way? (iv) When did it happen?

This section reviews qualitative research methods to find out which one/combination is the most appropriate to adopt in this research to achieve its aim. There are five qualitative research methods: action research, design science research, case study research, ethnography and grounded theory (Creswell, 2007).

4.5.1 Action Research

Action research is a research method that aims to solve current practical problems while expanding scientific knowledge. It is consultant research and orientated towards collaboration and change involving researchers and subjects. “Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework” (Rapoport, 1970). The distinctive feature of Action research is the collaboration with practitioners and the deliberate intervention of the researcher (Järvinen, 2007).

Action research can take a positivist or interpretive research form. ‘Classical action research’ is positivist and is seen as a method for testing and refining a hypothesis or solution. Interpretive action research sees social reality as socially constructed (Myers, 2013).
One advantage of Action research is that it helps to ensure that research is practically relevant (Järvinen, 2007). However, the disadvantage of Action research is that it is difficult to do the action and the research. An exemplary action research study makes a contribution to practice and a contribution to research (Myers, 2013).

4.5.2 Design Science Research

Design Science research is similar to action research (Järvinen, 2007). Design science research is designed to improve a system in the real world (Van Aken, 2005). It is research that seeks: (i) to explore new solution alternatives to solve problems, (ii) to explain this explorative process, and (iii) to improve the problem-solving process (Simon, 1973b). The common goal in design science research is developing “a means to an end,” an artefact to solve a problem (Holmstrom et al., 2009). Either the means or the end, or both, must be novel.

4.5.3 Case Study Research

Designed to contribute to a new theory or explore/test an existing theory, case study research can be used in exploratory research to discover, or in explanatory research to test, explain or compare. The orientation of the researcher is to study people. The purpose of case study research is to use empirical evidence from real people in real organisations to make an original contribution to knowledge. Yin (2008) defined a case study as “an empirical inquiry that: investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. Case study research uses empirical evidence from one or more organisations where an attempt is made to study the subject matter in context (Myers, 2013). Multiple sources of evidence are used, although most of the evidence comes from interviews and documents. In business and management, case study research almost always involves a firm or organisation.

Case study research can take positivist or interpretive research form. Yin’s (2008) approach to case study research was basically positivist, since he recommended the use of hypotheses and/or propositions. Yin (2008) suggested five components of good case study design: a study’s questions, its propositions; if any, its unit(s) of analysis, the logic linking the data to the propositions, and the criteria for interpreting the findings. In contrast,
interpretive case studies generally attempt to understand phenomena through the meanings that people assign to them. Interpretive case studies define quality in terms of the credibility of the story and the overall argument (not validity and reliability) (Esterberg, 2002). Interpretive case studies focus on the social construction of reality; how and why people see the world in the way they do.

Case study research allows researchers to explore or test theories within the context of messy real-life situations, and requires less time in the field (weeks / a few months at most) (Yin, 2008). However, the disadvantage of case study research is that it can be difficult to gain access to the particular company or group of companies that you want to study (Creswell, 2007). The researcher has no control over the situation, and it can be time-consuming.

4.5.4 Ethnographic Research

Ethnographic research is one of the most in-depth research methods possible. An ethnographer sees what people are doing as well as what they say they are doing. It provides researchers with rich insights into the human, social and cultural aspects of organisations. The main purpose of ethnography is to obtain a deep understanding of people and their culture. One distinguishing feature is fieldwork. Ethnographers immerse themselves in the life of people they study (Lewis, 1985), and seek to place the phenomena studied in their social and cultural context. In ethnographic research, the context is what defines the situation and makes it what it is. The orientation of the researcher is to learn from people, so it requires a significant length of time in the field (months / a year) (Myers, 2000). Data can be collected from interviews, documents, notes from fieldwork and participant observation.

The most valuable aspects of ethnographic research are the depth of understanding and challenge to assumptions (Hammersley and Atkinson, 2007). However, it takes a long time and does not have much breadth, and it can be difficult to write up the findings for a journal article (Myers, 2013).
4.5.5 Grounded Theory

Grounded theory is a research method that seeks to develop theory grounded in data systematically gathered and analysed. Grounded theory has been defined as “The discovery of theory from data systematically obtained and analysed in social research” (Glaser and Strauss, 1967). There is a continuous interplay between data collection and analysis.

The purpose of grounded theory research in business and management is to develop new concepts and theories of business and management-related phenomena, where these concepts and theories are firmly grounded in qualitative data. It allows for the emergence of original and rich findings that are closely tied to the data. “The methodological thrust of grounded theory is toward the development of theory, without any particular commitment to specific kinds of data, lines of research, or theoretical interests … Rather it is a style of doing qualitative analysis that includes a number of distinct features … and the use of a coding paradigm to ensure conceptual development and density” (Strauss, 1987).

Qualitative data analysis in grounded theory has three main characteristics (Dey 1999):

1. **Description.** ‘thick’ description (context intention process)
2. **Classification;** conceptual foundations for analysis and comparison are guided by research objectives (codes or themes)
3. **Interconnections;** builds the theory (relationships between codes)

Codes, or categories, are concepts, and theories are built from these concepts. i.e. coding works as theory-building. Theories are built by naming concepts and the relationships between them. This is grounded in the data, by proving that there are many instances of these linked categories. How this relationship is theorised is up to the researcher, but it needs to be related to current theories.

There are two main approaches to grounded theory:

1. Strauss and Corbin (1990) provided one coding paradigm (context, conditions, interactions, conditions and consequences).
Although Glaser (1992) accused Strauss and Corbin (1990) of being too restrictive and of forcing data and concepts into a preconceived mould, the Strauss and Corbin (1990) approach is the most widely used. However, whichever approach a researcher undertakes, they must maintain some considerations to ensure effective implementation of this research method (Dey, 1999; Creswell, 2007):

1. The aim of grounded theory is to generate or discover a theory. The researcher has to set aside theoretical ideas in order to let the substantive theory emerge.
2. Theory focuses on how individuals interact with the phenomena under study.
3. Theory asserts a plausible relationship between concepts and sets of concepts.
4. Theory is derived from data acquired from fieldwork interviews, observation and documents.
5. Data analysis is systematic and begins as soon as data is available.
6. Data analysis proceeds through identifying categories and connecting them.
7. Further data collection (or sampling) is based on emerging concepts.
8. These concepts are developed through constant comparison with additional data.
9. Data collection can stop when no new conceptualisations emerge.
10. Data analysis proceeds from open coding (identifying categories, properties and dimensions) through selective coding (clustering around categories) to theoretical coding.
11. The resulting theory can be reported in a narrative framework or a set of propositions.

However, the general rule in grounded theory is that the researcher should make sure that they have no preconceived theoretical ideas before starting the research. This does not involve ignoring the literature - the intention is to make sure that the researcher is not constrained by the literature when coding. The researcher should make sure that they do not impose concepts on the data. Concepts should emerge from the data. In this sense, researcher needs to be very familiar with the subject area or, as Glaser put it, steeped in the field of investigation (Glaser, 1978).

Correspondingly, as with any other research methods, grounded theory has its own advantages and disadvantages. The advantages are:
- It has intuitive appeal for beginner researchers, since it allows them to become immersed in the data at a detailed level.
- It is suited for new areas where little theory exists.
- It gets researchers analysing the data early.
- It encourages systematic, detailed analysis of the data and provides a method for doing so.
- It gives researchers sufficient evidence to back up their claims.
- It encourages a constant interplay between data collection and analysis.
- It is especially useful for describing repeated processes e.g. the communications processes between information systems analysts and users.

On the other hand, the disadvantages are:

- First-time users can get overwhelmed at the coding level.
- Open coding takes a long time.
- It can be difficult to ‘scale up’ to larger concepts or themes.
- Because it is a detailed method, it can be difficult to see the bigger picture.

If the researcher wishes to develop or modify a theory rather than borrowing one that is off-the-shelf, the grounded theory approach is best adopted (Creswell, 2005).

4.5.6 Chosen Research Method for this Research

Reviewing the available qualitative research methods (i.e. action research, design science research, case study research, ethnographic research, grounded theory), and based on the research aim (to generate a novel Lean Briefing Process for effective design management and explore its validity within AEC projects), the author saw the grounded theory research method as the most appropriate to adopt in this research. This was because the researcher was conceiving to build a new theory (i.e. Lean Briefing), based on industry practitioners’ perception, interpretations and experience of briefing processes and by making use of Lean Management theory grounded in construction (i.e. Lean Construction) and other trades (e.g. Lean Manufacturing). The grounded theory research method was the best to serve this research aim as the method was designed to develop theory that is grounded in data that has been systematically gathered and analysed.
Based on the research problem the first consideration was whether to use action research or design science research, as the research problem (i.e. briefing process practice) is research practice related. After careful review and consideration of the purposes of those two methods, the research context, and its intended outcome, it was decided to disregard those two methods as not the ideal models to be adopted in this research for the following reasons:

1- There is no clear vision of the potential solution, whereas these two methods either suggest a solution and test it (action research) or take a solution and put it under development (design science research).

2- A long time is required for both models to engage with practitioners, which did not fit within the time frame limit for this research.

3- There is an on-going debate about how far design science research can be differentiated from action research method and what its key distinguishing elements are. It has also, as mentioned earlier, been the subject of substantial critiques (e.g. Susman and Evered, 1978; Schön, 1984), and to some extent it is unclear exactly how design science is to be performed, which may be due to the fact that it is not a very well-established methodology. The approach may work in clinical research, as the advocates for design science claim (e.g. Van Aken, 2004; Koskela, 2008), but in the view of the author it seemed problematic within the present field of research, and quite risky to use it in this research.

4- From the author’s point of view there was not yet a solution to be developed, or an existing holistic solution that could be tested it. In order to deliver the right solution, correct diagnosis of the problem is needed first. In the view of the author, there was no one developed solution able to provide a holistic solution to the experienced problem, but rather several that fixed parts of the problem.

Although one may still view this research as design science, it was not the intention of the author to explicitly live up to any requirements of this methodology for the above-mentioned reasons.

Similarly, the case study research and ethnographic research methods were also disregarded after reviewing their purpose because they were not appropriate. A case study was not ideal at the current stage of the research focus topic (Project Brief), as this research conceived building a new theory (i.e. Lean Briefing) and the aim of a case study research is to contribute to a new theory or explore/test an existing theory in one or a few organisations,
which was not the aim here. The ethnographic research method was not seen as appropriate
as it would not help in achieving the research aim. The main purpose of ethnography is to
engage with people in their daily work life (i.e. fieldwork) to obtain a deep understanding of
people and their culture and seek to place the phenomena studied in their social and cultural
context (i.e. purely social focus), whereas the research case has only a partially social focus
as it focuses on people’s practices and processes. Furthermore, it requires a significant length
of time in the field which is does not fit within the time frame of this research.

For these reasons, the grounded theory research method was chosen to be adopted in
this research in order to achieve the aim, to generate a novel Lean Briefing Process for
effective design management and to explore its validity within AEC projects. The key
research fundamentals to be achieved via adopting the grounded theory research method in
this research were:

- To understand the briefing process based on industry practitioners’ experience and
  interpretations of briefing by carrying a rigorous investigation of current briefing
  practice through interaction with practitioners in construction organisations. By
  means of exploring current briefing process practices, the study would gain a
deeper understanding of the process, and identify deficiencies in its practice as well
  as mapping good practices.

- To explore the use of Lean Management principles in the briefing process, and
  explore its implications for the briefing process by means of building a new theory
  (i.e. Lean Briefing) based on Lean Management theory grounded in construction
  (i.e. Lean Construction) and other trades (e.g. Lean Manufacturing).

Although the earliest schools of thought claimed that grounded theory research should
be conducted without a literature review (Myers, 2000), a literature review was done to
investigate and try to map the relevance between what appeared in literature and in the life.
The author notes that this is not applicable to all types of research: this might be the case if
the data was collected for another research problem and through the data analysis of that
research data some issues were noticed that were not within the focus of that research. The
author sees the difference mainly in the analysis of the collected data and whether the
analysis was done properly to allow the theory to emerge. The focal point in academic
research is the contribution to knowledge. The literature review allowed the researcher to
define gaps that need to be researched to contribute to existing knowledge. The author believes that even researchers who disagree with the early literature review in this type of research method will have some background knowledge, perhaps from previous research. This background knowledge is considered as an unintentional literature review.

4.6 Data Collection Techniques

Data collection techniques are used to gather data from a particular sample of people within a limited time frame. All methods of data collection can supply quantitative data (numbers, statistics or financial information) or qualitative data (usually words or text). The positive features of different available data collection techniques can be utilised through the careful design of the data collection; this will enable the researcher to eliminate bias and to select a representative sample (Creswell, 1994).

There are two main sources of data in any research: secondary data (desk study) and primary data (fieldwork research). Secondary data, previously published data (e.g. articles, books), are those that have already been collected by someone else for a different purpose. Secondary data can be collected through a literature review, which is the process of exploring all sources of published information, whether textual, statistical or diagrammatic (Naoum, 2007). The literature review fills the gap between the on-going study and previous related research by providing insight into the research topic; it also aids the establishment of points of comparison between present and previous studies (Nachmias, 2000). Writing the literature into a qualitative study differs from writing it into a quantitative study. The qualitative approach uses the literature inductively at the start to shape the problem, whereas the quantitative approach uses it deductively to work out the problem (Creswell, 1994).

Primary data are unpublished and are collected by the researcher directly themselves from the field using techniques such as experiments, questionnaires, interviews, focus group, workshop, observations, case study and the use of documents. The primary data generated by these methods may be qualitative in nature or quantitative. Each method has its own advantages and disadvantages and the methods or techniques used for collecting primary data will depend on which best obtain the information that will enable the fulfilment of the research objectives (Naoum, 2007; Creswell, 1994). However, it is not necessary to use only
one method or technique, as some of the drawbacks of one specific method can be overcome by conducting supplementary methods.

Primary data add richness and credibility to research. However, collecting primary data is time-consuming and expensive, even for a relatively small sample. A sample is part of a whole population which is selected in order to reflect the rest (Naoum, 2007). The objective of the research defines the sample size and the criteria in terms of what the researcher needs to know and who they wish to know it from. As it is impossible to investigate a complete population due to limitations of research time and cost, the researcher has to ensure the characteristics of the sample and make it representative (Nachmias, 2000).

Following the aim and objectives of this research, and the decision on the research approach and paradigm (i.e. inductive approach and qualitative paradigm), this section includes a review of the likely data collection techniques (i.e. interview, focus group) that help to collect qualitative data in a manner and format appropriate to support achieving the research aim and objectives.

### 4.6.1 Interviews

Interviews are one of the most important forms, and the most common form, of data collection in qualitative research. A good interview focus on the subject’s world, and allows rich data to be gathered from people in various roles and situations.

There are three types of interview: structured, semi-structured and unstructured (Kvale, 1996, Rubin and Rubin, 2005; Kvale and Brinkmann, 2009). A structured interview uses pre-formulated questions, strictly regulated with regard to the order of the questions, and sometimes regulated with regard to the time available. A semi-structured interview uses some pre-formulated questions, but no strict adherence to them. New questions might emerge during the conversation. An unstructured interview uses a few if any pre-formulated questions. In effect, the interviewee has free rein to say what they want and often no set time limit.

The use of interview techniques can encounter some potential problems such as the artificiality of the interview, lack of trust, lack of time, level of entry, elite bias, hawthorne
effect / observer effect (The need for social approval is very strong and this may lead interviewees to alter their stories, construct knowledge or use ambiguous language), Interviews can go wrong, there can be problems of meaning, and use of leading questions (Kvale and Brinkmann, 2009).

One way to try to overcome potential problems is to use a dramaturgical model of the interview (Rubin and Rubin, 2005). The dramaturgical model treats the individual interview as a drama.

Dramaturgical model:

- The Interviewer’s Part: entering, listening, prompting, directing, encouraging, exiting, and listening carefully.
- The interviewee’s Part: showing off, confessional/ cathartic, shy, awed, bored, fatigued, probing, and deceiving.

Additionally, maintaining interview performing skills will ensure a good interview performance (Rubin and Rubin, 2005; Kvale and Brinkmann, 2009):

- Eliciting skills: how questions are asked is important. The use of open questions in interviews is more effective. Open questions take the form ‘who’, ‘what’, ‘why’, ‘where’, ‘when’, ‘how’, and usually lead to answers that are open-ended and more descriptive (i.e. qualitative data).
- Listening skills; Chrzanowska (2002) stated, “An interviewer needs to follow the content of what is being said, listen to the meaning underneath the words, and then gently bring this into the conversation. He/she offers or reflects back what they have heard, so that the respondent can confirm, deny, or elaborate. This way of working creates empathy, deepens the conversation and ensures the meaning has been understood”.

4.6.2 Focus Groups

Most qualitative interviews are one-to-one, but group interviews can be used as well. The purpose of a focus group interview is to get collective views on a certain defined topic of interest from a group of people who are known to have had certain experiences (Rabiee, 2004). In a focus group, the benefit comes from the interaction. It helps different group
members to generate ideas they might not have thought about. It enables researchers to elicit
opinions, attitudes and beliefs held by members of a group which will help to overcome
issues of individual input in one-to-one interviews (Rubin and Rubin, 2005).

Using a focus group will encounter similar problems to one-to-one interviews, although less hawthorne effects will be experienced in focus groups thanks to the presence of other members of similar professions in the group. Similar skills regarding the likely encountered problems in one-to-one interviews are applicable here as well.

4.6.3 Chosen Data Collection Techniques for this Research

The research study was based on both secondary and primary data. Secondary data was collected through an extensive literature review of relevant subjects such as the design process, briefing (architectural programming), design management, Lean Management and Lean Design Management by accessing relevant texts, books, professional journals and publications. This helped in gaining a deep understanding of the area, discovering the latest developments, and therefore identifying knowledge gaps, developing research questions and informing the methods for use in collecting primary data.

As already mentioned, the research study was developed from the author’s Master’s Dissertation, which explored the interpretation and application of Lean Design Management in architecture, engineering and construction (AEC). The outcome of the primary data from that research, collected through 125 questionnaires completed by industry practitioners (17 architects, 15 design managers, 38 project managers, 5 coordinators, 28 engineers, 12 quantity surveyors, and 10 construction-related roles such as a key account director, marketing manager, managing director and director of architecture), working in the UK inspired this research study. This data helped to articulate the problem and helped in identifying where the largest amount of waste is generated (the briefing process). Therefore, in this research and as a continuous development of the previous research, it was decided to start from the results of the earlier research study.

In terms of the primary data for this research, by reviewing data collection techniques (Section 4.6) and considering the research aim and objectives and the research method to be adopted (i.e. grounded theory), interviews and focus groups were selected to be used as data
collection techniques. It was believed that in the earlier phase of the research, interviews would support the exploration of current briefing process practices, gaining a deeper understanding of the process, and identifying deficiencies in its practice as well as mapping good practices. Similarly, in the later phase of this research, focus groups and interviews supported the exploration of the implication of Lean Management principles on the briefing process, as well as validating and verifying the new developed theory (i.e. Lean Briefing).

However, the author agreed with Henry Mintzberg’s statement regarding research samples “… we shall never understand the complex reality of organisations if we persist in studying them from a distance, in large samples with gross, cross-sectional measures. We learn how birds fly by studying them one at a time, not by scanning them on radar screens”. In this sense, the strategy of purposeful sampling in qualitative research was considered with reference to the research trustworthiness. It was anticipated that primary data would be collected from construction industry practitioners working in design companies and construction organisations. The targeted practitioners from both categories included architects, design managers, project managers, engineers and quantity surveyors, as defined by the research objectives. The plan was for the targeted categories to be based in the UK but data from other geographical areas would be considered if needed through the research progression.

4.7 Data Analysis

4.7.1 Qualitative Data Analysis Approach

There are various approaches to interpreting and analysing qualitative data: content analysis, analytic induction, series of events, critical incidents, discourse analysis, hermeneutics, semiotics, narrative analysis, conversation analysis and metaphorical analysis. However, the data analysis approach is ideally connected to the research philosophy, whether it is positivist or interpretive. As this research was classified as interpretive research and considering the research aim and objectives, and therefore the projected context of the data analysis, this section includes a review of the only data analysis approaches appropriate to be adopted in this research.
4.7.1.1 Interprettative Phenomenological Analysis

Interpretative Phenomenological Analysis (IPA) is a relatively recent qualitative approach. The aim of IPA is to explore in detail how participants are making sense of their personal and social experiences, events, and/or states (Fiske and Taylor, 1991). IPA is concerned with trying to understand lived experience and with how participants themselves make sense of their experiences.

IPA is phenomenological, as it desires to explore an individual’s personal perception or an explanation of an event/state and is not an attempt to produce an objective record of the event/state itself (Fiske and Taylor, 1991). This link is complicated, and the researcher sometimes has to interpret people’s mental and emotional states from what they say. The aim is to try to understand the content and complexity of those meanings rather than measure their frequency (Manen, 1997). This requires the researcher to engage in an interpretative relationship with the transcript. They are trying to get close to the participant’s personal world through a process of interpretative activity based on their own ideas. Hermeneutics, the theory of interpretation, is important for IPA as one cannot do this directly or completely (Packer and Addison, 1989; Palmer, 1969).

IPA employs a qualitative methodology. In-depth interviews are used in most IPA work. The interviews are audio-recorded, transcribed verbatim and subjected to detailed qualitative analysis. IPA is an attempt to elicit the key experiential themes in the participant’s talk. It is concerned with detailed analysis of the case itself before moving to other cases (Denzin, 2000). However, other qualitative data collection methods can also be used (e.g. diaries or observation notes).

The advantage of this approach is to provide a clear series of steps, which could help first-time researchers to manage the large amount and complex nature of qualitative data much more easily. Significantly, this method enables the researcher to synthesise the identified themes across the whole data.
4.7.1.2 Hermeneutics

Hermeneutics suggests a way of understanding textual data. It is primarily concerned with the meaning of a text or text-analogue. The basic question in hermeneutics is: what is the meaning of this text? (Gadamer, 1976).

Hermeneutics focuses primarily on the meaning of qualitative data, especially textual data. The purpose of using hermeneutics is to aid human understanding. It helps the qualitative researcher in business and management to understand what people say and do, and why. Taylor (1976) stated, "Interpretation, in the sense relevant to hermeneutics, is an attempt to make clear, to make sense of an object of study. This object must, therefore, be a text, or a text-analogue, which in some way is confused, incomplete, cloudy, seemingly contradictory - in one way or another, unclear. The interpretation aims to bring to light an underlying coherence or sense".

Hermeneutics suggests the circle concept to understand a complex whole from preconceptions about the meanings of its parts (Gadamer, 1976). Human understanding is achieved by iterating between the parts and the whole which they form. The goal of interpretation is “to produce a reading of the text that fits all important details into a consistent, coherent message, one that fits coherently into the context …” (Diesing, 1991).

It also suggests that the concept of prejudice, pre-judgement or prior knowledge plays an important part in our understanding. Our attempt to understand a text always involves some prior knowledge or expectation of what the text is about. In fact, we cannot understand a text unless we have some understanding of the language. Hermeneutics suggests that understanding always involves interpretation; interpretation means using one's own preconceptions so that the meaning of the object can become clear to us (Gadamer, 1975). The critical task of hermeneutics then becomes one of distinguishing between “true prejudices, by which we understand, from the false ones by which we misunderstand” (Gadamer, 1976). In this sense, as researchers we need to become aware of how our own views, biases, culture and personal history have a significant impact on how we view the world.
However, Ricoeur (1981) made an important distinction between verbal speech and written text. He said that the author's meaning, once it is inscribed in a text, takes on a life of its own. This process of autonomisation takes place whenever speech is inscribed in a text. This means that the text now has an autonomous, 'objective' existence independent of the author. Ricoeur (1991) suggested that the hermeneutic task is to make Aristotle's writings our own. The "text is the medium through which we understand ourselves". Gadamer suggested that meaning does not reside in "the subjective feelings of the interpreter" nor in "the intentions of the author". Rather, meaning emerges from the engagement of reader and text. This process of critical engagement with the text is crucial (Gadamer, 1976).

There are four types of hermeneutics:

- **Pure hermeneutics** stresses empathic understanding from the 'inside'. It sees the text or object as 'out there', ready to be investigated.

- **Post-modern hermeneutics** says there is no such a thing as an objective or 'true' meaning of a text. 'Facts' are what a cultural, conversational community agrees they are (Madison, 1990).

- **Critical hermeneutics** takes a middle position – the interpreter has the important task of judging between alternative explanations.

- **Depth hermeneutics** assumes that the surface meaning of the 'text' hides, but also expresses, a deeper meaning.

In qualitative research studies about business and management, the 'text' is what people say and do. Interviews, documents and field notes record the views of the actors and describe certain events. This material needs to be ordered, explained and interpreted in order to 'make sense' of the situation. The ordering is done according to the researcher's theoretical position and by comparing one text with another. The researcher's understanding of the whole has to be continually revised in view of the reinterpretation of the parts.

The main advantage of using hermeneutics is that it enables a much deeper understanding of people in business settings. Hermeneutics is well-grounded in philosophy and the social sciences more generally and hence relatively easy to justify. However, the disadvantage of hermeneutics is that the researcher focuses almost entirely on text rather
than lived experience. Another potential disadvantage is that it can be difficult to know when to conclude a study: when does the interpretive process stop?

4.7.1.3 Series of Events

An event listing is a series of events organised by sequential order (Miles and Huberman, 1994). The events can possibly be sorted into categories. Some events occur before others and are connected. Then they can be presented as a narrative or summarised in table form or flow chart.

4.7.1.4 Critical Incidents

A critical incident is a shorter form of a series of events. This is a listing of only those events deemed by the researcher to be extremely important and pertinent to the research (Chell, 2004).

4.7.1.5 Conversation Analysis

Conversation analysis looks at the use of language by people as a type of action, or as a skilled accomplishment by competent actors. A key concept within conversation analysis is the idea of the speaking turn. The principle of turn-taking in speech is claimed to be a universal feature of all conversations. It does not presume the existence of fixed meanings in words and idioms. Meanings are shaped in the context of the exchange (Miles and Huberman, 1994).

4.7.1.6 Discourse Analysis

Discourse analysis looks at the way in which texts are constructed and is concerned with the social contexts within which the text is embedded. The word discourse refers to communication that goes back and forth, like an argument or debate. All language can be treated as a social interaction (there is always a speaker/writer and listener/reader), but discourse analysis focuses mostly on language in use - the use of naturally occurring language in speech and/or written text (Keller, 2011). Discourse analysis is concerned with actual instances of language as used in communication, and encourages multiple readings and interpretations of a text.
4.7.2 Qualitative Data Analysis Techniques

Analysing qualitative data requires following some technique to run the task efficiently. These techniques (e.g. coding, memos and use of software) support approaches to interpreting and analysing qualitative data.

4.7.2.1 Coding

Coding is used for whole-text analysis. “Codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study. Codes are attached to ‘chunks’ of varying size – words, phrases, sentences, or whole paragraphs, connected or unconnected to a specific setting” (Miles and Huberman, 1994). Codes/themes are used to retrieve and organise the data. They empower and speed up analysis. There are various types of code, e.g. descriptive codes, interpretive codes, pattern codes.

4.7.2.2 Memos

Memos are the theorising write-up of ideas about codes and relationships as they strike the analyst while coding (Glaser, 1992). In effect it is your own commentary on what was happening or what you were doing during your research project. Esterberg (2002) said there are two main types of memo: procedural and analytic. Procedural memos focus on the research process; they help the researcher to keep track of what they have done. Analytic memos focus more on the subject matter; they focus on the data and contain hunches and ideas about what the data mean.

4.7.2.3 Use of Software

Software (e.g. NVivo) is available which supports qualitative data analysis (Bandara, 2006; Jemmott, 2008). Weitzman and Miles (1995) stated that, Qualitative Data Analysis (QDA) software can help the qualitative researcher in:

- Making notes in the field, writing up or transcribing field notes.
- Editing: correcting, extending, or revising field notes.
- Memoing: writing reflective commentaries on some aspect of the data.
- Coding: attaching keywords or tags to segments of text to permit later retrieval.
- Storage: keeping text in an organised database.
Search and retrieval: locating relevant segments of texts.
- Data 'linking': forming categories, clusters, or networks of information.
- Content analysis: counting frequencies, sequence, or locations of words and phrases.
- Data display: placing selected or reduced data in a condensed organised format.
- Conclusion-drawing and verification: helping interpretation of data and testing findings.
- Theory-building: developing systematic explanations of findings; testing hypotheses.
- Graphic mapping: creating diagrams that depict findings or theories.
- Preparing interim and final reports.

4.7.3 Chosen Data Analysis Approach and Techniques for this Research

Qualitative data analysis is considered a difficult task due to having enormous data in the form of raw data. Ritchie and Lewis (2009) argued that the form of qualitative raw data is various and most commonly comprises verbatim transcripts of interviews, discussions, audio, observational notes, etc. Creswell (2007) and Yin (2008) indicated that data analysis consists of a number of stages, i.e. examining, categorising and presenting or otherwise recombining the evidence, in order to address the initial goal of a study. In this regard, Krueger and Casey (2000) suggested that the purpose should drive the analysis; they believed that data analysis should start by going back to the intention of the study and survival required a clear fix on the purpose of the study. In qualitative analysis, the focus is to bring meaning to a situation rather than the search for truth focused on by quantitative research (Rabiee, 2004). Strauss and Corbin (1998) described the analysis process as interaction between researcher and data although admitting that, there is an extent of subjectivity in the selection and interpretation of the generated data.

The above discussion revealed that interpretative phenomenological analysis (IPA) was given a significant role in analysing the interviews due to its having a systematic process. It comprises a searching-out of underlying themes in the materials being analysed. Themes are defined as units derived from patterns such as conversation topics, vocabulary, recurring activities or meanings (Taylor and Bogdan, 1984). They are identified by bringing together fragments or components of ideas or experiences which would otherwise seem meaningless
when viewed alone (Attride-Stirling, 2001). This is extremely helpful for managing the data, making sense of what is going on, eliminating extra and irrelevant information and navigating safely through the confusion of large and complicated paths of information, and thus addressing the aim of the study. Accordingly, since IPA achieves a robust research outcome by searching out themes which strengthen interview findings, this research selected this approach as the main approach for analysing raw data collected by interviews. However, other approaches were needed to support the main approach in achieving a robust research outcome: (i) Hermeneutics to support interpretation, (ii) Series of events and critical incidents to support identifying briefing process steps, and good and bad briefing practices. NVivo software was used as a data management tool to organise and manage the generated qualitative data.

4.8 Research Design Roadmap

Reviewing the literature helped in planning the research design that best supported answering this research questions, and achieving its aim: to generate a novel Lean Briefing Process for effective design management and to explore its validity within AEC projects. The resulting research design plan (Figure 4.3) included deciding on the philosophical premise of this research (i.e. relativist/constructivist ontology, interpretive epistemology, inductive approach and qualitative paradigm methodology, value-laden axiology), selecting the research method to be adopted in this research (i.e. grounded theory), selecting data collection techniques to be used in this research (i.e. interviews and focus groups), and deciding on the data analysis approaches to be adopted (i.e. phenomenological analysis, hermeneutics, series of events, critical incidents). In addition, alongside the research study, ethical issues were taken into account in the research study at different points during the research process, starting with the proper referencing of others’ work, including honest reporting of the research procedures and incidents, and ending with managing anonymity where it was required or requested.
Therefore, in this research and as a continuous development of the previous research (El Reifi and Emmitt, 2011), it was decided to start from the results of that study and organise the working strategy into eight main phases, each feeding the next; Table 4.1.
Table 4.1 Research working strategy

<table>
<thead>
<tr>
<th>Phase</th>
<th>Work description</th>
<th>Objective/s to be achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONE</td>
<td>Identify the research aim/objectives, articulate the research questions and clarify the research focus, scope and limitations by doing further reading regarding the briefing (architectural programming) concept, its current practice and research done to date to improve its practice, followed by a deep study of Lean Thinking philosophy, its principles, tools, and transformation techniques. Review Lean Design Management topics. Complete any further reading required by other emerging issues linked to research topic such as Building Information Modelling (BIM). See Chapters 2 and 3.</td>
<td>1 and 2</td>
</tr>
<tr>
<td>TWO</td>
<td>Adopt research methodology that serves the research aim and objectives by designing a conceptual Lean Briefing Process Model using Lean Management philosophy. See Chapters 3 and 4.</td>
<td>2</td>
</tr>
<tr>
<td>THREE</td>
<td>Conduct interviews with construction industry practitioners. Analyse interview data combined with the literature review to find out about briefing practice in the industry, figure out inefficiency (waste), map the briefing process value stream, including good briefing practice elements, and introduce a basis for a potential solution. See Chapter 5.</td>
<td>1, 3, and 4</td>
</tr>
<tr>
<td>FOUR</td>
<td>Design and develop Lean Briefing concept and approach (i.e. Management Framework with an associated Lean Briefing Process Operational Roadmap). See Chapter 6.</td>
<td>3 and 4</td>
</tr>
<tr>
<td>FIVE</td>
<td>Conduct one-to-one interviews with Lean experts for initial validation and verification of the developed Lean Briefing concept and approach (i.e. Management Framework and its associated Process Operational Roadmap) (i.e. validation and verification from Lean perspective). See Chapter 7.</td>
<td>3 and 4</td>
</tr>
<tr>
<td>SIX</td>
<td>Improve the Lean Briefing Management Framework and its</td>
<td>3 and 4</td>
</tr>
</tbody>
</table>
associated Lean Briefing Process Operational Roadmap in respect to the initial validation and verification phase (i.e. Lean experts’ feedback and comments). See Chapter 7.

EIGHT Improve the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap in respect to the final validation and verification phase (i.e. construction industry practitioners’ feedback and comments). See Chapter 7.

Additionally, in support of the working strategy of the research, a vision on how research objectives were going to be achieved was planned. The following table illustrates the planned vision; Table 4.2.

Table 4.2 How research objectives were planned to be achieved

<table>
<thead>
<tr>
<th>No</th>
<th>Objective</th>
<th>Achieved via</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Establish importance (function and value) of the Project Brief in relation to the project, and the influence of its process on design management efficiency.</td>
<td>- Literature Review</td>
</tr>
<tr>
<td>2</td>
<td>Develop a conceptual Lean Briefing Process Model.</td>
<td>- Literature Review</td>
</tr>
</tbody>
</table>
| 3  | Generate Lean Briefing concept.                                           | - Literature Review 
- Interviews                                          |
| 4  | Design, develop, and validate a Lean Briefing concept and approach.        | - Literature Review 
- Interviews 
- Focus group workshop                                  |
Figure 4.4 illustrates the development cycle of the Lean Brief throughout the research period. It shows the first cycle (i.e. initiation and development) of Lean Briefing Process (LBP) where LBP Conceptual Model was established from the literature review (Chapter 3), and then the first LBP version was developed from the empirical interview investigation. The figure also explains the second cycle (i.e. validation) where the 1st LBP version was processed into the first validation by interviewing lean experts, and then the improved second LBP version was processed into the second validation by conducting a focus group and interview with industry practitioners.

Figure 4.4 The development cycle of lean briefing

Phases three and four of the research are discussed in the following two chapters; Chapter 5 and Chapter 6 of this thesis. The validation (i.e. research phases 5, 6, 7, and 8) is discussed in Chapter 7 of this thesis.

4.9 Summary

The chapter informed the research design and methodology for carrying out the empirical research, collecting primary data and accomplishing the stipulated research objectives. Reviewing the research design and different research methodologies helped in planning the
research design and choosing the methodology. The research design and the adopted methodology were chosen to address the research questions and consequently respond to the aim and objectives of the research. The philosophical position of this research was chosen to be located within the relativist/constructivist ontology, interpretive epistemology, and value-laden axiology. However, ethical issues concerning data interpretation to be considered alongside the whole research process, starting with the proper referencing of others’ work, including honest reporting of the research procedures and incidents, and ending with managing anonymity where it was required or requested. 

A grounded theory research method was chosen to be adopted in this research in order to achieve the research aim. The criterion of a good theory is understanding of meaning and intentions rather than deductive explanation. The interpretive research perspective suggests a more inductive approach to theory building. Similarly, the qualitative research paradigm allows scholarship and practice to come together. The researcher intended to study the situation in the industry via interaction with practitioners in construction organisations to explore briefing practice based on their experience and views. Thus, more emphasis was placed on using a qualitative paradigm; methodology premise.

Interviews and Focus group were selected to be used in primary data collection as these believed to support exploring current briefing process practices, gain a deeper understanding of the process across a range of construction industry practitioners’ experience and views, and identify deficiencies in its practice and room for improvement as well as mapping good practices.
CHAPTER FIVE

DATA ANALYSIS AND DISCUSSION
CHAPTER FIVE

5 DATA ANALYSIS AND DISCUSSION

5.1 Overview

This chapter presents the empirical research that was carried out by means of an interview survey to investigate briefing practices in the UK construction industry and explore the implementation of Lean Management principles in the briefing process to enhance its practice. It further presents the empirical research that was carried out to select some good briefing practice lessons from briefing practices in the Libyan construction industry. The empirical research involved interviewing practitioners to understand briefing practice from their experience and views. The chapter starts by illustrating the rationale for the empirical research, followed by an explanation of the empirical research preparation plan. Then, the interview survey procedure and practice are outlined. Next, the analysis of the qualitative data collected from the interview survey is presented. Then, this data is discussed in the light of the literature review and the context of Lean Briefing. Uncertainty about the brief concept and the absence of formal briefing procedures were identified as the main waste drivers in briefing practices in the UK. The analysis and discussion of the collected data further identified room for improvement in briefing process practice and the philosophical premises for setting up the Lean Briefing perspective. This identified philosophical premise and the selected good briefing practice lessons from briefing practices in the UK and Libya are used in developing the Lean Briefing concept and planning the Lean Briefing approach based on Lean Management theory in the next chapter.

5.2 Rationale for the Empirical Research

Given the fact that different practices and views on brief and the briefing process exist in current practices in the UK, it was felt that an empirical research employing an interview survey would be useful to elicit an understanding of current briefing practices, gauge industry attitudes towards current briefing practice efficiency, and identify room for improvement by exploring the different practices, experiences and views on the project brief.
In addition, it would provide further familiarity with the phenomenon of ineffective project briefs and reinforce the justification for this research mentioned in earlier chapters. This empirical research included a focus on a potential Lean perspective to briefing. In the field of phenomenological study, the interview is recognised as a primary method to collect descriptions from individuals who have experienced the phenomenon under investigation (Creswell, 1998). It is also ideally suited to examining a research topic in which different levels of meaning need to be explored (King, 1994).

5.3 Empirical Research Preparation Plan

The empirical research was conducted through an interview survey. Unstructured face-to-face interviews were conducted with industry practitioners. However, an early front-end preparation plan was completed before commencing the interview survey. This included identifying the target population, interviewee selection, contingency questions and empirical investigation ethical approval.

5.3.1 Target Population

As noted earlier, this grounded theory research is aimed to generate new theory (i.e. Lean Briefing) rather than empirical generalisation. In this regard, systematic sampling was not an important element of the target population for this empirical research. The target population (sample) was chosen based on the strategy of purposeful sampling. It was influenced more by other two important research-related factors: firstly, understanding the phenomena and secondly, identifying room for improvement. In the opinion of the researcher this would be achieved via robust interaction with variety of practitioners representing diverse views from organisations in the UK construction industry. Hence, the initial plan was to target those who have practical experience of the briefing process in the UK. Elite interviewing is suggested to focus on a particular type of interviewee, considered to be “the influential, the prominent, and the well-informed people in an organisation or community […] selected for interviews on the basis of their expertise in areas relevant to the research” (Marshall and Rossman, 2006).

However, research requires the researcher to be flexible and open to new lines of enquiry and idea, and as the research progressed, it was realised that seeking different
experience from an overseas geographical area as well would allow the potential identification of good briefing practices that would support the development of the new theory, as well as determining the project brief perspective from different entity of the architectural design world. This re-thinking of the target population was advantageous, as it led to both national and international contributions to the research which, in turn, provided more robust multi-dimensional views for developing the Lean Briefing theory.

5.3.2 Interviewee Selection

Interviewees in the UK were selected purposely. A decision was made to approach practitioners from architectural practices within the East Midlands, as these would be easy accessible and financially viable to the researcher whom is based at Loughborough. However, it was also thought useful to approach some well-known architectural practices based in London, as London is still easy accessible from Loughborough. The selection process was completed by consulting the RIBA online directory in order to obtain a list of architectural practices in the selected region. Then, to find out about each company practices, each company website was accessed to find out those mentioned briefing practice in their practice profile. Next to that, the company’s people list was accessed and searched for people with architecture, design management, and/or project management background and experience, preferably mentioning briefing practice in their profile. A shortlist of 34 design companies was the outcome of the whole Web search process.

It was also thought useful to seek views and experiences from people who participated in the earlier MSc research that drove this research. The questionnaire survey documents from the Author previous research were revisited to obtain contact details, where provided, for architects, a design manager and project manager, more specifically those who claimed an ineffective project brief to be one of the factors that have a negative impact on effective design management. This added an additional of 18 construction organisations to the shortlisted design companies from the Web search. Consequently, a total of 52 organisations from the UK construction industry being identified to give the national view and experience.

Simultaneously, Interviewees in Libya were also selected purposely from the researcher’s established professional network of construction industry practitioners in Libya, based on their background and experience in the architecture field. The researcher made
decisions on this selection based on his personal familiarity with those working in well-known architecture practices within the Libyan construction industry. A total of four architecture practices from the Libyan construction industry were selected to give an indication as to the appropriateness of the research to Libya.

It was later found during the interviews with practitioners from the UK construction industry that some also had international experience. This conveyed further advantages to the research, as it further strengthened the multi-dimensional views for developing the Lean Briefing theory.

5.3.3 Contingency Questions

The interviews were planned to be unstructured in order to comply with the interview aim mentioned early in Section 5.2. However, it was believed that contingency questions were required. A list of questions was prepared in case they were needed to help keep the conversation on track throughout the interview. The list of contingency questions can be found in Appendix (A).

In addition, a compulsory anonymous General Information about the Interviewee and the Organisation Form was prepared to be completed by each interviewee to aid reporting research data in this study. This can be found in Appendix (A).

5.3.4 Ethical Approval

An application for ethics approval was submitted to the Loughborough University Ethical Advisory Committee in order to fulfill Loughborough University’s human participant research requirements, and research ethics approval was obtained. A Participant Information Sheet about the research and an Informed Consent Form were prepared to be handed to and completed by each interviewee in order to comply with research ethical requirements. The Participant Information Sheet and the Informed Consent Form can be found in Appendix (A).

5.4 Interview Survey Procedure

Following the completion of the empirical research preparation plan, the interview survey was launched. It commenced by sending invitation emails to the identified interviewees. The
emails template can be found in Appendix (A). A total of 149 potential nominees were contacted by the researcher through emails addressed personally requesting them to be interviewed regarding the research topic. The decision on the time and place of interviews was left to each nominee, to suit their time schedules. Slow responses (positive and negative) were experienced at the outset, and a decision was made to send a follow-up reminder email hoping to get further responses. This yielded a few further positive responses, after which no response was forthcoming. This low interview response was not disappointing as it is considered normal practice experienced in academic research due to nominees’ time and work commitments. However, a time schedule for the interviews with those agreeing to be interviewed started to build up, and it was decided to start these agreed interviews and see whether there was a need to chase up further responses.

The interview time schedule ended up with a total of 15 agreed interviews with construction industry practitioners; 11 based in the UK, and 4 in Libya. According to Creswell (1998), a phenomenological study typically involves long interviews with informants ranging in number from 5 to 25. In this regard, the size of the interview sample was considered reasonable. The interviews took place sequentially in the following order; set of nine interviews in the UK, followed by the four interviews in Libya, and the last two interviews in the UK.

As those scheduled interviews proceeded, it was noticed that a rich text of data containing information regarding briefing practice and the potential Lean Briefing approach was being acquired. A decision was taken to cease the interview survey when it was evident that no new information was emerging, because interviewees started to repeat what had been learnt from prior contacts (Stake, 1995). It was believed that the data collected by that stage had reached a saturated level whereby the research could proceed to a further stage, especially with the limited time frame associated with PhD research project.

5.5 Interview Survey Practice

Having completed the empirical research preparation as shown in Figure 5.1, unstructured interviews were conducted face to face with 15 construction industry practitioners. Each interview was conducted in an individual session ranging from 25 to 75 minutes long at the interviewee’s office, as all interviewees requested and welcomed that. The interview started
with an introduction where the researcher introduced himself and gave an overview of the research topic and the aim of the interview. Then, to comply with research ethics, the Participant Information Sheet and the Informed Consent Form were handed to the interviewee and they were asked to complete the Informed Consent Form. Following to this, space was given for the interviewee to introduce themselves. Some chose to further address their personal professional experience besides ideas about their organisation practice. Prior to this, permission for interview voice recording was requested. The purpose of audio recording is to record each interview as fully and fairly as possible with particular descriptions from the interviewee. In addition to increasing the accuracy of data collection, the use of an audio recorder helped the interviewer to be more attentive to the interviewee in order to develop the interview in depth. In all cases, interviewees gave their consent in advance to the recording and were assured that the content of the interviews would be used anonymously and only in this research, thus reducing the potential for intimidation. This in turn helped in the effective reporting of the collected data in this research.

Figure 5.1 Empirical Research Preparations
Next, the researcher encouraged the conversation by asking what the interviewee thought of the briefing process. Then, the conversation started to develop throughout the interview. Most interview conversations were developed with minimal use of the prepared contingency question list as most investigation aspects were acquired throughout the conversation. However, to further the research, some interesting issues raised in earlier interviews were introduced into later interviews to seek others’ views on them. At the end of each interview, the researcher thanked the interviewee for their time and effort by taking part in this research, and asked them to complete the anonymous General Information Form about the interviewee and the organisation. Additionally, the interviewee was asked for future collaboration support with the research development phases. The completed forms were handed back and each interview closed with a positive encouraging message from the interviewee regarding the outcome of the research. Most of the interviewees expressed their positive interest in further collaboration. However, a few suspended their decision to take account of the context of the collaboration enquiry and its timing.

5.6 Interviewees’ Background and Experience

The 15 interviewed construction industry practitioners were working in different organisation practices (i.e. design companies, a consultancy company, construction organisations, and a client’s in-house consultant service team); 11 were based in the UK, and 4 in Libya. This sample included 10 architects, 2 design managers, 1 interior designer and 2 chartered surveyors.

Almost half of the interviewees (7) worked for large organisations consisting of more than 250 employees. The annual turnover for 7 of the surveyed companies was more than £100m, while the rest was between £50m and £100m. The interviewees were involved in a variety of projects in the residential/housing, commercial, industrial, retail, cultural, education, sport and leisure centre, and health sectors, and in new builds and/or renovation/refurbishment. They also had experience of both private and public clients. Their practical experience varied from 15 to 30 years.

Table 5.1 illustrates the interviewees’ details with respect to their qualification, position, experience, and organisation practice.
Table 5.1 The Interviewees’ details

<table>
<thead>
<tr>
<th>Interview Code</th>
<th>Interview duration</th>
<th>Location</th>
<th>Interviewee profession</th>
<th>Current role</th>
<th>Years of experience</th>
<th>Organisation practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBP-01</td>
<td>45min</td>
<td>London</td>
<td>Architect</td>
<td>Head of the technical department</td>
<td>30</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-02</td>
<td>25min</td>
<td>Glasgow</td>
<td>Chartered surveyor</td>
<td>Director</td>
<td>20</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-03</td>
<td>50min</td>
<td>Loughborough</td>
<td>Architect</td>
<td>Regional director</td>
<td>15</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-04</td>
<td>1 hour</td>
<td>Birmingham</td>
<td>Chartered surveyor</td>
<td>Partner</td>
<td>20</td>
<td>Design, consultation, and construction</td>
</tr>
<tr>
<td>LBP-05</td>
<td>40min</td>
<td>London</td>
<td>Design manager</td>
<td>Director</td>
<td>20</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-06</td>
<td>1 hour</td>
<td>Lincoln</td>
<td>Design Manager</td>
<td>Design Director</td>
<td>+15</td>
<td>Design, consultation, and construction</td>
</tr>
<tr>
<td>LBP-07</td>
<td>1 hour 15min</td>
<td>London</td>
<td>Architect</td>
<td>Partner &amp; head of workplace consultancy</td>
<td>15</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-08</td>
<td>35min</td>
<td>London</td>
<td>Architect</td>
<td>Partner</td>
<td>23</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-09</td>
<td>30min</td>
<td>Loughborough</td>
<td>Architect</td>
<td>Director of Facility management</td>
<td>25</td>
<td>Estate management</td>
</tr>
<tr>
<td>LBP-10</td>
<td>45min</td>
<td>Libya</td>
<td>Architect</td>
<td>Director</td>
<td>22</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-11</td>
<td>35min</td>
<td>Libya</td>
<td>Architect</td>
<td>Director</td>
<td>24</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-12</td>
<td>30min</td>
<td>Libya</td>
<td>Architect</td>
<td>Partner &amp; Architectural practice</td>
<td>28</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-13</td>
<td>30min</td>
<td>Libya</td>
<td>Architect</td>
<td>Executive manager</td>
<td>+30</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-14</td>
<td>1 hour</td>
<td>Leicester</td>
<td>Interior designer</td>
<td>Practitioner &amp; lecturer</td>
<td>27</td>
<td>Design and consultation</td>
</tr>
<tr>
<td>LBP-15</td>
<td>50min</td>
<td>Leicester</td>
<td>Architect</td>
<td>Project architect</td>
<td>+28</td>
<td>Design and consultation</td>
</tr>
</tbody>
</table>

5.7 Processing Interview Survey Data

Because the raw data of interviews are the actual quotations spoken by interviewees, the most desirable data to obtain is full transcription of interviews (Patton, 2002). So in order to process the data, all of the voice-recorded interviews were transcribed verbatim, providing a guarantee of full data coverage for the analysis. Examples of transcribed verbatim interviews can be found in Appendix (A). As a result, a large amount of raw textual data was generated. One dilemma for qualitative research is how to manage and process large volumes of generated textual data from the research endeavour (Thompson, 2002). With regard to data presentation, qualitative research has been criticised as often being merely an assembly of anecdotal and personal impressions, strongly subject to researcher bias (Mays and Pope, 1995; Myers, 2000). However, interview voice recording and verbatim transcribing would help mitigate much of such likely bias or subjectivity in interpreting collected qualitative data.

Additionally, qualitative research studies have been criticised for failing to illuminate thoroughly how they derive the outcomes of the analysis (Attride-Stirling, 2001; Neuman, 2007). For such reasons as these, some writers have called for a more rigorous reporting of
techniques through the use of computer programs (e.g. Tesch, 1990; Bryman and Burgess, 1994; Bandara, 2006; Jemmott, 2008). While contemporary computer software offers a number of ways to help organise, manage and analyse qualitative data, it cannot analyse the data robotically (Coffey et al., 1996; Blismas and Dainty, 2003). Human thinking and logic are still required to interpret and analyse the data itself.

In this research a large amount of raw textual data resulted from the empirical research (81,950 words), and it was essential to develop a strategy to deal with this huge amount of data. A decision was taken to use the NVivo software available to support qualitative data analysis. NVivo is designed to remove rigid divisions between data and interpretation, and has become more functional in handling non-numerical, unstructured data by using an easier coding system for indexing, searching and theorising about qualitative data (Richards, 2002).

The NVivo software was used mainly for organising and managing the generated qualitative data. The use of NVivo software for the qualitative data analysis enhanced the analysis of the interview study in two key ways. Firstly, for the analysis process itself, NVivo gave the main advantage in terms of effectiveness in handling the large amounts of textual data of transcripts. Secondly, NVivo helped the qualitative analysis to be intelligible and transparent in representing the descriptive excerpts of findings drawn from the data and in conveying the deep insights of the data. However, before inputting qualitative data in NVivo, the data needs to be in a specific structure format. Thus, the voice-recorded data was transcribed verbatim and structurally formatted in an MS Word document beforehand, then it was; (i) imported to NVivo, and (ii) managed in NVivo to support the analysis process.

Using NVivo, the data generated from the empirical research were reviewed several times before being analysed. This was to enhance familiarity, relationship, and ease living with the data (Thompson, 2002; Blaxter et al., 2010). Then, a greater amount of time was invested in sorting, highlighting and handling the data. Using the software's symmetrical link between the 'documents' and 'nodes' systems, the analysis could be shown and reviewed in a logical and easily understandable manner. Alongside this process, regular note-making about the data (i.e. what was interesting or significant from what the practitioners said) was maintained using Memo and Annotation within the NVivo software. Those technical action steps were helpful in interpreting in terms of finding themes and connecting the data, as well as helping to regularly review and develop ideas as the analysis progressed. Figure 5.2
summarises how the enormous amount of textual data resulting from this empirical research was processed and analysed systematically.

Figure 5.2 Processing Interview Survey Data Steps

5.8 Analysis of the Interview Survey Data

Qualitative data analysis covers a range of processes and procedures that illustrate the transition from collected data into some form of explanation, understanding or interpretation of the people and situations under investigation. The process typically involves identifying, coding and categorising patterns found in the data (Bryne, 2001). There are a number of approaches to the analysis of qualitative data, as explained in Chapter 4. In practice, as Myers (2000) identified, most researchers use a combination of approaches. The best approach or combination that a researcher can undertake depends on what they want to draw out from the available collected data to answer the research questions, i.e. why this data was collected. Krueger and Casey (2000) suggested that the purpose should drive the analysis; they believed that data analysis should start by going back to the intention of the study and survival requires a clear fix on the purpose of the study.
In this empirical research, data was collected to:

1. Elicit an understanding of current briefing practices;
2. Gauge industry attitudes towards current briefing practice efficiency;
3. Identify room for improvement by exploring different practices, experiences and views around the project brief (e.g. a potential Lean approach to briefing).

The approach of the analysis basically involved questioning the raw data to achieve those targeted outcomes. From studying the data analysis approaches discussed in Chapter 4, the researcher believed that a combination approach was needed, as no single individual approach would be sufficient to address all of the three goals of the empirical research.

In this sense, data generated from this empirical research was analysed by making use of a combination of four approaches: Interpretative Phenomenological Analysis, Hermeneutics, Series of Events and Critical Incidents. Interpretative Phenomenological Analysis, which is an inductive approach to qualitative data analysis, was used as the main approach for this empirical research. The other approaches were adopted to provide support (as discussed in Chapter 4).

The selected approaches are discussed under each of three targeted outcomes as following;

1. Elicit an understanding of current briefing practices.

To elicit an understanding of current briefing practices, the data was queried using the questions listed in Table 5.2 and the answers were extracted from the raw data using the analysis approach listed against each question in Table 5.2.

<table>
<thead>
<tr>
<th>Data queried for</th>
<th>Analysis approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the practitioner’s perspective of the brief concept?</td>
<td>Interpretative Phenomenological Analysis - Hermeneutics</td>
</tr>
<tr>
<td>2. What are the approaches to briefing?</td>
<td>Interpretative Phenomenological Analysis - Hermeneutics</td>
</tr>
</tbody>
</table>
2. Gauge industry attitudes towards current briefing practice efficiency.

To gauge industry attitudes towards current briefing practice efficiency, the data was queried using the questions listed in Table 5.3 and the answers were extracted from the raw data using the analysis approach listed against each question in Table 5.3.

<table>
<thead>
<tr>
<th>Data queried for</th>
<th>Analysis approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 How was the briefing process seen in regard to the design process?</td>
<td>- Interpretative</td>
</tr>
<tr>
<td></td>
<td>Phenomenological</td>
</tr>
<tr>
<td></td>
<td>- Hermeneuts</td>
</tr>
<tr>
<td>2 How was the current briefing practice evaluated?</td>
<td>- Interpretative</td>
</tr>
<tr>
<td></td>
<td>Phenomenological</td>
</tr>
<tr>
<td></td>
<td>- Hermeneuts</td>
</tr>
<tr>
<td>3 Why would current briefing practice be seen as inefficient?</td>
<td>- Interpretative</td>
</tr>
<tr>
<td></td>
<td>Phenomenological</td>
</tr>
<tr>
<td></td>
<td>- Hermeneuts</td>
</tr>
</tbody>
</table>
3. Identify room for briefing process improvement.

To identify room for briefing process improvement, the data was queried using the questions listed in Table 5.4 and the answers were extracted from the raw data by using the analysis approach listed against each question in Table 5.4.

<table>
<thead>
<tr>
<th>Data queried for</th>
<th>Analysis approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What could be the cause of inefficient briefing practices?</td>
<td>- Interpretative Phenomenological</td>
</tr>
<tr>
<td></td>
<td>- Hermeneutics</td>
</tr>
<tr>
<td>2. How could the briefing process and practice be improved using Lean Management principles?</td>
<td>- Interpretative Phenomenological</td>
</tr>
<tr>
<td></td>
<td>- Hermeneutics</td>
</tr>
<tr>
<td></td>
<td>- Series of Events</td>
</tr>
<tr>
<td></td>
<td>- Critical incidents</td>
</tr>
</tbody>
</table>

Although the selected analysis approach (Interpretative Phenomenological) is deemed to be a systematic approach, qualitative analysis is inevitably a personal process, and the analysis itself is interpretative work which the researcher does at each of the stages. Reporting the followed steps is vital in qualitative research to explain the rigour of the analysis, as explained in Section 5.7. However, in reporting the analysis outcome the following principles were maintained through the writing:

- Firstly, the meaning inherent in the participants’ experience was outlined in the statements.
- Secondly, the narrative argument was combined with verbatim extracts from the transcripts to support the case.
- Thirdly, care was taken to distinguish clearly between what the respondent said and the research’s interpretation or account of it.
- Finally, no attempt was made to omit or select particular passages for special attention, while special attention was given to individual messages that may have low frequencies but high significance to the research.
5.9 Interview Survey Findings

Classifying the collected data was seen as essential as to support practical presentation of the data in this research, and aid its rigour and robust analysis. After careful consideration, the collected data was classified into five categories: (i) Briefing practice; (ii) Briefing value; (iii) Briefing practice evaluation; (iv) Lean briefing; and (v) Brief and BIM. These were derived from the research rationale, as it was believed that the best category approach would be achieved by aligning the data to the empirical research rationale which basically set out the investigation and exploration issues. These categories helped sorting and effectively handling the data under nodes in the NVivo software: the nodes created in the NVivo software were each given the same individual category names, Figure 5.3.

Figure 5.3 Handling the Interviews Survey Data in NVivo
It must be reported that explicitly differentiating or classifying the sources of data into national/international was not seen as an important in reporting the findings and analysing the data for three reasons;

1- The international interviews aimed to seek different experiences from an overseas geographical area as well as identify potential good briefing practices that would support the development of the new theory (Lean Briefing), as well as to determine the project brief perspective from a different entity of the architectural design world. In this sense, the aim mainly served to build the new theory rather than giving a comparison between national and international briefing approaches.

2- Some of the UK interviewees were also working on overseas projects, and they articulated and reflected on their briefing experience in the international projects throughout the interviews, referring to some briefing good practices. This again, mainly served to build the new theory.

3- As mentioned in Section 5.3.1, the national/international contributions brought advantages to this research, and provided more robust multi-dimensional views for developing Lean Briefing theory. It was felt that explicit differentiation of the data would destroy the robust multi-dimensional views built into this study.

The findings from the international interviews were mainly used in establishing the brief concept and value from a different entity of the architectural design world, as well as selecting good briefing practices lessons that would support the development of the new theory of Lean Briefing.

The findings from the interviews are presented under five headings expressing the classification categories listed above.

5.9.1 Briefing Practice

5.9.1.1 Brief Concept

To establish a better understanding of briefing practices, it was important to find out about practitioners’ views of the brief concept in terms of their perception of the briefing stage in the front-end of the design process and whether the stage is seen as a process of developing a brief for design or not. So, the data was queried in this regard to draw out an overall understanding of the brief concept from the practitioners’ expressed views. A firm
agreement about the briefing concept as process of developing a brief for design was established by most of the interviewees. For example, a design manager stated, “there is a real advantage to having it as more of a process-driven initiative as opposed towards the document hopefully delivers”. However, opinions on how long to take over the briefing were varied, as will be seen from the practitioners’ views on the briefing approach discussed in the following subsection (Briefing Approaches).

It was also important to find out about briefing from the practitioners’ point of view and whether they see it only as a one-way information collection process. Several views were found regarding briefing in the interviewees’ collective views. Briefing was thought of as a collaborative process with the client to better understand their need and their vision. Table 5.5 highlights some examples of the interviewees’ views in support of this perspective on briefing.

<table>
<thead>
<tr>
<th>Table 5.5 Briefing as a Collaborative Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I think even in the shortest brief there is a message from the client. Sometimes it is in the brief and sometimes you say, ‘Well, I need to find it out’. All client briefs need a sort of analysis to interpret them and that is best to done through dialogue, and obviously to know the choices you make to make sure the client is with you.” - Architect</td>
</tr>
<tr>
<td>“We have to work with them to understand what they may need, what the scenario could be. In this way, we can test those scenarios to work out what level of flexibility and adaptability they need in their project by having different scenarios. Then, we can find tunes as we go along and put more information in.” - Architect</td>
</tr>
<tr>
<td>“It is the start of a conversation. It is not like this: Is this what you want? I have now drawn it whether you like it or not.” - Architect</td>
</tr>
<tr>
<td>“I think a good client brief should have room for interpretation but obviously it does mean there needs to be a dialogue. In the dialogue outcomes what is important to the client or not because sometime something important to the client, it is not in the brief. They assume it is to be so obvious and it is actually interpreted.” - Architect</td>
</tr>
</tbody>
</table>

Briefing was also thought of as a process of understanding client needs and business requirements. Table 5.6 highlights some examples of the interviewees’ views in support of this perspective on briefing.
Table 5.6 Briefing as a Process of Understanding

“I think it is important to go through the process of understanding what the client is and what they need and then how you’re going to go about answering those needs.” - Architect

“Education is so important and the briefing is so much more than just a statement of requirements. It is an understanding of clients’ needs, how they work and who they are. It is also an explanation of those things to them; it is not just for the architect.” - Architect

Table 5.7 Briefing as a Process of Exploring Project Solutions or Opportunities

“You try different approaches to find out which works the best. Because sometimes the client can be wrong because they can say that, ‘I like a tower’ and you say, ‘Well, actually a lower building could give you more area and better net to grow.’” - Architect

“It is about exploring because the solution is not, from most projects we have been involved in, that easy.” - Architect

“The briefing process is also a learning or a research exercise; it is not just about listing things on a piece of paper. It is actually an experiment and it is crucial that we do experiment.” - Design Manager

“Sometimes the brief is there but they would obviously expect you to complete it to a building that get permission and can be built.” - Architect

Briefing was also thought of as a process of exploring project solutions or opportunities. Table 5.7 highlights some examples of the interviewees’ views in support of this perspective on briefing.

Table 5.8 Briefing as a Value Identification Process

“What is the value? What does value mean? Is it an enjoyable space to be in? What does that mean? The briefing is about getting as far down into the detail as possible. You work out which is best together.” - Architect

“We have to work with them to understand what they may need, what the scenario could be, so we can test those scenarios out to work out what level of flexibility and adaptability they need in their project by having different scenarios and then we can fine-tune as we go along and put more information in.” - Architect

Briefing was also thought of as a value identification process. Table 5.8 highlights some examples of the interviewees’ views in support of this perspective.
“There are lots of variables and people will say these are as valuable as treasure. It is exploring these.” - Architect

Briefing was also thought of as an interface process between the vision and what is possible. This perspective appreciated and recognised the interaction between the briefing phase and the design phase. Table 5.9 highlights some examples of the interviewees’ views in support of this perspective on briefing.

Table 5.9 Briefing as an Interface Process between the Vision and What is Possible

<table>
<thead>
<tr>
<th>quotation</th>
<th>source</th>
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<tbody>
<tr>
<td>“At the concept design I would say obviously you need to start with the brief but the dialogue is important because he/she can be in the wrong way and it is all about interpretation of words. So during the concept there is that sounding out and showing and saying and also explaining to them.”</td>
<td>Architect</td>
</tr>
<tr>
<td>“Briefing process is definitely iterative. In the start of thinking you want this, then you will look at the design, you think you want something different. You do a bit more study, you change things. You’ve got to save a bit more money, you change things. You have to have a clear understanding of what the end point is, what you want to get out of it, but you have to be flexible about upfront.”</td>
<td>Architect</td>
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</tbody>
</table>

However, a few practitioners claimed that the brief is completely a client task and it is not usual practice for designers to go through a process of brief development. Table 5.10 highlights some examples of the interviewees’ views in support of this.

Table 5.10 The Brief as a Completely a Client Task

<table>
<thead>
<tr>
<th>quotation</th>
<th>source</th>
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</thead>
<tbody>
<tr>
<td>“The brief belongs to the client and then design team prepare it to respond to that brief.”</td>
<td>Chartered Surveyor</td>
</tr>
<tr>
<td>“We are not producing the brief in behalf of the client we respond to the brief we will have a client who come to us with the brief.”</td>
<td>Chartered Surveyor</td>
</tr>
<tr>
<td>“Normally it’s the client who is responsible for preparing the brief. We as a design team, we will get involved and prepare the brief on behalf of the client where one does not exist.”</td>
<td>Design Manager</td>
</tr>
<tr>
<td>“I have come across one example just once where the architect does the brief but in general I have never come across anybody and anybody of my team could distinguish between the strategic brief and design brief it is just a brief.”</td>
<td>Design Manager</td>
</tr>
</tbody>
</table>
“The brief comes from the client. It is the client side. The client is briefing us. We do not know about any job until that phone rings.” - Architect

In contrast, most practitioners expressed a view of the significance of the development of the client brief into a Project Brief (Design Brief). Table 5.11 highlights some examples of the interviewees’ views in support of this.

Table 5.11 The Significance of the Development of the Client Brief into a Project/Design Brief

<table>
<thead>
<tr>
<th>Quote</th>
<th>Interviewee</th>
</tr>
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<tbody>
<tr>
<td>“Definitely it is a process. When it gets to my level as an architect I would hope I would be able to influence the briefing in some way, I think it is important to have clarity from the client that they understand what they’re asking for, you know what their needs are before you start addressing them.”</td>
<td>Architect</td>
</tr>
<tr>
<td>“I would say properly more round the development lead opportunity. Where it is more for a process map to develop that brief and get an understanding to where things need to be.”</td>
<td>Design Manager</td>
</tr>
<tr>
<td>“It is not he said, ‘Okay I got you’ client brief and I will come back in 3 months, ‘Here is scheme,’ and the chance that this is exactly what I dream will be a big risk.”</td>
<td>Architect</td>
</tr>
<tr>
<td>“I do not think client brief like you have hold a telephone book types of that everything is defined. You probably find that more in the industry or repeat business but I do not think that is a way of getting great architecture. There has to be a dialogue in the best cases. There is work required to turn a brief into a building before you can then talk about the design and build.”</td>
<td>Architect</td>
</tr>
<tr>
<td>“You try to find something in the client brief and what is of this and what of these. You start finding things that you need to know that is not in the client brief and that where the briefing starts. It needs to be evolving.”</td>
<td>Architect</td>
</tr>
</tbody>
</table>

5.9.1.2 Briefing Approaches

To establish a better understanding of briefing practices, it was important to find out about practitioners’ experience in terms of the different briefing approaches in current briefing practices. In general practice they were accustomed to receiving a brief from the client side in the form of a general statement. For example, an architect stated that the brief might be, “I like the building you did over there,” or it might just be an email. How detailed a brief varies according to the type of client in terms of their experience in carrying out projects. Another
architect stated, “It depends a lot on the type of client you have. Some clients are actually very detached. They give you a very basic brief and they are not really that involved, have 3 or 2 things in their mind and they kind of leave you to fill in the gaps. Some other clients are very perceptive”. However, some of the interviewees mentioned that they received a type of standard brief from repeat business, housing associations, local authorities and retailers as they know what they need. Another form of brief that was stressed by most of the interviewees was what they called a ‘competition brief’. They mentioned that they get invited to tender on some jobs where the brief comes with it.

Then, most of the practitioners stated that they had no specific approach to follow; this depended on different client and project contexts. For example, one architect stated, “It does depend very much on whether something is a particular type of building for a user client or if you are talking about a developer brief”. Another architect claimed, “I have been here for over 20 years. I have seen it done in many ways and, by the time things evolve, then I think you start to learn”. In usual operational practice, the brief is set as the document delivered by the client at the project’s outset. From that point, it is the duty of the job captain, or what is sometimes called the project architect, to take the brief and start to interpret it through design (i.e., briefing by design). Sometimes in what is ‘not a usual practice’ some analysis has to be carried out to investigate precisely what the brief says. For example, an architect claimed, “I think we tend to work a lot of options. You do not start the design with a vision. You line and say ‘This what it is going to look like’.”.

However, a few interviewees mentioned that they aligned the process to the RIBA stages and sign-off gates. For example, a design manager stated, “You want to have that document as part of the competition stage or appointment documentation yes then that becomes the process where the design integrates with the brief and theoretically they should challenge it, and that can take anything from stage RIBA stage B [Design Brief according to RIBA, 2007] and up to normally stage D [Design Development according to RIBA, 2007]”.

Similarly, another architect stressed, “through the process of the design you are still finding the opportunity and it is important that you still do really”. Other practices, however, carried out a series of one-to-one meetings to pick up messages and key points and list them in a written form. They then conducted a number of further meetings to evaluate the brief and get it signed off. However, an architect affirmed, “I think it’s fair to say that the written
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A document we got to start with but once we start I would say it develops in more of a drawing terms rather than expanding the written word”. Additionally, other interviewees mentioned that they gave out a bespoke brief format that they offered specifically for smaller projects and they cut and pasted accordingly. For example, an architect explained, “We come up with a little schedule based on another job that had a bit more information. So we twist it around on them and said what about this and actually go through our own list, ‘Yeah that is a good idea, yeah we will have that’. So what was the design brief starts off like that but when we finish it was like this because we put some meat on the bone from what they originally wanted”.

Furthermore, through querying the data generated from the interview survey to establish an understanding of briefing practices, attention was given to exploring practitioners’ views in terms of the briefing process value stream. It was found that all of the interviewee agreed the importance of the certainty element in the early project stages. So there is an agreement on first, the necessity of having an early client brief at the beginning of the briefing process, to work as a base brief that sets expectations and drives the process. For example, an architect stressed, “It is really important that we have that initial brief from the client so that we can always look back to it and ask if we are still meeting the intended goals and requirements, because there is no point in having a building that is on budget, on time and that fits the environmental agenda and the climate, etc. if it is not actually fulfilling the requirements of the client”.

Then, there is the need for the briefing process journey to get to the point. However, disagreeing views were found on how long that journey should take. The fix or dynamic process is again the controversial issue about briefing mechanisms. For example, a chartered surveyor argued, “The more detail the brief has, the more chance you have of achieving a satisfactory project outcome. Actually, I think the brief starts at a very high level and then should be developed to a stage where there is enough information to avoid unnecessary tasks and a lot of reworking”. Conversely, an architect stressed, “I think the brief has to stop”. However, some of advocators of a fixed briefing process had a similar view on sticking to the early stages of the RIBA Plan of Work. They believed it is an excellent model to follow in terms of briefing process milestones. However, it looks there is a need for re-thinking the briefing concept to address the requirement evolvement issue.
However, interestingly an architect claimed that in a competitive market like the construction industry, the responsibility for looking after service quality is down to the company, and that does not mean everyone has to do it in the same way. He stressed, “It is the most important thing that when you are appointed you clearly set out a structure on how you’re going to get from A to B”. They have to use their design thinking not just to design but to design their process on how they approach the project and how they define the brief. He claimed, “I think it is healthy if everybody has the opportunity to deliver their service the way they do it, providing that they meet the minimum in terms of the professional coded expectation. They have been taught in the same way and are professionally responsible to do certain things in the right way. So they have like RIBA Plan of Work stages which outline which way they should generally approach the work, but the detail, that can be significantly different from practice to practice”. He further claimed: “We all buy the codes and practice professionally as we have to do that but how far we go beyond that is what makes each practice unique. That is our selling point”. That was the extra value that they give, he believed.

5.9.1.3 Professionals Engaged in Briefing Process

As part of establishing a better understanding of current briefing practices in the UK construction industry, it was important to find out who is responsible for briefing within the organisation and who is involved in briefing process task, if any. So, the data generated from the interview survey was queried to find out the answer from the practitioners’ articulated experience. It was found that the brief is more to be an architect’s task, so the architect is involved in interpreting client requirements and developing those and it is principally the lead architect or a senior project designer who would get the ownership of the brief on a one-to-one basis. However, one architect claimed, “it is a big task for the architect to carry alone”.

One organisation mentioned that it has a workplace consultancy team which is responsible for carrying out the brief for most projects within the organisation. As a result of this, they have built up a good level of experience in this field. They did not achieve this independently but work as an integrated team with the project architect. This team also acts as a kind of checking mechanism when the design proposals are offered. They claimed that
the overall control and responsibility should be within the project team and within the company to ensure that the design and the brief meet up.

5.9.1.4 Good Briefing Practices

Part of understanding briefing practices was to find some good briefing practices to help in planning the intended Lean Briefing perspective. So, the data generated from the interview survey (nationally and internationally) was deeply queried to explore good briefing practices according to practitioners’ articulated experience and views. Table 5.12 lists some good practice tips that were identified from the interviewees’ experienced practices and expressed views, to be considered in planning the process improvement where applicable.

<table>
<thead>
<tr>
<th>Table 5.12 Good briefing practice tips from the interviewees’ views and experienced practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Set up a monitoring process along the design stages to understand the replication of change from the design brief and support transparency between stages.</td>
</tr>
<tr>
<td>2- Preform briefing as a process of exploring solutions and opportunities.</td>
</tr>
<tr>
<td>3- Set up a workshop programme to be held between the design team and the client team.</td>
</tr>
<tr>
<td>4- For huge complex projects with lots of different buildings, have a kick off meeting between the design team and client team, carry out a series of small cluster workshops between the design team and a client team representing each individual building, join again together in one workshop and every cluster gives a debrief to the whole group to share information, and then a design manager writes the brief.</td>
</tr>
<tr>
<td>5- Organise for the client a similar project visit to provide something which is tangible.</td>
</tr>
<tr>
<td>6- Ensure an upfront collaborative process where M&amp;E structural engineer and design architect and all key people involved in the process help develop the brief.</td>
</tr>
<tr>
<td>7- Set up a collective not just a criticism review process to do a project close out at the end of each scheme. The output to be implemented into the next project.</td>
</tr>
<tr>
<td>8- Carry out research work to get specific information about the project and explain it to the client.</td>
</tr>
<tr>
<td>9- Work out the very best scenario case and run a space occupation study. Then test those against workshops and focus groups and undertake analysis and auditing of the space. Then benchmark against similar organisations as a way of developing a solution.</td>
</tr>
</tbody>
</table>
10- Set up in-house consultancy team who lead the briefing on most of the project with the lead architect from the project team. The team need to work as an integrated team for the project architect and act as a checking mechanism to review design options.

11- Carry out a series of interviews to get as detailed requirements as possible from the briefing process before starting the design. Then, present the preliminary design to the client and discuss the design problem and why the solution is presented in this way.

12- Identify similar examples that are close to the client project and show them to the client as a reference. Use illustrations like photographs or built examples.

13- Set up structure to manage the process in stages and provide a report at the end of each stage.

14- Build up an in-house project library (e.g. CAD, 3D visuals and a BIM) of completed projects to help map requirements for similar projects.

15- Consider the traditional appointment where the architect initially comes on board at the very early project stage through the brief, who might be supported by two key consultants to look at the opportunities and assist the project.

16- Consider bringing in a consultant who may be a specialist to support a particular project or part of the project.

17- Engage the client and building user (ultimate client) in the briefing process to give them a sense of buying into a sense of ownership of the building so they are part of the process.

18- Try to see really what clients need and are aiming for before you start introducing a design which may lead you in a way that maybe in the end is not exactly best for the client.

19- Set up a dialogic and relationship process strategy between the person who is executing the project and the person who is commissioning the project.

5.9.2 Briefing Value

To establish the value of the project brief in relation to the design process, it was necessary to gauge practitioners’ views on brief value. So, in the interview conversation, the practitioners (national and international) were asked to express their view of the brief and whether they saw it as an important element for the design process. All of them agreed on its significance for the design process. One architect stressed, “We see it as an important facet of the design process. However, it is not the only one”. Brief value was clearly recognised from their offered collective views as contributing to (i) initiating the design, (ii)
understanding client needs and project requirements, (iii) understanding project scope and
design parameters, (vi) recognising design opportunities, and (v) benchmarking design
outcomes. For example, a chartered surveyor stated, “The brief is essential as it’s so central
as your starting point and it is obviously valued because you know where you’re going,
otherwise it is just wasting your time”. Equally, another architect argued, “If you do not
have a clear objective it is going to be more difficult to get where you need to get to. I think
to have the same image in the mind of the architect and the client. The person who
commissioned the project and the person who is delivering the project need to have the same
image, so that they can actually aim to get to the same place so definitely it is value added
form that point of view”.

They further agreed on the value of delivering the brief with clear and well-captured
requirements in the front-end of the design process for effective design deliverables and
better design management. For example, an architect claimed, “If you’ve got a decent brief
or a fully worked up brief, as we call it, then when we start doing the concept design we can
keep the brief. There is no guesswork because you’ve got a pretty decent brief to work from.
You have got a good idea as to what and when you are starting to do in your concept”.

5.9.3 Evaluation of Briefing Practices

Next in the interview conversation, the interviewees from the UK construction industry were
asked to evaluate current briefing practice in terms of its efficiency and whether its supposed
value is achieved in its current practices. Most of the interviewees agreed that the industry is
suffering from inefficient briefing practices. For example, a chartered surveyor claimed, “I
think we are quite inefficient in the industry with regard to developing and responding to the
brief”. They further agreed that there is a lot of waste in the design process as a result of
ineffective briefs, and that can be noticed obviously from the amount of time and effort spent
in reworking designs because of client requirement change orders. However, some
interviewees admitted that there is certain example where the brief works well. They
elaborated that this depends on the architect, briefing process, project context, and client type
(experienced/inexperienced).

All of the interviewees agreed that the industry was quite inefficient with regard to
developing and responding to the brief because very little advice was available in terms of
how to perform the briefing process. For example, an architect claimed, “There is a minimum outline based on hopefully good sound professional training, this is how you should look after your client”. However, most of the Interviewees agreed that consistency at this early stage would help in addressing deficiency in its practice.

In addition, a few interviewees claimed the limited time assigned to develop the brief to be another factor which contributes waste to the brief, whereas, some others claimed that what they called the ‘Competition brief’ contributes to the current inefficiency in briefing practice. For example, an architect argued, “Literally, we are given the brief. We have no opportunity to develop it with the client”. They claimed that they get invited to tender on some jobs where the brief comes with it. For example, some tenders specify the design development stage as the start and no allowance is made in the submitted bid to revisit the brief. One architect stated, “It leads to an unsatisfactory outcome because the opportunity has been missed to look at why the brief is the way it is, and you cannot add value which might be explored through other options and alternatives”. Another architect argued, “In a competitive environment, it is hard to have a dialogue with a client because it is a more distant procedure and that is why it is perhaps unlikely that you will achieve a perfect building through competition”.

5.9.4 Brief and Lean

To identify room for improvement in practice, interviewees from the UK construction industry were asked whether they had knowledge of Lean, and their views were requested about using Lean Management theory to facilitate and enhance efficiency in the briefing process. Although most of the interviewees had little knowledge and experience of Lean Management, none of them criticised the idea. All were open to Lean Briefing and saw it as having initiative and being an original attempt. They further expressed positive views and interest in the idea because they believed that briefing was important and an area that should be improved.

A few people who had a background in Lean Management and were at a stage where they were looking to start using Lean principles in their organisation were very attracted and open to the idea, as expressed by one architect: “I would really like to see Lean Construction go right the way through from commencement or inception to the end result”. Equally, a
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A design manager stressed, “That is a perfect way of looking at it and a perfect way of dealing with it. The Lean journey should start right from the conversation to handing over keys. We do not use a Lean Briefing scenario but the nearest we would love to get to it”.

However, one architect was open to the idea yet he thought that careful consideration was needed when Lean is implemented in construction, as not all construction scenarios are completely production-based like in car manufacture. He commented, “I would worry hugely about what is it because the construction industry procures to itself and is not like other industry and I come across consultants and practitioners who are comparing it to the car industry. That is wrong, hugely wrong: you do not build cars with your hands anymore and I understand construction is pre-fabricate and that is fine, there are some fantastic advantages, but at the end of the day even those elements arrive on the site and someone uses their hands and puts them on the building and it is managed by people in building sites in the safe way to put it onto the building. It still rains and the wind still blows, it does not do that in the car factory”. He appreciated the advantage of Lean but suggested careful consideration when implementing it. This view probably highlights an on-going issue about Lean Design Management interpretation and the need to focus on the design for manufacturing and assembling philosophy when interpreting Lean Design Management.

Similarly, another architect, although very interested in the idea, emphasised the challenge of distinguishing true waste from several desirable tasks and activities within the design process because of the thinking associated with it. He claimed, “I think we have to live with some of inefficiency in it [design process] because it is part of the design process. You have to think, you have to allow yourself to dream, you are offering something. We would like to give the client something like that is unique for their needs, that is special, that has not been done necessarily by somebody else, and that process requires a lot of thinking, and you know it is not always Lean or it is not always to be. Sometimes you have to visit several options before you can actually get to what is needed”.

The idea of using Lean to enhance the briefing practice was discussed further with the interviewees in the context of the RIBA Plan of Work. The interviewees welcomed the idea, as they claimed that would further standardise the approach and therefore improve industry-wide consistency. For example, an architect expressed, “From an industry point of view, I think it will be absolutely fantastic if there was a kind of an RIBA briefing roadmap and I
was able to say that will legitimise the whole process”. Most of them agreed that aligning people to the same way of working has advantages. One architect highlighted, “For a very successful end product it is very important to have that kind of briefing process”. However, some mentioned the challenge of implementing the idea industry-wide, unless there is a prerequisite from a government lead or an industry lead as with the BIM scenario. Some further believed that considering the RIBA briefing work stages timeframe will help with managing briefing time based on project context and client complexity because it would make it obvious for the client what level of certainty the designer need to have at different stages. For example, an architect stated, “I think it is important so that everybody understand the process you’re going through and I believe to a certain point we try to do that but it is not a ready-made document”. However, all emphasised the importance of making sure it is open enough so that it can be adapted to different project contexts, because the construction is not always an off-the-shelf product type.

### 5.9.5 Brief and BIM

Similarly, to identify room for improvement in practice, interviewees from the UK construction industry were asked whether they had experienced using BIM in briefing practice. All interviewees acknowledged that they have never experienced using BIM to facilitate briefing or even come across it. A few stated that they use BIM but not in the briefing process: they have not gone that far yet. One design manager claimed, “I have not come across any contractor yet who is using BIM. I think we are in that stage of the learning curve”. Similarly, another design manager claimed: “It is still early doors for us in terms of whether we are getting the best out of it”.

However, they stated that is an interesting thought. One architect stressed, “I think it would be great to be able to use BIM at a really early stage. I mean right at the concept stage, to be able to understand the implications of changes”. Similarly, another architect stated, “At the scheme stage that would be helpful. The client likes to see some little 3D views because a lot of people cannot visualise plans, elevations, sections but if you show them a little 3D shoot of this room, or I think if it is a big job do a computer walk through or some think like that, then they can immediately get a handle what it is going to look like, what it feels like”. These views emphasised the idea of using BIM as enabler to Lean Briefing as it was discussed in section 3.7 of Chapter 3.
5.10 Discussion of the Major Findings of the Interview Survey

In general, the interview survey has helped gain an understanding of current briefing practices in the UK, determining industry attitudes towards the efficiency of current briefing practices efficiency, and finding room for briefing process improvement. Consequently, this has helped the emergence of the results of the interview survey: (i) confirming the importance of the Project Brief to the design process, (ii) identifying the source of shortcomings in briefing process practice in the UK construction industry, and (iii) revealing Lean Management principles through which a new briefing perspective would be developed, and the briefing process could be improved. Making an insightful review of the briefing practice survey data in light of the literature review allowed the main outcomes to emanate, and supported an organised discussion of the interview survey data. The major outcomes of the interview survey are discussed in this section under three headings, reflecting the main answers to the interview survey query: (i) value of the Brief, (ii) waste in the Briefing process, and (iii) the Lean Briefing as new perspective on briefing process.

5.10.1 Value of the Brief

The value of the brief in relation to the design process and its efficient performance has been reported in the literature (e.g. O’Reilly, 1987; Kelly, 2002; Hansen and Vanegas, 2003; Emmitt, 2007). This was further well-established from the interview survey, evidenced by the practitioners’ views. For example, an architect conveyed the significance of the brief to the design process when he stressed, “We see it as an important facet of the design process”, while another architect further stressed: “The design brief is the base stone. I think it is the main stone to start the design with”. However, the value of the study in this context is that it has explicitly recognised multi-dimensional value elements of the brief in regard to the design process in accordance with the views of several construction industry practitioners (see Figure 5.4). In the first place, in terms of the Briefing process;
Figure 5.4 Multi-dimensional Value Elements of the Brief In Regard to the Design Process

I. **The briefing process** is thought of as the process by which potential solutions and opportunities are explored to collaboratively find out which works the best for the client and the project. For example, an architect justified, "It is about exploring because the solutions are not, from most projects we have been involved in, that easy to find", while another architect explained, "It is about making sure the clients are open to different ideas. You work out together how the scheme could develop. You work out which is the best together, not getting into detailed specification and specifying it in the brief, rather it is offering scope to the architect to work with". In this sense, it is seen as important not to jump to the design solution before going through a process of understanding what the client is, their needs and what they are aiming for until sufficient information is collected, and then how you are going to go about answering those needs through exploration and evaluation of different design built example options as a more tangible version to help decide which is the best to adopt (e.g. Kamara and Anumba, 2001; Kamara et al., 2002).

II. **The briefing process** is seen as the process through which a shared understanding and the vision of the project outcome is built up and established. For example, an architect expressed, "If you do not have a clear objective it is going to be more difficult to get where you need to get to. I think kind of have the same image in the mind of the architect and the client. The person who commissions the project and
the person who is delivering the project need to have the same image, so that they can actually aim to get the same place”.

III. The briefing process is believed to be the process by which client and project value is identified and presented. For example, an architect elaborated, “There are lots of variables and people will say these are as valuable as treasure. It is exploring these”, while another architect stressed: “What is the value? What does value mean? Is it an enjoyable space to be in? What does that mean? The briefing is about getting as far down into the detail as possible. We have to work with them to understand what they may need, what the scenario could be. So we can test those scenarios out to work out what level of flexibility and adaptability they need in their project by having different scenarios and then we can find tune as we go along and put more information in. You work out which is best together”. This finding is also in line with the results of previous studies that identified briefing as by which values is identified (e.g. Smith et al., 1998; Othman, 2004; Emmitt et al., 2004; Tilley, 2005; Thompson, 2006; Yu et al., 2007; Thyssen et al., 2008; El.Reifi and Emmitt, 2011; 2013).

IV. The briefing process is understood as not just a process; it is an interaction. It is about communication. For example, an architect stressed, “the dialogue is important because he/she can be in the wrong way and it is all about interpretation of words. So during the concept there is that sounding out and showing and saying and also explaining to them”, while an interior designer further stressed, “It is a process of informing, educating, persuading”. Therefore, the briefing is critical because that is where the interaction occurs, that is where the understanding occurs, and that is where clients, including the user are given the opportunity actually to have some input into the project (e.g. Barrett and Stanley, 1999; Hudson, 1999; Blyth and Worthington, 2001; Kamara et al., 2002; Ryd, 2004; Yu et al., 2007).

V. The briefing process is assumed to be the process through which to achieve a sufficiently detailed Project Brief to support the design, as failing to achieve this would have huge negative impacts on the design process and the project delivery stages.

Correspondingly, in terms of the briefing process outcome (i.e. the Project Brief);

I. The Project Brief is seen as important as being the briefing outcome by which the design is initiated. For example, a chartered surveyor stated, “The brief is essential as it’s so central as your starting point and it is obviously valued because you know
where you’re going, otherwise it is just wasting your time”, while another architect justified, “It just gives us the starting point. It gives a scenario. It gives the ability to start going the right direction because as the design process goes on, it becomes after a stage, it becomes like a super tanker. It is really hard to change the direction of it once it is going away down the road”. This finding is in line with the previous studies which advocated the significance of having brief to start the design process (e.g. Gray et al., 1994; White, 1999; Kelley, 2002).

II. The Project Brief is believed to be important in its consequence on the efficiency of the design stages. For example, an architect specified its value in regard to the design stages when he explained, “If you got a decent brief or a fully worked up brief as we call it, then when we start doing the concept design we can keep the brief. There is no guesswork because you’ve got a pretty decent brief to work from. You have got a good idea as to what and when you are starting to do in your concept”, while another architect stated, “It has the biggest effect on the effectiveness of the design. It has a large effect on design. It is understanding your client needs and I think we as an industry are getting much more out of it now from when I started 10 years ago to now”. This finding is also in line with the previous studies which highlighted the consequences of inefficient brief on design process (e.g. Hansen and Vanegans, 2003; Emmitt, 2007, El.Reifi and Emmitt, 2011; 2013).

III. The Project Brief is thought of as important for benchmarking the design. For example, a design manager specified: “It is the brief document itself from our point of view which specifically within the design would be kept as a master snapshot”. This finding is also in line with the previous studies which advocated the importance of having brief to check design against (e.g. O’Reilly, 1987; Othman, 2004a; Yu et al., 2006; Chung et al., 2009). However, it will be more valuable if there is an element of revision going through it.

In this sense, the briefing process is about communication. It is also about clarifying what is the best for the client and the project. It is about confirming it. And lastly, it is about evaluating the outcome, because if you do not have a clear target in the project brief, how can you benchmark what you have done? Fundamentally, it is about setting the design elements in the first instance to achieve the vision in the last place. However, it is clear from the identified multi-dimensional value elements that the brief and design feed each other, because you start off with an idea. Accordingly, one major outcome of the interview survey is that it has demonstrated the significance of the brief to the design process. It has further
identified the significance of the briefing process to the design concept stage. This finding is in line with the previous studies that pointed the importance of briefing stage and design stage interaction (e.g. Atkin and Flanagan, 1995; Kumlin, 1995; Salisbury, 1998; Barrett and Staley, 1999; Kamara and Anumba, 2001; Lawson, 2006; Blyth and Worthington, 2010).

Additionally, the interview survey further established the significance of the brief as regards the project's final outcome. For example, an architect supposed, "I think that [Project Brief] is what separates the good from the one that is not so good and the successful project from the not successful project", while another architect stated, "I think that the briefing process that we have with clients is hugely value added because of the point if you do not have a briefing process then you're going to have a bad building". This finding is in line with the results of previous studies that claimed that delays in projects, budget overspends and, in many cases, less value being delivered to the client, are related to the early design stages (Hansen and Vanegas, 2003; Bertelsen and Emmitt, 2005; Tilley, 2005; Jorgensen and Emmitt, 2008; El.Reifi and Emmitt, 2011; 2013).

### 5.10.2 Waste in Briefing Process Practices

Although, the interview survey has established the value of the brief, it has further acknowledged that the current UK construction industry is quite inefficient with regard to developing and responding to the brief. This was evidenced in the practitioners' views and experience. For example, a design manager admitted: "I do not think I have come across yet when the brief is 100% and you just work to the brief". This observation is in line with previous studies that claimed the briefing process is suffering from inefficiency in its practices (Green, 1996a; Barrett and Stanley, 1999; Yu et al., 2007; El.Reifi and Emmitt, 2011; 2013; Mrryian and Tzortzopoulos, 2013). However, this interview survey has revealed that inefficient briefing process practices can be obviously recognised from the several forms of waste experienced in the design process, such as the time spent in working on options that then easily get rejected, and the necessity sometimes to carry out detailed design tasks within the briefing process. For example, an architect claimed, "People may be asking for something they do not understand and they may be asking for the wrong thing and you have to go through the process of design to prove the brief is not really right for them so in that sense it is ineffective". Yet, careful consideration is needed when trying to minimise waste in the briefing and design process. For example, an architect cautioned: "What we do
not want to do is going too far the other way and in the effort to cut all the waste to end up with much inferior product or not being able to change based on different client requirement [...] evolving needs”.

Moreover, the study has claimed that the industry is quite inefficient with regard to developing and responding to the brief because the briefing process is not given sufficient time to develop the brief early on in the front-end of the project. For example, an architect claimed, “By looking at any construction programme, you will notice as an example 24 months to build a building but just 4 weeks to work it out. This is where an alarm bell must ring”. This lack of sufficient time to develop the brief was claimed to drive waste in the briefing process. However, in line with Boyd and Chinvio (2006), this research has demonstrated that a prefect Project Brief is also a challenge to achieve in the construction industry. For example, an architect argued, “It is not an engineering from my point of view and only you have just one answer, you could have several answers, there are many answers there and it could be equally valuable, so that is a challenge”, while another architect admitted, “I have never experienced a perfect brief and you just work to the brief, nor will I ever maybe”.

The interview survey has further revealed that ineffective brief delivery is often experienced because of the ‘competition brief’ as it was called by industry practitioners. For example, an architect claimed, “Literally, we are given the brief. We have no opportunity to develop it with the client”. The way the construction industry market operates now, and how projects are secured, is mostly through competition. It was claimed that this operational practice hinders the efficiency of the brief, as in some cases, architects bid for projects where the brief is already part of the tender. For example, an architect claimed, “In a competitive environment, it is hard to have a dialogue with a client because it is a more distant procedure and that is why it is perhaps unlikely that you will achieve a perfect building through competition”. The scenario is even worse, as claimed by another architect, who said, “It leads to an unsatisfactory outcome because the opportunity has been missed to look at why the brief is the way it is and you cannot add value which might be explored through other options and alternatives”.

However, a major finding of the interview survey has revealed that the industry is quite inefficient with regard to developing and responding to the brief because of an
inappropriate brief concept. For example, some practices claimed that the brief is client’s task and in usual operational practice, the brief is set as a document delivered by the client in the form of a general statement at the project’s outset. For example, an architect argued, “Brief is what we get from the client when we get a commission to do a project”. How detailed a brief is varies based on the type of client in terms of their experience in carrying out projects. For example, an architect stated that the brief might be, “I like the building you did over there”. The brief, then, is mostly interpreted through design (briefing by design) and sometimes, in ‘not a usual practice’, analysis has to be carried out to investigate precisely what the brief says. Kamara and Anumba (2001) argued that involving designers can limit the effectiveness of the briefing in terms of identifying a client’s requirements.

Moreover, the study has indicated at a lack of an agreed briefing methodology to analyse and develop the project brief. For example, an architect admitted: “I have been here for over 20 years. I have seen it done in many ways and, by the time things evolve, then I think you start to learn”. This observation is in line with previous studies that claimed the briefing process is lacking process methodology (i.e. Barrett and Stanley, 1999; Bouchlaghem et al., 2000; Kamara et al., 2001; Shen et al., 2004). However, the best way to understand waste is to explore the ways in which the process and people interact and discover how and why people have to adopt and work around or outside the process (Terry and Smith, 2011).

Undertaking further insightful analyses of the interview survey data has helped explore the origin of shortcomings in the briefing process practice in the UK construction industry. The survey data has revealed that waste occurs because very little advice is available in terms of how to perform briefing. For example, an architect claimed, “there is a minimum based on hopefully good sound professional training, this how you should look after your client”. This has led to different practices and views in terms of the brief and the briefing process. A few practices align their briefing to RIBA’s Plan of Work stages and sign-off gates. Other practices carry out individual practices (e.g. a series of one-to-one meetings, a bespoke brief format, a standard brief from repeat business). The overall trend drawn out has suggested that the briefing process is developed subconsciously, depending on the project’s context or the practice within the organisation. This could vary within one organisation, depending on the project’s architect and their experience with briefs. Barrett and Stanley
(1999) observed that briefing in the UK is done in a lot of different ways dependent on the experience of the individual professional. In line with this, an architect acknowledged, “I think it can be very effective in certain examples and it can be ineffective in others. But I think it is the architect’s task to try and make it as effective as possible”.

Accordingly, one major outcome of the interview survey is that it has helped in identifying the source of deficiency in brief process practice in the UK construction industry. The absence of a formal procedure on how to perform briefings, and uncertainty in terms of the concept of the brief (see Figure 5.5) have been identified as being at the heart of such inefficiency. This has led to industry-wide inconsistency in briefing practice and negatively contributed waste to the design process, construction and eventually the final project outcome. So, consistency in this early project stage is important to help address the deficiency in its practice. For example, a design manager reported, “I suppose in a way there are so many instants where the briefing process could be improved and I would certainly support the need for a greater consistency in its approach and how it is developed”.

![Figure 5.5 Main Waste Drivers against Brief Value Stream](image)

5.10.3 Lean Briefing as a New Perspective on Briefing process

When looking for room to improve briefing process practice, a major outcome from the interview survey is that it has helped establish a potential improvement opportunity. There
was clearly room for improvement in briefing process practice using Lean Management thinking. This was evidenced from the positive views which were expressed concerning the use of Lean Management theory to enhance briefing process practice to facilitate the briefing process. For example, an architect stated: “I would really like to see Lean Construction go right the way through from commencement or inception to the end result”, while a design manager expressed, “That is a perfect way of looking at it and a perfect way of dealing with it. The Lean journey should start right from the conversation to handing over the keys. We do not use a Lean Briefing scenario but the nearest we would love to get to it”. However, one architect, although open to the idea, cautioned: “careful consideration needs to be considered when Lean is implemented in construction as not all construction scenarios are completely production like in car manufacture”. He admitted the advantage of Lean to support the process but consideration is needed on how far you take that in the construction industry. Also, in the assumption that the designer may feel that, the brief in this idea of Lean Briefing lacked innovation and limited design creativity, an interior designer argued, “That is the most creative to be, because you are constrained, as anyone can be creative at the other extreme”.

Equally, diagnosing the origin of inefficiency in briefing process practice, together with recognising the multi-dimensional value elements of the brief in regard to the design process have further established the ground by which process improvement through Lean Management principles could be achieved. It has helped in capturing (i) industry-wide agreement on the brief concept and (ii) establishing a formal briefing process (Figure 5.5 page 173), as the most essential elements for the briefing process value stream at the strategic level, and therefore for effective project brief delivery. This has further supported the idea of enhancing the briefing process using Lean Management theory. This would support implementing Lean Management principles in the briefing process.

Accordingly, the most major outcome from the interview survey is that it justified and supported the need for this research to address inefficiency in briefing process practices through a Lean perspective. It further helped in identifying the basis for Lean Briefing by which an alternative new briefing perspective could be established using Lean Management principles. These identified bases for Lean Briefing will be highlighted and discussed in the next chapter, through which the Lean Briefing perspective will be established. It is hoped
that this novel perspective on the briefing process will enhance briefing practices, improve industry-wide consistency and facilitate effective design management.

5.11 Summary

The chapter discussed the findings of the empirical research that was carried out by means of an interview survey to investigate briefing practices in the construction industry and explore the implementation of Lean Management principles in the briefing process to enhance its practice. It aimed to elicit a deeper understanding of current briefing process practice based on industry practitioners’ experience and interpretations of the project brief. The investigation further aimed to identify deficiencies in practice, as well as good briefing process practice. The empirical research included a focus on exploring the potential Lean approach to briefing and gauging the industry’s attitude towards the idea.

The analysis of the interview findings highlighted inconclusive briefing practices, and stressed the fact that several views and inconsistencies in briefing process practices currently exist in the UK. It further revealed the source of briefing process deficiency as uncertainty about the brief concept and the absence of formal procedures on how to carry out the process. The empirical research provided further familiarity with the phenomenon of the ineffective project brief and reinforced the justification for this research.

The analysis of the interview findings further identified room for improvement in briefing process practice and the bases for setting up the Lean Briefing perspective. This identified bases and the selected good briefing practice lessons were used in developing the Lean Briefing concept and planning the Lean Briefing approach based on Lean Management theory in the next chapter.
CHAPTER SIX

LEAN BRIEFING PERSPECTIVE
CHAPTER SIX

6 LEAN BRIEFING PERSPECTIVE

6.1 Overview

Based upon the preceding chapter, the main focus of this chapter will be on reporting the development of the Lean Briefing perspective as a response to the identified waste drivers in briefing practice. This chapter brings the research aim of this research to fruition. In light of the insights gained from the data analysis and findings, further work was undertaken to develop an alternative new system that explains how best to deliver a design value-added project brief. The Lean Briefing perspective was identified in Chapter 3 (see Section 3.7), and in the interview survey (see Chapter 5) as to provide a potential improvement to the briefing process practice in the UK construction industry. This chapter presents the application of Lean Management principles to the briefing process in order to achieve a design value-added project brief. It starts by discussing the rationale for the Lean Briefing process perspective, followed by setting up the Lean Briefing perspective. Then, the process of generating the concept of Lean Briefing is illustrated, followed by the process of designing and developing the Lean Briefing approach (i.e., Lean Briefing Management Framework). Lean Briefing concept, together with the framework and it is associated Operational Roadmap presents the contextualisation of the findings obtained from the empirical research and data acquired from the literature review. Lean Briefing concept, together with the Lean Briefing approach demonstrate and represent the Lean Briefing perspective proposed to enhance the briefing process practice. Following that, the Lean Briefing perspective practice implementation is described. The chapter concludes by discussing the value of the Lean Briefing perspective.

6.2 Rationale of the Lean Briefing Perspective

Although the briefing was mentioned in the early research as where the project value is added, inefficiency in its practices has largely contributed to the causes of ineffective design management in construction industry (discussed in Section 2.10.1 of Chapter 2). The review
of the existing literature indicated a dearth of literature specific to the origin of such inefficiencies in the briefing process practice (discussed in Section 3.5 of Chapters 3). In addition, it was noted that methodologies and procedures for briefing were lacking (see Chapter 2). The Lean Briefing Perspective is intended to bridge these present gaps in the literature which was highlighted in Chapters 2 and 3. However, it was essential to re-examine the way in which briefing is conducted and how designers make use of it in order to plan improvement. The outcome of the deep analysis of the interview survey data re-emphasised the problem with the current briefing practice: mainly, it helped to identify the absence of a formal procedure for performing briefings, and uncertainty in terms of the brief concept as the main waste drivers in its practice (see Section 5.10.2 of Chapter 5). This leads to subjective practices and therefore causes ineffective project brief delivery and industry-wide inconsistency. Ries (2012) stated, “What matters is not setting quantitative goals but fixing the method by which those goals are attained”. It is clear from the interview survey that practitioners acknowledged the importance of the brief in terms of its added value to the design and to the project overall. However, the absence of a formal procedure for performing briefing, together with uncertainty in terms of the brief concept has a huge negative impact on briefing practice.

The Lean Briefing perspective is particularly aimed at eliminating the waste associated with the briefing process practices at its origin. In response to this aim, Lean Briefing is an alternative novel perspective for informing more effective design management. The importance of this early project stage and its consequences on the following project stages, alongside the interviewees’ desire for a better, more efficient and structured approach to briefing, justified and supported the need for Lean Briefing perspective. There is a lack of a clear mechanism or guidance for the practical consideration of how this stage can be better managed.

6.3 Setting up the Lean Briefing Perspective

Chapter 2 mentioned the wide use and effectiveness of Lean Management theory in several industries to maximise customer value by gauging the best process value stream, (i.e., how this value can best be achieved), and Lean Management principles to recover inefficiency (waste) in processes. The focus of the interview survey conducted in the construction industry was on finding the origin of the problems in the operation of the briefing process.
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that causes waste, as well as gauging some good industry briefing practices in order to plan process improvement. The interviews helped in identifying room for improvement through the use of Lean Management theory. They further revealed that industry-wide agreement of the Brief concept, together a formal Briefing process are crucially needed to address the value stream elements of the briefing process on a strategic level (i.e. effective project brief delivery). Based on these outcomes, a new alternative Lean Briefing perspective was established. It was designed to achieve an effective procedure for managing the briefing process based on an agreed clear concept of the brief, as the lack of these aspects was identified the main waste driver against the brief value stream. Figure 6.1 outlines Lean Briefing perspective as to include concept and approach (i.e. Framework). The next sections will explain in detail how this alternative new briefing process perspective was crafted.

![Lean Briefing Perspective](image)

**Figure 6.1 Lean Briefing Perspective**

6.4 Generating the Concept of Lean Briefing

As mentioned above, industry-wide agreement is crucially needed in terms of the brief concept. Several interviewees offered views on the brief concept (see Sections 5.9.1.1 and 5.10.1 of Chapter 5) and this, combined with their professional experience of the briefing process practice and the reality of the brief stage being at the front-end of the project delivery stages according to the RIBA Plan of Work 2013 (see Figure 2.6 page 29) were helpful in forming a basis on which a concept of Lean Briefing could be drawn up.

The views on the brief concept were expressed and articulated in various forms, yet they all revealed the same general concept which is a process of collaboration between client and design team to work out the project brief. For example, an architect stated: “It is the
start of a conversation. It is not like this: ‘Is this what you want? I have now drawn it whether you like it or not”. It is seen as a collaborative process by which client and project value is identified and presented. For example, an architect elaborated, “There are lots of variables and people will say these are as valuable as treasure. It is exploring these”, while another architect stressed: “What is the value? What does value mean? Is it an enjoyable space to be in? What does that mean? The briefing is about getting as far down into the detail as possible. We have to work with them to understand what they may need, what the scenario could be. So we can test those scenarios out to work out what level of flexibility and adaptability they need in their project by having different scenarios and then we can find tune as we go along and put more information in. You work out which is best together”. It is also seen as a collaborative process for generating and processing the client and project requirement, and not just a process of processing client requirements. For example, a design manager said: “The briefing process is also a learning or a research exercise; it is not just about listing things on a piece of paper. It is actually an experiment and it is crucial that we do the experiment”. Indeed, the brief is a collaborative process and a value-added device because, at least, it offers somewhere that the project can be started. However, although firm agreement about being a collaborative process was established by all of the interviewees, opinions on the length of time people should take over briefing and whether it needs to be interacted with the design were varied (i.e. Static Vs dynamic), as it will be seen from views given by several interviewees about their experience of briefing. Further discussion on this can be found in the Section 6.7 of this Chapter on the Lean Briefing Operational Roadmap.

A brief is a brief and a design is a design (e.g. Preiser et al., 1993; Cherry, 1998). The interaction between a brief and a design is that a brief sits as a guide and reference for the design (e.g. White, 1991). The brief is not just a statement of a client’s needs or requirements; it is much more than that. The client does not offer a solution to the problem. Instead, the client outlines the problem and then should work collaboratively with the design team to arrive jointly at possible solutions that can be put into what is almost like an abstract diagram for the design task: a design roadmap (e.g. Peña et al., 1977; Schön, 1983; Rowe, 1987; Green, 1996b; Lawson, 2006). Briefing should be a front-end process which deeply explores opportunities and understands who the client is and what he/she needs, as well as revealing how those needs will be answered. It could be claimed that this can limit the options that can be considered and therefore design creativity. Conversely, in most projects,
there will be constraints, targets, building regulations and planning conditions that effectively limit and define the brief. These can limit the options as well, but are also far more challenges to creativity. One architect stated: “It is nice when the brief remains fairly well accepted as it is and when it has not been coloured by any other decisions so you can try and really see what they (the clients) need and what they are aiming for before you start introducing designs which may start to lead you in a direction which, in the end, is not exactly what is the best for the client”. However, the design is, by nature, an iterative process and the proposed solutions often also cause the client’s requirements to evolve, such as when new business opportunities are explored. The design team has to also make rapid decisions on how to solve a specific issue, and it is often difficult to note all interdependencies. The issue that cannot be ignored was stated by Brown (2001): “Expectations and goals may change throughout the project, as the knowledge base develops and additional contributors join the project”. This is where the value focus of the Lean Briefing concept process should be. “Education is so important and the briefing is so much more than just a statement of requirements. It is an understanding of clients’ needs, how they work and who they are. It is also an explanation of those things to them; it is not just for the architect”, as it was stated by an architect.

Early focus is needed on effectively defining the project’s requirements in the briefing process through better learning, understanding and value identification. Thus, the idea and challenge of Lean Briefing is to focus on how to effectively develop the knowledge base, and convey subjective into objective for both client and designer at the right time early on in the front-end of the project ‘Do it Right the First time’, rather than leaving it to be inconsistently developed over the project lifecycle, leading to unpredictable waste throughout the project lifecycle. One architect claimed: “People may be asking for something they do not understand and they may be asking for the wrong thing and you have to go through the process of the brief. Sometimes you need to interpret the interpretation because what you have got as a brief has actually been prepared on behalf of the client”.

In this sense, Lean Briefing should view the brief as a two-way (bidirectional) education process where the designer broadens the client’s vision through introducing potential options which will help the client to figure out and make decisions on the project requirements, while the client helps the designer to realise and highlight those values in the
favour of the later design task. It is more of a dialogue which involves discovering, interpreting and interacting to find an outcome by exploring several possible solutions. The process must facilitate learning about the actual requirements of the project, not what clients say they want or what designers think they should have. It is also about engaging people further down the line (the ultimate client) in this learning journey. It is a value-focused interactive planning process for the design task which understands the project and client requirements and reveals how these could be answered through the explored and identified opportunities, with the Project Brief as its outcome.

Thus, the concept of Lean Briefing is that it is an up-front shared understanding platform that works as a learning exchange exercise (application), between client and design team, to develop the project knowledge base early on by means of minimising potential waste that might be caused later as a result of lack of project knowledge, and ensuring the identification and representation of the precise client and project requirements (e.g. client value).

6.5 Developing a Lean Briefing Approach

To further help achieve the Lean Briefing perspective, it was important to develop a Lean Briefing approach. This was achieved by designing a comprehensive guidance strategy for managing Lean Briefing. Lean Briefing Management Framework was designed to provide a working guidance strategy for UK construction industry organisations on how to manage the Lean Briefing process in their practice. However, to further ensure industry-wide consistency and fulfil industry practitioners’ desire for a more detailed structured briefing approach to follow, it was necessary to support the framework by planning a detailed Lean Briefing Process Operational Roadmap. Lessons learned along several years of briefing practice and the good practice gauged from the interview survey were helpful in planning this (see Section 5.9.1 of Chapter 5). Lean Briefing Process Operational Roadmap was designed as to further support Lean Briefing approach (details will follow in Section 6.7). It directs step by step how to accomplish the Lean Briefing process.

6.6 Designing the Lean Briefing Management Framework

As implementing Lean Briefing requires strategic arrangements in the organisation, the Lean Briefing Management Framework was planned to be used as a company strategy to manage
and control Lean Briefing. Hence, the proposed Lean Briefing Management Framework was designed to advise a holistic management working guidance approach for UK construction organisations on how to manage the Lean Briefing process in their practice. To keep seeking perfection, the most important principle of Lean Management theory, was implemented in the Management Framework to help continuous Lean Briefing process improvement ‘Kaizen’ for future projects. The framework is aimed at construction industry organisations. However, it was made adaptable, so that organisations can customise it according to their business context.

### 6.6.1 Pre-Framework design

It was found that there has been limited research and a lack of practical guidance on how to establish frameworks. Reviewing a number of previous framework development processes revealed that they were mostly based on the method of concept mapping developed by Novak and Gowin (1984). The concept mapping method advises scheming frameworks in two stages; (i) identifying concepts, (ii) determining the relationships between them. Accordingly, it was decided to employ this method in its general principles in designing the Lean Briefing Management Framework, together with studying some existing framework examples in architecture, engineering and construction to gain insights and enlighten the Management Framework design process. In addition, it was believed that understanding the meaning of a framework in its general sense is key basis of framework design. The term framework pertains to a wide range of theoretical and practical concepts. The Cambridge Dictionary (2013) defines a framework in this context as “a system of rules, ideas or beliefs that is used to plan or decide something”. It is a visual/written product that explains factors, concepts, or variables and their presumed relationships (Miles and Huberman, 1994). However, this research case is concerned with providing structured guidance approach for Lean Briefing process practice implementation. According to McIvor (2000), a framework is related to making recommendations of what to do and what should be done. It acts as a benchmark, providing a frame of reference (Male et al., 1998). This understanding of frameworks, together with studying some existing framework examples further helped the establishment of the Lean Briefing Management Framework design assumptions.
6.6.2 Framework design assumptions

For the purpose of this research, some front-end assumptions were necessary in designing the Management Framework. The following assumptions were put in place in advance of designing the Lean Briefing Management Framework:

1. Targeted for UK construction industry practice organisations.
2. Bespoke to fit different construction organisation sizes and business contexts, and different client types (experienced/inexperienced) and different project contexts.
3. Designed to support Lean Briefing implementation in construction organisations.
4. Provides a tool to describe the overall concept and the approach for Lean Briefing implementation.
5. Illustrates the structure of managing the Lean Briefing process in a visible format to enable professionals in the construction industry to comprehend the scope and process of Lean Briefing.
6. Provides an organised comprehensive structure that easily communicates the Lean Briefing process perspective within construction organisations in a coherence manner.
7. Serves as a way to communicate the Lean Briefing perspective to professionals in the construction industry.
8. Aimed at improving existing briefing process practice, rather than completely replacing the briefing process.

6.6.3 Framework design

The Framework design was achieved through conducting several revisions and informal piloting sessions in order to verify its consistency, logic and integrity in terms of its design methodology and outcome. That involved five interconnected key stages: familiarisation; identifying framework elements; charting; mapping; and interpretation. Along these stages of Lean Briefing process approach development, a continuous interplay with the interview survey findings to find evidence, where possible, was utilised. Additionally, some factors were derived from the literature on Lean Management and briefing (see Section 3.7 where Lean Briefing Process Conceptual Model was discussed).

A framework describes both the component objects and how these objects interact, illustrates the interface of each object and the flow of control between them; and explains
how the responsibilities of a system are mapped into its objects (Johnson and Foote 1988; Wirfs-Brock et al., 1990). The most important part of a framework design is the way in which a system is divided into its components (Deutsch 1989). Accordingly, after careful consideration and many iteration sessions and reviews, the Framework plan was identified to be developed based on three main elements (Preparation Set up; Operational Roadmap; and Perfection Cycle) as shown in Figure 6.2. The Management Framework in Figure 6.2 was designed to include these three elements. The strategy was intended to work at two levels: the organisation and project level. The Preparation Set up and Perfection Cycle were considered to be at organisation level, while the Operational Roadmap was considered to be at project level. This works by first establishing a “Preparation Set up” on the organisation level, then, with this set up in place, the Lean Briefing process is put into practice using the recommended “Operational Roadmap” on the project level with a plan for a continuous process improvement ‘Kaizen’ through learned lessons by entering into an endless “Perfection Cycle” on the organisation level. All of the company briefing practices need to be delivered by means of this Management Framework.
6.6.4 Framework elements

The development of the three Management Framework elements (Preparation Set up, Operational Roadmap, and Perfection Cycle) is discussed in this section.

6.6.4.1 Preparation Set up

The Preparation Set up that is shown as a component of the Management Framework elements at the organisation level (see Figure 6.2 page 184) and shown in Figure 6.3 was planned to be considered at organisation level. It was planned to provide advice on the special resources arrangements set up that needs to be put in place at the organisation level to help in handling briefing practices in the same way for all projects that the company is commissioned to carry out. It was believed that special resources arrangements are needed at organisation level to help operate Lean Briefing at project level. Those arrangements include: appointing an in-house Brief Team, establishing an organisation Databank, and having to hand a step-by-step Operational Roadmap on how to perform Lean Briefing application with clear stages of deliverables.

![Figure 6.3 Preparation Set up on the LBP Management Framework](image-url)

Figure 6.3 Preparation Set up on the LBP Management Framework
6.6.4.1.1 Brief Team

The idea behind proposing in-house Brief Team (see Figure 6.3) responsible for carrying out all of the company’s project briefs was to help build the base by which lessons learned from different company’s project briefing practices can be exchanged between projects, as all the information will be available in the same database and managed by the same people. Additionally, proposing the Brief Team aimed to ensure that the operational task focuses on finding and identifying client and project requirements. This offers the potential to avoid briefing by design (e.g. Darke, 1979; Preiser et al., 1993; Bowen et al., 1999; Kamara and Anumba, 2001), which most practices do. This research found that architects tend to identify requirements based on testing several design proposals. This practice, as discussed in earlier chapters, can have a negative impact on brief delivery and consequently contributes to the waste experienced in the design process because, in most cases, design ideas are likely to be launched from the architect view’s rather than from the project requirements. Thus, the aim was to help launch the design idea from the identified requirements rather than from the idea, as some ideas might be missing. What is more, having the Brief Team as a design review panel will ensure design process value. The idea of the Brief Team was developed from the identified good briefing practices (see Section 5.9.1 of Chapter 5), as one company mentioned that it has a workplace consultancy team which is responsible for carrying out the brief for large projects within the organisation. As a result, they have built up a good level of experience in this field. They did not achieve this independently but work as an integrated team with the project architect. This team also acts as a kind of checking mechanism when design proposals are offered. Nicholson (1995) also advised that it is necessary for the profession of ‘architectural manager’ to emerge: someone who can take on the tasks of design briefing.

An architect stated: “The brief can be formulated from a two-people organisation but as you go further to the concept design stage you will need other design team specialists and they start to join the table and the team starts to get larger. They will be still inputting to develop the brief and they should do, because obviously you need people to tell you something.” The in-house Brief Team was proposed to work as part of the design management system in the company, and consist of a fixed group of people (i.e. Architect, Structural Engineer, Service Engineer, Quantity Surveyor) working together with other
exchangeable members who will vary for each project. These exchangeable members are the
design team for a specific project and any special consultants needed depending on the
project context. Details of this are shown in the Lean Briefing Operational Roadmap (see
Figure 6.11 Page 202). However, appointing a specific Brief Team was thought to be subject
to the size of each organisation and its business context. For example, with a small
construction organisation that is not procuring many projects at a time, it is not financially
practical to recruit a Brief Team just to perform the briefing task. However, in such cases,
this difficulty could be avoided by adding management of the Project Brief task as an extra
responsibility to a related practitioner within the organisation (e.g. Architect or Design
Manager) to fulfil the required Brief Team setup. Other required Brief Team members who
are not available in the organisation can be hired as consultants.

6.6.4.1.2 Databank

In addition, in terms of the Databank (see Figure 6.3 page 185), it was proposed to establish
a Databank within the organisation to support the learning application, in accordance to the
generated Lean Briefing concept, while performing Lean Briefing at the stage of brief
development process. It was thought that establishing such a database within the company is
crucially important to perform Lean Briefing. The Databank was planned to include learning
support tools such as BIM simulations from previous project libraries besides other data
sources (e.g. specifications, standards, manufacturers’ catalogues, professional magazines).
Details of this are shown in Lean Briefing Operational Roadmap (see Figure 6.11 Page 202).
The idea of the Databank was developed from the identified good briefing practices (see
Section 5.9.1 of Chapter 5), as one company which works on a large number of residential
housing projects mentioned that they have built quite a massive library of CAD drawings
and 3D visuals from their repeated residential projects. They mentioned that they use this
library to help project requirement mapping for similar clients. Another interviewed
organisation mentioned that they carry out space occupation studies for office buildings and
benchmark these against similar buildings. They acknowledged that this helps them greatly
in project requirement identification.
6.6.4.2 Process Operational Roadmap

The Operational Roadmap which is shown as a component of the Management Framework elements at the project level (Figure 6.2 page 184) and shown in Figure 6.4 was planned to be included in the Set up and to be considered at project level. It was believed that: it is important to have to hand an initial ready-made step-by-step Operational Roadmap guide on how to perform the Lean Briefing process to be used in performing the first Lean Briefing practice in the company. The Operational Roadmap was planned by making use of good practices and learned lessons explored via the interview survey (see Section 5.9.1 of Chapter 5). However, this Operational Roadmap will then be subject to continual improvement ‘Kaizen’ based on learned lessons from Lean Briefing practices within the company. The Operational Roadmap explains how to carry out the Lean Briefing process in detail and was planned to encompass two models; “DO Model” and “CHECK Model”. The “DO Model” explains project brief development process, whereas the “CHECK Model” describes the project brief monitoring process. A detailed explanation of the Operational Roadmap design and development will follow in Section 6.7 of this chapter.

Figure 6.4 Operational Roadmap on the LBP Management Framework
6.6.4.3 Perfection Cycle

The Perfection Cycle that is shown as part of the Management Framework elements at the organisation level (Figure 6.2 page 184) and shown in Figure 6.5 was planned to be considered at organisation level. A plan to achieve continuous process performance improvement ‘Kaizen’ over the long term was thought to be necessary in the Framework design. This concept was thought to be achieved by utilising the most important principle of Lean Management theory (i.e. keep seeking perfection), and the concept of learned lessons. Accordingly, this requires a very organised and systematic guidance component within the Framework. The Perfection Cycle was planned to advise how to continually improve the Lean Briefing process by making use of the reported learned lessons from on-going projects. It was believed that seeking Lean Briefing process perfection is crucially needed to gain the value of Lean Management implementation in the briefing process. The learned lessons were planned to be reported back into the Perfection Cycle via the “DO Model” and “CHECK Model” that were built into the Operational Roadmap. The reported lessons will help in adjusting the Lean Briefing process for future projects; see Figure 6.5.

![Perfection Cycle on the LBP Management Framework](image-url)
6.7 Designing the Lean Briefing Process Operational Roadmap

The Lean Briefing Process Operational Roadmap is operated at the project level within the Lean Briefing Management Framework (see Figure 6.2 page 184), which in turn needs to be embedded in the organisation’s working strategy as explained above. The Operational Roadmap explains in more detail how to carry out the Lean Briefing process to ensure a design value-added project brief delivery. It was designed based on the generated Lean Briefing concept (see Section 6.4). Lean Management principles were implemented in the Operational Roadmap to enhance the briefing process outcome and eliminate the waste experienced in its practice. The Operational Roadmap is aimed to help construction industry organisations perform the Lean Briefing process task. It is made adaptable so that organisations can customise it according to each individual project’s context. It could be adapted to various project scheme scenarios when it is applied. This section explains the designing of the Lean Briefing Process Operational Roadmap.

6.7.1 Operational Roadmap design basis

Investigating current briefing practices and finding out about the experiences and views of different industry practitioners helped in exploring the briefing process value stream and making use of this in developing the Operational Roadmap. Overall, from the practices described by the professionals, below are the two best practice formats for the briefing process from the author’s point of view.

**Practice 1:**

This format was succinctly described by an architect: “The briefing should be somewhere to start as there have to be a number of drivers at the beginning of the process”. This suggested that, it is best to carry out the process in two stages. As an early element, a base brief is needed in order to set out the client’s expectations; then a journey is necessary to explore the requirements. A Final Project Brief is then required, which outlines where the project starts and how it proceeds, as well as deciding what options will be adopted. This perception was best expressed by an architect who claimed: “It is really important that we have that initial brief from the client so that we can always go back to make sure. Then, whatever happens, if nothing else, we can look back and ask if we are still meeting the
intended goals and requirements because there is no point in having a building that is on budget, on time and that fits the environmental agenda and the climate, etc, if it is not actually fulfilling the requirements of the client. This is because it is, in fact, fundamental that we are there to provide a product for the client.”

Practice 2:

This was perfectly explained by an architect as follows: “A brief is not like a completely tailored suit with exactly the right dimensions. The brief has to be something that has the flexibility to allow change, the flexibility to grow. Thus, it is constantly evolving in terms of what needs to be done. So, the brief constantly changes by adding layer after layer, adding more and more information to achieve a brief that consists of a number of different levels”, while a chartered surveyor claimed: “The more detail the brief has, the more chance you have of achieving a satisfactory project outcome. Actually, I think the brief starts at a very high level and then should be developed to a stage where there is enough information to avoid unnecessary tasks and a lot of reworking”. This suggested that, the brief’s levels could be organised according to the RIBA design stages, but including a time line should be avoided, as this can be difficult, since there are always different types of client (experienced or inexperienced, for example). It is perhaps best to keep the brief aligned to the RIBA stages, which use milestones. This would make it obvious to the client what the level of certainty is at each different stage. In addition, advocates of this approach suggested two check points are also required: one when the project goes to planning and the other when it goes to tender.

Although both views have their own advantages, the advantages of Practice 1 far outweigh those of Practice 2 as Lean Management is more to do with keeping everything in a line while moving effectively through each stage. Although none of the interviewees reported that they perform briefings according to the briefing stages proposed by the RIBA, it was noticed that Practice 1 was still the closest to the RIBA system which is another advantage although more clarification and arrangements need to be put in place. This means that the value stream of the lean brief process should be carried out in line with the official brief stages in the RIBA Plan of Work 2013 (see Figure 2.6 page 29). The challenge is to detect the right inefficiencies especially when the design process is being conducted from a business point of view; which is the usual situation. What may be forgotten is that some
aspects which are claimed to be wasteful have to be lived with, because they are part of the design process. For example, sometimes, several design options must be considered before arriving at what is actually needed. However, during the concept design, where the project brief needs to be finalised according to the RIBA Plan of Work 2013, there is a chance for ideas to be discussed, shown, adapted and explained. What is more, it is very difficult to include subjective information in a brief, and the more objective the brief, the easier it is for the client to explore and compare options before actually embarking on the design process itself. Thus, it is at this stage that there should be a dialogue with the client. One design manager stated: "Effective does not mean it is done quickly or cheaply. At the end of the day, you need to have a product which everybody wants." So, some work needs to be done because it is desirable, not because of inefficiency. This is because the brief should help the clients to extract what their desires are. Design often offers several answers, not just one, and several could be equally valuable, so the challenge is to find which is the most appropriate in the circumstances. "It is not engineering from my point of view, and you do not only have just one answer, you could have several answers and they could be equally valuable, so that is the challenge" as stated by an architect.

Accordingly, the development of a Lean Briefing Operational Roadmap was based on the following: (i) the brief sits as a reference for a design, (ii) the brief is a design front-end process which deeply explores opportunities and understands who the client is and what he/she needs, as well as revealing how those needs will be answered. Furthermore, there should be an element of consistency industry-wide (i.e. standardisation from lean perspective; see Sec. 3.7) in the early stages, and this issue needs to be addressed through a formal system. The RIBA Plan of Work 2013 (see Figure 2.6 page 29) sets out the stages of the brief but fails to address the process (RIBA, 2013a; 2013b; 2013c; 2013d). A few interviewees suggested that Continuous Professional Development could address this. However, this absence of guidance methodology on how to perform briefing process suggested the need to develop a high-level format for how to carry out the lean briefing process based on The RIBA Plan of Work 2013 official brief stages, which in turn would further improve consistency throughout the industry. A roadmap is required that will legitimise the whole process.
The research work and its main outcome discussed earlier in this section helped to identify the basis from which a Lean Briefing Process Roadmap could be developed. The most important aspect, however, as revealed by the interview survey is that it needs to be a bespoke rather than a restricted standard format, as no single unadaptable briefing process can fit every type of building and every type of client, even within one sector of the construction industry. Each type of building will necessitate some adaptation in the detail of the process, because different contextual factors will affect it. An example of this was mentioned by one architect who worked on two lab buildings. These were very similar in context, but one took a lot more amount of work and effort and time to reach the required level while the other was easier to accomplish because the project manager had expended more effort at the start. The architect claimed: “It just meant we had to push harder and to work harder. We had to put in more effort and more time; it was a really, really tough process.” This work took place in one sector, but if a different building, an office building or a museum, is considered, the briefing process is different in each case. The same architect stated: “It is a different language. It is as if you are speaking a completely different language with very little similarity.” Therefore, it is important to make sure that the Operational Roadmap is open enough to be adapted to address different needs, different types of project, different timetables, different clients and different organisational contexts. This formed the basis for the Lean Briefing Operational Roadmap, illustrated in Figure 6.6.

**Figure 6.6 The basis of Lean Briefing Process Operational Roadmap**
6.7.2 Operational Roadmap design assumptions

A number of design assumptions were made based on the research. These were that the Operational Roadmap would;

1. Provide reference guidance applicable from the point the company is commissioned for a building project. The Lean Briefing process was designed to start after the point where the client calls for the project via the project's Strategic Definition; Stage 0 (i.e. client brief); see RIBA Plan of Work 2013 (Figure 2.6 page 29).

2. Be designed based on the introduced Lean Briefing concept as being “an up-front shared understanding platform that works as a learning exchange application between the client and design team to develop the project knowledge base early on by means of minimising potential waste that might be caused later as a result of lack of project knowledge, and ensuring the identification and presentation of the precise project requirements (e.g. client and project value)”.

3. Be a process of understanding the project and client requirements and revealing how those could be addressed through the explored and identified opportunities.

4. Be a value-focused interactive planning pre-task for the design task with the Project Brief as its outcome.

5. To legitimise Lean Briefing and improve industry-wide consistency, the Lean Briefing process Operational Roadmap was worked out in conjunction with the official RIBA Plan of Work brief stages; see RIBA Plan of Work 2013 (Figure 2.6 page 29).

6.7.3 Operational Roadmap design

The Lean Briefing process was planned to be developed over two stages: an early journey is necessary to explore the expectations (i.e. base brief), then a final element (project brief) is needed in order to set the project and client requirements. Additionally, to legitimise the whole Lean Briefing approach and enhance industry-wide consistency, the Lean Briefing Operational Roadmap, fundamentally, needs to meet the Project Brief requirements outlined in the RIBA Plan of Work 2013 (see Figure 2.6 page 29). According to the RIBA, the Project Brief is planned to be the outcome of a process that occurs right at the start of a project (RIBA, 2013a). Officially, that process develops from Preparation and Brief (Stage 1) to the Concept Design (Stage 2). Hence, the value stream of the Lean Briefing process was
identified as it flows in line with the official brief stages outlined in the RIBA Plan of Work 2013.

The Lean Briefing process was planned to be kicked off by the Client Brief which needs to be delivered from the client side at Strategic Definition stage; Stage 0 as a call for the project. This was planned as a hard gateway where the Strategic Brief needs to be evaluated to find out whether it is advanced enough to progress to the Lean Briefing process. Then, Lean Briefing process was planned to be accomplished by means of two operational models, the “DO Model” and “CHECK Model”, (see Figure 6.7).

![Figure 6.7 Lean Briefing stages - Operational Roadmap](image)

### 6.7.4 Operational Roadmap models

A model, according to the Concise Oxford Dictionary (2011), is defined as “an excellent example of a quality” and also as “a simplified mathematical description of a system or process, used to assist calculations and predictions”. In this research, it idealises current briefing practice in the UK construction industry within the new Lean Briefing Operational Roadmap based on practitioners’ views and good briefing practice experiences that were identified and elected from the briefing practice investigation. It is used here to simulate the Lean Briefing process scenario and explain it, in order to facilitate
understanding of process operations. It is a recommended as a first-hand process to start with in Lean Briefing process implementation and contains only those features that are of primary importance to the process operations.

The Operational Roadmap was designed to go through two main operational phases alongside the RIBA Plan of Work stages. These were represented as the “DO Model” and “CHECK Model” (see Figure 6.7 page 195). The Models are a simplified representation of the Lean Briefing process and are used to explain the process operations. The “DO Model” explains the Project Brief development process and runs between Stage 1 (Preparation and Brief) and Stage 2 (Concept Design) of the RIBA Plan of Work, whereas the “CHECK Model” describes the delivered Project Brief monitoring process and runs from Stage 3 (Developed Design) to Stage 6 (Handover and Close Out). Lean Management aspects were implemented and realised in this Operational Roadmap design in terms of: firstly, defining a briefing value stream map so as to strictly carry out the brief development process in line with the RIBA Plan of Work official project brief stages; secondly, building up pull ‘kanban’ in the process by carrying out briefing as a learning application. This advised learning exchange application will push potential project options to arise on the shared understanding platform, and testing these throughout concept design will pull the correct project requirements. Lastly, to get the most of the Lean Management principles, the “CHECK Model” was built up for continuous improvement ‘Kaizen’ of the Lean Briefing process.

6.7.4.1 Lean Briefing DO Model

The “DO Model” Figure 6.8 was planned to operate between the early stages of the RIBA Plan of Work: Stage 1 (Preparation and Brief) and Stage 2 (Concept Design). It represents the project brief development process phase and explains in detail how to perform Lean Briefing as a learning exchange application in a way that will aid the client and design team in collaboratively finding potential project options during the “Preparation and Brief” Stage, and then testing those through the concept design task to find out which is the best to meet the client and project value. Throughout this project brief development process (i.e. DO Model), in accordance with the Lean Briefing process, the project brief acquisitions established in the RIBA Plan of Work need to be fulfilled. A well-established project brief (i.e. Final project Brief) is needed at the end of Stage 2 to facilitate effective design process tasks.
Brown (2001) stated, “Expectations and goals may change throughout the project, as the knowledge base develops and additional contributors join the project”. In addition, the “client brief” cannot substitute the designer’s skills and sensitivity in interpreting needs (Smith et al., 1998). The brief is a design front-end process which deeply explores opportunities and understands who the client is and what he/she needs, as well as revealing how those needs will be answered. The design team and architects must utilise all the available resources in order to gain a deeper insight into the clients’ requirements (London et al., 2005). The focus in the “DO Model” design was to create a shared understanding platform by which the learning application would be performed to develop the project knowledge base early. Accordingly, Stage1 (Preparation and Brief) of the “DO Model”, Figure 6.8, was planned to work as a shared understanding platform between the client and design team by which the learning exchange application is performed to develop the project knowledge base. A facilitator party (Brief Team) takes the responsibility there for finding opportunities and pulling ‘kanban’ potential project solutions through this learning exchange application by means of detecting unseen possible requirements and interpreting subjective needs into objective needs. At this stage, potential project design solutions are explored and proposed (Set-based design solution from lean perspective see Sec. 3.7). A series of tasks, explained in detail within the “DO Model” in the Operational Roadmap shown in Figure 6.8 DO Model on the Operational Roadmap
6.11 Page 202, need to be undertaken to help achieve that. A soft gate was planned at the end of this stage where an Initial Project Brief needs to be delivered in the form of a design mood board which comprises several potential project scenarios; see Figure 6.8 page 197.

From then, the target should be towards achieving the Final Project Brief at end of Stage 2. The delivered Initial Project Brief was planned to be taken to the next stage, Stage 2. Stage 2 (Concept Design) of the “DO Model”, Figure 6.8 page 197, was designed to work as the platform for testing the proposed potential solutions (Set-based design solution from lean perspective see Sec. 3.7) and choosing the one or combination that best fulfils the client and project requirements. The stage is perceived as the first stage in which the Project Design Team are officially engaged in the project. At this stage, the proposed potential solutions (Set-based design solution) need to be tested by the Project Design Team, and then it needs to be evaluated by the Brief Team to help develop the project design concept. It was planned that the Brief Team works as a review panel to check and initially validate it. A Final Project Brief is then required at the end of Stage 2 which outlines where the project starts and how it proceeds, as well as deciding what options will be adopted. A hard gate was planned at the end of Stage 2 where the Brief Team issues the Final Project Brief and confirms it by the final client approval; see Figure 6.8 page 197. Accordingly, after this gateway, the Lean Briefing process is switched from the “DO Model” to the “CHECK Model”. At this point the Project Brief was planned to be finalised for that specific project and the monitoring process via the “CHECK Model” was planned to take place at the end of each stage of the RIBA Plan of Work.

6.7.4.2 Lean Briefing CHECK Model

The “CHECK Model” Figure 6.9 was planned to be run between Stage 3 (Developed Design) and Stage 6 (Handover and Close Out) of the RIBA Plan of Work. To keep seeking perfection is the most important principle of Lean Management theory. In addition, Kamara et al. (1999) advocated for a structured rationalistic approach inspired by manufacturing, arguing that such an approach is necessary for mapping and managing changes in requirements that may occur over time. The “CHECK Model” describes in detail the delivered Project Brief monitoring process; see Figure 6.9. The purpose of this is not a continuous development of the project brief, but rather a recovery process to capture any deviations from the established project brief, and find out about its consequences on the
project delivery outcome early. The aim of this monitoring process is to track changes and report learned lessons for continuous Lean Briefing process improvement ‘Kaizen’ in the favour of the next project brief delivery for future projects. It works by delivering a regular reflection ‘Hansei’ report at the gateways from Stage 3 to Stage 6; see Figure 6.9. The gateways work as checking points where, for example, the developed design needs to be reviewed against the Final Project Brief, and feedback reported for two purposes: firstly to forecast early the impact of any deviation from the delivered Project Brief on the following project deliverable stages, and then, most importantly, to report learned lessons for future Lean Briefing process improvement ‘Kaizen’.

Figure 6.9 CHECK Model on the Operational Roadmap

6.8 Implementation of Lean Briefing Process Perspective

Lean Briefing has to be implemented in practice via the Lean Briefing Management Framework, see Figure 6.10, which was advised by this research to be embedded within UK construction organisations’ project practice strategy. It is implemented first on the organisation level, setting up the resources needed according to the specified Preparation Setup, see Figure 6.10. When the specified required setup is in place, the briefing process is conducted, on the project level, by making use of the recommended Lean Briefing Process
Operational Roadmap; see Figure 6.11. The Operational Roadmap is conducted by means of two operational models: the “DO Model” and “CHECK Model”. The “DO Model” represents the Project Brief development process, whereas the “CHECK Model” represents the delivered Project Brief monitoring process.

Having the ready-made Lean Briefing Operational Roadmap to hand as a starting point will help in practising the first Lean Briefing process. The first Lean Briefing process practice is unlikely to be the ideal practice. However, keeping practising the Lean Briefing process via the Operational Roadmap and continuously improving it by means of the planned Perfection Cycle (Figure 6.10) will help in capturing the required process improvement, and consequently help in adjusting the Lean Briefing process for the next project. Eventually, the Lean Briefing process will reach a stage where the learned lessons become exhausted and it gets closer to the optimum practice within the organisation. However, it must be stated that the optimum briefing process practice as shown on Figure 6.11, where no deviation from the Project Brief occurs at all, is unlikely to be attainable in the construction industry. However, the aim of implementing this “CHECK Model” in the Operational Roadmap is to minimise the prospective deviation as much as possible and get closer to the optimum practice.

On the strategic level, the Brief Team is advised to evaluate the attributes of the Lean Briefing practice implementation in terms of what seems to be working and whether any major challenges or problems are occurring during the use of the Management Framework and Operational Roadmap. This provides a basis to enable the Brief Team to assess the implementation of the Lean Briefing. It is further advised to consider the following issues about major successes for each delivered project scheme, where possible, to aid continuous Lean Briefing process improvement ‘Kaizen’;

- In the short term:
  - Assess whether a satisfactory detailed project brief has been achieved.
  - The performance of the Lean Briefing process is measurable by the quality of the design achieved from the delivered project brief, and the level of client and building organisation satisfaction with the resultant design, measurable by how many changes and adjustments were required to ensure final product/building satisfaction.
In the medium term:
- Upon completion, the measure is whether the built solution meets the client’s expectations in accordance with the delivered project brief. The performance of the Lean Briefing process is measured by the client agreeing that the completed product/building meets their expectations.

In the long term:
- Assess how the product/building meets the business and users’ value, and how it adapts to constant use and maintenance.

The Operational Roadmap Figure 6.11 further provides a detailed explanation of the action plan at each of the briefing stages: what to do at each stage, how and by who. At the top of the Operational Roadmap, the scope of work in terms of the project brief at each stage of the RIBA Plan of Work is explained. Afterwards, in chronological order, the responsibility for the stage, the body in charge, and the contributing members of the Brief Team for each of the briefing stages are specified. Then, the data sources required to perform each of the briefing stages are defined. These are classified into two main types: data from the organisation’s Databank and data from research/exploration. The data from the organisation’s Databank is the BIM simulations library and all the recorded data from previous projects, together with other data source materials (e.g. specifications, standards, manufacturers’ catalogues, professional magazines), whereas, the data from research/exploration represents the potential research/exploration that mostly will be needed to find information related to the on-going project. Following this, the tasks that need to be undertaken at each of the briefing stages are outlined and a detailed description of how to perform each task is given. Then, at the bottom of the Operational Roadmap, the outcomes in terms of the project brief at each stage of the lean briefing stages are defined.
6.9 The value of Lean Briefing Perspective

Lean Briefing provides a uniquely efficient briefing process perspective, which is needed to ensure a design value-added project brief delivery, as its main focus is on value identification and enhancing the design process. However, as with any new system to be introduced to the construction industry market, or any other industry market, obviously, there will be a question as to its value.

Lean Briefing perspective is valuable mainly because it is unlike other systems by virtue of its being Lean. Lean Management theory and its principles are embedded in Lean Briefing. Lean Management aspects were implemented and realised in the Operational Roadmap in terms of; firstly, identifying the briefing value stream map to strictly carry out the brief development process in line with the RIBA Plan of Work project brief stages; secondly, and according to Lean Management theory, achieving the best process value stream by establishing pull ‘kanban’ in the process flow, which was the focus in designing the Lean Briefing process. This feature was achieved in two places, in the first instance, by keeping the development of the project brief aligned with the RIBA Plan of Work, in the front-end of the project. This will help achieve push and pull between the brief stage and design stage and therefore achieve the best value stream for project delivery. In the second instance, push and pull were established within the Project Brief development stage itself by planning Lean Briefing to be carried out as learning application. The learning application that was built into Lean Briefing by means of developing the knowledge base early in the front-end of the project will push potential project options to arise on the shared understanding platform, and testing these throughout the concept design will enable pulling the right client and project requirements. Keep seeking perfection is the most important principle of Lean Management theory. The Perfection Cycle was embedded in the Lean Briefing Management Framework, which will enable continual Lean Briefing process improvement ‘Kaizen’ via learned lessons.

Besides being Lean, it serves both experienced and inexperienced clients, and facilitates engaging all potential project stakeholders. It also serves different project context. However, special arrangements are likely needed for some procurement routes in terms of how to exchange the learned lessons and record them in the planned Perfection Cycle for continual process improvement ‘Kaizen’.
The value of the Lean Briefing perspective is further believed because it was developed based on a platform of a wide range of learned lessons from several organisations, some of them well-known global companies. It is further thought that this novel Lean Briefing perspective as a process of generating and processing client and project requirements will likely: (i) offer an alternative uniquely efficient briefing process approach, (ii) ensure design value-added project brief delivery, and (iii) help provide industry-wide consistency.

6.10 Summary

This chapter reported the development of the Lean Briefing perspective as a response to the identified waste drivers in briefing practice. In light of the insights gained from the data analysis and findings, further work was undertaken to develop an alternative new system that explains how best to deliver a design value-added project brief for effective design management. A novel theoretical and methodological basis for the briefing process was successfully developed by making use of the emerging Lean Management theory in the construction industry to create an innovative solution unlike anything that has been proposed before. Lean Briefing perspective was developed by means of lean briefing concept and approach. A Lean Briefing concept was developed to enhance Project Brief delivery, and the Lean Briefing approach (Framework and Operational Roadmap) was successfully generated for the in-depth understanding and effective capturing of client and project requirements. The underlying assumptions of the Lean Briefing perspective have been made explicit and justified within the context of the framework.

The empirical research findings indicated the basis of the Lean Briefing approach. The development of the approach was principally based on this and the good/suggested process components selected from the exploration of briefing practices in the UK, as well as some useful lessons from briefing practices in Libya and some guidelines derived from the literature review. The objective was focused on the process of constructing a framework to address the Lean Briefing approach, and on the measures required to assure its consistency. This was achieved through conducting several revisions and informal piloting sessions in order to verify the framework’s consistency, logic and integrity in terms of its methodology and outcome. The development of the Lean Briefing approach was influenced by the interviewees’ perspectives, as the formal procedure needed to be generic to suit different
briefing practice contexts. This was beneficial, as it aided designing and achieving a more flexible and adaptable Lean Briefing Management Framework that is applicable to different types of organisational and business context. It further aided planning and achieving a legitimate methodological briefing procedure (the Lean Briefing Process Operational Roadmap based on Lean Management theory and the briefing process value stream that was believed to be optimal (i.e. strictly keeping the development of the project brief according to the RIBA Plan official briefing stages, Stage 1 and Stage 2, in the front-end of the design process). Similarly, the Operational Roadmap was open enough to be adapted to address different needs, different types of project, different timetables, different clients and different organisational contexts.

Lean Briefing concept, together with the framework and it is associated Operational Roadmap presents the contextualisation of the findings obtained from the empirical research and data acquired from the literature review. These are demonstrating the Lean Briefing perspective proposed to enhance the briefing process practice and therefore effective design management. However, this outcome represents the initial version of Lean Briefing perspective that was then taken into a verification and validation process for further improvement. The verification and validation process are discussed in the next chapter.
CHAPTER SEVEN

VALIDATION AND VERIFICATION
CHAPTER SEVEN

7 VALIDATION AND VERIFICATION

7.1 Overview

This chapter presents the outcome of the evaluations conducted to validate the concept and the approach of Lean Briefing (i.e. Lean Briefing Management Framework). The development of the initial version of the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap throughout the two validation phases is explained and reported in this chapter. The chapter starts by reporting the first validation phase, which involved interviewing Lean experts from the construction industry, followed by the second validation, which involved a focus group session and one-to-one interview with practitioners from the UK construction industry. This includes explaining the aim and describing the preparation and procedure for each of the validation phases, together with a description of the findings. It further analyses and discusses the participants’ views and feedback on the concept of and planned approach to Lean Briefing. The suggestions for improving the Framework and Operational Roadmap in each of the validation phases are reported at the end of each of the validation phases, plus their application. The chapter ends by presenting the resulting final version of the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap.

7.2 Why Undergo Validation and Verification?

The Lean Briefing concept (Section 6.4), and its inventive approach, the Lean Briefing Management Framework (Section 6.6) (Figure 6.10 see page 202) and its associated Lean Briefing Process Operational Roadmap (Section 6.7) (Figure 6.11 see page 202), were developed and designed in Chapter 6. Several revisions and informal piloting sessions were conducted in order to verify the consistency, logic and integrity of the Lean Briefing Framework and Process Operational Roadmap in terms of their methodology and outcome. However, to confirm the alignment, practicality and value of Lean Briefing to the construction industry in the UK, it needed to be run through an evaluation process (i.e.
verification and validation). This helped developing Lean Briefing to an acceptable mature level that made it applicable for practice.

7.3 Verification

Lean Briefing needed to be verified against the official briefing requirements in place to make sure it works within those parameters and does not cause conflict or obstacles in practice. Lean Briefing was checked against the applicable requirements in terms of the construction project delivery stages. The one official requirement in terms of project briefs in the UK is laid out in the RIBA Plan of Work 2013 (see Figure 2.6 page 29), with which the Lean Briefing Process (LBP) is planned to be compatible: it was designed by aligning the Lean Briefing Process to the RIBA stages and the final project brief deliverables (i.e. the final outcome requirements and time stages: Initial Project Brief at Stage 1 and Final Project Brief at Stage 2). This verifies that the Lean Briefing Process (LBP) meets the related approved requirements.

7.4 Validation

The concept of validation is dependent on the view that the framework is a representation of the real world, or part of it (Pidd, 2009). Furthermore, validation is used to check if the framework behaves as the real world would under the same conditions (Miser, 1993; Pidd, 2009). A further reason for validating was to ensure that the proposed framework truly represented the key findings identified from the research. Miser (1993) and Pidd (2009) argued that useful and realistic views of validation emphasise the possible utilisation of models as the means of validation. This allows the framework to appear to be of more practical use. Lean Briefing validation was completed by conducting interviews and a focus group with some Lean experts and industry practitioners. They were invited to offer their perspective regarding the proposed framework and whether it indeed reflected reality. Early interviews were conducted with Lean experts from the construction industry to check the Lean Briefing concept and approach from a Lean perspective, as it was developed and planned by make use of Lean Management theory. Then a validation focus group was conducted with UK construction industry practitioners, followed by an in-depth one-to-one intensive validation interview with a senior architect partner from a well-known design company in the UK. It was beneficial to validate the Lean Briefing through two phases
whereby the outcome of each phase would add certain developments before it was moved to the next. The two-phase validation was purely qualitative and was targeted at expert practitioners to gain their professional opinions. Figure 7.1 illustrates the Lean Briefing validation process.

Figure 7.1 Lean Briefing Validation
7.5 Lean Briefing Process (LBP) First Validation Phase

As a Lean approach was implemented in the Lean Briefing Management Framework (Figure 6.10 page 202) and Lean Briefing Process Operational Roadmap (Figure 6.11 page 202), it was important to validate the implemented Lean strategy from a Lean perspective. This phase aimed to evaluate the framework’s practicality, clarity and appropriateness against the Lean concept before moving it into practice. In this first phase, the targeted audience was experts and advocates of Lean.

It was decided to make use of the annual International Group of Lean Construction summit to present the framework and conduct individual interviews with some of the audiences, preferably architects or design managers, to gain their views on the developed Lean Briefing from a Lean perspective, and to make sure that Lean aspect were covered in the framework design.

7.5.1 Aim of the First Validation Phase

The aim of the first round validation phase was to obtain Lean expert feedback on the developed Lean Briefing concept and the planned approach (i.e. the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap).

7.5.2 Preparation for First Validation Phase

An early front-end preparation was completed before going into the first validation phase. The preparation steps were as follows:

1- A conference paper explaining the Lean Briefing concept and outlining the basis for its approach was prepared and submitted to the IGLC 22 Conference (El.Reifi et al., 2014).
2- The Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap were planned and finalised so as to be ready to go through the validation process.
3- A Lean Briefing concept presentation was prepared and the Lean Briefing Management Framework and Lean Briefing Process Operational Roadmap included at the end of the presentation. This was to highlight the framework to the audience.
and make a call through the presentation for a one-to-one individual interview to evaluate the framework.

4- The Lean Briefing Management Framework and Lean Briefing Process Operational Roadmap were printed on an A3 poster for the interviews.

5- An application for ethics approval was made to fulfil Loughborough University’s human participant research requirements and research ethics approval was obtained. Consent form and participants’ information sheet can be found in Appendix (B).

7.5.3 First Validation Phase Interviews

To complete the first validation phase, six validation interviews were conducted at IGLC 22, each lasting between 20 and 45 minutes.

7.5.3.1 Purpose of the Interviews

The purpose of these interviews was to validate the developed Lean Briefing concept, and its planned approach, as well as the Lean implementation design strategy in terms of their value, by gathering Lean experts’ opinions and views. Lean Briefing and its Management Framework and Process Operational Roadmap were developed as a result of early interviews conducted with construction industry practitioners.

7.5.3.2 Interviewees’ Background and Experience

Six individual validation interviews were conducted with Lean experts: Three Lean Consultants, one Design Manager, one Facility and Management Advisor and two Client Advisors. They had between 10 and 30 years of project delivery experience. Four were from the USA, one from Norway, and the other from Denmark.

7.5.3.3 Interview Procedure

The validation process was conducted by presenting the Lean Briefing concept and its approach at IGLC 22, and then some of the audience who expressed their interest through the question slot after the presentation were approached and asked for an individual interview to go through the developed Lean Briefing concept and approach and give their views and feedback. The presentation slides can be found in Appendix (B). Interviewees
were interviewed at the end of the presentation session and on the following two conference days.

Using the A3 poster, the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap were presented to the interviewees with a brief explanation of the methodology and the philosophy of creating a holistic Lean Briefing Management Framework and the supplementary Operational Roadmap that contains two models, the DO Model and CHECK Model. Then, the interviewees were asked for their judgement.

7.5.3.4 Interview Results

Lean Briefing was received as a great idea by all of the interviewees and an overall interest was expressed by the interviewed experts. It was considered to be a positive contribution to the evolving research on Lean Design Management and its implementation. However, some useful comments were received and considered in the framework improvement. Although the interviews were individual, all of the interviewees agreed on one point regarding the descriptive tasks listed in the framework, as these might give a negative first indication to the practitioner user of the framework. They will likely feel it is a heavy task to undertake as many are listed there at once. Some interviewees suggested keeping just the main task in the Operational Roadmap and including the descriptive details of the task on a separate sheet as an appendix to the framework. This point was considered as useful and was addressed in the Framework improvement.

Another comment raised by one interviewee was to add the client (customer) as an element in the Preparation Set-up at the Organisation Level in the Lean Briefing Management Framework. However, the framework is planned for construction organisations. It was believed that the client is already an element of the Operational Roadmap and the author saw no logical reason to include the client in the Preparation Set-up at the Organisation Level. One Lean expert recommended including Choosing by Advantages as a tool aiding Lean Briefing. On the other hand, most of the interviewees suggested that Building Information Modelling (BIM), Value Management, and Choosing by Advantages should clearly be included in the Preparation Set-up as tools to aid Lean Briefing. These suggestions were considered as useful and were addressed in the Framework improvement.
Additionally, in terms of the format, most of the interviewees agreed that keywords and some important parts of the text on the Operational Roadmap should be highlighted by making use of text formatting (Underline, Italic, Bold or Font colour). This recommendation was considered as useful and was addressed in the Framework improvement.

However, none of the interviewees criticised the idea of generating the framework and all of them agreed that it would be a useful practical guide for construction organisations, whether or not they are employing Lean Management Strategy in their overall operation. None of them said that this initiative was not an original attempt. Accordingly, most of the interviewees expressed their interest and wished to see this work published in the near future. Furthermore, one of the interviewees asked for further collaboration during the future development process, as this work would support his on-going work towards developing a Lean Design Management operation strategy for the organisation in which he works.

7.5.4 First Improvement of the Lean Briefing Process (LBP)

A new version of the Lean Briefing Management Framework (Figure 7.2) and its associated Lean Briefing Process Operational Roadmap (Figure 7.3) was developed to reflect the comments and feedback from the participants in the first validation phase (discussed in Sub-Section 7.5.3.4). These were further highlighted in Figure 6.10a and Figure 6.11a. Lean Briefing was detailed by issuing Lean Briefing Handbook as a result of the first validation phase. The first edition of the Handbook can be found in Appendix (C).
Figure 6.10a Recommended Improvements on Lean Briefing Management Framework

- The Operational Roadmap was copied from the top part of the Operational Roadmap to further help reading the Framework in conjunction with the Operational Roadmap.
- The Operational Roadmap was rearranged and its contents were re-chosen to match with its corresponding in the Operational Roadmap to further help reading the Framework in conjunction with the Operational Roadmap.
- The Preparation Set up components were rearranged and its colours were re-chosen to match with its corresponding in the Operational Roadmap to further help reading the Framework in conjunction with the Operational Roadmap.
- The Operational Roadmap was changed to red colour to further help reading the Framework in conjunction with the Operational Roadmap.
- The Preparation Set up components were rearranged and its colour were re-chosen to match with its corresponding in the Operational Roadmap to further help reading the Framework in conjunction with the Operational Roadmap.
- Lean Briefing enabled tools were reflected in the Preparation Set up.
The element reflecting the project Brief Development Process was re-shaped to illustrate the end of briefing process development at the end of Stage 2.

The row colours contain details related to the Brief Team and the Databank were re-chosen to match with its corresponding in the Preparation Set up on the Framework. This is to further help reading the Framework in conjunction with the Operational Roadmap.

Milestones flags were added at end of each stage to illustrate Briefing gateways.

Keywords and some important parts of the text were highlighted in italic and bold format.

The detail descriptive of each task listed in the Operational Roadmap was moved to an attached page in the Handbook. Page number was given to direct the practitioner to the page contains the detail deceptive of the task.

### Figure 6.11a Recommended Improvements on Lean Briefing Process Operational Roadmap
Figure 7.2 First Improved Version of Lean Briefing Management Framework

Figure 7.3 First Improved Version of Lean Briefing Process Operational Roadmap
7.6 Lean Briefing Process (LBP) Second Validation Phase

After surveying Lean experts’ views and acquiring their feedback on the developed Lean Briefing concept and planned approach, it was essential to acquire validation from the intended user practitioners of the future framework. In this regard, the improved Lean Briefing Process was taken to the second phase of validation to validate the concept of and approach to Lean Briefing in terms of its value, as well as the design strategy and practicality of the improved Lean Briefing Management Framework (Figure 7.2 page 215) and Lean Briefing Process Operational Roadmap (Figure 7.3 page 215) based on construction industry practitioners’ experience and perspective. This phase aimed to evaluate the framework’s practicality, clarity and appropriateness against briefing process practices for further improvement before moving it into practice. In this second phase, the targeted audience were architects and design managers.

The second validation phase was initially planned to include two focus groups at two large well-known companies in the UK. However, due to unforeseen issues, it was not possible to complete the arrangements for one of the focus groups, and this was replaced by a one-to-one interview with a senior architect in the same company. A detailed explanation of the validation focus group and interview is included below.

7.6.1 Aim of the Second Validation Phase

The Lean Briefing concept and planned approach were planned and developed as the result of early interviews, and the first validation phase interviews. The aim of the second validation phase was to obtain UK construction industry practitioners’ feedback in terms of the Lean Briefing concept and the improved approach (i.e. the Lean Briefing Management Framework (Figure 7.2 page 215) and its associated Lean Briefing Process Operational Roadmap (Figure 7.3 page 215).
7.6.2 Preparation for the Second Validation Phase

An early front-end preparation was completed before starting the second validation phase. The preparation steps were as follows:

1. Organisations from the UK construction industry to be invited to participate in the second validation phase were defined.

   This was planned early on through the early interviews, as interviewees were asked whether they are happy to participate in the research validation phase. Most of the interviewees reflected their interest in participating in the research validation phase. Two of the interviewees from a large well-known organisation expressed their interest in participating. However, they had concerns about sitting in the same room as practitioners from their competitors and sharing ideas in front of them. Each offered separately to host a focus group in their organisation’s headquarters. It was believed that, it is better to make use of this opportunity to get their good track record of experience which was advantageous to this research.

2. Second validation phase participants’ professions were defined.

   Participants were needed to be from among those who practice doing the project brief, and those for whom the brief is part of their duties or has an impact on their tasks. Thus, ideally the participants should be a mix of Architects, Design Managers, Project Managers, (and Client/ Client Design Advisors if secured).

3. A time line for the second validation phase session was put in place.

To make effective use of the session time, a time plan to run the session was put in place in three slots as follows:

- **Slot 1:** (15min) Introductory presentation to advise the focus group plan, and familiarise participants with the Lean Briefing concept and approach. The presentation focused on: What is Lean Briefing? Why has it been developed?
How to do Lean Briefing, Lean Briefing Management Framework and Lean Briefing Process Operational Roadmap.

- **Slot 2:** (30min) Discussion and validation questions. Participants were asked initially to discuss their views and comments, and offer their feedback regarding the presented Lean Briefing. Then, participants were asked to weight their attitudes in terms of a set of statements about Lean Briefing using a voting device.

- **Slot 3:** (15min) Summary. This summed up the important issues from the discussed views and the offered feedback.

A soft copy of the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap was sent to the participants in advance to help in running the session.

4- A list of tools and resources to be used to help running the event was prepared:
   - Electronic response system device.
   - Printed copy of Lean Briefing Process Handbook as intended to be delivered in its final format. It can be found in Appendix (C).
   - A0 poster of the Lean Briefing Management Framework and Lean Briefing Process Operational Roadmap. It can be found in Appendix (B).

5- Ethics approval was obtained.

An application for ethics approval was made to fulfil Loughborough University’s human participant research requirements and research ethics approval was obtained. Consent form and participant’s information sheet can be found in Appendix (B).

6- Session validation questions were prepared.

Attitude evaluation multiple choice questions mainly concerning Lean Briefing were planned to allow participants to judge the proposed Lean Briefing in terms of its; (i) Concept and approach, (ii) Strategy, and (iii) Practicality. Additional questions were also prepared as a contingency plan in case there was a need to encourage participants’ discussion. A list of the validation questions can be found in Appendix (B).
7.6.3 Second Validation Phase - Focus Group

As part of the second validation phase, a Lean Briefing Process validation focus group was conducted at one of the UK’s largest construction and design companies. It lasted about 1 hour and 45 minutes and was recorded, which helped effective reporting of the validation focus group results.

7.6.3.1 Purpose of the Focus Group

The purpose of the focus group was to contribute to the Lean Briefing validation process by gauging UK construction industry practitioners’ opinions and view on the Lean Briefing concept and the improved approach (i.e. Lean Briefing Management Framework (Figure 7.2 page 215) and its associated Lean Briefing Process Operational Roadmap (Figure 7.3 page 215)) which were developed as a result of the early interviews, and the first validation phase.

7.6.3.2 Focus Group Organisation and Participants’ Background

The large design and construction company had 100 to 250 employees. The annual turnover of the company was more than £100m. The participants in the focus group session were six professional practitioners from the company: (i) the Design Director; an architect with 20 years’ experience, (ii) the Architectural Technologist; an architect with 20 years’ experience, (iii) the Lead Architect; an architect with 40 years’ experience, (iv) a Senior Project Designer; an architect with 25 years’ experience, (v) a Sustainable Design and Construction Specialist; an architect with 18 years’ experience, and (vi) the Design Coordinator; an architect with 13 years’ experience. Participants were involved in a variety of projects in the residential/housing, commercial and industrial sectors and in new builds and/or renovation/refurbishment. They also had experience of both private and public clients.

7.6.3.3 Focus Group Procedure

The session room was set up as in Figure 7.4. The session started with a 15 minute introductory presentation slot. This was to advice the focus group session plan, and familiarise participants with the Lean Briefing concept and planned approach; the
presentation is included in Appendix (B) of this study. Then, a 45 minute discussion slot was held where participants discussed and exchanged views and comments, and offered their feedback on the presented Lean Briefing. Following that, for about 45 minutes, the multiple choice evaluation questions about the Lean Briefing concept, and its planned approach were asked. The participants were asked to weight their attitudes in terms of a set of statements about Lean Briefing using a response system device. Moreover, alongside the multiple choice question session there was also a useful discussion, as using the digital response system supported generating an immediate result after each question. This feature was useful for encouraging further discussion in case disagreeing views were noticed. It positively encouraged further discussion between participants. At the end, the session was closed by summarising the important issues, and the participants were acknowledged for participating in the focus group, and for giving their feedback and views. In addition, and under no obligation, participants were asked to provide further comments, views, and feedback, if they had any, later via email.

Figure 7.4 Focus Group Room Set-up

7.6.3.4 Focus Group Results

Overall, Lean Briefing was well received, especially the DO and CHECK Models in the Lean Briefing Roadmap that allow transfer of lessons between projects. Positive feedback was received from the participants, as none of them criticised the idea of generating the framework and they all agreed that it would be a useful practical briefing guide for the
construction organisation. They mentioned that the challenge is always with the client and whether they wish to go through the advised learning journey. Additionally, none of them claimed that this initiative was not an original attempt. The participants’ detailed evaluations of Lean Briefing are presented here against each step of the focus group validation procedure.

Participants’ Views

This was an open slot which was left to the participants in the focus group to discuss their views, comments and offer their suggestions for the further improvement of Lean Briefing. This was useful as the participants were given the opportunity to ask to clarify some points and discussed their views and comments on the presented Lean Briefing. The following summarises the main discussion points raised by the participants and their suggestions for further improvements for the Framework and Process Operational Roadmap.

Participants discussed the presented Lean Briefing by reflecting on their briefing practices experience. They started by highlighting the briefing challenges they experience in terms of client types. One architect stated, “I have been going through very similar process with [X] project where a client who had no experience at all procuring buildings and did not really know what they wanted could not express at all what they wanted. So we sought consultation from [N] who is really experienced procuring similar projects. We used our brief requirements template to kind of write down everything we thought the client may want. We had lot of review meetings with the client where we walked them through an idea, going literally to each space to see what each space was going to have, and kind of halfway through we thought we needed such a tool of linear progression to set that”. The Architectural Technologist argued, “the problem with briefs is not straightforward, because you may get a brief from a person at that meeting and part away along, ‘oh no, we changed our mind’ or somebody gets involved and changes it. It is not even that they do not know what they want; this person thinks they know what they want and the next person might want something else and that is where the difficulty is”. The Senior Project Designer claimed, “The job I am working on now, the client still has no idea what they want and by the time the steel structure got up we started ignoring the ideas of the client and ended up doing what we
usually do. It is just inefficient and wasteful”. They all agreed that experience will help a project.

Then the participants discussed Lean Briefing in terms of its process. The Lead Architect revealed that it is useful seeing it aligned to the RIBA Plan of Work but that is not always the case, as some practices in the industry do not follow the RIBA Plan of Work. The Design Manager noted, “The way I see it at the minute is it is not a case of reinventing a process. It is more about making sure each specific section of let’s say the RIBA Plan of Work is reviewed and agreed before you progress further forward, because I suppose time and the time again you will get a scenario where we pick what we think is a client brief and we develop that and we get to a situation where we get variations, we get these design changes. In reality, what you are trying to do is create bit of a regimented approach to developing that brief but not going any further until that brief has been realised as exactly what they want to be built”. Another architect elaborated further: “It is kind of re-evaluating what should happen in a typical process and in a way it is kind of giving another level to go through; it is like a check list. This is brilliant, as you check that you have done and covered everything, I think there is more value in what you do”. The Design Manager argued that the CHECK cycle is new in continually referring back and recording. He further stressed its value: “Because the idea once you have done let’s say three years of constant review you almost get to the exhausted list of the things in the briefing stage that need to be picked up and need to be considered about the learning over the last 12 or n months of practice”. He mentioned previous experience when his company used a very similar principle but applied it to the bidding process. There they spent time feeding learned lessons from bidding into a bidding framework process to improve the company’s bidding hit rate. In response, another architect claimed, “We tend to rely on person. We tend to use people to hold that in their head rather than formalised and make it available for everybody else. I believe this [the CHECK cycle] is good”.

However, the Design Coordinator thought that the trouble with the process is the time to do it, especially as a lot of it is subjective and bespoke down to how far you go with it; how do you know you get to a point of time and say the brief is sufficiently developed? He
argued, “It is very rarely when you get to a document and tell the client this the brief; is this what you want? We have experienced scenarios where we hardly get it signed off because they never say this is what we want but then on the flipside, you get another scenario where that brief is signed off but they do not read it properly and then later you get to a point where someone will pick up on that brief”. It was established by all of the participants that the challenge is still getting to that mutual agreement.

Following to this, the discussion was moved towards discussing BIM as tool to aid Lean Briefing. All of the participants agreed that during this early stage of the project, BIM supports the development of the brief but it does not happen all at once, as there is a need to go back to different drawings, specifications and images to facilitate action. The Senior Project Designer claimed, “But over time that 3D presentation covers the whole drawing and by looking at the 3D presentation clients develop the space awareness and understand what they are going to get. Effectively, that would be the briefing document”.

Then, the participants discussed the ownership of Lean Briefing. A Lead Architect questioned the Brief Team and claimed, “The briefing process best targets it with a project architect”. The Design Manager replied, “It is another level of the RIBA Plan of Work, but a level contractor needs to be aware of it, the client needs to be aware of. I suppose in a sense this needs to have three owners: the client, the design team and then arguably the contractor, because at the end of the day you need those three stakeholders involved in the earliest process. Who takes the ownership for it might be another agreement within the contract itself”.

At the end, all of the participants raised a serious concerns related to the motivation to use Lean Briefing. They claimed that it is not practical to use in a small practice, but is more for large clients and large projects. They further built on BIM as an example benchmark for Lean Briefing implementation in terms of investing in setting up. The Lead Architect claimed, “It is really interesting. It is great but to get this done, to get this implemented industry-wide, it needs to come from government like the BIM strategy: ‘by 2016 we want everybody to work through this process and everybody needs to be aware of this process’.”
has to come like a government initiative getting everybody on board”. Another architect thought the motivation is more with clients if they are knowledgeable to understand any weakness in briefing need variations in the tender. However, participants agreed that engaging with client organisations would give more insight.

Participants’ Evaluation Feedback

In this slot, the participants were asked to evaluate Lean Briefing by giving their feedback in terms of a set of three evaluation criteria: Lean Briefing Concept and Approach, Lean Briefing Strategy and Lean Briefing Practicality. Finally, the participants were asked about the Lean Briefing Handbook and whether they would like to give Lean Briefing a go. The participants’ responses are presented in this section underneath each evaluation criterion.

Lean Briefing Concept and Approach

This section aimed to evaluate Lean Briefing in terms of its concept and approach. To do this, participants were asked to respond to a set of questions designed to evaluate the Lean Briefing concept and approach from two points of view: firstly, in terms of the project brief that would result from performing Lean Briefing, and secondly in terms of the influence the resulted project brief would have on some aspects of project delivery. The participants’ responses are summarised below.

In terms of the project brief that would result from performing Lean Briefing, almost all participants agreed that the Lean Briefing concept and approach will help in generating an effective and value-added project brief when it is performed as a learning exercise. They also all agreed that it will help in the early development of the project knowledge base.

Some of the participants agreed that Lean Briefing will not limit design creativity. However, the Design Manager believed that this would depend on the opportunities for the outcome to not be restricted by limited options. The Lead Architect thought that this cannot be ensured on a lower level as Lean Briefing is more or less directed towards a sophisticated business rather than an individual.
Most participants agreed that the Lean Briefing approach establishes the prospect of using BIM from early in the project stages. However, the Design Coordinator stated that far more than using it as an education tool, it is the opportunity of setting up the process of using BIM from an early project stage, as stated by the Design Manager: “I suppose with BIM how you set everything up and move things up and when you decide to use it or not, at least it becomes informed in that process, you know what the benefit of it was in the last job”. They further agreed that Lean Briefing will support achieving the UK Government BIM mandate because BIM is implemented functionally in Lean Briefing.

On the other hand, in terms of the influence the resulting project brief would have on aspects of project delivery, some participants agreed that Lean Briefing will have a positive influence on the quality of design deliverables and therefore support effective design management. However, a Senior Project Designer thought it will help but that should not be taken for granted, as it is still down to how effectively the designer makes use of that outcome (i.e. the Project Brief). It all depends on how Lean Briefing is implemented in the business, whether truly on a strategy level or on an individual level. Similarly, some participants agreed that Lean Briefing will enhance construction project delivery. Others claimed that other downside construction industry issues count.

Most participants agreed that Lean Briefing will support achieving both client and construction organisation value. However, one Architect thought value is a complicated conflict issue in the construction industry, as the client wants to get what they need as cheaply as possible but the contractor wants to complete something satisfactory and make a margin. She stated, “It is very different aims”. The Design Manager argued further that “Even if you sacrifice a project because there is an opportunity for repeat business to happen, still you want to make some profit out of it”. The Lead Architect claimed, “I do not think whether you got a good brief or Lean Briefing will make any difference in achieving value, rather it might help somehow in defining value but whether to achieve it or not is still not the brief’s function”.

Overall, all of the participants agreed that the Lean Briefing approach is an innovative, approach, and the challenge is getting the client to buy into the idea. However, a few further revealed that, although not on the same principles, its perception is inventive, as it formalises and coordinates many elements from what they normally should do. This was seen as one of the advantages of this research, as part of the idea of Lean Briefing is to create the best value stream for the briefing process. The message clearly emphasised that the Lean Briefing Process had not reinvented the entire briefing process, but rather reinvented the best briefing process value stream. In addition, all agreed that the Perfection Cycle is not usually captured, and neither is the discipline of checking the brief and putting lessons learned from it into the next scheme.

Lean Briefing Strategy

This section aimed to evaluate the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap in terms of its design strategy. To do this, participants were asked to respond to a set of questions designed to evaluate the Lean Briefing planning strategy. This was to ensure that the established assumptions set at the outset of planning the Framework and the Operational Roadmap were attained in the resulting Lean Briefing Management Framework and Process Operational Roadmap. The participants’ responses are summarised below.

Almost all of the participants agreed that the planned Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap can be considered as a high-level strategy process and is well planned to support a bidirectional learning exercise between the client and design team. Similarly, they agreed that it provides a shared understanding platform to switch subjective requirements to objective requirements which in turn supports the Lean Briefing concept. However, the Design Coordinator argued, “Lean and value are driven from less waste, shorter programme, less money. One would argue how this process would be Lean and in the same time is dragging us into extra meetings. I believe it does not end up as Lean unless you educate all the parties about Lean, and set it out obviously right at the beginning that this process will make this saving. Getting
A few participants who claimed to have a good Lean background believed that the principles and advantages of Lean Management are clearly recognised in some of the framework’s obvious feature such as the Perfection Cycle. They further stressed that the briefing process value stream map was captured by the Lean Briefing Process Roadmap. However, others felt it was natural to argue that debate still exists today on what Lean construction means: is it spending less money or going through fewer process steps? Those people further noted that, aside from whether it is Lean or not, the approach would help with better Project Brief delivery.

Most participants agreed that the value of using BIM as an enabler for Lean Briefing is well established in the framework design. However, a Senior Project Designer argued that it is too early for such a view, as the value of using BIM is not well established even in the industry. There are many people out there still using BIM as clash detection. She stated, “This is because some companies like us have invested in setting up BIM in their practice as they are in a position to financially do it. A lot of companies are not in a position to do it”.

Overall, all agreed that the Framework and Operational Roadmap are well planned in principle. However, testing them in practice will highlight any developments needed.

Lean Briefing Practicality

This section aimed to evaluate the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap in terms of their practicality. To do this, participants were asked to respond to a set of questions designed to evaluate Lean Briefing practicality. This was to ensure that the designed Framework and Operational Roadmap are practically valid for used and management by the intended user. The participants’ responses are summarised below.
All participants agreed that the Management Framework and its associated Lean Briefing Process Operational Roadmap are bespoke and manageably adaptable in terms of the construction organisation context, project context, and client type (experienced/inexperienced). However, one Lead Architect claimed, “It is great, but not all people out there do use RIBA”. Other participants replied, “You still can adapt it to whatever type of process you follow”.

Overall, some participants thought that the Framework and the Operational Roadmap look practically good. Conversely, a few others felt not sure about its practicality, revealing that it might be practically good in principle but it is more down to judgement of the practical implementation. They all agreed that the Lean Briefing Handbook is an excellent guide.

The evaluation slot was closed by asking the participants whether they would give Lean Briefing a go. All participants expressed their interest to try it. However, they further stated that it would not be their sole decision, as it is still down to the company.

7.6.4 Second Validation - Interview

As part of the second validation phase, a one-to-one semi-structured validation interview was conducted in one of the UK’s largest design companies. It lasted 1 hour and 30 minutes, and was recorded, which helped in the effective reporting of the validation interview results.

7.6.4.1 Interview Purpose

The purpose of the interview was to contribute to the Lean Briefing validation process by gauging the UK construction industry practitioners’ opinion and view on the Lean Briefing concept and approach which were developed as a result of the early interviews, and the first validation phase of the Lean Briefing Process.
7.6.4.2 Interviewee and Organisation Background

The well-known large design and consultation company works in the UK and overseas and had more than 250 employees. The annual turnover of the company was more than £100m. The interviewee was an architect with 30 years’ work experience gained from working on projects in the UK and overseas. The interviewee was involved in a variety of projects in the residential/housing, commercial and industrial sectors and in both new builds and renovation/refurbishment. He also had experience of both private and public clients.

7.6.4.3 Interview Procedure

A soft copy of the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap was sent by email in advance to the interviewee to look at it briefly. The interview started with a brief introduction for about 15 minutes. This was to advise the interview plan, and familiarise the interviewee with the concept of and approach to Lean Briefing (i.e. the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap). Then, about 45 minutes of useful discussion was maintained where the interviewee was questioned, discussed his views and offered some comments for further improvement of the Lean Briefing Process. Following that, around 30 minutes were spent asking the multiple choice validation questions about the Lean Briefing concept and approach and the interviewee was asked to weight his attitude in terms of a set of statements about Lean Briefing. Alongside this there was also a useful discussion, as the interviewee chose to elaborate further explanations of his answers to some of the questions. This was a positive and encouraged further useful discussion with the interviewee. At the end, the important issues from the interview were summed up and the interviewee was acknowledged for his time and participation. Although under no obligation, the interviewee was asked to provide further comments, views, and feedback, if any, later via email.

7.6.4.4 Interview Results

Overall, Lean Briefing was received as great idea and positive feedback was received from the interviewee. The idea of generating the framework was not criticised by the interviewee.
He agreed that it is an original initiative and would be a useful practical guide for construction organisations. The interviewee gave a positive reaction about the developed Lean Briefing concept and its planned approach. The interviewee’s detailed responses are presented here against each step of the interview validation procedure.

**Interviewee’s Views**

The interviewee was given the opportunity to ask to clarify some points and discuss his views and comments on the introduced Lean Briefing perspective. The following summarises the main discussion points raised by the interviewee and his suggestions for further improvements for the Framework and Process Operational Roadmap.

The interviewee started the discussion by stating his view of the concept of and approach to Lean Briefing: “I believe your idea has some definite steps to achieving that goal. I suppose this is a good way of thinking as you can go through the principles but the details change from project to project. So it is putting it into a framework where you go through a set of tasks and everybody achieves their goal and they make sure they do not miss anything else”. He further stated that the process would be useful even for experienced clients, as in some cases the client has a clear idea of what they want but they are not sure how to achieve it. However, he claimed that not all practices use RIBA. He mentioned his company as an example, as they deal with some overseas projects and they have to go through particular countries’ specific work stages. However, the interviewee thought that this framework will work efficiently in companies that have built a practice profile over years of experience, but it would be a challenge for companies in their early stage of practice to make use of some its elements. Elements such as the Databank take time and need to be built through practical experience. He claimed that the more projects you do, the greater your understanding of the whole process to meet all the targets and understand the complexity of that scheme, and the more similar projects you have, the better the roadmap works and the more efficient it becomes.

Then, the interviewee elaborated on BIM as an element of Lean Briefing. He believed that the idea of having BIM built into the framework as an enabler within the Databank is a
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great idea and he believed that over the next years of practising, using BIM will enrich the Databank. However, he thought that it would be good if there was a notion of a national Databank project at the government level, run by organisations such as Building Societies, where well-delivered projects are well documented, and then make it accessible for practitioners to use. This would help any other project because it could always be compared to a benchmark in that national Databank. The interviewee believed that such a project would help overcome the challenge of companies in their early stage of practice and help project delivery in the UK. This was considered a good point by the researcher, and it could be a plan for a new research project.

Following this, the interviewee discussed his view on the Reflection Report within the CHECK Model in the Lean Briefing Process Operational Roadmap. He reported that normally at each design stage you will get a Design Report which summarises exactly the design status at the end of each stage, which then have to be to agreed and signed off by the client to say they have understood the concept of that stage and agree up to this point. At the detailed design stage, this report would have a risk assessment summary which results from going through all targets which have not been met for whatever reason, whether the client, the excavation or the site exploration and the need to tweak the design and amend it. This is like a list of issues that are running as a result of that and how the design is going to put it back on track and any cost implications. The interviewee suggested that the Reflection Report could be part of or an appendix to the Design Report.

Then, the interviewee discussed the members engaged in the Lean Briefing Process. He noted that, there should be an element to get the contractor on board at this early stage, if necessary to help define the procurement process or, depending on the complexity of the project and/or the site, it could be to help formulate the programme because specific construction methods might be needed. Sometimes the impact of the contractors at the early stage is necessary, as they can steer the project with their knowledge and experience. He mentioned Central London schemes as an example, with a lot of site constraints and the need to have specialist input from contractors at an early stage in order to achieve the final target.
At the end of the discussion slot the interviewee further highlighted the following points as suggestions for the further development of the framework:

1. Print the RIBA requirements in terms of Project brief in a different font colour or presentation on the Process Operational Roadmap to make a clear contrast between the RIBA requirements and the research element (i.e. how those requirements are met and progressed). The interviewee believed that, by doing this all the information related to the Project Brief would be available in one outcome and the framework would work as a Project Brief overlay to the RIBA Plan of Work.

2. Include a definition of some terminology used in the framework to maintain clarity; for example, ‘reflection report’, as the term reflection might mean different things to different people. This was addressed in the final edition of the Lean Briefing Handbook.

3. Make specific suggestions about who is in the Brief Team, their specialism and scope of work, because the term could be very open-ended. This was addressed in the final edition of the Lean Briefing Handbook.

4. In terms of how practices would buy this novel idea, it would be a challenge to find companies that easily agreed to take the risk of testing it in a new project, and it would also take time until the project is finished to see the value of using it. The interviewee recommended it might be more practical to test it against some well-documented completed projects. This was in line with the author’s view, as the outcome of this research (i.e. Lean Briefing) is recommended to be tested in a future case study research project.

**Interviewee Evaluation Feedback**

The interviewee was asked to evaluate Lean Briefing by giving his feedback in terms of a set of three evaluation criteria: Lean Briefing Concept and Approach, Lean Briefing Strategy, and Lean Briefing Practicality. The interviewee was asked also about the Lean Briefing Handbook and whether he would like to give Lean Briefing a go. The interviewee’s evaluation responses are presented in this section underneath each evaluation criterion.
Lean Briefing Concept and Approach

This section aimed to evaluate Lean Briefing in terms of its concept and approach. To do this, the interviewee was asked to respond to a set of questions designed to evaluate the Lean Briefing concept and approach from two points of view: firstly in terms of the project brief that would result from performing Lean Briefing, and secondly in terms of the influence the resulting project brief would have on some aspects of project delivery. The interviewee’s responses are summarised below.

In terms of the project brief that would result from performing Lean Briefing, the interviewee agreed that Lean Briefing will produce an effective project brief when it is performed as a learning exercise. He agreed that that in turn will help in developing the project knowledge base early and therefore supporting a value-added project brief delivery. He further stated, “The principle should work and it is a beneficial thing to have in the project. it is just how exactly it is implemented and how it is monitored, and how you get from one stage to the next without making it too bureaucratic in terms of having to discuss each stage and each detail in endless meetings. Additionally, if there is too much bureaucracy and too much meeting and every single stage has to be agreed and then referred back, then it would properly limit design creativity because you are imposing a framework on everything”.

On the other hand, in terms of the influence the resulted project brief would have on aspects of project delivery, the interviewee claimed that Lean Briefing will not necessarily have a positive influence on the quality of design deliverables because it is a process; it does not define quality. He revealed, “It is a framework. I would think of the quality of the end product rather than a rigid framework and constantly checking everything because some project might have very specific requirements to achieve that have not been previously experienced”. However, the interviewee thought that, subject to how it is implemented, Lean Briefing will support effective design management, and consequently enhance construction project delivery.
The interviewee agreed that Lean Briefing will support achieving both client and construction organisation value as long as the checking is clear and does not conflict with something like what RIBA already set out, and as long as reference to comparison projects is used in a coherent manner, because no two projects are identical and in some situations the project might not have a direct comparison.

Additionally, the interviewee agreed that Lean Briefing defines where the value of using BIM sits in the front end of the project. However, he could not judge whether it will support achieving the UK Government BIM mandate. He argued, "It is difficult to know quite how it would work. I mean it should work with BIM because I suppose once you start BIM it is a completely new world. The whole BIM process is very particular and as long as this is used in conjunction with it, it should all work but it is difficult to see how exactly they are married".

Overall, the interviewee thought that the Lean Briefing concept and approach are a novel idea and in principle should all work, but this is very much subject to the team involved. He stressed that the whole dynamic of the team structure is important. It will work very well with the right team, especially if the team has strong leadership.

**Lean Briefing Strategy**

This section aimed to evaluate the Management Framework and its associated Lean Briefing Process Operational Roadmap in terms of its design strategy. To do this, the interviewee was asked to respond to a set of questions designed to evaluate the Lean Briefing planning strategy. This was to ensure that the established assumptions that were set at the outset of planning the Framework and Process Operational Roadmap were attained in the resulting Lean Briefing Management Framework and Lean Briefing Process Operational Roadmap. The interviewee’s responses are summarised below.

The interviewee claimed that the planned Lean Briefing Management Framework could be considered as a high-level strategy process in terms of the organisation but is more hands-on because it relies on a Roadmap and Databank that many practices would not
necessarily have. The Databank element does restrict a number of practices unless you have a national project where the Databank is a UK library of projects that can anyone can tap into and look into to supplement their own knowledge. Otherwise, it needs a practice specialised in one particular field or with vast experience that can be tracked and the end product refined. He argued, “It is like BIM: when it started there was nothing but obviously the more people put into it and all the subcontractors, the manufacturers made their own models of products, then the library built up and up so everyone can use it: that is where you get the benefit of the BIM and that is the same thing with your Databank”.

The interviewee agreed that Lean Briefing is well-planned to support a bidirectional learning exercise between client and design team as it conceptually provides a shared understanding platform to switch subjective requirements to objective requirements. He further agreed that it supports the Lean Briefing concept. However, this will depend on the people involved and will be subject to practice.

Overall, the interviewee thought the Framework and Operational Roadmap strategy a good plan which should work well with the right team.

**Lean Briefing Practicality**

This section aimed to evaluate the Management Framework and Lean Briefing Process Operational Roadmap in terms of their practicality. The interviewee was asked to respond to a set of questions designed to evaluate Lean Briefing’s practicality. This was to ensure that the Management Framework and Lean Briefing Process Operational Roadmap are practically valid to be used and managed by the intended users. The interviewee’s responses are summarised below.

The interviewee agreed that the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap are bespoke, and easily manageable and adaptable in terms of the construction organisation context, project context, and client type (experienced/ inexperienced). However, he claimed that highlighting the RIBA
requirements and how those requirements need to be achieved via Lean Briefing need to be
obvious in the framework.

Overall, the interviewee thought, in principle, that the Framework and Process
Operational Roadmap looked practically good, but are still subject to practical
implementation. He considered the Lean Briefing Handbook Appendix (C) an excellent
guide.

At the end, the interviewee was questioned as to whether he would give Lean Briefing
a go. He answered, “not sure, but it would not be up to me”.

7.6.5 Second Improvement to the Lean Briefing Process (LBP)

A final version of the Lean Briefing Management Framework (Figure 7.5), and its associated
Lean Briefing Process Operational Roadmap (Figure 7.6), was developed to reflect the
comments and feedback from the focus group (discussed in Section 7.6.3.4) and the one-to-
one interview (discussed in Section 7.6.4.4) in the second validation phase. These were
further highlighted in Figure 7.2a and Figure 7.3a. A final edition of the Handbook was also
issued and it can be found in Appendix (D). These illustrate the improved new version of the
Lean Briefing Process (LBP). This resulted Lean Briefing Process (LBP) has reached an
advanced acceptable level for practice.
Adding the RIBA requirements in terms of Project Brief on the Operational Roadmap to make a clear contrast between the RIBA requirements and how those requirements are met and progressed.

Adding an element to illustrate monitoring Project Brief process through stages from Stage 3 to Stage 6.
Adding the RIBA requirements in terms of Project brief on the Process Operational Roadmap to make a clear contrast between the RIBA requirements and the research element (i.e., how those requirements are met and progressed).

Adding an element to illustrate monitoring Project Brief process through stages from Stage 3 to Stage 6.

Adding an element to illustrate the bi-directional learning application between the design team and the client, together with emphasising the Pull "kanban" in the learning application.
7.7 Summary

This chapter reported the conducted validation process and the development outcome of the initial version of the Lean Briefing perspective. The aim of the validation process was to confirm its reliability and consistency within briefing practice and assess the appropriateness and workability of the framework and ascertain whether the Lean Briefing concept had been captured in the developed framework. This was achieved via two series of validating phases using empirical research (interviews and focus group), whereby the outcome of each phase added certain developments to the framework before the next validation phase was conducted. The validation activity was conducted by means of interviews with Lean experts from the construction industry, followed by focus group and interview with practitioners from the UK construction industry, all held in the context of the Lean Briefing concept. The overall feedback obtained from the participants was mostly positive, and a few improvements were suggested by participants in each phase, and were considered by the researcher.

The validation process supported exploring the implications of Lean Management principles on the briefing process by which current briefing process practices in the UK could be improved. The validation revealed that the Lean Briefing concept is novel, and the approach is adequately developed and useful in its principles for practice. The final version of lean briefing perspective as an innovative practice procedure for the briefing process was presented and its validity within AEC projects has been established.
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8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Overview

Based on the research work reported in the previous chapters, this chapter conveys the coherent conclusion of the research. It starts by highlighting the major outcomes of the research, followed by a review of the achievement of the research aim and objectives, with specific reference to the outcomes from each research project phase. Then, the originality of the research and its contribution to knowledge are demonstrated, followed by a critical appraisal of the accuracy and limitations of the research. The chapter concludes by advising recommendations to the construction industry, together with suggestions for further studies based on issues emerging from the research outcomes.

8.2 Major Outcomes of the Research

This research helped in confirming the value of the Project Brief in relation to design deliverables, design management and eventually effective project delivery. It further informed on the briefing process as the process by which project value is identified and presented. However, the research demonstrated that the UK construction industry is currently suffering from inefficient briefing process practice. Vitally, the value of this research is that it helped in exploring and identifying the original source of such inefficient practices and shortcomings in the briefing process that negatively contributes waste to the design process (see Figure 5.5 page 173). This discovery further helped in diagnosing where to improve the process, and accordingly in establishing an alternative new briefing perspective using Lean Management theory (Chapter 6). It is believed that this novel Lean Briefing perspective will enhance briefing process practice and facilitate effective design management. To the author knowledge, this is the first time that this approach has been applied in this way. The research enterprise has provided a unique insight into the briefing process and contributes new aspects to the theoretical understanding and practical
implementation of Lean Design Management in architecture, engineering and construction (AEC).

8.2.1 **Lean Briefing Process (LBP) for Effective Design Management**

Emmitt (1999) stated, “Design management is not so much about the management of people as the management of the process, the better the framework for management the process the better the result”. A major outcome of this research is that it has supported creating a novel and innovative concept and approach of Lean Briefing, which will enhance Project Brief delivery and design deliverables, and consequently aid effective design management. The following will highlight the major research outcome in regard to the invention of the proposed new Lean Briefing process perspective.

Ries (2012) stated, “What matters is not setting quantitative goals but fixing the method by which those goals are attained”. In this research, industry-wide agreement on the brief concept and the formal briefing process was explored as it is crucial to address briefing process value stream elements on a strategic level (i.e. a design value-added project brief delivery). This research has helped in generating a new Lean Briefing concept based on the Lean perception, and construction industry practitioners’ firm agreement on the brief concept.

Lean Briefing views the brief as a capturing of client and project requirements through learning, understanding and value definition and representation. It is a learning exchange application which should occur at the front-end of a project in order to develop a project-related knowledge base (subjective and objective) at the right time, early on, and explore several possible solutions by means of (i) minimising potential waste resulting from the lack of a knowledge base, and consequently (ii) ensuring the precise capture of client and project requirements. It is more a matter of learning the actual requirements of the project, not what clients say they want or what designers think they should have. Part of the design management process is gaining a clear understanding of your client in order to satisfy them (Bowen et al., 1997; Smith et al., 1998).

Lean Briefing is also about engaging the people further down the line (the ultimate client) in the learning application. To deliver better value, the client needs to be more flexible and take part in the stages of the project, as their involvement with interpersonal communication helps both the client and professionals to explore values and value (Emmitt
et al., 2005; Pasquire and Garrido, 2011; Christian et al., 2014). The proposed Lean Briefing concept has further managed to address the issue raised by Brown (2001) regarding the project knowledge base: “Expectation and goals may change throughout the project, as the knowledge base develops and additional contributors join the project”. This was achieved by focusing on early development of project knowledge base through the proposed learning application in the planned Lean Briefing perspective. A further detailed discussion on the Lean Briefing concept was given in Chapter 6 of this thesis.

The research has also helped in planning and developing an alternative new Lean Briefing approach based on the original Lean Briefing concept, Lean Management principles, and most importantly the RIBA Plan of Work official Project Brief requirements (RIBA, 2013a), which legitimise the whole Lean Briefing approach. According to the RIBA Plan of Work, the Project Brief is planned to be the outcome of a process that occurs right at the start of a project. Officially, that process develops from Preparation and Brief (Stage 1) to Concept Design (Stage 2). This further helped in capturing the briefing process value stream. The value stream of the briefing process was identified as flowing in line with the official brief stages outlined in the RIBA Plan of Work. The Lean Briefing process is planned to be developed over two stages: an early journey is necessary to explore the expectations (Initial Project Brief), and then a final element (Final Project Brief) is needed in order to set in the project and client requirements. This research has conveyed a Lean Briefing Process Operational Roadmap (see Figure 7.6 page 239) that explains how to carry out the Lean Briefing process in detail, from the start to end, to deliver and monitor the project brief by means of the “DO Model” and “CHECK Model”. The “DO Model” outlines brief development stages (Preparation and Brief, Stage 1 and Concept Design, Stage 2), whereas the “CHECK Model” outlines brief monitoring stages (from Developed Design, Stage 3 to Handover and Close out, Stage 6).

The “DO Model” explains in detail the activities, tasks, and tools that the Brief Team needs to undertake throughout the brief development stages in order to craft a design value-added project brief over two phases; firstly, performing a learning exchange application on a front-end shared understanding platform in a way that aids the Brief Team, client and design team to collaboratively find potential project options (i.e. Initial Project Brief at the end of Stage 1), before embarking on an actual design. Engineers and designers must present
several potential solutions to demonstrate that they have explored the ‘design space’ (Morgan and Liker, 2006a). “It is nice when the brief remains fairly well accepted as it is and when it has not been coloured by any other decisions so you can try and really see what they (the clients) need and what they are aiming for before you start introducing designs which may start to lead you in a direction which, in the end, is not exactly what is the best for the client” was articulated by one architect. The second briefing phase involves testing the explored potential project options through the concept design task to find out which of them is best to be adopted to meet the project and client value. This in turn helps in effectively defining the client and project requirements in the Final Project Brief at the end of Stage 2. The Final Project Brief outlines where and how the project will proceed; “In reality, what you trying to do is create a bit of a regimented approach to developing that brief but not going any further until that brief has been realised as in that is exactly what wants to be built,” as a design manager said. However, a Strategic Definition is needed from the client side at Stage 0 to kick off the Lean Briefing process: “The briefing should be somewhere to start as there has to be a number of drivers at the beginning of the process” as one architect emphasised.

Achieving ‘Lean’ is not a state but a continuous journey (Liker et al., 1996; Karlsson and Åhlström, 1996; Sobek II et al., 1999; Ballé and Ballé, 2005; Morgan and Liker, 2006b). Accordingly, the “CHECK Model” describes in detail the monitoring process that the Brief Team needs to undertake after delivering the Final Project Brief in order to forecast early the consequences of any deviation from the Final Project Brief on the following project deliverable stages, and most importantly to feed learnt lessons from the on-going project/s into the Perfection Cycle for continuous improvement ‘Kaizen’ of the Operational Roadmap in future projects. Scott and Harris (1998) demonstrated that when a design fault is identified and recognised and then presented in an accessible way to designers for future projects, improvement can be achieved. In the same sense, Snider et al. (2000) stated that, although the idea of learning from experience is timeless, recently considerable attention has been given to formalising systems for capturing and disseminating learnt lessons within an organisation. They argued that learnt lessons are regarded as a driver for an organisation to improve its performance by encouraging staff to learn from their past experience when executing previous projects in order to improve performance in future projects. Liker (2004) argued that the true advantage of Toyota lies within its culture, which builds on long-term
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thinking and a unique approach to problem-solving and leading ‘people and partners’ towards continuous improvement (‘Kaizen’). Similarly, as noted by Morgan and Liker (2006b), the term ‘cultural transformation’ is linked to Deming’s (or Shewhart’s) Plan-Do-Check-Act learning cycle which, according to Morgan and Liker (2006b), can express the approach through which Toyota has become a ‘humble, learning organisation’.

In addition, the improvement of learning will increase over time by improving staff skills and thus will strongly reflect the value of the learnt lessons. Likewise, Pitman (1991) emphasised the importance of the value of learnt lessons when avoiding past mistakes. However, special arrangements are likely needed for some of the procurement routes in terms of how to convey learnt lessons to the Perfection Cycle for continuous improvement of the Operational Roadmap.

While realising these major outcomes (the Lean Briefing concept and approach), the research has offered further and innovative help to the AEC industry by delivering a novel Lean Briefing Management Framework (see Figure 7.5 page 239) to advise practice strategy for the UK construction industry. The strategy instructs on managing Lean Briefing on two levels: the organisation and project level. This is achieved by first establishing a Preparation Setup on the organisation level, and then practising the Operational Roadmap on the project level with a plan for continuous process improvement through learned lessons by entering into an endless Perfection Cycle on the organisation level. However, it is a bespoke framework, so organisations can customise it according to their business context. Further discussion on the Lean Briefing approach was given in Chapter 6 of this thesis.

Furthermore, aligning Lean Briefing to the RIBA Plan of Work 2013 stages has helped in facilitating the challenge of different project contextual factors. Those factors could be: building type - “It is a different language. It is as if you are speaking a completely different language with very little similarity”; inexperienced clients - “It just meant we had to push harder and to work harder. We had to put in more effort and more time; it was a really, really tough process”; experienced clients - “Some cases the client has their clear idea of what they want but what they are not sure of is how to achieve it”; or project complexity - “Sometimes the impact of the contractors in early stage is necessary as they can steer the project with their knowledge and experience” (all quotations from
architects). Using RIBA Stages milestones instead of a timeline would allow some adaptation in the detail of the process. It would further make it obvious what the level of certainty is at each different stage. Lean Briefing is planned to be open enough to be adapted to address different needs, different types of project, different timetables, different clients and different organisational contexts: “I believe your idea as to have some definite steps to achieve that goal. I suppose this is good way of thinking as you can go through the principles but the details change from project to project. So it is putting into a framework where you go through a set of tasks and everybody achieves their goal and they make sure not to miss anything else” (architect). Achieving flexible elements in a perfect process is important to avoid waste (Emmitt et al., 2004; Bertelsen and Emmitt, 2005; McCarron, 2006).

Similarly, aligning Lean Briefing to the RIBA Plan of Work 2013 brief stages has helped in achieving the further major innovative outcome: the establishment of a Brief Overlay over the RIBA Plan of Work (RIBA, 2013a). The RIBA Plan of Work sets out the stages of the brief but fails to address how to carry out the briefing process (RIBA, 2013a; 2013b; 2013c; 2013d). The existing literature lacks a unifying cohesive briefing guide which shows what should be done and explains how that can be done (Barrett and Stanley, 1999; Shen et al, 2004; Yu et al., 2007). This research helps by providing a methodological procedure on how to carry out the process. What is more, achieving the Brief Overlay of the RIBA Plan of Work enhances consistency industry-wide, which is important in the early stages of project delivery.

Another major outcome of this research is that it has helped the implementation of Lean Management principles to the briefing process to improve its efficiency. Accordingly, the Lean Briefing perspective contributes to Lean Design Management interpretation and implementation. Lean Management theory and its principles are embedded in Lean Briefing. According to Lean Management theory, the best process value stream can be achieved by establishing push and pull in the process flow (Womack et al., 1990; Womack and Jones, 1996; Ries, 2012). This feature is achieved in Lean Briefing in two ways: in the first instance, by strictly keeping the development of the project brief according to RIBA Plan of Work, in the front-end of the project. This helps to achieve pull ‘kanban’ between the Brief Phase and Design Phase and therefore achieve the best value stream of project delivery. Secondly, push
and pull is established within the Project Brief development phase itself via the embedded learning application which is planned for the process of project brief development by means of developing the knowledge base early in the front-end of the project and therefore achieving the best value stream of the Project Brief. This will push potential project options to arise on the shared understanding platform; testing these throughout concept design will enable project requirements to be precisely pulled ‘kanban’. Additionally, part of Lean Management is creating the best process value stream to enhance process efficiency. The Lean Briefing process does not re-invent the entire briefing process, but rather re-invents the best briefing process value stream. The “DO Model” is a formalisation and coordination of elements from briefing practice; “its perception is inventive as it formalised and coordinated a lot of elements from what we normally should do” (architect).

Likewise, to keep seeking perfection is another important principle of Lean Management theory (Womack et al., 1990; Womack and Jones, 1996; McCarron, 2006). This research has helped in this by embedding the discipline of checking the brief and putting learnt lessons into the next scheme. The Perfection Cycle is planned in the Lean Briefing Management Framework to track inefficiency (waste) in Lean Briefing practice. This enables continuous improvement ‘Kaizen’ of the Operational Roadmap via reporting learnt lessons from both the DO and CHECK Models that are embedded in the Operational Roadmap. Continuous improvement brings many benefits, including improved performance/quality (Goh 2000); reduction of waste (Gallagher et al., 1997); reduced costs (Gallagher et al., 1997) and improved client satisfaction (Gallagher et al., 1997; Taylor and Hirst, 2001).

Another major outcome of this research is that it has helped in identifying the interaction between the brief and a design. The research revealed that the brief sits as a reference for a design, as a front-end process which deeply explores opportunities and understands who the client is and what their needs are, as well as revealing how those needs will be answered; “It is not an engineering from my point of view and not only do you have just one answer, you could have several answers, there are many answers that could be equally valuable so that is challenge” (architect). The research further identified the Concept Design stage (Stage 2) as the first stage for the Project Design Team to be officially engaged in the project. At this stage, the Project Design Team tests the proposed potential solutions
(Set-based design solution), which are then evaluated by the Brief Team. The Brief Team works as a review panel to check and initially validate the solutions. Accordingly, this supports delivering design for assembling and production as a means of Lean Design Management.

The research has further helped by introducing the Brief Team to construction organisations’ practice. The Brief Team is responsible for carrying out all of the company’s Project Brief, not independently, but working as an integrated team with the Project Design Team. Working as a team that is focused on this task of finding and identifying project requirements to create briefs will help the Brief Team to build up a good level of experience in doing briefs and further help avoid the common practice of briefing by design: “People may be asking for something they do not understand and they may be asking for the wrong thing and you have to go through process of design to prove the brief that not really right for them” (architect). Architects tend to find requirements based on testing several design proposals that are, in most cases, launched from the architect view’s rather than from the project requirements. However, this would help to launch the design idea from the identified requirements rather than from several design ideas, as some vital requirements might be missed. What is more, having the Brief Team as a design review panel, a kind of checking mechanism when the design proposals are offered, will ensure both client and organisation value. This will further enhance the base by which lessons learned can be exchanged between projects, as the whole information is available in the same database, managed by the same people. “We tend to rely on one person. We tend to use people to hold that in their head rather than formalised and made available for everybody else. I believe this [Check cycle] is good” (architect). This will further help the Brief Team to benchmark against similar buildings.

A further outcome from this research is that it helps in identifying potential synergy between briefing and BIM. It has established BIM as an enabler to support the learning application at the Project Brief development stage, as BIM is implemented functionally in Lean Briefing. The research further identified the briefing process as the opportunity for setting up the process of using BIM from an early project stage: “I suppose BIM how you set everything up and move things up and when you decide to use or not, at least it becomes
informed in that process you know what the benefit of it is in the last job” (design manager). This in turn would support in achieving the UK Government BIM Mandate.

8.3 Achievement of Research Aim and Objectives

The research aimed to generate a novel Lean Briefing process for effective design management and to explore its validity within AEC projects by looking at Lean theory and the application of Lean Design Management. It was an attempt to explore the use of Lean Management principles in the briefing process and their implications on the briefing process. To meet the research aim, a research vision was planned and then the research was carried out to accomplish four objectives that were set at the beginning of the research. Table 8.1 summarises the methods used to achieve the research objectives.

**Table 8.1 Methods Used to Achieve the Research Objectives**

<table>
<thead>
<tr>
<th>No</th>
<th>Objective</th>
<th>Achieved Via</th>
<th>Chapter/s</th>
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<tbody>
<tr>
<td>1</td>
<td>Establish importance (function and value) of the design brief in relation to the project, and the influence of its process on design management efficiency.</td>
<td>- Literature Review</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Develop a conceptual Lean Briefing process model.</td>
<td>- Literature Review</td>
<td>2, 3</td>
</tr>
<tr>
<td>3</td>
<td>Generate the Lean Briefing concept.</td>
<td>- Literature Review</td>
<td>2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>4</td>
<td>Design, develop, and validate a Lean Briefing concept and approach.</td>
<td>- Literature Review</td>
<td>2, 3, 4, 5, 6</td>
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<td></td>
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<td>- Interviews</td>
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The research has successfully managed to achieve its aim and objectives, as demonstrated below;

**Objective 1: Establish importance (function and value) of the design brief in relation to the project, and the influence of its process on design management efficiency.**

El-Reifi and Emmitt, (2011; 2013) highlighted that the project brief is most responsible for inefficient design deliverables and therefore ineffective design management in AEC. Accordingly, it was decided to start this research based on this main finding from the mentioned study. In this sense, this objective aimed to establish the importance (function and value) of the project brief in relation to the project, and its influence on design management efficiency. This objective was achieved through conducting a comprehensive literature review (Chapter 2). The purpose of this review was to: (i) establish a solid foundation for the research topic, (ii) explore the knowledge gaps through further reading regarding the briefing concept, its current practice and research done to date to improve its practice, (iii) formulate the research questions and clarify the research focus and scope. The literature examined briefing in relation to design management and defined its negative impact on design deliverables, design management and consequently construction project delivery.

The brief was identified as the place where the definition and representation of project value occurs. Ensuring efficient project brief delivery (i.e. effective identification and capturing of client and project requirements in the project brief) would have a positive influence on value delivery (i.e. project delivery) and value capture (i.e. project success and customer satisfaction with the final product). The literature findings further revealed several briefing problems mainly related to the quality of the client brief, client complexity, process mechanism (static and dynamic, as phrased sometimes or soft and hard in some other studies), and the lack of a based theory methodological briefing guide. However, according to the literature, most previous research has focused mainly on how to manage and handle the problems encountered in inefficient brief delivery, in addition, a very few studies on the quality of the early client brief (i.e. Strategic Definition). None of the research efforts have tried to explore the original source of the problems in briefing practice that lead to ineffective project briefs and why they happen or made an effort towards creating better briefing practice through understanding the briefing process, and then unifying a cohesive
practice framework with the aid of a coherent guided theory. This major gap in knowledge encouraged the conduction of an empirical research to seek answers to investigate current briefing practice and define the source of waste in its practice, and this research achieved that plan in an innovative way.

**Objective 2: Develop a conceptual Lean Briefing process model.**

By achieving the first objective and identifying the research problem, the researcher decided to conduct a preliminary investigation into the application of Lean Management to the briefing process, and explore its potential implications on the briefing process, before embarking on the empirical research. This objective was achieved through a preliminary study conducting a comprehensive literature review on the Lean Thinking philosophy, its principles, implementation, tools such as value management, and transformation techniques. The topic of Lean Construction was also reviewed, gaining substantial, comprehensive and deeply insightful views of Lean Design Management and its implementation. Additionally, Building Information Modelling (BIM) was reviewed by means of exploring its potential value to support the briefing process. This highlighted the increasing adoption of Lean Management in many industrial sectors as a technique for improving process performance and its outcomes. Its positive implications for the construction industry were highlighted. The literature review further highlighted the on-going evolution of research on Lean Design Management and some successful Lean Design implementations. A potential value of implementing Lean Management to enhance the briefing process and its outcome was identified from the preliminary investigation. This helped in developing a conceptual Lean Briefing process model, and this further encouraged the conduction of an empirical study to investigate briefing process practice from a Lean perspective. However, before starting the empirical research, it was vital to review the research methodology and philosophy (Chapter 4). This helped in determining the most appropriate methodology for conducting this empirical research.

**Objective 3: Generate the Lean Briefing concept**

After achieving the first two objectives, an empirical research (Chapter 5) was conducted to address the major gap in knowledge. A rigorous investigation was carried out to explore current briefing practices and identify room for improvement. Unstructured interviews with
15 construction industry practitioners, 11 in the UK and 4 in Libya, were conducted. This aimed to elicit a deeper understanding of current briefing process practice based on industry practitioners’ experience and interpretations of the project brief. The investigation further aimed to identify deficiencies in practice, as well as good briefing process practice. The empirical research included a focus on exploring the potential Lean approach to briefing and gauging the industry’s attitude towards the idea. The analysis of the interview findings highlighted inconclusive briefing practices in the UK, and stressed the fact that several views and inconsistencies in briefing process practices currently exist in the UK. It further revealed the source of briefing process deficiency as uncertainty about the brief concept and the absence of formal procedures on how to carry out the process. Room for improvement by means of Lean Management principles was also identified. The empirical research provided further familiarity with the phenomenon of the ineffective project brief and reinforced the justification for this research. Further detail and analysis of the interview findings can be reviewed in Chapter 5. The obtained findings from the empirical research were discussed in light of the literature review and a new briefing concept (Lean Briefing) was developed. This further discussed the formal procedure to carry out briefing. The bases of the Lean Briefing approach were elucidated from the discussion and considered in the fourth objective of the research.

**Objective 4: Design, develop and validate a Lean Briefing concept and approach.**

The achievement of Objective 3 highlighted a feasible process improvement via a Lean Briefing approach. This final objective aimed to generate a Lean Briefing Management Framework using Lean Management principles. The empirical research findings indicated the basis of the Lean Briefing approach. The development of the approach was principally based on this and the good/suggested process components selected from the exploration of briefing practices in the UK, as well as some useful lessons from briefing practices in Libya and some guidelines derived from the literature review. The objective was focused on the process of constructing a framework to address the Lean Briefing approach, and on the measures required to assure its consistency. This was achieved through conducting several revisions and informal piloting sessions in order to verify the framework’s consistency, logic and integrity in terms of its methodology and outcome. This process was covered and discussed in detail in Chapter 6. The development of the Lean Briefing approach was
influenced by the interviewees’ perspectives, as the formal procedure needed to be generic to suit different briefing practice contexts. This was beneficial, as it aided designing and achieving a more flexible and adaptable Lean Briefing Management Framework (see Figure 7.5 page 239) that is applicable to different types of organisational and business context. It further aided planning and achieving a legitimate methodological briefing procedure (the Lean Briefing Process Operational Roadmap (see Figure 7.6 page 239)) based on Lean Management theory and the briefing process value stream that was believed to be optimal (i.e. strictly keeping the development of the project brief according to the RIBA Plan official briefing stages, Stage 1 and Stage 2, in the front-end of the design process). Similarly, the Operational Roadmap was open enough to be adapted to address different needs, different types of project, different timetables, different clients and different organisational contexts.

The final objective was further achieved through validating the reliability and consistency of the developed framework within briefing practice. The aim of the validation process was to assess the appropriateness and workability of the framework and ascertain whether the Lean Briefing concept had been captured in the developed framework. This was achieved via two series of validating phases using empirical research (interviews and focus group), whereby the outcome of each phase added certain developments to the framework before the next validation phase was conducted. The validation activity, presented in Chapter 7, was conducted by means of interviews with Lean experts from the construction industry, followed by focus group and interview with practitioners from the UK construction industry, all held in the context of the Lean Briefing concept. The overall feedback obtained from the participants was mostly positive, and a few improvements were suggested by participants in each phase, and were considered by the researcher. The validation revealed that the Lean Briefing concept is novel, and the approach is adequately developed and useful in its principles for practice.

Research aim: To generate a novel Lean Briefing process (LBP) for effective design management and to explore its validity within AEC projects.

By achieving all of the four research objectives, as demonstrated above, a novel theoretical and methodological basis for the briefing process was successfully developed by making use of the emerging Lean Management theory in the construction industry to create an
innovative solution unlike anything that has been proposed before. A Lean Briefing concept was developed to enhance Project Brief delivery, and the Lean Briefing approach (Framework and Operational Roadmap) was successfully generated for the in-depth understanding and effective capturing of client and project requirements. The underlying assumptions of the Lean Briefing perspective have been made explicit and justified within the context of the framework; its validity within AEC projects has been established.

Accordingly, the research fulfils its aim, as it introduces a new briefing concept and finds an innovative practice procedure for the briefing process. The author argues that this new Lean Briefing perspective will enhance project brief delivery and therefore effective design management. Moreover, the Lean Briefing approach would not entirely replace the briefing process, but would rather work as an alternative approach by which current briefing process practices in the UK could be improved.

8.4 Research Originality and Contributions to Knowledge

In light of the above discussion of the major outcomes of the research, it is appropriate to highlight the originality of the research by reporting a summary of the contributions that this research has made to current knowledge on the briefing process, design management and Lean Construction. Blaxter et al. (2010) argued that successful research must achieve a balance between detailed investigation of a specific issue and linking it to its broader context of the subject field. Although this research was focused on the briefing process, it also linked Lean Briefing as a pragmatic response to the Egan and Latham Reports’ recommendations for creating a better construction industry.

The overarching outcome of this research is the Lean Briefing concept and approach to briefing which is believed to enhance the briefing process for better project brief delivery and consequently effective design management. To the author knowledge, this is the first time this has been done. As well as being novel and original, this significantly contributes to the existing bodies of knowledge in several ways. The major contributions to knowledge fall into three main categories: theoretical contribution, industry and practice contribution, and methodological contribution.
8.4.1 Theoretical Contribution

The construction management literature revealed that there is an increasing amount of research on the efficiency of construction project delivery. This is in response to the call for the construction industry to move towards properly integrating design with construction and performance in use, standardisation of products and processes, radical improvement in the process of construction to achieve continual improvement and sharing learning, as emphasised in the UK government reviews by Egan (1988) and Latham (1994). In broad terms, this research contributes to the emerging literature on construction management. More specifically, it contributes to the topic of Lean Design Management, which is still in its infancy. Moreover, in the context of the research focus, the research further contributes to the topic of briefing; the front-end stage of the construction project delivery process. It provides unique insights into the briefing process and contributes to the theoretical understanding and practical implementation of Lean Design Management in AEC.

This research provides a valuable insight into the briefing process. It confirms the limitations of current briefing practices reported in the literature. It further identifies the major reasons behind the underachievement of project briefs and the dominant sources of this limitation or waste that affect its efficiency as uncertainty about the briefing concept and the absence of formal procedures on how to carry out the briefing process. Existing approaches to the briefing process have been shown to be divergent and frequently lacking any coherent theoretical basis. This discovery led to the contributions to the philosophical perspective on and methodological practice of briefing.

In terms of the philosophical perspective of briefing, this research introduces and explicitly articulates the concept of bidirectional learning to the briefing process to develop the knowledge base for the client’s project early and concurrently support the effective capture and identification of client and project requirements. A further contribution in terms of the philosophical perspective on briefing, explored and verified by the empirical research in this research, is made as the new perspective extends the vision of the briefing process as not only a process of compiling and processing information concerning client requirements (i.e. current perceptions of the briefing process as it established from a broad literature review), but also a process of exploring, understanding, and generating client and project
requirements, and then processing the emerged information. The new briefing perspective recognises and addresses the client complexities involved in the briefing process. Additionally, in the light of the new briefing philosophical perspective, the research developed a new methodological briefing process.

In terms of the methodological practice of briefing, this research introduces a unique Lean approach to the briefing process to aid the learning perspective and enhancing its process and therefore its outcome (the Project Brief). This research has developed the theoretical basis of the briefing process by drawing from the emergent Lean Management theory. As a result, the philosophical learning perspective of on briefing process has been established in a theoretically cohesive manner. It is believed that the learning perspective will bring a radical change to the perception of the briefing process, and that the Lean approach has a theoretical basis for building a coherent methodological briefing practice. The Lean Briefing approach has been developed and demonstrated to be theoretically rigorous and practical as a framework for performing the briefing process: The Lean Briefing Management Framework. In contrast to the existing briefing process research, the proposed approach offers a holistic framework that gives an insight into the briefing process. The empirical validation of Lean Briefing in this research provides evidence that the approach is able to develop the client knowledge base, and client requirements will be collectively understood through the shared understanding platform in the “DO Model” built into the Lean Briefing Process Roadmap.

A further contribution has been captured in this research regarding the identification of the tangible benefits and importance of knowledge management in the briefing process to stop the lessons learnt seeping away and therefore producing shared and reused knowledge for continuous process performance improvement in future projects. The Lean Briefing approach stresses the relationship between learnt lessons and continuous improvement ‘Kaizen’ and emphasises the importance of rooting the concept of continuous improvement in the DO and CHECK Models via the Perfection Cycle built deliberately into the framework. Furthermore, through the formalisation of the process, there are many lessons to be learnt leading to sustained process performance improvement in future projects.
8.4.2 Industry and Practice Contributions

The research contributes a novel deployment framework (the Lean Briefing Management Framework) to construction industry practices in the UK that provides strategic guidance for managing the briefing process based on the Lean approach. The framework’s practicality, clarity, and appropriateness in practice have been evaluated and its value in producing effective project briefs confirmed in principle through empirical validation. The framework is bespoke and thus, has the flexibility to be customised to suit any specific characteristics of the organisational, client, or project context. In addition, in the context of the framework, the research contributes a structured briefing methodology (the Lean Briefing Process Roadmap) that represents the value stream of the briefing process. It explains in depth how client and project requirements need to be collectively explored, captured, understood and identified through the procedural guidance in the “DO Model” built into the Process Roadmap.

The research further contributes a new component of the briefing process (the Perfection Cycle) that aims to capture learned lessons and allow learning from past mistakes for continuous performance improvement ‘Kaizen’ of the briefing process. In this context, the research contributes an integrated improvement strategy through two models, the DO and CHECK Models, which aim to facilitate the application of the Perfection Cycle.

In a further significant contribution, this research contributes the value stream of the briefing process which overlays the RIBA Plan of Work 2013. This overlay successfully defines the interface between briefing and design in the construction project delivery process. In addition, it will allow practitioners to read the Lean Briefing Process Roadmap in conjunction with the briefing requirements stated in the RIBA Plan of Work.

Correspondingly, the formalisation of the briefing process by means of the Lean Briefing Management Framework will enhance industry-wide briefing consistency and provide a uniquely efficient briefing process which is needed to ensure a design value-added project brief. Industry-wide briefing consistency will support the effective transfer of project knowledge between construction organisations. This consistency brings further value to the construction industry, as it will support the practical implementation of construction industry
brief-related rules and policies, as well as providing a basis for evaluating briefing performance practice in the industry.

A further significant contribution is the Lean Briefing Handbook, which is a unique guide for practitioners. A soft copy of the Handbook can be found in Appendix (D) and an artefact of the Handbook is submitted with this thesis.

Moreover, although the outcome of this research (Lean Briefing) is aimed to be a contribution to Lean Design Management implementation, it is valid for any project, whether procured as Lean project delivery or a non-Lean project delivery. The outcomes of the Lean Briefing research reveal that it could be utilised as an effective initiative to respond to Egan and Latham’s recommendations for creating a better industry. Both Latham (1994) and Egan (1998) urged that there is a need for a quantum leap in the construction industry. Egan (1998) emphasised the importance of five aspects of improvement: committed leadership; focus on the customer; integrated processes and teams; quality driven agenda; and commitment to people.

8.4.3 Methodological Contribution

The research method adopted in this research (i.e. grounded theory) is considered novel in briefing qualitative research. The adoption of Interpretative Phenomenological analysis to qualitative data analysis is novel in briefing research, especially the combination of Hermeneutics, Series of Events, and Critical Incidents approaches to support the interpretation and mapping of the briefing process and good briefing practices.

Correspondingly, the adopted approach to validate and improve this research outcome further adds a methodological contribution to existing briefing research methods as it is based on examination, analysis, and comparison of the views, experience, and judgement of practitioners from different construction industry organisations.

8.5 Research Accuracy and Limitations

The accuracy of research is decided by assessing the research outcomes and processes for reliability and its validity. In this regard, qualitative researchers need to convince themselves and others that their findings are based on critical examination and that the studies are
credible (Creswell and Miller, 2000; Silverman, 2007). A critical appraisal of this research in which the outcomes and processes are evaluated for reliability and validity is reported in this section. However, although all necessary measures were taken to make the research as accurate and satisfactory as possible, a few limitations have been unintentionally imposed on this research in terms of its conduct and scope. Those are also reported and justified alongside the appraisal.

8.5.1 Research Reliability

Reliability is the extent to which the same empirical research procedure in the same context yields the same information, thereby demonstrating that the operations of a study are consistent and can be repeated over time with the same results (Kirk and Miller, 1986; Nachmias, 2000). However, questions about people’s opinions and attitudes always suffer from low reliability, as they may change over a period of time (Kvale, 2008). The subjectivity involved in the present research is acknowledged due to the social (human factor-based) settings of the briefing phenomena under investigation, which was heavily reliant on practitioners’ experience. Calculating reliability for qualitative research is dependent upon measures of the investigator documenting their procedure in such a way that decisions internal to the research project are made obvious in order to satisfy its reliability. By doing this, the reader is informed of how the investigator prepared for the study and how data was collected and analysed (Kirk and Miller, 1986). Therefore, in order to earn credibility in qualitative research, a researcher must cite actual data and ensure that results are independently and objectively verifiable so that they can be traced back (Greenhalgh, 1997). For the present research, the research design was planned in advance, and the empirical research process carefully described and reported in detail in order to illustrate how the aspects of the practices were investigated, and how the data was collected and analysed. Actual data is cited whenever relevant and quotes can be traced back to the interview transcripts. Nevertheless, although the procedure followed is well documented and the accounts represented in this thesis can be described as representing what Geertz (1973) called a thick description, there is no assurance that it would yield the same accuracy of data if repeated.
8.5.2 Research Validity

Validity refers to the extent to which an account accurately corresponds to the phenomenon it represents (Brinberg and McGrath, 1985). However, it is noted by Hammersley and Atkinson, (2007) that, “data in themselves cannot be valid or invalid; what is at issue is the inferences drawn from them”. Research is assessed in terms of its internal and external validity. Internal validity refers to a characteristic of a research’s design and is a measure of the interconnection between the variables encountered in the study (Brinberg and McGrath, 1985; Creswell and Miller, 2000). However, unlike quantitative research, qualitative research is less about establishing the reality outside our perception of it. Thus, credibility is said to be a better measure for internal validity (Glaser and Strauss, 1967; Guba and Lincoln 1994; Corbin and Strauss, 2008). In their view, credibility establishes that, the results of a qualitative research are believable and reliable. A qualitative research reflects the participants’, researchers’ and readers’ experience of the phenomenon, but at the same time the explanation is only one of the many possible (Corbin and Strauss, 2008).

External validity is concerned with establishing the domain to which a research’s findings can be generalised or transferred to other contexts and settings beyond the immediate research (Stake, 1995; Creswell and Miller, 2000). However, this is less problematic with exploratory research, provided the case is, obviously, an example of a generic class of process or phenomenon (Brinberg and McGrath, 1985); which is the case for this research. In addition, unlike quantitative research, designed to test theories, qualitative grounded theory research does not represent a sample, therefore its goal is to generate and generalise theories (analytic generalisations) rather than enumerate frequencies (statistical generalisation) for generalising to populations or universes (Glaser, 1992). However, no empirical research offers certainty that its findings are valid over other populations due to uncontrolled research practices challenge (Creswell and Miller, 2000), external validity is a more difficult problem to address; which was not an exception in this research. For example, one challenge was in terms of the data analysis. The interpretive stance adopted in this research is subjective by nature, and thus the results may be subject to other interpretation, which limits their generalisability (Bryman, 2008).
Another challenge was in terms of the research outcome. The Lean Briefing Management Framework would work efficiently in companies with years of experience. It would be a challenge for companies in their early stage of practice to make use of one of its elements (i.e. the Databank), as this element takes time to develop and requires practical experience. However, the proposed creation of a national UK library of projects with the aid of BIM may mitigate this limitation in the future. Similarly, special arrangements are likely needed for some of the procurement routes in terms of how to convey learned lessons to the Perfection Cycle for continuous improvement of the Operational Roadmap.

Further challenge was in terms of data access. In the early empirical investigation research, although much care has been taken to obtain a representative outlook on the briefing process, accessibility challenges meant that some people who actually influence briefing process could not be reached. The investigation to identify briefing practice and experience was limited to construction industry practitioners’ perspective and experience (the supply-side). For instance, it would have been valuable to incorporate into the research opinions and contributions from the client as well (e.g. an experienced client), and thereby a vital link to the demand-side that consists of key players in briefing process is lacking. Similarly, access to client design advisors’ briefing experience was presumed valuable as it would bring further relevant insight on briefing experience to the research. However, due to the pressure of work in a busy construction industry, all efforts to obtain such participants to collaborate on the research were unsuccessful. Similarly, in the late empirical evaluation, testing the developed Lean Briefing Management Framework against some case studies would further confirm its practicality and intended value to users and thereby, further enable its transfer from theory into practice. It was not possible within the time frame to process the Lean Briefing Management Framework to a second evaluation platform (i.e. testing).

However, the value of Lean Briefing Management Framework is believed to be upheld, because it was based on a wide range of construction industry practitioners’ views and experience and a platform of wide range of learned lessons from several organisations, some well-known companies that work globally. Nevertheless, examining clients’ views would have provided relevant insight input to the framework, especially with respect to the learning briefing perspective. Additionally, although the data in this research was originally limited to participants from the UK who were willing to collaborate, the external validity and
transferability of this research were improved through the diverse sources of data (Creswell and Miller, 2000) which was achieved by using interviews with practitioners from different organisations. The diverse sources of data were further enriched in this research as the interviews included some practitioners with national and international experience, as well as accessing data from other geographical areas in the early interviews by means of searching for good briefing practices (from Libya) and in the late validating interviews by means of acquiring Lean expert views (from the USA, Norway, Denmark). Therefore, the research resulted in a well-diversified opinion that captured as many varied opinions as possible and can be claimed to be generalisable to the entire UK construction industry, especially concerning Lean Project Delivery.

8.6 Research Recommendations

To complete this research, recommendations are made to the construction industry based on an analysis of the findings against the aim and objectives. Following this, suggestions for further studies are outlined, based on some issues emerging from the data analysis and research limitations beyond the scope of the research project.

8.6.1 Recommendations to the Construction Industry

Based on the findings identified in this chapter, and in light of the results obtained from this research, the author recommends the following:

1- To help minimising construction industry waste, it is strongly recommended that Lean Briefing should be implemented in construction project delivery, more specifically, in Lean Project Delivery procurement.

2- It is highly recommended to educate all the parties on Lean, and make it obvious right at the beginning that the Lean Briefing process will lead to value and savings; explaining the concept and why it needs to happen, and overcoming the idea of investing time upfront to deliver savings.

3- Preventing wasted effort by ensuring a clear project vision is established by Final Project Brief delivery.

4- Engage contractors and utilise special consultants’ views in the briefing process to bring particular expertise to the design process.
5- Ensure effective Perfection Cycle operation by ensuring regular monitoring and input of learned lessons from projects via the DO and CHECK Models.

6- Undertake in-house assessment of briefing process practice through a rigorous process review to ensure best practice.

7- Schedule regular peer review throughout the project between the Design Team and Brief Team to work out all interdependencies in order to ensure that all parties know what they are delivering, to whom, and by when.

8- Improve the quality of the project brief by providing designers and Brief Team staff training in the preparation of a clear brief, in addition to other technical skills that aid effective performance of the brief task (e.g. critical thinking, negotiation, critical analysis).

9- The RIBA should place more focus on professional briefing requirements and skills via Continuing Professional Development (CPD) courses. The Lean Briefing Management Framework also implies the need for some other specific briefing practice-supported skills.

10- To enhance industry-wide consistency, it is strongly recommended that Lean Briefing is implemented within the construction industry.

8.6.2 Recommendations for Future Study

Based on issues emerging from the data analysis and the research limitations, the author recommends some relevant issues to be considered for future research. First, recommendations raised from this research for future research in the area of the briefing process:

1- A natural extension to this research would be to test the novel Lean Briefing Management Framework in real briefing practice, which was beyond the scope of the current research. Further investigation needs to be carried out to test it in a simulation scenario, by testing it against case studies to further confirm its practicality and intended value to the construction industry, and to explore further improvement before it is transferred into real practice.

2- It would be useful to explore client perspectives on the Lean Briefing concept and approach. This will provide further insight input to the Lean Briefing, especially with respect to the lean design implementation, and the learning application in briefing perspective.
3- Further research is required to develop assessment criteria to distinguish when the Final Project Brief is well developed.

4- The author would have liked to delve deeper into briefing practice in terms of briefing perspectives. The interpretive research paradigm could be applied more extensively to develop alternative perspectives and enhance a better understanding of the briefing process.

5- Further research is required to investigate the Lean Briefing Management Framework in regard to project procurement routes, with particular focus on how to convey learnt lessons to Perfection Cycle for continuous improvement of the Operational Roadmap. Immediate solutions to the limitation that special arrangements are likely needed for some of the procurement routes were not possible within the scope of this research.

Secondly, recommendations raised from this research for future research in related areas but still supporting briefing process practices;

1- Further research needs to be carried out on the issue of a national Databank library to document well-delivered projects, preferably in the context of BIM. This recommendation arose from the research findings as a limitation that might hinder industry-wide Lean Briefing implementation, but immediate solutions to this limitation were not possible within the scope of this research.
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10 APPENDICES

Appendix A: Empirical research materials

I. The prepared interview contingency questions
II. Participant General Information Form
III. The Participant Information Sheet and the Informed Consent Form
IV. The sent email template
V. Examples of transcribed verbatim interview (2 examples)

Appendix B: LBP Validation materials

I. Participant General Information Form
II. The Participant Information Sheet and the Informed Consent Form
III. Validation questions.
IV. IGLC 22 presentation slides (1st Round Validation Phase-Lean experts)
V. Workshop presentation slides (2nd Round Validation Phase-industry practitioners)
VI. Lean Briefing A0 poster (2nd Round Validation Phase-industry practitioners).

Appendix C: First Lean Briefing edition

Appendix D: Final Lean Briefing Handbook edition
I. The prepared interview contingency questions
II. Participant General Information Form
III. The Participant Information Sheet and the Informed Consent Form
IV. The sent email template
V. Examples of transcribed verbatim interview (2 examples)

Appendix (A)

Empirical research materials
Interview code (………….) Location ..............................

Thank you for giving me part of your time to assist me with my research project.

First and as part of the university research ethical procedure, I would like you to go through this form please.

Now, do you mind recording the interview to make it easy for me reporting notes later?

This interview is conducted as part of my research project data collection. It is an attempt to investigate and analyse the application of lean management principles in the briefing process (design brief) for effective design management.

The main purpose of the interview today is to find out about briefing process practice in construction industry by exploring your views on briefing, including your experiences and current approaches to briefing. Also any good practices you have experienced in briefing process.

Q1. How do you see the brief (design brief), is it a process? Or is it just a document need to be there as part of project requirements’ such as planning permission?

Q2. How you see the briefing process?
   - Is it predesign and an iterative process?
   - Is it a process of understanding the project and client requirements? Or is it just about listening to the client?
   - Is it a design roadmap, and a communication and a decision making instruments?
   - Is it a problem seeking?

Q3. Could you please explain to me in more detail your experience of briefing process in terms of how the briefing process conducted and how it develops?

Q4. How you find, gather and analyse project information required for design in the brief?

Q5. Do you use some of survey tools to gather information and develop project brief?

Q6. Do you apply value management in the briefing process?

Q7. In the briefing process, are there any specific mechanism to treat unseen design information’s and some other design Issues that might be unknown at the outset of the project and in case if some of the known depends on the unknown? Or it is just develop with the development of design process?

Q8. Do you align briefing process development to design development stage? If so do you use RIBA plan of work?
PhD Research: A Novel Lean Briefing Process for Effective Design Management

Interview contingency questions

Q9. What do you think of freezing of the brief process?

Q10. Later in the project, is there any space to accommodate requirements change’s within the briefing process?

Q11. Who is doing the brief? Is it a team where client is part of? Or it is just completed in isolation?

Q12. Are there any specific skills needed for the person/team who carry and control the process?

Q13. Is the briefing process affected by type and size of the project?

Q14. Is the briefing process affected by procurement method (design-bid-build or design & build)?

Q16. Do you think the way briefing is carried on is an efficient and effective process?

Q17. From your experience, how could it be better? Is there any good practice to make it value-added process?

Q18. Do you have any knowledge/experience of lean thinking/lean briefing?

Q19. Do you have any knowledge/experience of using BIM to facilitate briefing process?

Finally, could you please complete the following general question sheet that will help me present the interview data in my research?
General information about the interviewee and the organisation

About you:
1- What is your profession?

2- What is your current role?

3- How long is your professional experience?

About your organisation:
1- Your organisation do
   a. Design and consultation
   b. Design and construction
   c. Construction

2- Approximate number of organisation employees?
   a. Less than 25
   b. 50-100
   c. 100-250
   d. More than 250

3- Approximate annual turnover for the organisation?
   a. 1-£10m
   b. 10-£50m
   c. 50-£100m
   d. More than £100m

4- Type of construction sector you have been involved in?
   a. Residential/ housing
   b. Commercial
   c. Industrial
   d. Other .................

5- Type of projects you have been involved in?
   a. New build
   b. Renovation/ refurbishment

6- Type of projects (in terms of client classification) you have been involved in?
   a. Private
   b. Public

The next step in the research project, I will use the interview data to develop a lean briefing process model. To validate it, a workshop of industry practitioners will be planned and conducted. Do you like participating in the workshop?

Thank you for time and assistance
A Novel Lean Briefing Process Model for Effective Design Management
Participant Information Sheet

Mohamed Hani El-Reifi, Research student, School of Civil and Building Engineering, Loughborough University, Loughborough LE11 3TU, United Kingdom, M.H.El-Reifi@lboro.ac.uk, Phone +44 1509 223981
Prof. Stephen Emmitt, Research Supervisor, School of Civil and Building Engineering, Loughborough University, Loughborough LE11 3TU, United Kingdom, S.Emmitt@lboro.ac.uk, Phone +44 1509 222815
Dr Kirti Ruikar, Research Supervisor, School of Civil and Building Engineering, Loughborough University, Loughborough LE11 3TU, United Kingdom, k.d.ruikar@lboro.ac.uk, Phone +44 1509 223774

What is the purpose of the study?
The research is an attempt to investigate and analyse the application of lean management principles in the briefing process for lean design management implementation; and to explore its validity within AEC project by looking at the theory and the application of lean design management. In this context, validity refers to the project contributors’ businesses and the customer’s satisfaction with the final product. The study to be conducted to fulfil partial of the requirement required for getting the award of Doctoral of Philosophy of Loughborough University.

Who is doing this research and why?
The research will be conducted by:
1- Mohamed Hani El-Reifi, Research student
2- Prof. Stephen Emmitt, supervisor
3- Dr Kirti Ruikar, supervisor
This study is apart of a Student research project funded by the Libyan Government and based at Loughborough University.

Are there any exclusion criteria?
Participants need to be professional construction industry practitioners’

Once I take part, can I change my mind?
Yes! After you have read this information and asked any questions you may have we will ask you to complete an Informed Consent Form, however if at any time, before, during or after the sessions you wish to withdraw from the study please just contact the main investigator. You can withdraw at any time, for any reason and you will not be asked to explain your reasons for withdrawing.

How long will it take?
The expected time required for each interview from 30 minute to 60 minute.

What will I be asked to do?
Respond to interview questions

What personal information will be required from me?
Experience, professional background
Are there any risks in participating?
No

Will my taking part in this study be kept confidential?
All information on participants will be treated confidentially and the result will be reported anonymously.

What will happen to the results of the study?
- The storage of data will comply with the data protection Act 1998.
- The audio recording (if permitted) of participants will be kept in a secure place and not released for any use by third parties.
- The audio recording (if permitted) will be destroyed within 10 years of the completion of the research.

What do I get for participating?
A summary of the main research outcome’s (if requested).

I have some more questions who should I contact?
Prof. Stephen Emmitt, School of Civil and Building Engineering, Loughborough University, Loughborough LE11 3TU, United Kingdom, S.Emmitt@lboro.ac.uk, Phone +44 1509 222815

What if I am not happy with how the research was conducted?
The University has a policy relating to Research Misconduct and Whistle Blowing which is available online at http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing(2).htm.
A Novel Lean Briefing Process Model for Effective Design Management

INFORMED CONSENT FORM
(to be completed after Participant Information Sheet has been read)

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the Loughborough University Ethical Advisory Committee.

I have read and understood the information sheet and this consent form.

I have had an opportunity to ask questions about my participation.

I understand that I am under no obligation to take part in the study.

I understand that I have the right to withdraw from this study at any stage for any reason, and that I will not be required to explain my reasons for withdrawing.

I understand that all the information I provide will be treated in strict confidence and will be kept anonymous and confidential to the researchers unless (under the statutory obligations of the agencies which the researchers are working with), it is judged that confidentiality will have to be breached for the safety of the participant or others.

I agree to participate in this study.

Your name ________________________________

Your signature ________________________________

Signature of investigator ________________________________

Date ________________________________
Subject:

Research Interview “A NOVEL LEAN BRIEFING PROCESS MODEL (LBP) FOR EFFECTIVE DESIGN MANAGEMENT”

Dear ……….,

I am a PhD Student at Loughborough University, School of Civil and Building Engineering, working on my research project. My research is an attempt to investigate and analyse the application of lean management principles in the briefing process (client and design brief) for effective design management; and to explore its validity within architecture, engineering and construction projects. In this context, validity refers to the project contributors’ businesses and the customer’s satisfaction with the delivered project.

I would like to interview you to explore your views on briefing, including your experiences and current approaches to briefing. All information will be treated confidentially and the results will be reported anonymously in my thesis. If you could spare between 30 and 45 minutes of your time to assist me with my research it would be appreciated.

I look forward to hearing from you soon.

Yours faithfully,

Mohamed Hani El.Reifi  
Research Student  
Loughborough University  
School of Civil and Building Engineering  
Email: M.H.El-Reifi@lboro.ac.uk  
Tel: 01509 223981  
Mobile: 075 8404 8403
Interview transcribed verbatim (Interview No. 6 05/07/2013 56min)

Interviewer
Thank you for your time to assist me with my research

Interviewee
Yeah, so a little bit about (Company name) just to give you an overview (Company name) is a business. It’s a main contractor, regional contractor, operating UK wide and we are four business sectors or business units. The first one specifically gets involved in development and land deals. So we try to secure land, unlock land for retail and new build development. The second bit is the construction element to that, so we act as a main contractor to fit out, build new shells, etc. There are a fit out deviation specifically set out towards retail and retail fit out refurbishment and then the bit I am responsible for and look after now is the RIBA design practice. It sits within the organisation.

Interviewer
Oh, good.

Interviewee
Within the organisation and I have been with (Company name) now for 12 months and previously I was at Wait Construction and I am just principal at the minute, going through a restructure within the business, to actually try and get design backup on fees through. Because it is a tough market at moment too, tough sector, tough industry and we have just kind of scaled down to the needs. We got the moment and looking to start the building back up again but we focus on three sectors, a core development build within internal opportunity. We get there and retail specifically, and now we also work with the pharmaceutical sector and our primary customer in the pharma sector is GlaxoSmithKline, which we work with them for about 20 years and we have a very healthy partner portfolio and relationship with them but I think the good thing about (Company name) of this is systematically with all of them, they’re all interested in looking at Lean Construction and a method of trying it to make the process more efficient and but the retail bit is, for me, you have a very wide opinion as to what Lean actually is?

Interviewer
Especially when it comes to design and the matters, Lean is coming from a manufacture perspective. Yeah, whether it is fit within the construction industry or not this is the debate now whether it is okay or not.

Interviewee
Absolutely, so I am more than happy to support you where I can, and fire away

Interviewer
Thank you very much, so to start with this interview is part of my research data collection. My research is about trying to apply Lean Management principles to briefing process clients and design briefs. The aim is for effective design management. The purpose of this interview is to find out about the current approach of briefing processes within the UK construction industry and to find out about your experience and views about the briefing and any good practice of briefing
Interviewer
So to start with, what do you think of brief - is it a process? Or just a document needs to be delivered as part of project documents such as planning permission?

Interviewee
Um, I would say traditionally, from what I experienced it has primary been a document or has been an approach where documents been delivered to as part of that brief and but I do think going forward it is getting more towards a process-led and initiative, and we have experienced a couple of changes certainly in the last six months, where I would say probably more around the development lead opportunity. Where it is more for a process map to develop that brief and get an understanding to where things need to be, the scope delivery of it, but you still find it within retail. It becomes more of the document-led format and some are very, some are quite good and some are quite clear and some are very vague, but it really depends on the strength of the relationship you have with your client or customer is to how that brief can then be enhanced. But I think there is little of, you’re probably sitting between those two, but I think going forwards there is a real advantage to having it as more of a process-driven initiative as opposed towards the document will hopefully deliver what we want, and because there is a lot more time certainly front-end, the more time can be put forwards towards the right team, the right people. We can get so much into that as opposed to just receive a document that says that is what we want.

Interviewer
Do you see it as a process, do you think of it as a roadmap for design, it can work as a roadmap for the design?

Interviewee
Yeah, I do very much. I mean, I suppose in a way the one I’d probably cite as a real example for it is the tendering process, we tend to encourage that now because the example we have recently just had is customer comes, wants to cut cost by 30% down. They want to improve the programme, want to, and improve the quality of the product they get, and we get a 6 week window to tender that and that can be quite a challenge in timescale to work within and particularly in a retail project, you know. But the bit the, within that 6 week window that process of actually creating a design roadmap to get there is the bit, actually get a based evidence in the end, and we literally just come out of a tender scenario very similar to that, went to five companies and we look at it very much in a process-led basis and we have been able to interrogate the design. We have been able to raise assumptions, questions, you know, on what’s deemed as complying and non-complying. We have analysed innovation within it. We have analysed methods of programme and get them three options and we have analysed alternatives to finish construction techniques to be able to deliver a more effective programme. And we presented it Tuesday this week, and just that kind of six-week gateway has enabled us to put forward something that actually is collaborative and it is thought out as opposed to being a typical call contactor approach. We receive the tender and we’re gonna act as a supply chain, we have challenged everybody to come with their ideas. We have picked the best package of them all and sent them back to the client. It sounds very much more, almost two weeks week-by-week teamwork meeting process to actually to get to the
scenario where M&E, structure, refrigeration and design architect, all of those key encompass have been involved in every one of those meetings to get to the point where that process upfront has been collaborative, and that in itself was not actually called a brief. It helped us develop the brief that then we have presented back to the customer and said that’s exactly what we want, too. So it is for me very much a roadmap or journey. The challenge becomes whether you’ve got the right time and the optimum amount of time to be able to develop a road, post-

**Interviewer**
The competition.

**Interviewee**
Yeah, you need to be able to, you know, I suppose things, six weeks to do a retail tendering and develop brief on it is reasonably okay, but it takes six weeks to look to the core retailers will only give us two weeks to turn round, you know, and interpret the brief, and that becomes a challenge, that does become a challenge, so …

**Interviewer**
So can you tell me how you do briefing, generally I mean?

**Interviewee**
Um, retail wise, I we, a lot of the customers we work with are relationship based. So we’re a nominated supplier, we are an allocated supplier list and what generally tends to happen is we will have a series of one-to-one meetings, relationship meetings, a project will come up and we will give a verbal debrief as to what to their expectations are and what they’re trying to achieve. We then generally take that one away and we will assign, I suppose, in a way we reframe what they have gone through. We will pick up the key messages, key points and we list that out in a way, just in a way that reiterates that conversation. We then put a programme to it, and we will then assign a commercial approach to it from an RIBA scale as to how we develop that scope of services. Most of them now tend to go from percentage based proposals and we deal with it in a way that, where is more of a written scope is what is they have actually asked for us to do and then that’s assigned on a time charge basis and that would form the basis. They say the outline debrief at the discussion that we had, that will go in, then we will negotiate it, it will be accepted and then from there on in we will probably have two further meetings to evaluate that brief that we have written it, following those conversations, and once we get to that second stage, meet. It will get signed off and locked to a frozen proposal and then we will deliver the scheme and the design from that point onwards. So that can be, I mean the scale of work with particularly the retail, they can be quite low-key, time briefing instruction but we generally try to stick to almost a three-stage meet or opportunity to say we have been and took that instruction and interpreted it. We have then presented it back to sign it off and then we get to the point where we then implement that design and getting to what I probably call the preconstruction design phase and design development phase leading up to start on site and with regards development. The development brief itself primarily comes from the development manager that we have within the business, and they again, it’s I suppose keeping it at a fairly higher level. It still comes from a lead and opportunity within almost to site out, ending in a straight agency-based-led contract and what those guys then do is they basically sort the market to find out whether a certain retailer or certain client would be interested in those sited and if they get that interested. Our brief back to them or our
agreed service back to them pretty much goes along, it is almost like a stepladder scenario where we develop basically put through high level sketches to set criteria. So they might set on say its 30,000 square foot for that site. They might want 20,000 square foot for retail, 5,000 square foot for unsalaried and background. We just do a very quick sketch in how that might sit on the site so an element master plan, do it, and then that we would negotiate whether the opportunity is viable to that customer. If they are, there is a line drawn on the that point and there a very headline, top of heads of terms agreement forward, that customer will then sign and agree to in principle. We will then get a further five weeks to develop a bit more of an outline package and scope to it, and at which point they will then go to look to funder finding final agreement to lease deals on it before we then commence any further. But it again’s pretty much going along a similar line of a process map that we will work to. The only thing in a development phase for us, or what we have experience with in the development section since I have been here, is in terms of applying a Lean method to do it, it’s quite a straight process map but the timescale to get there’s very fluid, very fluid. There is no control on it at all. I mean we premeditatedly try to work time wherever we can to develop things as quickly as we possibly can and make sure effectively, you know, delivered to get the retains basically, but from a development point of view it’s, you know, they’re getting an agreement with a deal. It could be anything from three weeks to three months and even then it subject to change, subject to discussion with a client in terms of we are not quite away to funded level yet, you know, could come back, look to alternative options. So then that development lead section is still very fluid there is a nice process to do it, but the timescale is a bit kind of, does not really lend itself to seem less of a route through.

**Interviewer**

Do you think the timescale is extended by client to get a response about briefing is it because there is not sufficient information in the briefing in terms of sometimes the client does not quite know his requirements? So do you use for example similar projects in that brief to help client decide his requirement, for example, or you conduct a value workshop or engineering workshop with the client?

**Interviewee**

There are probably a number of little challenges we have along the way. There will be an element of clients. Most clients we deal with do have a fair idea what they want or what they’re trying to achieve and we have developed that through kind, of we have honed that through repetition so you get an element. We work a lot with like Waites or Boots or an M&S and we have got really an understanding of what those clients now want, but you still have that element of that this store is not quite how we normally attack it. We want to do this or we want to do that. So there is an element of unknown there that we deal with, and the bit that I feel we’ve probably come unstuck with nowdays compared to how it has been in the past is the planning permission process, and the pre-application and enquiry and consultation period that we now we need to go through, that itself is a real kind of tread and trek scenario to get through it and I definitely think at the moment certainly since some planning legislation has changed it’ll probably get worse before it tries to get better. A typical example that I have picked up from the past, as I have seen in the past, certainly coming in and development jobs, it’s really round retail project. They have got a justice period of three years. It’s principally within (Company name), there tends to be about a three-year period before you get to the point where you get out a decision get out a real consultation, you’re then in a position, you basically start to commence with that design and from a Lean approach point of view trying to improve that
process. That is the really big trick with it. If we can get rid of it through that. I mean a lot of what we do and are involved in, they are not large scale inner city developments. They're out of town, you know, through that sort of retail element and five, six units, nothing really too complex and yet we still find ourselves going through that three, four years kind of process to get to the point where everything has been ticked with the local authority, authority planning legislation etc. and that is a tough one to break down at the minute.

*Interviewer*

Do you think, I mean, now the briefing process within your organisation, is it led by a specific team or any architect can lead that briefing process or the design manager or project manager for that specific project?

*Interviewee*

Um, it tends to very, depends on how it comes in, without trying to give you, I suppose, a straight answer, because there are many different sides to the business. If we have a tender scenario coming, the briefing principally commences with the pre-construction team and the bid team so there is a bid director that will launch that project. He will lead that project and he will make sure that we basically attain every level of the bid requirements that is within it. If we get a development lead opportunity it’s principally managed and led by the department development manager until such point that the scheme becomes viable. If that scheme’s viable we then have a hand-out process and where if it is internal to internal department shift, it will go from a development project manager to a construction project manager and the lead architect and then we would principally take the reins of that scheme through commences and delivering, and if we have a one-to-one relationship with the customer direct, it principally will be a lead architect or a senior project designer that would have the ownership of that brief on the one-to-one basis.

*Interviewer*

But is there any certain strategy with the organisation?

*Interviewee*

No there is no kind of clear cut-off, one size fits every time we get a project. It just depends on which level it drops into the process. We have got as to who gets the ownership of it first, but they will obviously, that kind of process drops through. It will drop over to another lead contact that then will start to take the ownership of it for that project.

*Interviewer*

And as briefs develop you have mentioned the freeze of the brief, how do you treat client changes later in the project? is it reported back in the brief?

*Interviewee*

It is the brief document itself from our, my point of view which specifically within the design would be kept as a master snapshot, there will be an element of revision status going through it and we use a document management control system to track changes anyway and, but we will always have that master and then we allow, if there is several changes, you will be able to go back to it and see exactly on each and every one of these changes along the way. And then we also track it as a commercial level to the point of saying well the design freeze or the brief freeze were fixed to X and then along the way
we have added several changes that if they had a commercial effect or not but at which point every single one of those we try and get the client to sign off and expect, “Yes we are in agreement to that change and there is a reason why we have done it”. So there is a reason why we have done that, so we do and try to track all that and keep that journey there. But with a lot of these things, I mean from our point of view there is one Lean construction and in its true since it’s a perfect journey from the top in the best possible time and you will get variation along the way, but how we deal with that variation is still incomplete to that Lean process from our point of view. Typically you get client change, that client change could still take three to four weeks to get in approval to it, but in reality you do not stop. It is doing that, and you have then to pick the pieces up, and at the end the ideal will turn round and say the clients make change and we need to make change and it is dealt within the kind of list at the end of the day. It is an issue that if it is approved we move on and then we get to the point if you could do that all the way along, in reality you’ve got to be final account closer, everything else is done and you know it is perfect but it is not that way you tend to find, even in today’s process. There are still so many consultants and people involved that everybody’s still got a part of things to deal with that might take three, four, five weeks post-completion to ratify before actually you get to the point, “Okay, project closed,” and I would really like to see Lean Construction go right the way through from commencement or inception to the end result.

**Interviewer**

Product or building.

**Interviewee**

Yeah and I think we have got a way to go before we get to the point where that your topic is under research actually.

**Interviewer**

Do you align briefing development to the design development stages?

**Interviewee**

Yeah.

**Interviewer**

And do you use the RIBA Plan of Work?

**Interviewee**

Yeah, we have just updated ours. We have a series of let’s say interpretation and scope of service in a brief and we have a bespoke one that we will do specifically for smaller-end projects. So if it is just literally we want 1 Z to be delivered in six weeks and then we know it we will do it on a bespoke basis but in mainstream projects we get involved, we got everything lined up to the RIBA Plan of Work, which is now obviously they numbered sections to A, B and we do everything as close as we can to that and we can demonstrate everything in the sense that if there’s been a variation and change in stage 3 this is what we have picked up and why and we trying to do that now with the BIM process. Um, we are overlaying the BIM process with the RIBA stages and almost try to educate the customer as well. It is same sort of thing, but you know the method of BIM which it gets through the, you know, the method of BIM that has been- We are in a fairly steep learning curve with BIM. We have been using it for about two years, three years probably but it is not fully supported across all customer-client networks, etc. So it is
really still a bit of strategy level wherever they request it we can use it but it is not industry-wide yet.

**Interviewer**

The claim we have about the research problem has actually come out from a previous survey and in that survey we have two views from the industry practitioners regarding the briefing and I wonder whether you’re aware of something called dynamic and static brief in the industry? So practitioners say the brief, say as you mentioned, the brief needs to be a baseline document, so by the end of the project the client can use that basis to judge the final output of the project, whether it is delivered according to his requirement or not. Other practitioners say no, the brief needs to be developed through all design stages and by the time when it goes to the site it needs to freeze at that time, because they claim that the client needs the time of design development to decide what his real requirements are okay. Trying to avoid change as much as possible so academically there is something called static and dynamic, we are not sure the industry use these terms: the static brief some think is like freeze. So from what you have said, it looks that you agree that it needs to be a base document to track changes later?

**Interviewee**

Yeah, I mean from the way you explained those two scenarios, certainly up to the start on site you need an element of both because for me, uh, what we have experience the way we tend to try to operate with clients and certainly within retail, like to understand what that fixed brief and initial outset is trying to get before the commence, and most retail will have knowledge they themselves will change as much as along the way they possibly can because you know retail markets change within an hour and they need different from the commitment of the brief to even start on site. They can change tenfold, so I think an element of- certainly early doors you need a little bit of both, you need a base brief to set the expectation, you then need that journey to get to the point, or maybe you start on site you then have a finalised brief that says right you start at there, you know there that is the one we go with, but you still want the data to pack that up.

**Interviewer**

That works as a base.

**Interviewee**

Yeah, then the idea maybe when you get to the point of start off on-site that brief, then the final one will change hopefully does not happen, you have added that period of time to at least track it and to be fair in my way of looking at it is principally an order, and it is principally it’s a journey you can go forward and back on. The one thing we try and do when we are not sure of our customer and certainly in larger projects is we will have a plan to review the process so we do a project close-out at the end of each scheme and will kind of go through all the good and the bad deals and get to the point of saying, “Right, so in that scheme X amount was really positive X amount was could it be better and these things really let us down,” and it is a collective not just a criticism or challenge to the construction. They’re collective and everybody will be involved in it and ideally once we have got that, those outputs will basically be implemented into the next project, hopefully with that repeat customer.

**Interviewer**

Yeah, sort of learning from.
Interviewee
Yeah, it is a learning process.

Interviewer
It is one of the Lean principles, this one.

Interviewee
Yeah, absolutely but you know I suppose it is like anything, any process and any kind of system you try and work with, it’s only as good as the contribution that’s made by those working with it or those putting, all those who were put into it, and you still get from time to time contractors doing a deal to the learning. They had in the previous project, customer will know that they need to step in but they do not and then they will take on change and things so an ever-increased challenge to get there but I do feel it should be an element of static dynamic brief in there to get to the point where you then say, “Alright, we are ready to go, let’s build it”.

Interviewer
Because you know you cannot stop client from doing changes.

Interviewee
No.

Interviewer
It’s the nature of the construction industry that client needs changes and this is what I am trying to work as Lean. From a Lean perspective to try do briefing or try to develop a model of something in between static and dynamic, so we’re trying to divide briefing into stages for example, and by each stage there will be gateways and by that gateway it needs to be signed off. Information needs to be decided and agreed and proceed to the next stage; any changes after the signoff will be treated as changes otherwise it will be flexible, so something in between.

Interviewee
I mean in a way through it. That is a perfect way of looking at it and a perfect way of dealing with it because again taking a typical retail scenario, the number of times that you go through a process we work with customer that where we have been working with probably the last 10, 12 years and they used to have exactly that right away from the start: I have got a project we want do something about, from that conversation through to finish on site. They will have a series of gateways and it used to run like clockwork, but it would take 30 weeks to probably get from start to finish. What they got to know, it’s because people come. There is an initiative and waging conversion, and report about the Lean Construction quicker about faster costs, you know have been a challenge between every sector. It has automatically got to a point where what they have done is to drop that gateway and just go “I want it quicker I want it better I want it faster,” all, “Now we can do it in 15 weeks we can now do it in five weeks,” but fundamentally what you still experience within those five week is there are six or seven gateways, they have been missed or they have been kind of just schemed over.

Interviewer
And the saving they try to do, they will pay it later.
Interviewee

Yeah, and without being too critical of the design process and the construction process the ones that tend to fundamentally fall down the most or you are involved with new sites or state deals or legal issues before you can get to the point of saying that project is viable and that principally that legal state-led, local authority-led, comply with authority realise that, kind of forcing it in, and you then get to the scenario then when everything’s done and design coordinators and everything and you are in a holding scenario because there has been a gateway here along the way has been missed then what that does, that, it creates the initial timeline and bubble for the client to look back at that scheme and go, “I want to change something,” and they change it but then it starts to create further ways of challenge and it is time again, and arguably you get to the point where to drop the process and it’s come back down to five weeks but in reality it’s probably taken 25 weeks to still deliver and you have add an absolute nightmare trying to get through it. Whereas if we could stick to that process but actually got people to buy into that, at maybe an early point of that timeline, you have at least still managed to achieve your objective, and that for me is what Lean is all about, it is about keeping everything in line but moving it through effectively.

Interviewer

Yeah, the idea is to develop a value stream map and try to follow that value stream map and try to cut waste all over the line.

Interviewee

Yeah, absolutely. I mean, you know with everything you trying do now particularly in construction industry and design it is subconsciously you develop some of these processes without really knowing about it, and typically we have got a very small programme of work where we’re surveying small units for retailers to take out, but the cost to do those stores is very low, and the only way we can make that cost work is to literally create a checklist for colleagues to go to sites and literally physically tick out the bits they have been there to do. They going to set the measure out and take the photographs and they assess the building condition, they have got the address detail they got the point to - kind of it is all the little basic bits but unless they go away knowing they have achieved all of those, it could cost more money to go back in. Anyway a very small example but it’s still a Lean process map that we’re trying to develop to say, “Right, we’re doing it for X, to make X work you need to achieve that and do not leave site until it is been ticked”.

Interviewer

Actually all about value, trying to find out what is the customer value.

Interviewee

Yeah.

Interviewer

Because some customers, their value as you mentioned is cost, need it as cheap as possible, other customers for example their value is time, because they need their building to be finished by a certain time to start running the business, other customers they see it as how beautiful their building is, something standalone. So the idea is to work out what is the customer value and from that point you can work out because not all customers look at time and cost.
Interviewee

Yeah, I mean everybody, their value stream is different and the beauty we have within the retail sector we focus on, it generally tends to be cost, time and then make sure that we’re protecting that brand. They are kind of the three main drivers to any retailer, and if you can better the time that is added value to them because it’s cashing the till earlier than they expected to be. The brand pretty much hardly gets changes because you go there and change, you cannot affect the cooperate brand, but cost really comes back to the point that if the way we try and demonstrate it is through reputation, we can get the cost fairly low if we’ve got reputation and the style we trying to get in. At the moment most companies will tender the same type of project every single time, so you are in a competition with six or seven likeminded contractor design consultants to deliver the same project you probably secured 6 months ago, but you going through that tendering process again and in reality where we need to be a little sharper with it. It is actually demonstrating to that customer that relationship and the value that can be added from the repeat business is far greater than that constant tendering cycle you go through because arguably cost, say the cost is 10,000 to tender a project, if we get 10 of these projects the same and we have tendered each one, that’s 100,000 pound worth of investment and we are currently returning about one in three. So you could argue it costs you 30,000 or 40,000 before you actually, you got the scheme to deliver your profit from, and we need to be able to, say, look to tender trial and then if there are 10, then actually we can save you 100,000 in being allocated those 10 and we will create a Lean value stream that actually enables the same cycle is going to be achieved in every single one of them rather than going back to the wheel again, because they will reinvent the wheel every time they need to tender.

Interviewer

And they do not know the contractor because having a repeat client and having a repeat contactor it will work effectively more in terms of the project, because even the previous one you delivered works as a learning journey for the new one.

Interviewee

Yeah, it is the time in the learning curve scenario and actually the learning curve like that every time but with a slightly slower outcome the more you secure, but actually you secure the 10 and set them up all the same way. Your learning curve is very low and actually your return on that investment is massive, but then the industry not just geared up for those. At the moment everything is a single-stage tender now

Interviewer

Coming to this point, do you think the briefing process is affected by project context? I mean for example client: if it is a repeat client or it is just a one-time client or first-time client who just procures a building, does it differ in terms of the briefing process?

Interviewee

Um, no it is not too different, to be honest. I think the basis of it is still the same, the bit where you probably end up with, I suppose, a bit of an advantage in being able to smooth that process through is where the customer you are in constantly in repeat business with. That content of it is still the same, but what you have to do with the customer you do not know or you bid on a one off basis and that said, there is a lot more that needs to go into that to be able to try to define that process you need to go through, but the structure around that briefing, I would say it is fairly similar.
Interviewer

What about procurement method? I mean with design and build for example, procurement methods, do you think it affects the brief where it’s a design, bid and build for example because some, for example, if we talk about design and build procurement their claim is if we have a design and build briefing process it’s not carried out efficiently because the contractor who is the designer is believing any issue ignored early can be resolved later because the project is secured, whereas with design bid build, the designer tries to work out the best design to go to the site. So do you think brief is affected?

Interviewee

I think it is, there are two very different approaches it to it. I think design and build is a more effective way of achieving it than traditional method, but then I also I think again there is potentially another research or paper that could do in the interpretation of what design and build and what through design and build mean, and from our point of view, I think the strength we have within (Company name) is having essentially all the skills within one business, but what we have, a kind of a double challenge, is from a design point of view we will probably understand the client expectation far more better than the contractor in a division will and procurement will go out and buy the best product, so the cheapest product to deliver that retain a margin. We actually have a double challenge in managing the client expectation and what they’re gonna get under that D&B process, but equally we have to manage the procurement team and the contractor to make sure that actually the quality in that product and that bid is not compromised because there is a number of time when we’ve gone through a design and build process where contractor will become divided from the team and they will make their own decision off their own bat and take things away from the design straight scope and deliver inferior products, and in itself can have interruptions in the end far later down the line and the sort of stuff that can come back to you with 10 years. You know, build quality issues might take a while to come through, but fundamentally under the design bid build contract, it needs to be dealt with and managed so much earlier in that process rather than it’s being a case of where we get appointed, we have cut out we have cut out and give low fees, but in product wise it is probably slightly inferior, and then you are under a contract agreement to go back and repair and put right the issues you have caused. So we have a double whammy from a design point of view because we are quite patient about maintaining customer expectations, but equally trying to achieve the best recourses for contractors and that is you know is a very different scenario to traditional.

Interviewer

And it is a challenge as well.

Interviewee

Very challenging.

Interviewer

Do you have like a kind of briefing checklist you follow with each project, a standard format for example?

Interviewee

Yes, we have I suppose in a way, we have one which is more of a quality management process. So we have a quality plan that we set for every customer every project and the
only way we may do that differently is if there is a volume of work to an certain appointment or set one for maybe multiple projects and coming to through the same appointment but with the quality plan which basically sets the basis of the team expectation and who is working on it and key contacts and all of those. But in terms of briefing checklist, we tend to, we tend to stick with the base structure aligned to RIBA in terms of the stages and, but then what we will do, we create, we will make it bespoke on the basis of what the expectation is that’s been set by the customer.

**Interviewer**

You do not use for example British standard briefing checklist? The one I found is actually the old version. The one I found is 1995.

**Interviewee**

No, with everything we do now we tend to make it bespoke to that core need of the customer and just making sure the core expectation within the customer is the checklist we try to. So it is very rare we will go back to like almost a British standard format.

**Interviewer**

Do you think if there is a standard format it will work effectively?

**Interviewee**

I think it would improve the consistency along the industry definitely. I mean, it comes back to the gateways process of having a top scenario: if people were more aligned to the same way of working then yes, that has to be an advantage. I mean I think a bit like a BIM scenario, unless there is another drive from the government lead or an industry lead standard that says that you shall work to this level, you will always get a kind of pocket of people who’re picking it up knowing it but then do not if it’s created as a point to be a prerequisite to be able to deliver projects. It has to have a benefit because it delivers consistency.

**Interviewer**

You know, interestingly from the previous interview I did, some people I meet, they agreed the standard format to be the minimum checklist and they see the briefing as their selling point for their organisation. So they interpreted it as a selling point where each organisation needs to do it differently and this is a selling point for their customer to choose them. What do you think?

**Interviewee**

Yes, that is how the industry has got. You know, I suppose for me, saying we try to create bespoke all time for the customer, because at the end of the day comes the selling point is coming back to knowing what your customer wants as opposed to what the industry would like to do, which in a way I suppose in some instances is the tail wagging the dog, but the industry has got so competitive over the years. We have moved completely away from standard set service, standard set of briefs, standard set of documents, standard - this customer now wants almost like the till reset, “Show me what I am going to get and I will tell you what I do not want”. So you kind of create a shopping list and then what they will do, they will take an element out and, “Now provide me with that,” and what we will do then we will create that as being a basis of the brief or a benchmark that we then work with it, and that’s just how the industry’s gone, is how the flexibility needs to be the selling point, is being flexible to that but still having control over it.
Interviewer
So as a general question, do you think the briefing process now in the UK construction industry is an effective process?

Interviewee
No I do not, I think. It is really generally a really kind of high-level question to ask because I suppose in a way there are so many instances where the briefing process could be improved and I would certainly support there being greater consistency in its approach and how it is developed, but I still think there is an element of client consultant contract need to add some flexibility in it to be able to get the best out of the problem at the end of the day, but consistency in the early doors needs to be addressed definitely.

Interviewer
Can I understand consistency as the good practice you suggest for looking to the brief as a value added process?

Interviewee
Yeah definitely. I think it has to because I mean in a way it comes back down to the point of challenge in time and cost and get the best effective solution, you know, during a period of time, and the one thing that tends to suffer in most scenarios is the upfront design briefing process before the client gets to sign and is the bit that’s being always a challenge, you know. We work schemes where we prominently, we like primarily to work on ten to eight week basis for a standard retail fit out. We have cut time, come to say I am done in two, you know, you end up, you always end up trying to manage that process. They never get it into, but you have to point to the risk and you then the process and say, “It is not we tick all of these, what we trying to do is tell you all of you need to be aware of,” and just put it back to them in another way but I do think it does need to be addressed in a way that’s bringing an element of rigour to it industry-wide and consistency needs to be, has got to be the biggest win.

Interviewer
From your answers and responses it looks you have some knowledge and experience of Lean - do you come across something called Lean Briefing?

Interviewee
We have never come across Lean Briefing in these terms; we have come across Lean Construction, but that Lean journey again should start right from the conversation to handing over keys and-

Interviewer
This we’re trying to do, my question is just to find whether there is practice like that in the industry. What I am trying to do is developing a Lean Briefing process just we have this question just to find whether there may be some organisation they use some kind of Lean Briefing.

Interviewee
We do not use a Lean Briefing scenario but the nearest we would love to get to with. It is to look, go back probably 10 years and I have a gateway process to everything from a point to start and sign. It is difficult to say that in part there is a process to everything we do and everything that the customer does but the one thing, is it Lean? And you create
effectiveness from it. Number three are we managed to the time scale or it creates the efficiency and that, the bits for me that are falling down because people, we cannot miss time, we cannot miss bits in the edges, there is no broad tick list in it. So if kind of go back and challenge that gateway and find the best route through it, that still achieves optimum output.

**Interviewer**

You have mentioned you have been using BIM for two or three years now or something like that: do you use BIM in the briefing process?

**Interviewee**

We are doing BIM now, I mean even right from the development stage now, and we try and use it even from the basically ground field site straight away, setup in a BIM environment and amassing just what the general scope of what is required will be done in a mobile format and we’re trying to use that BIM process to get the best out of that design. It is still early doors for us in terms of whether we are getting the best out of it or not, but I think in the, certainly in the 18 months that we deliver two development project with it to a very end level, and there is mileage in pursuing it properly, in getting to a point where actually there is definitely value coming out the other side, and that is value for me. It is time and a method of communicating output and which could be the two bits. One the communication output is where we fail the benefit in unlocking in planning decisions legislation, things like that, because it is all about it as what it feels and looks in size to the building permanently, and we are seeing some value in those bits. It is early doors as to whether we get maximum value out of it from a retailer fit out point of view, because obviously inside the fabric the box is, we’re still growing with that but definitely development scheme is a process there where we can benefit from it.

**Interviewer**

Thank you very much.

**Interviewee**

Pleasure, I hope I have helped.

**Interviewer**

Thank you.
Interview transcribed verbatim (Interview No. 7 08/07/2013 1h 16min)

**Interviewer**

So the interview is part of my research data collection. It is trying to investigate and analyse the application of Lean Management principles to the briefing process for effective design management. And the purpose of this interview is to find out about the briefing process within the UK industry and about your views and experience of briefing and of any good practice you have experienced whether in the UK or from being working all around the world.

**Interviewee**

Okay.

**Interviewer**

So to start with, how do you see briefing? Do you set it as a process or just a document to be delivered as part of project documents such as planning permission, for example?

**Interviewee**

For us briefing is very much a process and it is an on-going process. So we have different levels of briefing that take place in different stages of the project. We have strategic briefing that happens at the very beginning of the project. We are looking to understand the overall mission, visions, value for the organisation for their building and then as we go through the process we go down to more detail. So there is then a more detailed briefing that goes in to do with the- some are related to the project stages of the RIBA stages. So there is feasibility briefing, concept briefing and scheme briefing and detail briefing and those take place through dialogue with the project champion and the leadership organisation but it’s also with the staff within a specific department and division to find their more detailed needs.

**Interviewer**

So this is the process, do you see it as a roadmap for design or problem solving, I mean the briefing process?

**Interviewee**

It is, I mean it we see it as an important facet of the design process. However it is not the only one. When we are, there a number of different strategies in the design process, a number of different kind of key influences and one of them is definitely the need of the client and the occupier and thus probably the most important one, in my view. However, there are many other that influence the design process. I mean obviously absolutely the key one is cost, another one is the environment and sustainability requirements, another one is the overall client matter environmental aspect and another key one is the site and then there is the local authority and there is the planning department and also the local neighbours and the community who we have to be aware and responsive to, and so there is all of the different forces they get involved in from the outside. And then from the inside or within the team there is all the advisors and consultants and practice involved and who can be able to say what can be or cannot be done, what’s sufficient to do what is effective to do. So all these player strategies all come together and what I think it is really important is that we have that initial brief from the client so that we can always go back to make sure. Then, whatever happens, if nothing else we can look back and ask if we are still meting the intended goals and requirements because there is no point in having a building that is
on budget, on time and that fits the environmental agenda and the climate, etc. if it is not actually fulfilling the requirements of the client. That is because it is, in fact, fundamental that we are there to provide a product for the client.

**Interviewer**
Value for the client.

**Interviewee**
Absolutely, so we always have to go back and make sure and that is very important tools like value engineering that we look at. It is not just what we can save in terms of money. If we need to cut costs it saves money, however does it have any negative effect on the feasibility to preform effectively and if so is it so much of a negative effect. So you always have to be playing back and that is why so important to have that initial concept, the initial vision.

**Interviewer**
You know the main research is about value and how to add value to the client. This research was followed by previous research which was investigation of the application of Lean Design Management in UK industry and from the outcome of the previous research, it looks like most of the changes and the client being not sufficiently happy with the final building or the final product is related to design stages. As many drawings when it comes to the site, many changes happened there and in that research it was mentioned the brief as a factor contributing to that. However, there was to view some practitioners said that, “We need the client brief or the brief to work as a base later for the project when it is delivered so it can be judged whether it is delivered according to time, budget and value”. Other people see the briefing as a continuous process. Okay, I do not know whether you are aware of the terms dynamic briefing and static briefing, they may be academic these terms.

**Interviewee**
I understand I do.

**Interviewer**
Yeah it is academic because from my previous interviews it looks like in the industry are not popular to use these terms static and dynamic. But you have mentioned the process itself, so they mentioned the client needs time to find out what is really his requirements are. So you cannot ask the client early on when he develops the client brief to put all his requirements, because some clients, they need the space to decide what they want and also it is applicable to personal views, and sometimes they are affected by when they see other buildings other facilities that makes them make changes. So those people see briefing to be a continuous process to allow more time for the client.

**Interviewee**
Absolutely, now I think there are so many things in what you said, and I think what is for us it is absolutely a dynamic brief. It is completely it is evolving and that, however we have to start that process as early as, because there are, the brief is like an onion where peeling more layers of it but you cannot sometimes we in a situation where the client does not feel they can give us a brief at the beginning of the project because they say we do not know what we’re going to need in four years’ time. However we have to work with them to understand what they may need, what the scenario could be. In this way, we can test those scenarios to work out what level of flexibility and adaptability they need in their
project by having different scenarios. Then, we can find tune as we go along and put more information in. We need somewhere to start and I think that we are aware that there has to be, there are a number of drivers at the beginning of the process. They have to, they want to have a new building and we need to understand these drivers are and those do exist and they are very important and those drivers might change over time. Although the requirement might change over time, but they are specific needs and I think a lot of architects do not ask them, they do not interrogate them enough or question them about what those drivers and their needs are, why they need to have a building in the first place why they need to do this building and really drilling quite deep, because we can find a lot at the very beginning. Another fear the client has that if they tell us that is going to be written in stone and that is going to be what we design for them, and that is not the case. It is just give us the starting point. It gives a scenario, it gives the ability to start going in the right direction because as the design process goes on it becomes after stage, it becomes like a super tanker, it is really hard to change the direction of it once it is going away down the road. So you have to be, “What’s the direction we should be going in” right out from the beginning then once you have done that we then we’re consciously working for the client to find their brief, to find their need, and in the end what they want of the building project when we actually build a project that is the first day of 30, 50, 100 years of that building, those people will be in that building. So we had to be, whatever we design we had to design for flexibility and adaptability any way. A brief is not like a completely tailored suit with exactly the right dimensions. The brief has to be something that allows flexibility to change, flexibility to grow so it is constantly dynamic and it allows evolving, but with that what we want to do is not with the brief just changing things every time, what we need to do is adding layers to it, so the first brief is like that, the second like that, the third like that, the fourth like that, it is to more and more information and sometimes that information is changing but we’re just getting levels and levels. The other important for us is that we have a complete knowledge of when and why if we have changed anything through the process. So we can understand all the decisions that have been made and why those decisions have been made, because what sometimes happens, if there is many changes someone turns around to you and says, “Why did we decide not to have that room we decided? We do not want a cinema in development,” and they cannot remember why they changed something. So we can go back and we can explain where everything came from. All that is hugely important because people forget all of the time.

**Interviewer**

Especially with the time of the project.

**Interviewee**

Yeah, absolutely.

**Interviewer**

but you know, with the dynamic brief this flexibility leads to the design process being continued so it just keep designing, so the idea that I am trying to implement in the research is having something between static and dynamic brief where I have like a gateway throughout the process and these gateways for example need to be signed off so instead of having the brief, so flexible so dynamic and maybe we end up just doing the brief but by having these gateways we can track changes, for example.

**Interviewee**

Absolutely.
Interviewer
So, trying to make the process as efficient as possible because we cannot stop the client from making changes okay, and also as a designer you need to progress in the design, you cannot just work for example for a month and then work it again.

Interviewee
No, absolutely, yeah I think what, I think having those gateways is very important. I think for what I, at the same time, though, it shouldn't be that once you have gone through gateways there is no turning back in certain elements, I think that people, that people will always be things which mean critical changes might happen. I think just people’s understanding of different stages for the client and the architect, not just the client. The architect really understanding what the implications of certain changes are is huge, to be able to do that we will, because people often make changes not understanding, thinking so if they knew that we can make these changes now and a such small change but that small change is not going to cost small money and it has to have huge, say an office building this will have a real difference upon the productivity of, or it will have a real difference for the developer whose saleability of that building. However there might be something that looks like something very similar to the change. It looks small but actually that small change can have a huge implication in the cost and because it’s going to have knock-on effects. That little change means that has to change and that and that and the other. These people have to spend three more weeks working and have to do that and the benefit of it are gonna be very small. If we know what the cost and what the benefit is of these changes then great, then we can decide but at the moment what I think happens, a lot of people do not really understand. People are not making changes that they should make, they make changes they should not make. I have been in a situation where is not enough change made that something has come up and it means the brief has to change and there have been design implications of that and everyone just said, “It is too late, we cannot make that change,” and because of that they’ve gone down the course which is not a good course to go down and the building has suffered because of that. Opposite that, I have been in another situation the opposite has happened, so it is really understanding, because sometimes someone like the architect will see if the client gives us new information, new stuff happens. It made a big difference and we are not allowed to make changes. The client said, “No, we just fit it in well”. There 100 more people to go to the building or to have to cut some out of the building. It makes a big difference and if we were able to understand more clearly, explain more clearly what the impact is, I think that will be very good.

Interviewer
Do you think the current briefing practice is serving its purpose? Is it value added?

Interviewee
Briefing is so - okay I think the current briefing process at the moment is there is no one briefing process at the moment can be done for every type of client, even within one type of industry. One type of building will be a very very different process. For instance, we were doing two lab buildings, they were very similar scale they were both complex projects and when we started the client had the same level of information in terms of the scale and they were both complex projects and when we started the clients had a similar level of the information they provided to us. However, in one project the project manager has spent months and months getting that information and double checked it and explaining to his people internally the importance of getting that information right and
they have to spend time on working on how big their labs need to be. So they came to a specific information and we then are able to start designing around that and we are able to talk to about changes they needed to be done. So they can work most effectively and we are able to go through that process and adapt the brief slightly and change things. He got different requirements from us, we interviewed the entire researchers and the heads of department and we adapt the brief about and that process was so smooth. I would say that the building was what went through scheme design in terms of brief was 80% the same as what he had. I think the overall area was 98%, is within 2% of the area requirement but with the specifics I think eight out of ten of all things that he said were exactly what we built and two out of ten changed. Now we have another project, that lab is very very similar and everything changed, everything changed. It was not changed once, it probably changed ten times back and forward, people in client side change their mind, different information came up and they had changes of thought and the briefing process was probably ten times more intensive. Oh we got to the same place in the end, but it took a huge amount more efforts and time to get to the same place and that was because of the culture of that organisation and because of the individual within the organisation who was working on the project. We were the same team, it was myself and exactly the same people working on the briefing of those two projects and it was completely different and that is in the same industry. If you look at different industries, say you have an office building to a museum, the briefing process of those is so different. It is a different language it is like you speaking a completely different language very little similarity. The only thing is that is the structure that runs through is an attempt to get a strong decision-making body from the client, whether it is one person or it is a committee or it is so over. It needs to be a strong decision-maker, has to be very educated and either is educated to the architect or internally through them. Often we have people who end up telling the organisation about themselves. We do interviews like you’re doing this interview and we will go back to the project champion and to the steering group and we will say to them your department, these are your different departments and they because they do this, they need these things from their building. We tell them that we are telling them that they are not telling us that they are not coming up with those so often, they do not know in a lot of detail what people in their department do. We have to find that out. Other times they know very clearly what they do in particular.

*Interviewer*

This is the difference between repeat client and just one-off clients.

*Interviewee*

Oh yes, that absolutely is. If you look at most, say most of the large number of clients we have. They have not done a project like this before, is not even in the, for it is not what they do for living. Say you take, we have a client who is a museum, they are in the business of museum, they are not of the business of building a museum, and the person who becomes the head of that project might be well someone who has never worked in a building project before, a major project before and the same with if we’re designing a school, our main client may be the headmaster or the headmistress of the school. That headmaster or headmistress is a very, very good teacher they are not necessarily someone who understand how building works, yes. So for them it’s a one-off thing, most organisations, they will build one headquarters building in a generation, in 20, 30 years. They will just do one. So you are not, you are not dealing with people who understand what the process, and then so education is so important and the briefing is so much more than just a statement of requirement. It is an understanding of the client’s needs, of how
they work and who they are. It is also an explanation of those things to them; it is not just for the architect.

**Interviewer**

Shall we see it as small research? I mean the briefing itself, because as you mentioned there are clients it’s their first time. From the two scenarios you mentioned about labs with a perfect one you implemented good research tools for example you did find out some information which is similar projects for example and literature from similar projects, this lab for example, and there is some record-gathering of these information and providing to the client and trying to educate them, as you mentioned, also having regular value management workshops and trying to explain to him different proposals and different scenarios of the project so he can decide. We have to help him as a designer to make the right decision at the right time.

**Interviewee**

Absolutely.

**Interviewer**

Because clients sometimes tend to delay their decision-making because they are afraid of making decisions and from the implication of the changes later. They think about money, for example, so if they made a decision right now without being aware exactly what is the implication of that decision, so always they will tend to delay in making decision. So tools you have mentioned I see as important, such as finding information from similar projects, having value management workshops and interviews with the employees and sometimes you need to do monitoring. For example if the client has the same building or his business is moving to new building so having, just going to their business and sitting there trying to find out how they perform their work.

**Interviewee**

We did a lot, we do a huge amount of effort there is the whole arena of evidence-based design which deals with that which is where; rather than just interviewing people asking what they want we actually, we uncover evidence of what they’re doing, of what their requirements are, because people’s perception of what they do now and what they need are often quite different to the reality of it. So we do a lot of space occupation studies where we monitor how, say, for an office building or for a school, for a library, etc. they have space being used, which is used a lot, which is not. We carry, and then we can test those against running workshops and focus groups of people and we can do a lot of analysis in auditing space auditing furniture or different desk usage to find out how people are really using the space. We can then benchmark against similar organisations and I think that’s very useful as well. However with benchmarking, benchmarking can become too easy a way of developing a solution because, say, we find for instance that, we are designing a building for an account firm so far and then we look to three different account firms and then have a density of 1 person per 10 square metres, the first thing of three company have the same for person. So you should sound quite reasonable but it could be a very, very simple reason why they have 10 m²/person and there could be very good reason why in the building we building it should be 8 square metres per person or it should be 12 square metres, and that one decision well tell us if it is a company of 5,000 people for instance then that is the difference between 8 in a 50,000 square metre building and a 40,000 square metre building or a 60,000 square metre building, which can be the difference
between a, that could be a difference between a 100 million pound building and an 80 million pound building, just like that in one decision.

**Interviewer**

Because the client tends to delay their decision for this point.

**Interviewee**

Because of that we do, what we need to do is work out at the very beginning, we need to look at relevant ideas is too early. We say, “Okay we’re building you a building, one first decision we need to decide with you is about how big that building should be,” kind of start like that, how does that one decision get made, how does of that how, because if they get their decision wrong, it does not matter about everything else. So we have to make decisions or we cannot start. How we do about decision, how best decision to get benchmarking is one of them, but we need to find out about the organisation and then need to work out how big and we can start building up scenarios. We can build up completely different scenarios for the future in ten years’ time, and one scenario can come up with 90,000 square metres, 100*110 metres when we know that we can say, “Okay, based on that, what is the best thing we should do? Should we build a building with 120,000 square metres and gives you this flexibility and building in such a way you can rent out 40,000 metres if you need to, and you can get money from that and this can generate profit, but if you need to do we have to design it in such a way you’re left working away, so you do not have your tenants going through the same lift as you, in the same lift, or they do what floor, you have to design it in a such way to allow that”. Or we’re going to design, say we designed for 80,000 square metres, however, we can design it in such a way that the density of people within in it can increase, so that means we have to design the lifts, the staircases, the toilets, the servicing, all of these, all of the facilities so that you can increase the occupancy without getting overloaded. We can have those kind of debates and we can come up, we can set out with the client for two days and talk to all these things, and we can work out what the very best scenario case deals with each, all the negatives all the possible challenges. We can work out and then start the design, what happens along the project the architects do worldwide because they build a building which is too small for their client and they move in. What is the point of having a headquarters building if only 9 out of 10 of your staff can work in and the other one out of 10 has to be in another building next door? So some of this stuff we can really work out early on. It is not so much being sure that you have got the right solution. It is more that you understand the different implications of decisions you’re making and that you can, you can, they have ways to address any circumstances that come up based on that decision. The flexibility around that, the flexibility takes a lot of designing.

**Interviewer**

More time, but now from the scenario you …

**Interviewee**

Flexibility can cost more money. So you have to work out how much flexibility is right. For instance there was a lab building we designed where part of it originally they wanted all of it flexible. In the end we designed a part of it completely flexible because if we designed it all to be flexible all of its bit would have to have the most adaptable air handling solution. It would have the most adaptable flooring. It would, it have the most abatable services and all of that would it be really expensive. So we worked out which bit
was most needed to be most flexible and only that bit had the very expensive measures in it to make it adaptable and flexible.

**Interviewer**
Who leads the brief within your organisation, is it the architect who’s leading the project for example or there is a specific team who’s leading the brief?

**Interviewee**
We as an organisation, have, we, there is my team that, well we will lead the briefing on most of the projects in the office. We work with, we will go with any briefing session with one of the lead architects from the project team. There is some projects where the lead architect has done briefing before, has worked it with us before and they feel comfortable to run. If it is a less complex building they will run briefing, but typically it is run by, it will, all briefing process will be overseen by the partner in charge of the project. My team will go in and assist with the actual briefing because my team are is, we are, we are, lead brief. It is call workplace consultancy. My team, and we do all the briefing in all of our office buildings but we also do briefing on museum library projects and educational projects and industrial projects in the office and we will go in as a separate team and do the briefing. The idea behind that, we had a lot of experience of briefing and we can take stuff we can benchmark from other projects we work on. We can understand what bits, but we do not do that as independent. We always do work as integrated team for the project architect, because what we do not do is come up with a document and hand it over to them, so throughout the process we will be working with them. And they will be in the briefing session with us. They will be in the workshop with us and so they’re really part of the process. And what we also do, we act as a kind of as a checking mechanism, so when the architect then designs or designs an option for the project from the beginning, we talk to them they will show us their design and their proposal and we will review those before.

**Interviewer**
Aggregate them.

**Interviewee**
Absolutely, this what the client asked for or if you do it this way more in keeping, whatever. So we’re making sure as the design progresses that they stay on track.

**Interviewer**
But you have mentioned in both scenarios, and having in both different scenarios the same team, do you think the way the projects are delivered for these two projects or because of the absence of a briefing checklist or a roadmap of how to carry the process has affected the project? I mean one lab is carried out efficiently and effectively and the outcome was successful as you mentioned, let’s say 100% as the client wanted, whereas the other one was the opposite, although it was same project type and context, so do you think because you are the same team delivering the same process that was because there is no clear roadmap?

**Interviewee**
No, in fact-

**Interviewer**
I mean this is as an example.
Interviewee

As an example, in that particular example there was the same roadmap for both of them. We explained to them the different stages we will be going to and the different sign-off, different sign-off points for both of them and the project was able to develop in both of them. So there is no issue in terms of the overall project. What the difference was the amount of effort and time that we had to put in and the client had to put in and that in the first one a very strong project leader who had already done loads of work and so when we were able to give him the timeframe we able to work with them very easily and whereas in the second client timeframe will be fine. We are realise that the client was probably would not, probably would need more time, that would need more help than the previous client and we extended each of the timeframes although the same size project. We made sure each of these periods was quite a bit longer for each, because it was longer and what we did not realise, though, was how much indecision they were going to have and how we were going to check them. It just meant we had to push harder and we had to work harder and we had to put in more effort and more time but we got to the milestone right, but it was a really really tough process to work and because we are a practice the size we are with resources that we have and experience we had, we were able to cope with that. We were able to do it. I do not understand how a small company with limited resources would have been able to handle that job. I cannot imagine how they would done it and they would either have had just the reason. We were, we put so much effort to make sure we get the right answer, but we’ve got experience to work with, but I think for a small company with that client, the client would have made wrong decisions and it would not be a very good building. I think the first client, a good small architecture firm would be able to do a good job for them because the client was very, very be able to do work with them. I think on the project like the second one most company would it been a nightmare and so I think the part of the challenge is with the briefing and design changes being able to cope with those changes, being able to suck them up and being able to have the resources to cope with them, because if you resourced for the client to make minimum changes, what happens when they make changes if you only have 30 people in you company, then what do you do? Do you pull people from other projects you know or you had to employ more people - what happens if the whole, because it all linked up to your resources and having resources that can cope with these pieces and craft these design changes and having a project cost plan as well.

Interviewer

What do you think of the current briefing process? I mean within your organisation or within the UK industry, is it an effective process? Is it a value-added process?

Interviewee

I think that the briefing process that we have with client is hugely value added because of the point if you do not have a briefing process then you’re going to have a bad building. So I think the more briefing you do the more upfront you do it the earlier in the process you can do it with the most detail. It is hugely value added because I think it has the biggest effect on the effectiveness of the design. It has a large effect on design. It is understanding your client needs and I think we as an industry are getting much more out of it from when I started 10 years ago to now. It is becoming not just in England but globally, it’s becoming something which is taking something seriously by architect and by clients and I think that now we have, we are finding much, much better ways of being able
to brief effectively. We are able to use much large datasets than we could before, with big data we can work with adjacency. We use, to use, we have to do adjacency mapping manually. So you have 15 departments and these people need to be close to these people and you just sketch it out, what the network is, and I mean you show it to the client and you say, “Do you think this looks like,” when you show it to the client. “Oh yes it looks about right now”. We can do, you can plug that all into computer coding where you can run algorithms and that can work out all the difference ways of doing it and come up with the perfect adjacency or the most ideal adjacency, and nothing is perfect but the most ideal adjacency, but you do not just have to do it in the department level. You can do it on individual level so we can work out adjacency in a 5,000 person organisation and we can do that with the level of intelligence and accuracy we can never do beforehand. So we are starting to use more computational techniques in the briefing process which are going to make it much much better. So I think that, it is becoming a more exact science and we as an industry are doing it better and better, but I think the best there’s a long way to go.

**Interviewer**

Do you think other organisations perform effectively as you do in your organisation?

**Interviewee**

I would not know really about that. I have just known from other people in the industry. People are talking much about it. People are bringing much, more people bring departments to specialise which never used to be before. I think it is done much better than it used to, these are done more seriously than it used to, and I still think there is a long way to go because of, I think here is a lot of waste in the design process and there is a lot of time spent in doing options that then get rejected just like that, and so I think there is a lot of- but I think in the same time what we do not want to do is going too far the other way and in the effort to cut all the waste to end up with much inferior product or not being able to change based on different client requirements the understanding of different client requirement evolving needs. I think there is some architects are very, some architects are so un-business minded that they just can’t make any, they cannot make a living out of work. It is large practices, because they’re so much about design process but then end up costing a lot of money to design a building, but I think there is other architects who go to the other extreme that they are so waste conscious that they make sure they absolutely minimise the amount of design options they are able to and they narrow the client down, so relay in the process a solution and then make the client sign off at the solution and make the client pay for any change that comes up with inferior products. I think there has to be a balance in between that we do not be wasting hours and hours in the design, we also do not be wasting the client time on showing them stuff that-

**Interviewer**

Is not an interest to them, yeah?

**Interviewee**

Yeah, so I think getting the right balance. I think the architect getting much in doing that and I think technology’s helping us to do that and just awareness is helping us to do that. It becomes, I think, the harder the economic times the more important briefing, the more important it becomes to get it right because people cannot at the end of the 2007 2008 when people could build anything and then sell it and make profit, people did not really care too much globally about the product was particularly good. Now the product has to be
fantastic for you to be able to make any money on it as a developer or as a client, so getting it right becomes more important and the briefing becomes so much more important.

**Interviewer**

Do you think the absence of standard? It’s not standards, it is like checklist on how to carry the process? Because from the previous interview some people or some practitioners said, “We would like to have a roadmap on how to do it because for example if we talk about RIBA plan, it is just showing that there is a strategic brief and client brief and they form the project brief but how to carry out the process the roadmap of doing it is not mentioned”. It is applicable to different organisations’ interpretations, different architects, because there is no clear roadmap from the RIBA on how to do briefing. They asked not for a detailed one but at least a checklist. However, there is a checklist for the briefing in the British Standard but from previous interviews no one told me they have used it. The one I come across is 1995 and it is not updated since 1995, so the absence of having a roadmap or a minimum roadmap on how to carry out the process making the brief applicable to different people, different architects, different organisations’ interpretations, and when I was talking with some architects from several organisation they see briefing as their selling point. They mentioned that they would like to have like a minimum checklist for the briefing, how to carry out the process. They said it’s needed for them to work as a base for their organisation to do it but they believe the brief is considered as one of their selling points, which differentiates them from other competitors in the market. Have you got what I mean, so what do you think, do you see it as a selling point?

**Interviewee**

Absolutely, no, I think we always see our level of briefing as being one of our selling points. We as an organisation are really understanding clients’ needs more than other architects do, taking more having, taking more time over it, being more collaborative with our client at it and having more experience being able to efficiently, effectively do the briefing and I think that from an industry point of view I think it will be absolutely fantastic if there was a kind of an RIBA briefing roadmap and I was able to say that will legitimise the whole process and make it very client towards to it. So the client did not so easily be fooled into thinking that he could leave it right until the end of the process because we do not know our need yet. The brief can be taken to make consensus of making decisions now, the architect then can just build and it will be fine versus it is a dynamic process. So I think it would be absolutely fantastic to have a kind of roadmap, but that the only thing with the briefing roadmap is that when you start putting a timeline against it can be quite difficult for different clients, difficult to be able to keep to it, as I explained with the lab, to be able to keep to it sometimes but then again but then okay we have the RIBA three stages, the Plan of Work that has the timeframe against its briefing and have a milestone against it. It would be fantastic to have clear to the client what level of certainty you need to have at different stages. I think it will be very different decisions, I do not know the type of cladding in your building when you had to do that decision when you make the decision on say for example for office buildings where should be the core the lift and the staircase because even how big should be your building so I think there are-

**Interviewer**

Even the balance of the information is important as not to try to overload the design team and the architect with a lot of information early on which is not necessary early on. I understand the architect needs some vision of the building, so the information is to be
delivered as it is required instead of having all the information early on upon the project development or the design development.

**Interviewee**

Yeah, I think what we often we had with the client really in the process will be doing a block model and explain to them that shape, form and mass of the building. We might be six weeks into the project building, we might be. “I want to see the building what it looks like and am impatient,” and the problem is we do not know what it’s gonna look like yet at a very early stage, and secondly we do not want to show them something that then is going to side-track. If we show them a visualisation of something, the tower and the head client goes on about green glass you’re showing, “We really want the blue,” and suddenly it is trying to make a decision about something that no one want to make decision about in two years but what we really have to do a decision about is the building should be that tall or that tall, and so yes having that kind of roadmap so we do not worry about these things yet.

**Interviewer**

Misleading the project.

**Interviewee**

Get it done, the road, if the client has ten options for the types of the glass for the next meeting we will actually-

**Interviewer**

Time negotiation and talking about something which is-

**Interviewee**

… which is way down the road but then also making sure you do spend enough time discussion, negotiation, something does need to be talked because otherwise sometimes people it is too late, something has kind of just happened without really enough discussion and then its ends with the placeholder before but you know about the placeholder becomes “This what has been built, it is too late now,” like the column’s good in a building principle once that sets it is quite a big deal to change it. So you have to make sure that before you change it you have a lot of discussion about it, yeah, yeah.

**Interviewer**

BIM, do you use BIM in the briefing process?

**Interviewee**

Ah, we, we do not, we as a project team do not get involved in BIM until it gets to the- we used really to understand the implications of further down the deal. I think we could be using BIM early on the process. We do use it, we can easily see we can track the implications of changes.

**Interviewer**

Clashes.

**Interviewee**

But I think it would be great to be able to use BIM at a really early stage. I mean right at the concept stage, to be able to understand the implications of changes, so I am not really, I do more, might be earlier stage so that would be the early stage of, so we don't, I do not
have sort of direct, you know, I do not because I personally I do not use BIM myself. People in my team will, I am, but I think it is a very powerful tool. Obviously it can be, it does make things more complicated, because everyone can change things and add and um, you really need to have one person who is really understanding all the changes that are happening and being in charge of the BIM process. I think that it need to be the architect as it does get, because people have to understand the implication of changes, so if the engineering changes we have to understand what the implication are.

**Interviewer**
And cost.

**Interviewee**
Absolutely, and I think it can sometimes make things too easy to change because everyone can change bits on it because it is not like having a signed set of drawings, it is so dynamic with its own challenges.

**Interviewer**
Do you have knowledge of Lean or Lean Briefing?

**Interviewee**
No I do not really know what that means.

**Interviewer**
Actually the Lean itself is trying to maximise value for the client and minimise waste and trying to deliver the best product value for the client. It comes from Toyota from manufacture and then it’s implemented in the construction industry. Although it’s implement in the construction stage not in design stage, in the design stage it’s still under research. Lean Briefing is what I am trying to develop in my research, trying to develop a briefing process model exactly like a roadmap on how to carry out the process and to make the process as effective as possible to gain as much value from its process.

**Interviewee**
I think it would be fantastic to do, I think much, much, I think the right because people are taking briefing much more seriously now. I think this actually the right time to be doing that.

**Interviewer**
Having said you are leading the people who are leading the briefing within your organisation, I mean do you mind, for example, I do not know whether you have some documents how to carry out the road map so I can benefit from it in developing the process and we can share experience about this.

**Interviewee**
About a particular process.

**Interviewer**
For example good examples of briefing you did.

**Interviewee**
Yeah, I am, I have to think about which is the best project, so …
Interviewer
I am trying to make it as a learning process to learn from the previous lessons to implement in the model and try to benefit from to make it as practical as possible.

Interviewee
Ah, we have a few of, we have a really good project at the moment but has, er, that is a very confidential project. It is the only problem. Is this information asked to send to you or coming again and look at it?

Interviewer
It is up to you because you said it is confidential. I mean even if it is not specific information that confidential but I mean general, the general layout or the general form of the briefing roadmap you do within your organisation, because later, I mean later in my research, I will develop the model and then I will conduct a focus group, okay, as a workshop and try to invite some architects to be in that focus group and that explains the model trying to find their views and trying to validate it and try to make it more practical.

Interviewee
Well how about if so …

Interviewer
If you want to think about it and let me know by email.

Interviewee
So how about, is it just a kind of like if I send you through a, I could send you through a couple of things probably one would be a, maybe a process which kind of maps time. We here, what we a kind of idealise based on a view of different ones, views from different key stages and how much time we would spend on it. I think that would be quite good. Yeah I think, and then so let me do that and see what we, yeah I can do that quite.

Interviewer
I mean when developing, I mean developing that process it might be of interest to you later, I mean, so if you are engaged in evaluating the conceptual model. I mean maybe you then take it later and improve it.

Interviewee
Yeah, I think that would be fantastic and that would be great, that would be really, really good. Well let me let me think about it, and I will send you through a couple of things and then we will see whether that’s the right kind of thing I might need to if we send anything further through to you. I just have to see about the, if I mean this already got the copy of this.

Interviewer
This is yours actually and this is you can copy.

Interviewee
I will send this through and then I will see what I can do for you.

Interviewer
Yeah that is fine. If you need for example further letter from the university or from my supervisor-

**Interviewee**

No you just need to sign a non-disclosure agreement or something like that, then that will be fine and then we can, but it would be great to. It would be great to send you invent, to work with you. It would be great if you can came back in and talk to actually when you’ve started to get this roadmap.

**Interviewer**

Yeah actually this is like a general questionnaire that will help me presenting my data in the research and by the end of it I mentioned if you are happy to attend a workshop where the model will be presented and having your views and experience, so if we work in parallel from early on and try to develop that process so it will be useful later.

**Interviewee**

Well just I need to check about, I am not sure whether what we worry about us sharing information directly in a room with other practitioners about our stuff, so it might be fine or it might be that because it depends, it might be seen as inappropriate for me to be in a room with other architecture firms like us.

**Interviewer**

Okay.

**Interviewee**

Our information even gets information so it might be more about having something like one-to-one where we sit down.

**Interviewer**

What I am saying, because there is another organisation. I have an interview with them they are interested as well, I mean in attending the workshop but they like to sit as individuals as you mentioned. So we can do it individually within your organisation within your team or we can do individual workshops.

**Interviewee**

Yeah, okay let me just check this and then, shall I fill in this now?

**Interviewer**

Because you have worked in the USA, do you think architectural programming is the same as briefing or it is something different?

**Interviewee**

Uh, yes I think it is exactly the same. It is just really a pain because we have got because we say briefing and we say programming for the time and they say programming for briefing and scheduling for time, but it mean exactly the same thing. In the process we’ve gone through, any programming process I have done in America is exactly the same in London but if you talk about briefing they have not got a clue what it is.

**Interviewer**

Thank you.
I. Participant General Information Form
II. The Participant Information Sheet and the Informed Consent Form
III. Validation questions
IV. IGLC 22 presentation slides (1st Round Validation Phase-Lean experts)
V. Workshop presentation slides (2nd Round Validation Phase-industry practitioners)
VI. Lean Briefing A0 poster (2nd Round Validation Phase-industry practitioners).

Appendix (B)
LBP Validation materials
General information about the participants and the organisation

About you:

1. What is your profession?

2. What is your current role?

3. How long is your professional experience?

4. Type of construction sector you have been involved in?
   a. Residential/housing
   b. Commercial
   c. Industrial
   d. Other

5. Type of projects you have been involved in?
   a. New build
   b. Renovation/refurbishment

6. Type of projects (in terms of client classification) you have been involved in?
   a. Private
   b. Public

About your organisation:

1. Your organisation do
   a. Design and consultation
   b. Design and construction
   c. Construction
   d. Other

2. Approximate number of organisation employees?
   a. Less than 25
   b. 50-100
   c. 100-250
   d. More than 250

3. Approximate annual turnover for the organisation?
   a. 1-£10m
   b. 10-£50m
   c. 50-£100m
   d. More than £100m

Thank you for time and assistance
A Novel Lean Briefing Process Model for Effective Design Management

Participant Information Sheet

Mohamed Hani El-Reifi, Research student, School of Civil and Building Engineering, Loughborough University, Loughborough LE11 3TU, United Kingdom, M.H.El-Reifi@lboro.ac.uk, Phone +44 1509 223981

Prof. Stephen Emmitt, PhD Research Supervisor, Department of Architecture and Civil Engineering, University of Bath, Bath, BA2 7AY, United Kingdom, S.Emmitt@bath.ac.uk, Phone +44 1225 384722

Dr. Kirti Ruikar, PhD Research Supervisor, School of Civil and Building Engineering, Loughborough University, Loughborough LE11 3TU, United Kingdom, k.d.ruikar@lboro.ac.uk, Phone +44 1509 223774

What is the purpose of the study?
The research is an attempt to investigate and analyse the application of lean management principles in the briefing process for lean design management implementation; and to explore its validity within AEC project by looking at the theory and the application of lean design management. In this context, validity refers to the project contributors’ businesses and the customer’s satisfaction with the final product. The study to be conducted to fulfil partial of the requirement required for getting the award of Doctoral of Philosophy of Loughborough University.

Who is doing this research and why?
The research is conducted by:

1- Mohamed Hani El-Reifi, Research student
2- Prof. Stephen Emmitt, Supervisor
3- Dr. Kirti Ruikar, Supervisor

This study is a part of a Student research project funded by the Libyan Government and based at Loughborough University.

Are there any exclusion criteria?
Participants need to be professional construction industry practitioners’. More specifically, their professional background needs to be Architect, Design manager, and Project Manager.

What will I be asked to do?
Participate in a workshop where you asked to give your views, comments and feedback in terms of the developed Lean Briefing Management Framework. The workshop is planned to run in three slots;

Slot 1: (15min) Introductory presentation. This is to present Lean Briefing to familiar participants with Lean Briefing approach, and the developed Lean Briefing Management Framework.

Slot 2: (45min) Discussion. Here is where participants will be asked to discuss their views and comments, and offer their feedback regarding the presented Lean Briefing.

Slot 3: (20min) Validation questions. Here is where participants will be asked to weight their attitude in terms of a set of statements about lean briefing using the voting device.
Once I take part, can I change my mind?
Yes! After you have read this information and asked any questions you may have, we will ask you to complete an Informed Consent Form, however if at any time, before, during or after the sessions you wish to withdraw from the study please just contact the main investigator. You can withdraw at any time, for any reason and you will not be asked to explain your reasons for withdrawing.

How long will it take?
The expected time required for each workshop from 60 minutes to 90 minutes.

What personal information will be required from me?
Experience, professional background, participant’s organisation size, and type of projects you have worked in.

Are there any risks in participating?
No

Will my taking part in this study be kept confidential?
All information on participants will be treated confidentially and the result will be reported anonymously. The video or audio recording (if permitted) will be destroyed within 10 years of the completion of the research.

I have some more questions; who should I contact?
Prof. Stephen Emmitt, PhD Research Supervisor, Department of Architecture and Civil Engineering, University of Bath, Bath, BA2 7AY, United Kingdom, S.Emmitt@bath.ac.uk, Phone +44 1225 384722

Dr. Kirti Ruikar, PhD Research Supervisor, School of Civil and Building Engineering, Loughborough University, Loughborough LE11 3TU, United Kingdom, k.d.ruikar@lboro.ac.uk, Phone +44 1509 223774

What will happen to the results of the study?
- The storage of data will comply with the data protection Act 1998.
- The video or audio recording (if permitted) of participants will be kept in a secure place and not released for any use by third parties.
- The video or audio recording (if permitted) will be destroyed within 10 years of the completion of the research.

What if I am not happy with how the research was conducted?
If you are not happy with how the research was conducted, please contact Mrs Zoe Stockdale, the Secretary for the University’s Ethics Approvals (Human Participants) Sub-Committee:
Mrs Z Stockdale, Research Office, Rutland Building, Loughborough University, Epinal Way, Loughborough, LE11 3TU. Tel: 01509 222423. Email: Z.C.Stockdale@lboro.ac.uk

The University also has a policy relating to Research Misconduct and Whistle Blowing which is available online at http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing(2).htm.

What do I get for participating?
A summary of the main research outcome’s (if requested).
INFORMED CONSENT FORM
(To be completed after Participant Information Sheet has been read)

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the Loughborough University Ethics Approvals (Human Participants) Sub-Committee.

I have read and understood the information sheet and this consent form.

I have had an opportunity to ask questions about my participation.

I understand that I am under no obligation to take part in the study.

I understand that I have the right to withdraw from this study at any stage for any reason, and that I will not be required to explain my reasons for withdrawing.

I understand that all the information I provide will be treated in strict confidence and will be kept anonymous and confidential to the researchers unless (under the statutory obligations of the agencies which the researchers are working with), it is judged that confidentiality will have to be breached for the safety of the participant or others.

I agree to participate in this study.

Your name

Your signature

Signature of investigator

Date
VALIDATION QUESTIONS

Lean Briefing Concept and Approach

Please share your opinion by choosing one from the provided agreement scale: Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree, to express your agreement/disagreement attitude to the following statements:

a) It is expected that; Lean Briefing
   I. Will produce effective project brief when it is performed as a learning exercise.
   II. Will help in early development of the project knowledge base.
   III. Will support delivering a value-added project brief.
   IV. Will not limit design creativity.
   V. Defines where the value of using BIM sits in the front end of the project.
   VI. Will have a positive influence on the quality of design deliverables.
   VII. Will support effective design management.
   VIII. Will enhance construction project delivery.
   IX. Will support achieving both client and construction organisation value.
   X. Will support achieving the UK Government’s BIM mandate, because BIM is implemented functionally in Lean Briefing.

Lean Briefing Strategy

Please share your opinion by choosing one from the provided agreement scale: Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree, to express your agreement/disagreement attitude to the following statements:

a) The planned Management Framework and its associated Lean Briefing Process Operational Roadmap
   I. Are considered as a high-level strategy process.
   II. Are considered to be well planned to support a bidirectional learning exercise between client and design team.
   III. Provides a shared understanding platform to switch subjective requirement to objective requirements.
   IV. Supports the Lean Briefing concept.
b) Lean management principles and their advantages are clearly recognised in the framework and the Process Operational Roadmap design.

c) The value of using BIM as an enabler for Lean Briefing is well established in the Lean Briefing approach.

**Lean Briefing Practicality**

Please share your opinion by choosing one from the provided agreement scale: Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree, to express your agreement/disagreement attitude to the following statements:

a) It is believed that the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap:

   I. Are bespoke and manageably adaptable in terms of the construction organisation context, project context, and client type (experienced/inexperienced).

   II. Are easy manageable.

**Lean Briefing Evaluation**

a) Please give an overall evaluation of the following from your point of view by choosing one of the evaluation marks provided: Excellent, Good, Satisfactory, Poor, or Not sure:

   I. Lean Briefing approach.

   II. Framework strategy.

   III. Framework practicality.

   IV. Quality and clarity of the Lean Briefing Handbook.

b) Do you see Lean Briefing as a novel approach? (Yes, Not sure, No)

c) Are you happy to give Lean Briefing a go? (Yes, Not sure, No)

**Contingency Question List**

Additionally, the following questions were prepared as a contingency plan in case there was a need to encourage participants’ discussion:

1. What do you think of the setup preparations required to do Lean Briefing (i.e. Brief Team, Databank)? Any constraints?
2. Do you think that the participants planned to perform Lean Briefing are well planned for each stage? Do you think that any of them should not be there or are missing?

3. Do you consider that the outlined Lean Briefing tasks are enough to perform the learning task, and that they flow in a logical order?

4. Do you think that the contents of the advised Final Project Brief are sufficient as positive input to the following design tasks?

5. Do you see any space for Lean Briefing to start right at the beginning from the Strategic Definition Stage, Stage 0, or do you agree that the Client Brief is needed to kick off Lean Briefing?

6. Do you expect an active and positive attitude from the client towards the Lean Briefing approach?

7. With the existing of several project procurement roots, what are the arrangements that could be put in place to ensure the operation of the Lean Briefing Perfection Cycle?
EXPLORING THE LEAN BRIEFING PROCESS FOR EFFECTIVE DESIGN MANAGEMENT

Authors:
Mohamed Hani El-Reifi
Prof Stephen Emmitt
Dr. Kirti Ruikar

22/08/2015

CONTENTS
• Background
• Research Work Overview
• Exploring Project Brief Practice
• Main waste drivers against brief value stream
• Lean briefing
• The basis of lean briefing process
• Conclusion

BACKGROUND

According to the RIBA Plan of Work (RIBA, 2013; 2007), briefing occurs at the front end of the project. A key stage in the project’s development, it plays an important role in the initiation and design of a project, and in ensuring valuable outcomes or essential component of Design Management.

Waste in the briefing process lessens the value added to the project and contributes, directly or indirectly, to inefficiency in project delivery due to the creation of inappropriate design deliverables (El. Reifi & Emmitt, 2013; El. Reifi et al., 2013).

BACKGROUND

RESEARCH WORK OVERVIEW

Eliminating waste requires a deep understanding of the system of value creation and then measuring aspects against the definition of value and waste.

The aim of the study was to explore and elicit an understanding of current briefing practices in the industry by means of gauging it, identifying room for improvement, and determining potential briefing value stream.

One to one interviews with eleven experienced practitioners. The majority of them worked for large organisations in the UK construction industry. Their practical experience varied from 15 to 30 years and included various types of projects.

EXPLORING PROJECT BRIEF PRACTICE

1. Briefing practice
   • Briefing by Design, Sub-consciously developed.
   • Competition brief, “Literally, we are given the brief. We have no opportunity to develop it with the client”, An architect
   • It is the client’s task!
   • “I like the building you did over there”, An architect
   • Very little advice was available in terms of how to perform a brief.
   • Allowed time for the briefing.
   • Competition brief

2. Briefing practice evaluation
   • “I think it can be very effective in certain examples and it can be unhelpful otherwise”, An architect
   • “I think a lot of clients are in terms of how to perform a brief.
   • Allowed time for the briefing.
   • Competition brief

3. Lean briefing
   • “I would really like to see lean construction go right the way through from commencement to completion to the end result”, An architect

MAIN WASTE DRIVERS AGAINST BRIEF VALUE STREAM

- Wasting time and resource
- Inadequate communication
- Excessive rework
- Lack of collaboration
- Poor decision-making
LEAN BRIEFING 1/2

1. Lean briefing concept

“It is not just a process, it is an interaction. Therefore, the briefing is critical because that is where the interaction occurs, that is where the understanding occurs, that is where people are given the opportunity to actually have some input into the process”. A design manager

“We have to work with them to understand what they may need, what the scenario could be”. An architect

What is the value? What does value mean? Is it an enjoyable space to be in? What does that mean? The briefing is about getting as far down into the detail as possible. You work out which is best together”. An architect

“Expectation and goals may change throughout the project, as the knowledge base develops and additional contributors join the project”. Brown (2001)

Lean briefing view project brief as the outcome of an up-front education process that works as a shared understanding platform to understand the project and client requirements, and revealing how those could be answered through the explored and identified opportunities that will ensure delivery of a project’s value.

THE BASIS OF LEAN BRIEFING PROCESS

LEAN MANAGEMENT FRAMEWORK FOR PROJECT BRIEF

CONCLUSION

1. Identified the major source of inefficiency and waste in the briefing process, the absence of an official format, brief concept uncertainty, that hinders its supposed added value.
2. Pointed out that, the UK construction industry requires a high-level, official, structured, bespoke approach to briefing.
3. Identified a room for project brief efficiency improvement using lean management theory.
4. Concluded with a lean briefing perception that looks to the project brief as the outcome of an up-front education process that works as a shared understanding platform to understand the project and client requirements, and revealing how those could be answered through the explored and identified opportunities that will ensure delivery of a project’s value.
5. Concluded with a preliminary lean briefing approach, which is proposed as a new alternative novel approach for effective design management.

It is believed that, this novel approach may help to provide consistency across the industry, provide a unique, efficient briefing process which is needed to ensure a deliverable, value-added design, and contribute to the theoretical understanding and practical implementation of lean design management in AEC.
Workshop purpose

- Lean briefing and its management framework have been developed as a result of early interviews, and early validating one to one interviews.
- The purpose of this workshop is to evaluate the developed Lean Briefing based on construction industry practitioners’ experience and getting opinion and views for further improvement.
- The evaluation will be in terms of:
  - Lean Briefing Approach;
  - Lean Briefing Management Framework Strategy; and
  - Lean Briefing Management Framework Practicality.

Planning of the workshop

- **Slot 1: (15min) Introductory presentation**
  This is to present lean briefing to familiar participants with Lean Briefing approach, and the developed Lean Briefing Management Framework.
- **Slot 2: (45min) Discussion**
  Here is where participants will be asked to discuss their views and comments, and offer their feedback regarding the presented Lean Briefing.
- **Slot 3: (20min) Validation questions**
  Here is where participants will be asked to weight their attitude in terms of a set of statements about Lean Briefing using the voting device.
- **Slot 4: (10min) Concluding**

CONTENTS

- What is Lean Briefing?
- Why it has been developed?
- How to do Lean Briefing?
- Lean Briefing Management Framework
- Lean Briefing Process Operational Roadmap?

What is Lean Briefing?

Lean briefing is a process of delivering a value added project brief. It is an up-front shared understanding platform that works as a learning exchange exercise, between client and design team, to develop the project knowledge base early on by means of minimizing potential waste that might be caused later as a result of lack of project knowledge, and to ensure precise project requirements identification (e.g. Client value).

It needs to be implemented by the construction organisation with a project brief as its outcome.
Why it has been developed?

- Given that fact that construction industry has experienced inefficiency in briefing practice which was tracked back through the on-going research to:
  - Uncertainty in terms of project brief concept, and
  - Absence of formal procedure on how to deliver project brief.
- Lean Briefing has been developed to:
  - Deliver value added project brief which will enable better design management and therefore effective design deliverables.
  - It is hoped to contribute to overcome experienced causes of inefficient project delivery.

How to do Lean Briefing?

- Lean Briefing Management Framework was planned to provide a working strategy guide for construction organisation on how to manage Lean Briefing and deliver an effective value added project brief.
- The framework draws direction and explains how to perform Lean Briefing exercises by make use of lean management principles to achieve both client and organisation value's.
- The framework is aimed for construction industry. However, it is adaptable so organisations can customise it according to their business context.
What is the operational roadmap?

Slot 2: (45min)
Discussion

1. What do you think of:
   a) Lean Briefing Approach?
   b) Lean Briefing Management Framework?

2. What is your comments? Do you have any advise, or view that could make it better?

Slot 3: (20min)
Validation questions

Validation questions: Lean Briefing Approach 1/10

It is expected that, Lean Briefing will produce effective project brief when it is performed as learning exercise.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

Lean Briefing Approach
<table>
<thead>
<tr>
<th>Validation questions: Lean Briefing Approach 2/10</th>
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</thead>
<tbody>
<tr>
<td>It is expected that, Lean Briefing will help in early developing the project knowledge base.</td>
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<td>A. Strongly Agree</td>
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<td>B. Agree</td>
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<tr>
<td>C. Neutral</td>
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<td>D. Disagree</td>
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<tr>
<td>E. Strongly Disagree</td>
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<th>Validation questions: Lean Briefing Approach 3/10</th>
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<tbody>
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<td>B. Agree</td>
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<td>C. Neutral</td>
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<td>D. Disagree</td>
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<tr>
<td>E. Strongly Disagree</td>
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<tr>
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<td>B. Agree</td>
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<td>C. Neutral</td>
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<td>D. Disagree</td>
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<th>Validation questions: Lean Briefing Approach 5/10</th>
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</thead>
<tbody>
<tr>
<td>It is expected that, Lean Briefing defines where is the value of using BIM sits in the front end of the project.</td>
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<td>A. Strongly Agree</td>
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<td>B. Agree</td>
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<td>C. Neutral</td>
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<td>D. Disagree</td>
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<td>E. Strongly Disagree</td>
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<th>Validation questions: Lean Briefing Approach 6/10</th>
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<tbody>
<tr>
<td>It is expected that, Lean Briefing will have a positive influence on the quality of design deliverables.</td>
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<tr>
<td>A. Strongly Agree</td>
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<td>B. Agree</td>
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<td>C. Neutral</td>
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<td>D. Disagree</td>
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<tr>
<td>E. Strongly Disagree</td>
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<th>Validation questions: Lean Briefing Approach 7/10</th>
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<tbody>
<tr>
<td>It is expected that, Lean Briefing will support effective design management.</td>
</tr>
<tr>
<td>A. Strongly Agree</td>
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<td>B. Agree</td>
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<td>C. Neutral</td>
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<tr>
<td>D. Disagree</td>
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<tr>
<td>E. Strongly Disagree</td>
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</tbody>
</table>
It is expected that Lean Briefing will enhance construction project delivery.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

It is expected that, Lean Briefing will support achieving both of; client and construction organisation value.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

It is expected that, Lean Briefing will support achieving the UK Govt. BIM mandate because BIM is implemented functionally in lean briefing.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

The planned Lean Briefing Management Framework Considered as a high-level strategy process.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

The planned Lean Briefing Management Framework Considered as it is well planned to support bidirectional learning exercise between client and design team.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree
Validation questions: Lean Briefing Strategy 3/6

The planned Lean Briefing Management Framework Provides a shared understanding platform to switch subjective requirement to objective requirements.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

Validation questions: Lean Briefing Strategy 4/6

The planned Lean Briefing Management Framework Supports the Lean Briefing definition.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

Validation questions: Lean Briefing Strategy 5/6

Lean management principles, and its advantages are clearly recognised in the Framework design.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

Validation questions: Lean Briefing Strategy 6/6

The value of using BIM as enabler for Lean Briefing is well established in the Framework design.

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree

Validation questions: Lean Briefing Practicality 1/2

It is believed that Lean Briefing Management Framework is bespoke and manageably adaptable in terms of, construction organisation context; project context; and client type (experienced/ inexperienced).

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree
It is believed that Lean Briefing Management Framework is easy manageable.

- A. Strongly Agree
- B. Agree
- C. Neutral
- D. Disagree
- E. Strongly Disagree

Please give an overall evaluation of the Lean Briefing Approach?

- A. Excellent
- B. Good
- C. Satisfactory
- D. Poor
- E. Not sure

Please give an overall evaluation of the Lean Briefing Management Framework Practicality?

- A. Excellent
- B. Good
- C. Satisfactory
- D. Poor
- E. Not sure

Please give an overall evaluation of the quality and clarity of the Lean Briefing Handbook?

- A. Excellent
- B. Good
- C. Satisfactory
- D. Poor
- E. Not sure

Please give an overall evaluation of the Lean Briefing Management Framework Strategy?

- A. Excellent
- B. Good
- C. Satisfactory
- D. Poor
- E. Not sure
Validation questions: Lean Briefing Evaluation 5/6

Do you see Lean Briefing as a novel approach?

A. Yes
B. Not sure
C. No

Validation questions: Lean Briefing Evaluation 6/6

Are you happy to give Lean Briefing a go?

A. Yes
B. Not sure
C. No

Thank You.

Mohamed Hani El.Reifi
M.H.El-Reifi@lboro.ac.uk
Lean Briefing Management Framework

Lean Briefing Process Operational Roadmap

PhD Research Project by Mohamed Hani El. Reifi
Supervisors  Prof. Stephen Emmitt
Dr. Kirti Ruikar
Appendix (C)

Lean Briefing Handbook (First edition)
Lean Briefing
for Effective Design Management

PhD Research Project by:
Mohamed Hani El. Reifi

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Email: M.H.El-Reifi@lboro.ac.uk
Mobile No: +44 75 8404 8403
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   2.2 Operational Roadmap ............................................. 5
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Overview

Briefing is an up-front project stage to expose, articulate, understand, define and manage project and client requirements’, and revealing how those could be answered through the explored and identified opportunities which will ensure delivery of a project’s value. Lean briefing is a new novel approach that aims to deliver a value added project brief. It is developed as a more efficient procedure and better management and structured approach to briefing that will enable effective design management and therefore better design deliverables. Lean briefing view project brief as the outcome of a two way learning process where designer broaden the client vision through introducing potential options which will help the client to figure out and make a decision of the project requirements while client will help the designer realise and highlight those value in favour of design task later. It is a value focus interactive planning for the design task with the project brief as its outcome.

To do lean briefing, Lean Briefing Management Framework is planned with a supplementary Lean Briefing Process Roadmap to provide a working strategy for construction organisation on how to manage lean briefing and explains how best to deliver an effective value added project brief. The framework draws direction and explains how to perform lean briefing exercise by make use of lean management principles to achieve both client and organisation value’s. This handbook offer detail guide on Lean Briefing Management Framework and its associated Lean Briefing Process Roadmap.
1. Lean Briefing

Lean Briefing is an up-front shared understanding platform that works as a learning exchange exercise, between client and design team, to develop the project knowledge base early on by means of; minimising potential waste that might be caused later as a result of lack of project knowledge, and to ensure precise project requirements’ identification (e.g. Client value). Lean briefing provides a uniquely efficient briefing process approach which is needed to ensure a value-added design deliverable as it is main focuses on value identification and enhancing project delivery. The lean briefing approach is valuable as it is unlike others briefing approaches by being lean.

Lean Briefing Management Framework is crafted based on Lean Management theory with Lean Principles being embedded in the process. According to the lean management theory, the best process value stream can be achieved by establishing push and pull in the process flow, and this was the focus in designing the lean briefing. This feature was achieved in two places in Lean Briefing Management Framework. In the first instance, by keeping the development of the project brief in the developed Lean Briefing Process Roadmap aligned to RIBA Plan of Work; in the front end of the project. This will help achieving push and pull between brief stage and design stage and therefor achieving the best value stream of project delivery. The Second place, push and pull were established within the project brief development stage itself via planning briefing as a learning journey. This will enable project requirements to be pulled via the learning exercise that was embedded in the process of project brief
development by means of developing the knowledge base early in the front end of the project and therefor achieving the best value stream of the project brief. Keep seeking perfection is another important principle of lean management theory. Perfection cycle is embedded in the developed Lean Briefing Management Framework, which will enable future and continues improvement via learned lessons.

The framework is aimed for the construction industry and it is made adaptable so design and construction organisations can customise it according to their business context. However, to legitimise the lean briefing and improve consistency industry-wide, lean briefing approach planned in line with the RIBA Plan of Work. It serves both experience and inexperienced clients, and facilitate engaging all potential project stakeholders. It serves different project context, however, especial arrangement is likely needed for some of the procurement roots in terms of how to exchange information that are required to feed the process with lessons learned for continuous process improvement.

The value of Lean Briefing approach is believed because it is based on a platform of wide range of learned lessons from several organisation where is some of them are well known companies that work globally. It is also believed as this novel approach likely helps to provide consistency across the industry and provide a uniquely efficient briefing process which is needed to ensure a deliverable, value-added design. It is hoped to contribute to overcome experienced causes of inefficient project delivery.
2. Lean Briefing Management Framework

In general, the framework provides a holistic management system for delivering project brief. That includes strategy advice on how to improve the future delivering process through learned lessons. The framework instructs a strategy to work out lean briefing in two levels; organisational level and project level. This flow by starting a “Preparation Set up” on organisation level, then practicing “Operational Roadmap” on project level with a plan for a continual process improvement through learned lessons by entering into an endless “Perfection Cycle” on organisational level. All company’s projects need to be delivered under this management framework. It starts by establishing the “Preparation Set up”. Then by having this set up in place each project brief can be delivered by make use of the recommended lean briefing “Operational Roadmap”. This project brief will be subjected to reviewing and reporting process of learned lesson and their impact on the next stages, and future lean briefing process. This is made based on the planned “Perfection Cycle”.
2.1 Preparation Set up

To operate lean briefing on the project level, especial resources arrangements are needed on organisational level. Those arrangements include; appointing brief team, establishing databank with several data sources such as BIM and others that are necessary to support learning exercise during project brief development stage, and have in hand a step by step operational roadmap on how to perform lean briefing exercise with clear stages deliverables’. Preparation Set up provides advice on the required set up that need to be put in place to handle all the project brief delivered by the company in the same way.

The idea behind appointing brief team, responsible for carrying out all the company’s project brief, is building the base by which lesson learned from different project can be exchanged between projects as all the information will be available in the same database and managed by the same people. Further to that, its task focuses on finding and identifying project requirements and avoids briefing by design which many practices do. Architects tend to find requirements based on testing several design proposals that are, in most cases, launched from the architect view’s rather than from project requirements. So the point is to help launch the idea from the identified requirements not to lunch the requirements from the idea as some idea might be missing. What is more, having the brief team as design review panel will ensure both client value and organisation value. Organisation value is targeted through achieving client value which will build an excellent reputation and therefore secure repeat business. The brief team size is subject to company size and how many project they are doing. You will have fixed members of the
brief team and you will have exchangeable member vary for each project. These exchangeable members are the design team for that specific project and any special consultant needed depending on the project context. However, for small construction companies that are not procuring many projects at the same time, it is not financially practical to recruit a brief team just to do briefing task. So it could be worked out by adding management of project brief task as an extra responsibility to related practitioner (e.g. Architect, or Design Manager) within the organisation. Other required brief team member’s that is not available in the organisation can be hired as consultant member.

2.2 Operational Roadmap

The operational roadmap explains how to carry out the lean briefing process in detail. It details, by make of use of the “DO Model”, step by step, actions, resources, and activities which brief team has to undertake from the start to end for crafting efficient project brief, and monitoring that project brief, by make of use of the “CHECK Model”, by means of reporting and evaluating potential changes on the following project stages, and recording learned lessons for continual lean briefing process improvement in favour of future projects. Detail explanation of this operational roadmap will be in section 3.

2.3 Perfection Cycle

The perfection cycle shows how to continually improve lean briefing by make of use of the “CHECK Model” in the “Operational Roadmap” to track and record source of changes
Lean Briefing throughout project delivery stages. The idea is to have a lean briefing operational roadmap in hand as starting point which will help in delivering the first project brief. Reported lessons via delivered reflection reports in the “CHECK Model” for the first project will feed the required process improvement, and help adjusting lean briefing for the next project via previous learned lessons. Further explanation will follow through the operational Roadmap in section 3.
3. Lean briefing Process Operational Roadmap

The lean briefing process Operational Roadmap is operated within the Lean Briefing Management Framework that needs to be embedded in the organisation working strategy. It is operated at the project level. Operational roadmap explains in detail how to perform lean briefing as a learning exchange exercise in a way that will aid the client and design team collaboratively find out potential project options, and then testing those through the concept design task to find out which of them is the best to likely meet client value. This in turn will help in effectively define project requirements in the project brief. Additionally, the Operational Roadmap describes how to monitor the delivered project brief to early forecast the impact of any deviation from the delivered project brief on the next project deliverable stages, and most importantly for future lean briefing process improvement.

The Operational Roadmap is lined up to the official RIBA Plan of Work project stages, and it encompasses two operational models, “DO Model” and “CHECK Model”. The responsibility and the body in charge of the project brief at each stage of project development stages, as well as the contributors at each stage are detailed on the Operational Roadmap. Tasks to be undertaken at each stage are also outlined and detail description on how to perform each task are detailed on the Operational Roadmap. It advises also the data sources required to perform those tasks at each stage. In the last place, Operational Roadmap precisely articulates the expected outcomes in terms of the project brief at each stage of the RIBA Plan of Work.
According to the Operational Roadmap, project brief is the outcome of a lean briefing process that occurs right at the start of a project. The process develops from Preparation and Brief (Stage 1) to the Concept Design (Stage 2). The process operation commences by having an open up Strategic Definition (i.e. Client Brief) that needs to be delivered at Strategic Definition stage (Stage 0) from the client side as a call for the project. This is a hard gate. There Strategic Definition (i.e. Client Brief) needs to be evaluated to find out whether it is mature enough to start the lean briefing process. From there the project brief goes through two main phases over the Operational Roadmap. Phase one is the development of the project brief throughout the “DO Model” where project brief is sufficiently crafted to carry out project design task. Phase two is when the process is switched from “DO Model” to “CHECK Model” where the delivered project brief is monitored throughout the “CHECK Model”.
3.1 Lean Briefing DO Model

“Do Model” describes the development of the project brief. This development mainly occurs in the early stages of the official RIBA Plan of Work. It is set to be run between Stage 1 (Preparation and Brief) and Stage 2 (Concept Design) to explore project requirements. Stage 1 works as a shared understanding platform for learning exchange between client and design team where a facilitator party (Brief Team) takes the responsibility of finding opportunities, and pulling potential project solutions through this learning exchange exercise by means of detection unseen possible requirements, and interpreting subjective needs into an objective needs. At this stage the potential project design solutions are explored and proposed. Serious of tasks, explained in detail on the operational roadmap, need to be undertaken to help achieve that. Soft gate is planned at the end of this stage where an Initial Project Brief needs to be delivered in a form of design mood board.

Then the delivered Initial Project Brief is taken to the next stage, Stage 2. Stage 2 works as the platform for testing the proposed potential solutions and choosing among those the one that best matches client and project requirements. The stage perceived as the first stage for Project Design Team to be officially engaged in the project. At this stage the Project Design Team tests the proposed potential solutions which are then evaluated by Brief Team to help developing the project design concept. The Brief Team works as a review panel to check it and initially validate it. A hard gate was planned at the end of Stage 2 where Brief Team issues the Final Project Brief which outlines where the project starts and how it proceeds, as well as deciding and confirming with the client
what options will be adopted. At this point the project brief is finalised for that specific project, and monitoring process via “CHECK Model” will take place.

➢ **Lean Briefing DO Model Tasks**

**STAGE 1 PREPARATION AND BRIEF**

**a) Evaluate Strategic Brief (Brief Team)**

- Check and study the Strategic Brief whether it includes the minimum requirements from the client side to start the Project Brief (e.g. Feasibility study, business objectives, business relationships, available budget, proposed time, site location, constraints, specific needs if any, etc.).

- If it is not adequate to initiate the Project Brief, send it back to the client requesting the missing information to be provided OR appoint a Client Design Advisor to assist the client with the Strategic Brief.

**b) Analyse Strategic Brief (Brief Team)**

- Map business relationship bubbles

- Develop set of questions for the first official meeting with the client to understand more about the project and client business. Mainly to open the communication channel with the client and finding out possible access to investigate the client business to understand more about the project, and defining the limitations if any.

**c) Conduct an official meeting with the client (Brief Team)**

- Prepare the meeting agenda and ask client officially for the first official meeting, preferably in the client office.

- Do a quick tour in the client business office’s to build preliminary business background.

- Give a brief introduction of your understanding of the project and then find answers for your prepared set of question.
Lean Briefing

_ jointly translate and develop business objectives into a set of project objectives.

_ Record minutes of the meeting and keep any paper notes for filing.

  d) Site visit (Brief Team)

_ Arrange your first official site visit with the client to build preliminary site background.

_ Observe and note down any site issue and discuss it with the client.

_ Note down some planning requirements hints from observing the building around.

  e) Do a site survey (Brief Team)

_ Appoint surveyor to do a site survey

_ Site boarders, soil investigation, etc.

  f) Start precedent study (Brief Team)

_ Decide how you are going to approach the project and write a strategy of searching information related to the project.

_ Review client published reports.

_ Search and define similar project and make sure of option variety (e.g. Quality, technology used, etc.)

_ Review manufactures’ Catalogue and professional magazine.

_ Find out about planning requirements in the project area.

_ Find out about energy performance options

_ Find out about sustainable opportunities.

_ Conduct user survey (e.g. Questionnaire, interview, observation).

_ Check and analyse survey data and study outcome against Strategic Brief, project objectives and previous meeting outcome, and define opportunity and clashes if any.

_ Define similar building to visit
g) Conduct a Learning Workshop (Brief Team)

- Prepare to present the main outcome of the precedent study to the client, and invite the client officially for the official workshop.
- Conduct a workshop by means of educating the client of the potential opportunities. Simultaneously, you try to understand the likely potential trends according to client perspective through this exercise.
- Try as possible to engage different parties from the client organisation in the workshop (e.g. User, anybody you think might influence the project later)
- Report the main workshop outcome trends. No decision need to be developed here as the exercise mainly for tracking the project potential opportunities and identifying if any additional research or consultation are needed.
- Visit similar building

h) Conduct a Value Management Workshop (Brief Team)

- Based on the outcome from the conducted learning workshop, if needed, do any additional research required and contact any specific consultant needed to support with the project.
- Revisit data and the main outcome from precedent study and re-analyse it in conjunction with the learning workshop outcome and the additional research and consultation outcome.
- Prepare to present the main outcome from re-analysis to the client.
- Conduct a value management workshop and jointly redevelop project objective, identify the best potential root for the project design, and develop project requirements in objective form.
- Tools used to identify the best potential value need to be used here (e.g. Choosing by advantage, optioneering).
- Try as possible to engage different parties from the client organisation in the workshop (e.g. User, anybody you think might influence the project later)
i) Issuing Initial Project Brief (Brief Team)

- Using Value management workshop outcome, develop the Initial Project Brief by creating a mood board, outlining project objectives and requirements, and developing evaluation criteria.

- Present to validate the Initial Project Brief by conducting a validating workshop with the client, project architect and project design manager, and seek for client approval.

STAGE 2 CONCEPT DESIGN

a) Evaluate Initial Project Brief (Project Design Team)

- Check and study the Initial Project Brief to determine whether it is adequate to start the Concept Design.

- If it is not adequate to initiate the Concept Design, seek clarification from the Brief Team.

b) Develop a Concept Design (Project Design Team)

- Arrange for the Project Design Team to visit the site and get site background.

- Architectural plans and ideas need to be sketched by the Project Architect based on the Initial Project Brief.

- Preliminary structural design strategy needs to be outlined by Structural Engineer based on the Initial Project Brief and the developed Architectural plans.

- Preliminary service design strategy (e.g. Electrical system, ventilation and heating system) need to be outlined by Service Engineers based on the Initial Project Brief the developed Architectural plans.

- Preliminary Project cost estimation needs to be calculated by Project Quantity Surveyor based on the developed Concept Design.

- Coordinate and Collaborate with other design team member’s to define clashes if any, and verify the Concept Design.

- BIM need to be used here to support with defining clashes if any, test energy efficiency, cost estimation, visualisation, etc.
c) Review Concept Design (Brief Team)

- Check Concept Design against the Initial Project Brief to make sure it meets the project requirements.

- From your perspective, if the Concept Design added something good for the project which is not mentioned in the Initial Project Brief, keep it and explain to the client later and what benefit could it be brought to the project.

- If the Concept Design does not meet the Initial Project Brief, report that and discuss it with the Project Design Team to do the necessary alteration.

d) Conduct a Concept Design Validation Workshop (Brief Team)

- Ask Project Architect to prepare to present the Concept Design to the client.

- Conduct a Concept Design validation workshop.

- Record view and comments made by the client and develop the potential alteration report.

- Immediately in the workshop advise and explain to the client if you believe the comments made will have a huge impact on estimated project cost.

e) Improve the Concept Design (Project Design Team)

- Redevelop the Concept Design based on the outcome from the Concept Design validation workshop.

- Recalculate the project estimation cost.

f) Review the improved Concept Design and make sure the alterations requested are addressed (Brief Team)

g) Conduct a Concept Design Revalidation Workshop (Brief Team)

- Ask Project Architect to prepare to present the improved Concept Design to the client.

- Conduct a Concept Design revalidation workshop.
Lean Briefing

- Advise and explain to the client implications on the project cost estimation
- Record view and comments made by the client and prepare to consider them in developing the Final project Brief.

h) Issuing Final Project Brief (Brief Team)

- Revisit Initial Project Brief and update it according to the approved concept design and project cost estimation.
- Validate the Final Project Brief by conducting a validating workshop with the client, project architect and project design manager, and seek for client approval.

3.2 Lean Briefing CHECK Model

The “CHECK Model” is set to be between Stage 3 (Developed Design) and Stage 6 (Handover and Close Out). “CHECK Model” describes how to monitor the delivered project brief. The purpose of this monitoring process is not a continuous development of the project brief rather it is a recovering process to track any changes and its consequences, and to report learned lessons for a continual process improvement for future projects. It works by delivering a regularly reflection report at the gateways from Stage 3 to Stage 6. The gateways work as a checking point where is, for example, the developed design needs to be reviewed against the Final Project Brief, and reflect on that for two purposes; firstly the potential impact on the following project stages, and secondly reporting learned lessons for future projects.

Here it must be stated that, optimum briefing practice, where is no deviation from the project brief occurs “at all”, is unlikely attainable in the construction industry. However, the aim of implementing this “CHECK Model” in the Operational
Roadmap is to minimise the prospective deviation as possible as can to get closer to the optimum practice.

➢ Lean Briefing CHECK Model Tasks

STAGE 3 DEVELOPED DESIGN

a) Review the Developed Design against the Final Project Brief (Brief Team)

- Report changes, if any, and identify why it took place? Is it related to any unclear issue in the Final Project Brief? Is it related to client change of mind? Is it related to new issue arising such as new technology or upgrading in specific system?

- Report what implication could have those changes, if any, on the following stage/s.

- Deliver action report.

b) Deliver Reflection Report (Stage 3: Brief)

STAGE 4 TECHNICAL DESIGN

a) Review the Technical Design against the Final Project Brief, and the Reflection Report (Stage 3: Brief) (Brief Team)

- Report changes, if any, and identify why it took place? Is it related to any unclear issue in the Final Project Brief? Is it related to the changes that took place in the previous stage, if any? Is it related to client change of mind? Is it related to new issue arising such as new technology or upgrading in specific system?

- Report what implication could have those changes, if any, on the following stage/s.

- Deliver action report.

b) Deliver Reflection Report (Stage 4: Brief)
STAGE 5 CONSTRUCTION

a) Review the project against the Final Project Brief, and the Reflection Report (Stage 4: Brief) (Brief Team)

Report changes, if any, and identify why it took place? Is it related to any unclear issue in the Final Project Brief? Is it related to the changes that took place in previous stages, if any? Is it related to client change of mind? Is it related to new issue arising such as new technology or upgrading in specific system? Is it related to construction issue?

Report what implication could have those changes, if any, on the following stage/s.

Deliver action report.

b) Deliver Reflection Report (Stage 5: Brief)

STAGE 6 HANDOVER AND CLOSE OUT

a) Review the project against the Final Project Brief, and the Reflection Report (Stage 5: Brief) (Brief Team)

Report service operation issues, if any, and identify why it took place? Is it related to any unclear issue in the Final Project Brief? Is it related to the changes that took place in previous stages, if any? Is it related to arising new issue such as new technology or upgrading in specific system? Is it related to construction issue? Is it related to the quality issue? Is it related to miss operation? Is it related to conflict between systems?

Report what implication could have those issues, if any, on the use.

Deliver action report.

b) Deliver Reflection Report (Stage 6: Brief)
Lean Briefing for Effective Design Management

Appendix

Lean Briefing Management Framework
Lean Briefing Process Operational Roadmap
Lean Briefing
for Effective Design Management

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Overview

A briefing is a front-end project stage to expose, articulate, understand, define and manage the project and the client’s requirements, and to reveal how those can be answered through the explored and identified opportunities which will ensure the project’s value identification and representation. Lean Briefing is a novel approach that aims to deliver a design value-added project brief. It has been developed as a more efficient procedure and better management and structured approach to briefing that will enable effective design management and therefore better design deliverables. Lean Briefing views the project brief as the outcome of a bidirectional learning application where the designer broadens the client’s vision through introducing potential project solution options which will help the client to figure out and make a decision on the project requirements while the client will help the designer to realise and highlight values in the favour of the design task later. It is a value focus interactive planning process for the design task with the project brief as its outcome.

To undertake Lean Briefing, the Lean Briefing Management Framework has been planned with a supplementary Lean Briefing Process Operational Roadmap to provide a working strategy for UK construction organisations on how to manage Lean Briefing and explain how best to deliver a design value-added project brief. The framework draws direction and explains how to perform Lean Briefing to achieve both client and organisation values. This handbook offers a detailed guide on the Lean Briefing Management Framework and its associated Lean Briefing Process Operational Roadmap.
1. Lean Briefing

Lean Briefing is an up-front shared understanding platform that works as a learning exchange application, between the client and design team, to develop the project knowledge base early on by means of minimising potential waste that might be caused later as a result of lack of project knowledge, and to ensure the precise identification and representation of the project requirements (e.g. client value). Lean Briefing provides a uniquely efficient briefing process approach which is needed to ensure a design value-added project brief. Its main focuses is on value identification and representation. Lean Briefing is valuable because it applies a Lean approach to the briefing process.

The Lean Briefing Management Framework has been crafted based on Lean Management theory, with Lean Principles being embedded in the process. Aspects of Lean Management have been implemented and realised in the Operational Roadmap in terms of firstly, identifying the Briefing Value Stream Map so as to strictly make the brief development process in line with the RIBA Plan of Work official project brief stages. Secondly and according to Lean Management theory, the best process value stream can be achieved by establishing push and pull in the process flow, and this was the focus in designing the Lean Briefing process. This feature was achieved in two ways: in the first instance, by keeping the development of the project brief according to the RIBA Plan of Work, in the front end of the project. This will help in achieving push and pull between the brief and design and therefore achieving the best value stream of project delivery. Secondly, push and pull were established within the project brief development itself by planning Lean Briefing to be carried out as a learning application. The learning application
that was built in Lean Briefing by means of developing the knowledge base early in the front end of the project will push potential project solution options to arise on the shared understanding platform, and testing those throughout concept design will enabling the pulling of the appropriate client and project requirements. ‘Keep seeking perfection’ is the most important principle of Lean Management theory. The Perfection Cycle is embedded in the Lean Briefing Management Framework, which will enable continuous improvement in the Lean Briefing process via learned lessons.

The framework is aimed at the UK construction industry and has been made adaptable so that design and construction organisations can customise it according to their business context. However, to legitimise the Lean Briefing and improve consistency industry-wide, the approach outlined here has been planned in line with the RIBA Plan of Work. It serves both experienced and inexperienced clients, and facilitates engaging all potential project stakeholders. It also serves in different project contexts; however, to help in tracking and reporting the lessons learned in the planned Perfection Cycle for continuous process improvement, special arrangements are likely needed for some procurement routes where the following project delivery stages (e.g. construction stage) is completed by another company.

The value of the Lean Briefing approach lies in the fact that it is based on a platform of a wide range of learned lessons from several organisations, including well-known companies that work globally. It is believed that this novel approach will ensure design value-added project brief delivery and help to provide industry-wide consistency.
2. Lean Briefing Management Framework

The Lean Briefing Management Framework illustrated in (Figure 1; clear illustration is attached in the Appendix) provides a holistic management strategy guide for UK construction organisations on how to manage and control the Lean Briefing process in their practice. It includes advice on a strategy to help a continuous improvement in the Lean Briefing process for future projects. The framework is aimed at construction industry organisations and is made adaptable so that organisations can customise it according to their business context.

![Lean Briefing Management Framework](image)

**Figure 1 Lean Briefing Management Framework**

The framework provides a strategy to work through Lean Briefing on two levels, the organisation level and the project level. This works by first establishing a “Preparation Setup” on
the organisation level, then, with this setup in place, the Lean Briefing process is put into practice using the recommended “Operational Roadmap” on the project level with a plan for a continuous process improvement through learned lessons by entering into an endless “Perfection Cycle” on the organisation level. All of a company’s projects need to be delivered under this management framework.

2.1 Preparation Set up

The Preparation Setup (Figure 1.a) that is shown as a component of the Management Framework elements at the organisation level (Figure 1; clear illustration is attached in the Appendix) highlights the special resources arrangements that need to be put in place at the organisation level to help in handling briefing practices at project level consistently for all projects carried out by the company. Those arrangements include appointing a Brief Team, establishing an organisation databank, and having in hand a step-by-step Operational Roadmap for performing the Lean Briefing including clear stages and deliverables.

![Figure 1.a Preparation Setup](image-url)
It is advisable to appoint a Brief team to be responsible for carrying out the briefing task for all projects the company is commissioned for, and working as a design review panel to ensure design process value. Appointing a Brief Team will ensure that the operational task focuses on finding and identifying client and project requirements through the briefing process, and avoiding briefing by design. It will further help to exchange learned lessons between projects, as all information will be available in the same database, managed by the same people. The Brief Team should work as part of the design management system in the company, and consist of a fixed group of people (i.e. Architect, Structural Engineer, Service Engineer, Quantity Surveyor) working together with other exchangeable members who will vary for each project. These exchangeable members are the design team for a specific project and any special consultants needed depending on the project context. However, appointing a specific Brief Team will be subject to the size of each organisation and its business context, as sometimes it is not financially practical for a company to recruit a Brief Team just to conduct the briefing task (e.g. some small construction organisations do not procure many projects at the same time). In such cases, management of the project brief task can be added as an extra responsibility to a related practitioner (e.g. Architect or Design Manager) within the organisation. Other required Brief Team members who are not available in the organisation can be hired as consultants.

It is also advisable to establish a Databank within the organisation to support the learning application while preforming Lean Briefing at the stage of brief development process. This Databank includes learning support tools such as BIM
simulations from previous project libraries, besides other data source materials (e.g. specifications, standards, manufacturers’ catalogues, professional magazines).

Finally, it is advised to use the Operational Roadmap, as a ready-made step-by-step operational guide to how to perform the Lean Briefing process, to be used in performing the first Lean Briefing practice in the company. This Operational Roadmap will be subject to continuous improvement based on learned lessons from Lean Briefing practices within the company.

2.2 Operational Roadmap

The Operational Roadmap (Figure 1.b) which is shown as a component of the Management Framework elements at the project level (Figure 1; clear illustration is attached in the Appendix) explains how to carry out the Lean Briefing process in detail. It details, by making of use of the “DO Model”, the step-by-step actions, resources, and activities that the Brief Team must undertake from the start to the end to craft a design value-added project brief, then promotes the monitoring of the delivered project brief by making use of the “CHECK Model”, to achieve (i) early capturing and evaluating of the impact of any potential deviation on the following project delivery stages, and (ii) reporting learned lessons for a continuous Lean Briefing process improvement in the favour of the company’s future projects. A detailed explanation of this Operational Roadmap will follow in Section 3.
2.3 Perfection Cycle

The Perfection Cycle (Figure 1.c) that is shown as part of the Management Framework elements at the organisation level (Figure 1; clear illustration is attached in the Appendix) displays how to continuously improve the Lean Briefing process by using the learned lessons reported back to the system via both the “DO Model” and the “CHECK Model” in the “Operational Roadmap”. Having the ready-made Lean Briefing Operational Roadmap to hand as a starting point will help in practising the first Lean Briefing process. The first Lean Briefing process practice is unlikely to be the ideal practice. However, keeping practising the Lean Briefing process via the Operational Roadmap and continuously improving it by means of the planned Perfection
Cycle (Figure 1.c) will help in capturing the required process improvement, and consequently help in adjusting the Lean Briefing process for the next project. Eventually, the Lean Briefing process will reach a stage where the leaned lessons become exhausted and it gets closer to the optimum practice within the organisation. However, it must be stated here that an optimum briefing process practice where no deviation from the project brief occurs at all is unlikely to be attainable in the construction industry. The aim of implementing this “Perfection Cycle” is to minimise the prospective deviation as much as possible and to get closer to the optimum practice. Further explanation will follow through the Operational Roadmap in Section 3.

Figure 1.c Perfection Cycle
On the strategic level, the Brief Team is advised to evaluate the attributes of the Lean Briefing practice implementation in terms of what seems to be working and whether any major challenges or problems are occurring during the use of the Management Framework and Operational Roadmap. This provides a basis to enable the Brief Team to assess the implementation of the Lean Briefing. It is further advised to consider the following issues about major successes for each delivered project scheme, where possible, to aid continuous Lean Briefing process improvement:

- **In the short term:**
  - Assess whether a satisfactory detailed project brief has been achieved.
  - The performance of the Lean Briefing process is measurable by the quality of the design achieved from the delivered project brief, and the level of client and building organisation satisfaction with the resultant design, measurable by how many changes and adjustments were required to ensure final product/building satisfaction.

- **In the medium term:**
  - Upon completion, the measure is whether the built solution meets the client’s expectations in accordance with the delivered project brief. The performance of the Lean Briefing process is measured by the client agreeing that the completed product/building meets their expectations.
• In the long term:
  - Assess how the product/building meets the business and users’ needs, and how it adapts to constant use and maintenance.
3. Lean Briefing Process Operational Roadmap

The Lean Briefing Process Operational Roadmap (Figure 2) is operated within the Lean Briefing Management Framework (Figure 1), which in turn needs to be embedded in the organisation’s working strategy. The Operational Roadmap is aligned with the RIBA Plan of Work project stages, and encompasses two operational models, the “DO Model” and the “CHECK Model” (Detail illustrated is attached in the Appendix).

Figure 2 Lean Briefing Process Operational Roadmap

According to the Operational Roadmap, the project brief is the outcome of a Lean Briefing process that occurs right at the start of a project. The DO Model explain project brief development
process and runs from Preparation and Brief (Stage 1) to Concept Design (Stage 2). The operation process commences by having an open client brief that is normally delivered at the Strategic Definition stage, Stage 0, from the client side, is the call for the project. This is a hard gateway where the Strategic Brief needs to be evaluated to find out whether it is advanced enough to progress to the Lean Briefing process. After this point, the project brief needs to be delivered by means of the Lean Briefing process over Stages 1 and 2 of the RIBA Plan of Work. A well-established project brief is needed at the end of Stage 2 to facilitate effective design process tasks. Throughout this project brief development process, in accordance with the Lean Briefing process, the project brief acquisitions established in the RIBA Plan of Work need to be fulfilled. The Initial Project Brief needs to be delivered at end of Stage 1. However, it is a soft gateway and the outcome needs to be in a form of a mood design board which comprises several potential project scenarios. From then, the target should be towards achieving the Final Project Brief at end of Stage 2. This is a hard gateway for the Final Project Brief to be finalised and delivered.

Accordingly, after this gateway, the Lean Briefing process is switched from the DO Model to the CHECK Model, where the process of monitoring the design and construction project phases against the delivered project brief needs to take place at the end of each stage of the RIBA Plan of Work. The CHECK Model describes the delivered project brief monitoring process and runs from Stage 3 to Stage 6. The purpose of this is not a continuous development of the project brief, but rather a recovery process to capture any deviations from the established project brief, and find out about its consequences on the project delivery outcome.
early. The value of this CHECK Model is further to report learned lessons for continuous improvement of Lean Briefing process, in the favour of the next project brief delivery.

The Operational Roadmap (Detail illustrated is attached in the Appendix) further provides a detailed explanation of the action plan at each of the briefing stages: what to do at each stage, how and by who. At the top of the Operational Roadmap, the scope of work in terms of the project brief at each stage of the RIBA Plan of Work is explained. Afterwards, in chronological order, the responsibility for the stage, the body in charge, and the contributing members of the Brief Team for each of the briefing stages are specified. Then, the data sources required to perform each of the briefing stages are defined. These are classified into two main types: data from the organisation’s databank and data from research/ exploration. The data from the organisation’s databank is the BIM simulations library and all the recorded data from previous projects, together with other data source materials (e.g. specifications, standards, manufacturers’ catalogues, professional magazines), whereas, the data from research/ exploration represents the potential research/exploration that mostly will be needed to find information related to the on-going project. Following this, the tasks that need to be undertaken at each of the briefing stages are outlined and a detailed description of how to perform each task is given. Then, at the bottom of the Operational Roadmap, the outcomes in terms of the project brief at each stage of the briefing stages are defined.

3.1 Lean Briefing DO Model

The DO Model describes the project brief development process between Stage 1 (Preparation and Brief), and Stage 2 (Concept
Lean Briefing of RIBA Plan of Work (Figure 2). It explains in detail how to perform Lean Briefing as a learning exchange application in a way that will aid the client and design team in collaboratively finding potential project options during the Preparation and Brief Stage, and then testing those through the concept design task to find out which is the best to meet the client and project value. Stage 1 (Preparation and Brief) works as a shared understanding platform between the client and design team by which the learning application is performed to develop the project knowledge base. A facilitator party (Brief Team) takes responsibility for finding opportunities and pulling potential project solutions through this learning exchange application by means of detecting unseen possible requirements and interpreting subjective needs into objective needs. At this stage, potential project design solutions are explored and proposed. A series of tasks, explained in detail within the DO Model in the Operational Roadmap, need to be undertaken to help achieve that. A soft gateway is planned at the end of this stage where an Initial Project Brief needs to be delivered in a form of a design mood board (Figure 2). Then the delivered Initial Project Brief is taken to the next stage. Stage 2 (Concept Design) works as a platform for testing the proposed potential solutions and choosing the one or combination that best fulfil the client and project requirements. This stage is perceived as the first stage for the project design team to be officially engaged in the project. At this stage, the proposed potential solutions need to be tested by the project design team, then evaluated by the Brief Team, to help to develop the project design concept. The Brief Team works as a review panel to check and initially validate it. A hard gateway is planned at the end of Stage 2, where the Brief Team issues the Final Project Brief and confirms it by final client
approval (Figure 2). At this point, the project brief is finalised for that specific project, and monitoring via the CHECK Model must take place.

**Lean Briefing DO Model tasks**

**STAGE 1 Preparation and Brief**

1) **Evaluate Strategic Brief (Brief Team)**
   - Check and study whether the Strategic Brief includes the minimum requirements from the client side to start the Project Brief (e.g. feasibility study, business objectives, business relationships, available budget, proposed time, site location, constraints, specific needs if any, etc.).
   - If it is not adequate for initiating the Project Brief, send it back to the client requesting the missing information to be provided OR appoint a Client Design Advisor to assist the client with the Strategic Brief.

2) **Analyse Strategic Brief (Brief Team)**
   - Map business relationship bubbles.
   - Develop a set of questions for the first official meeting with the client to understand more about the project and client business, mainly to open the communication channel with the client and finding out possible access to investigate the client business to understand more about the project, and define the limitations if any.

3) **Conduct an official meeting with the client (Brief Team)**
   - Prepare the meeting agenda and ask client officially for the first official meeting, preferably in the client’s office.
   - Take a quick tour of the client’s office to build a preliminary business background.
• Give a brief introduction to your understanding of the project and find answers for your prepared questions.
• Jointly translate and develop business objectives into a set of project objectives.
• Record minutes of the meeting and keep any paper notes for filing.

4) Site visit (Brief Team)
   • Arrange your first official site visit with the client to build a preliminary site background.
   • Observe and note down any site issues and discuss them with the client.
   • Note down some planning requirements hints from observing the building around.

5) Site survey (Brief Team)
   • Appoint surveyor to conduct a site survey.
   • Establish site borders, soil investigation, etc.

6) Start precedent study (Brief Team)
   • Decide how you are going to approach the project and write a strategy for searching for information related to the project.
   • Review client’s published reports.
   • Search and define similar projects and make sure of option varieties (e.g. quality, technology used, etc.).
   • Review manufacturers’ catalogues and professional magazines.
   • Find out about planning requirements in the project area.
   • Find out about energy performance options.
   • Find out about sustainable opportunities.
   • Conduct user survey (e.g. questionnaire, interview, observation).
   • Check and analyse survey data and study outcomes against Strategic Brief, project objectives and previous meeting outcomes, and define opportunity and clashes if any.
   • Define similar building to visit.
7) Conduct a Learning Workshop (Brief Team)
   - Prepare to present the main outcome of the Precedent Study to the client, and invite the client officially to the official workshop.
   - Conduct a workshop to educate the client about the potential opportunities. Simultaneously, try to understand the likely potential trends according to the client perspective through this exercise.
   - Try to engage different parties from the client organisation in the workshop (e.g. user, anybody you think might influence the project later).
   - Report the main workshop’s outcome trends. No decision needs to be developed here, as the exercise is mainly to track the project potential opportunities and identify if any additional research or consultation are needed.
   - Visit similar building.

8) Conduct a Value Management Workshop (Brief Team)
   - Based on the outcome from the conducted learning workshop, if needed, conduct any additional research required and contact any specific consultants needed to support the project.
   - Revisit the data and main outcomes from the Precedent Study and re-analyse it in conjunction with the Learning Workshop outcome and the additional research and consultation outcome.
   - Prepare to present the main outcomes from the re-analysis to the client.
   - Conduct a Value Management Workshop and jointly redevelop project objective, identify the best potential route for the project design, and develop project requirements in objective form.
   - Use tools to identify the best potential value (e.g. choosing by advantage).
   - Try to engage different parties from the client organisation in the workshop (e.g. user, anybody you think might influence the project later).
9) Issue Initial Project Brief (Brief Team)
   • Using the Value Management Workshop outcome, develop the Initial Project Brief by creating a mood board, outlining project objectives and requirements, and developing evaluation criteria.
   • Validate the Initial Project Brief by conducting a validating workshop with the client, project architect and project Design Manager, and seek client approval.

STAGE 2 Concept Design

1) Evaluate Initial Project Brief (Project Design Team)
   • Check and study the Initial Project Brief to determine whether it is adequate to start the Concept Design.
   • If it is not adequate to initiate the Concept Design, seek clarification from the Brief Team.

2) Develop a Concept Design (Project Design Team)
   • Arrange for the Project Design Team to visit the site and get the site background.
   • Project Architect sketches architectural plans and ideas based on the Initial Project Brief.
   • Structural Engineer outlines preliminary Structural Design Strategy based on the Initial Project Brief and the developed architectural plans.
   • Service Engineer outlines preliminary Service Design Strategy (e.g. electrical system, ventilation and heating system) based on the Initial Project Brief and the developed architectural plans.
   • Quantity Surveyor calculates preliminary Project Cost Estimation based on the developed Concept Design.
   • Coordinate and collaborate with other design team members to define any clashes, and verify the Concept Design.
3) Review Concept Design (Brief Team)
   - Check Concept Design against the Initial Project Brief to make sure it meets the project requirements.
   - If the Concept Design adds something good for the project which is not mentioned in the Initial Project Brief, keep it and explain to the client later what benefit it could bring to the project.
   - If the Concept Design does not meet the Initial Project Brief, report that and discuss it with the Project Design Team to make the necessary alterations.

4) Conduct a Concept Design Validation Workshop (Brief Team)
   - Ask Project Architect to prepare to present the Concept Design to the client.
   - Conduct a Concept Design validation workshop.
   - Record views and comments made by the client and develop a potential alterations report.
   - During the workshop, advise and explain to the client if you believe the comments made will have a huge impact on estimated project costs.

5) Improve the Concept Design (Project Design Team)
   - Redevelop the Concept Design based on the outcome from the Concept Design Validation Workshop.
   - Recalculate the project estimation cost.

6) Review the improved Concept Design and make sure the alterations requested are addressed (Brief Team)

7) Conduct a Concept Design Revalidation Workshop (Brief Team)
   - Ask Project Architect to prepare to present the improved Concept Design to the client.
   - Conduct a Concept Design revalidation workshop.
   - Advise and explain to the client implications on the project cost estimation.

- Use BIM to support in defining clashes if any, testing energy efficiency, cost estimation, visualisation, etc.
• Record views and comments made by the client and prepare to consider them in developing the Final Project Brief.

8) Issue Final Project Brief (Brief Team)
• Revisit Initial Project Brief and update it according to the approved Concept Design and Project Cost Estimation.
• Validate the Final Project Brief by conducting a validating workshop with the client, project architect and project Design Manager, and seek client approval.

3.2 Lean Briefing CHECK Model

The CHECK Model describes in detail the delivered project brief monitoring process between Stage 3 (Developed Design) and Stage 6 (Handover and Close Out) of the RIBA Plan of Work (Figure 2). It describes the monitoring process that needs to take place at the checking point as to reviewing each stage deliverables against the Final Project Brief, and delivering a reflection report based on that on a regular basis at the gateways from Stage 3 (Developed Design) to Stage 6 (Handover and Close Out) for two purposes: firstly to forecast the impact of any deviation from the delivered project brief on the following project deliverable stages early, and then most importantly to report learned lessons for future Lean Briefing process improvement.
Lean Briefing CHECK Model tasks

STAGE 3 Developed Design

1) Review the Developed Design against the Final Project Brief (Brief Team)
   - Report changes, if any, and identify why they took place. Are they related to any unclear issue in the Final Project Brief? Are they related to client changes of mind? Are they related to new issues arising such as new technology or upgrading specific systems?
   - Report what implications, if any, these changes could have on the following stage/s.
   - Deliver action report.

2) Deliver Reflection Report (Stage 3: Brief)

STAGE 4 Technical Design

1) Review the Technical Design against the Final Project Brief, and the Reflection Report (Stage 3: Brief) (Brief Team)
   - Report changes, if any, and identify why they took place. Are they related to any unclear issue in the Final Project Brief? Are they related to client changes of mind? Are they related to new issues arising such as new technology or upgrading specific systems?
   - Report what implications, if any, these changes could have on the following stage/s.
   - Deliver action report.

2) Deliver Reflection Report (Stage 4: Brief)
STAGE 5 Construction

1) Review the project against the Final Project Brief, and the Reflection Report (Stage 4: Brief) (Brief Team)
   - Report changes, if any, and identify why they took place. Are they related to any unclear issue in the Final Project Brief? Are they related to client changes of mind? Are they related to new issues arising such as new technology or upgrading specific systems? Are they related to construction issues?
   - Report what implications, if any, these changes could have on the following stage/s.
   - Deliver action report.

2) Deliver Reflection Report (Stage 5: Brief)

STAGE 6 Handover and Close Out

1) Review the project against the Final Project Brief, and the Reflection Report (Stage 5: Brief) (Brief Team)
   - Report changes, if any, and identify why they took place. Are they related to any unclear issue in the Final Project Brief? Are they related to client changes of mind? Are they related to new issues arising such as new technology or upgrading specific systems? Are they related to construction issues? Are they related to quality issues? Are they related to missed operations? Are they related to conflict between systems?
   - Report what implications, if any, these issues could have on the use.
   - Deliver action report.

2) Deliver Reflection Report (Stage 6: Brief)
Lean Briefing for Effective Design Management

Appendix

Lean Briefing Management Framework

Lean Briefing Process Operational Roadmap