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Developing Configurations of Work Units - The Implications For Differentiation and Integration

by

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A Doctoral Thesis

Submitted in partial fulfilment of the requirements for the award of

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Abstract

Two major areas of organizational theory are considered in this thesis. The first is concerned with the development of a configuration based approach. This develops contingency theory by taking a more holistic view, looking for patterns amongst many different aspects of organizations, rather than reducing organizations to simple bivariate relationships. Previously, this had only been used at a macro organizational level. This research extended the configurational approach and identified micro-configurations of departments or work units within organizations. The benefit of doing this is that it allows a far more detailed picture of organizations to be obtained. Variables were selected for inclusion in the micro-configurations on the basis of a detailed survey of the contingency field. Thus, the approach was used to synthesise much of the existing contingency research in organizational theory.

The second aspect of the research focuses on the relationship between the two levels of organization and work unit in order to establish whether decisions made at the organizational level effectively determine the micro level. Although a strong relationship was found, the results suggest that there is room for variation in the design of work units. Particular attention was paid to the concepts of differentiation and integration as the need for differentiation mirrors the need for consistency within work units whilst effective integration is required to ensure that all of the work units are working towards the organizations corporate aims. Patterns of integrating mechanisms were measured and the relationships between these and the macro and micro configurations were analysed. The results here suggest that integrating mechanisms are chosen as a pattern and that a number of factors including the macro and micro-configurations and the environment faced by the organization influence their use. Finally, the level of differentiation between work units within an organization was computed and the link between levels of differentiation and integration was assessed. The results indicate that the relationship between differentiation and integration is strong and antagonistic in nature.

This research highlights the complex nature of organizations. A configurational approach is proposed as the way forward in organizational theory because only by taking into account the many contingencies facing organizations can we achieve a better understanding of their design.
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Introduction

This thesis considers two different areas of organizational theory. The first is concerned with the development of a configuration based approach. In the past organizational theory has been characterised by what has been termed a 'one best way' approach. This means that theorists have proposed a certain style of organization or relationship between different variables irrespective of the context, in other words, they have assumed that the same relationship will apply regardless of whether other factors change. More recently the contingency approach has come to the fore, at the heart of which lies the concept of organizational context. Unfortunately, contingency theory has been poorly operationalised, which means that instead of trying to consider organizations as totalities, theorists have concentrated on splitting them up into relationships between only two or three variables.

The configuration approach was developed in the eighties and has tried to extend contingency theory by measuring many different aspects of an organization and looking for patterns in them. Previously, this has only been used at an organizational level (see for example the works of Mintzberg 1990, Miller and Friesen 1984, Miles and Snow 1978, Hambrick 1983). The concept of recursion which has been put forward by systems theorists (Ashby 1965, Beer 1966, Ackoff 1971, Kast and Rosenweig 1979) suggests that configurations will also be found at lower levels in the organizational hierarchy. Therefore, the purpose of this research is to extend the configurational approach and attempt to develop micro-configurations of departments or work units within organizations. The benefit of extending the analysis is that as Van De Ven puts it, "a thorough assessment of complex organisations requires a theory and method that cuts across macro (overall organization) and micro (work unit or department) levels of analysis" (Van De Ven 1976, p73).

The main aim of this aspect of the research is to synthesize much of the existing contingency theory by using many variables rather than relying on only two or three. This should provide a much better understanding of organizations than has been obtained by following conventional contingency theory. Thus, the overriding objective of the research is to identify patterns or micro-configurations of work units within organizations. These will then be tested to ensure that they are both valid and stable.
The second aspect of the research focuses on the relationship between the two levels of organization and work unit. To do this the work unit configurations are compared to the organizational configurations derived by Miller and Friesen (1984). Particular attention is paid to the concepts of differentiation and integration made famous by Lawrence and Lorsch (1967). Patterns of integrating mechanisms are measured and the relationships between these and the macro and micro configurations are analysed. Finally, the level of differentiation between work units within an organization is computed and the link between levels of differentiation and integration is assessed.

The thesis is divided into seven chapters. The first three chapters set the scene for the research by providing an extensive literature survey. Chapter one gives an introduction to the concept of configuration, a rationale for the development of the approach for work units and a discussion of the use of taxonomies and typologies. Chapter two looks at the concepts of differentiation and integration and shows why these are so important in organizational theory; it also explains how these concepts will be used in analysing the relationship between macro and micro-configurations. It was decided that a good place to start developing the work unit configurations would be to synthesize the existing literature in contingency theory, to ensure that all previously used variables were included. Therefore, chapter three provides a very detailed review of contingency literature. All of the variables used in the derivation of work unit configurations are defined and the major works in each area are discussed.

Chapter four moves on to discuss the methodology that was employed to carry out the research. This is divided into a number of sections looking at different issues, for example: the sample, data collection, data analysis and validation. Chapters five and six are concerned with the results of the research. Chapter five concentrates on the development and validation of the micro-configurations, whilst chapter six analyses the relationship between the macro and the micro levels and considers the link between differentiation and integration. Finally, chapter seven pulls the two different elements of the research together. Each proposition is reviewed and discussed in the light of this research and other works in the field. The limitations of the research are also discussed before considering the implications for future research.
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Chapter 1 The Configurations Approach to Organizations

Introduction

A 'one best way' approach has dominated the field of organization theory for many years. Indeed Mintzberg (1984, p68) has argued that "one best way thinking continues to the present day, for example in the activities of consultants who believe that every organization needs Management By Objectives, or Long Range Planning or Organization Development." In the early days of organization theory, the best way was thought to be a very mechanistic, some would say dehumanised, approach towards organization design (Fayol 1949, Urwick 1947, Taylor 1911). This was superseded by later theorists who stressed the need for participative management practices (Mcgregor 1960, Mayo 1933, Bennis 1958). In more recent years, theorists have begun to recognise the importance of context and this has led to an upsurge in contingency theory, which "seeks to explain the fit between organization design and so-called contingency factors" (Robey 1986, p45). It could be said, however, that this has failed to meet expectations by concentrating on limited relationships between two or three variables rather than considering the whole context of a situation, to quote Randolph and Dess (1984, p114):

"Researchers have viewed organization design in a piecemeal and deterministic manner and as a closed system consisting of bivariate and static relationships"

Or, as Miller (1981, p2) puts it:

"Seldom is there any attempt to dramatically broaden the research and to view relationships within a much broader interpretive context; a context that incorporates many potentially relevant variables"

This chapter will outline a recent development of contingency theory, called configuration theory. This approach attempts to overcome the limitations of contingency theory by considering many different aspects of an organization at once and looking at the various patterns that have emerged in organizations. The chapter will then discuss the benefits of extending the approach to cover work units within
organizations and review the differences between typologies and taxonomies. Finally, the advantages of configurations over traditional contingency theory will be discussed.

**What is the Configuration Approach?**

The configurational approach to organizational theory is a fairly recent development, originating primarily from the work of Miles and Snow (1978), Mintzberg (1990), and Miller and Friesen (1984). It is basically an extension of contingency theory, relying upon the same basic premise that there is no "one best way" of organizing that should be used in all situations, and that any particular style of organization is not equally effective under all conditions. However, in contrast to traditional contingency theory, the configuration approach takes a holistic view, attempting to synthesize rather than analyse the information gathered about the organization. Thus, the approach develops rich descriptions of complex contingencies, as opposed to analysis of bivariate data.

The emphasis of the approach is very much on interrelationship, organizations are seen as patterns of variables. No one factor is seen as driving the organization - "Indeed the very notion of configuration is that one element does not cause another; instead all influence each other interactively" (Mintzberg 1981, p115). Therefore, it is proposed that when organizations "have characteristics that 'fit' together, that are 'consistent' and 'congruent', that are 'co-aligned' one tends to find efficient matter energy processes, effective information processes and stability within a moderate time frame" (Kotter 1978, p39). Configurations can be seen as internally cohesive in that the presence of certain attributes suggests the reliable occurrence of others. However, there is no suggestion that this link operates in only one direction or is causal in nature.

A crucial aspect of a configuration based approach is the belief that a relatively small number of these configurations or types are believed to encompass quite a large fraction of the population of organizations (Miller and Friesen, 1984). This can be linked to the Darwinian idea that "Species at any one time are not infinitely variable, and are not linked together by a multitude of intermediate gradations" (Darwin, 1968, p231). A configuration is effectively a subset of the whole organizational sample. If it is to be worthwhile, each one should characterise numerous aspects of many organizations. A configuration should also have predictive importance, in that it
should yield significant and reliable differences among elements that were not used to make the classification.

The configuration approach has very important implications for change within organizations. Miller and Friesen (1984, p21) have suggested that organizations may be "driven towards configuration in order to achieve consistency in their internal characteristics, synergy (or mutual complementarity) in their processes and fit with their situation." Thus, configurations tend to embody a sense of stability, with variables aligned closely together. Piecemeal change can be very harmful from a configurational viewpoint, in that it can "destroy a complementary configuration without having the scope to erect a new one" (Miller and Friesen, 1984, p204). Therefore, change in configurations will tend to be of a revolutionary nature. As variables are inter-linked, they will need to adapt to each other if consistency is to be maintained. Thus, change may be very costly and organizations may wait until it is absolutely necessary before embarking upon such a transition. This may help to explain some of the conflicting results that have been found by contingency theorists who have compared relationships between two variables in different organizations.

A diagram may help to show the basic difference between contingency theory and a configurational approach. Figure 1.1 overleaf is very simplified, for example the Miller configurations actually consider thirty-one variables not just three as is shown, but this diagram does serve to highlight the point. As you can see, the contingency approach is to link two variables together and to assume a linear relationship, thus, if variable x is high variable y is expected to be low. The configurational approach, on the other hand, looks at the patterns present in the data. A cluster is formed in multidimensional space to represent the range of values of the variables that group together in configurations.
The basic elements of a configurational approach can be summarised as:

1. There is no one best way to organize. The approach accepts the concept of equifinality, i.e. that certain methods of organization can be equally successful in different situations.

2. A large number of qualities, ideally of state, process and situation are studied simultaneously in order to give a detailed picture of the situation.

3. Many different organizations correspond to certain patterns, therefore it will be possible to identify common clusters in the data. Careful sample definition is required to achieve the most appropriate clusters.

4. A better understanding of organizations can be obtained by looking at many different variables and considering patterns rather than by looking for cause-effect relationships between only two or three.
The Use of Configurations in Organization Studies

Configuration theory is still in its infancy with regard to organization studies (although according to Mckelvey (1978) similar taxonomic approaches have been used for many years in the biological sciences). The original impetus for the approach appears to have come from Henry Mintzberg (1979), developed from the doctoral thesis of Pradip Khandwalla. Khandwalla (1970) found that the success of different businesses could be explained not by their use of any single attribute, but by how they interrelated various different attributes.

Other writers who have used a configuration based approach at the organizational level include: Miles and Snow (1978), who developed four characterisations of organizations: the Analyser, the Prospector, the Defender and the Reactor; Donald Hambrick (1983), who reviewed the Miles and Snow typologies in relation to different industries; Ralph Kilmann (1983) and William Ouchi (1979) who developed a typology of organizations, splitting them into markets, bureaucracies and clans. This has been popular in the literature, although the extent to which it has been seen in practice is open to question.

Slocum and Simms (1980) and Pinto and Pinder (1972) appear to be the only theorists who have tried any type of configurational approach towards work units. The work of Pinto and Pinder is particularly interesting as they attempted to taxonomically derive clusters of work units. The difference between their work and this research lies in the nature of the variables selected for inclusion, as Pinto and Pinder measured only dimensions of effectiveness. They also used a more varied sample, ranging from manufacturing firms to finance and insurance houses. Van De Ven and Drazin (1985) have identified three different theoretical approaches towards contingency theory at the work unit level. The selection approach sees fit at the micro level being determined by choices made at the macro level. The interaction approach sees fit as conforming to linear relationships of pairs of variables of context and organization and, finally, the systems approach sees fit as "a feasible set of equally effective, internally consistent patterns of organizational context and structure" (Drazin and Van De Ven, 1985, p521). The systems approach to contingency theory is, thus, very similar to a configurational approach, in that it accepts the concept of equifinality and uses multivariate data. It differs, however, in its limitation to variables of structure and context.
Perhaps the most important and without doubt the most prolific writer in this area has been Danny Miller (1978, 1981, 1983, 1987, 1990). He and Peter Friesen, in their book entitled Organizations - A Quantum View (1984), configured organizations according to thirty-one variables, falling broadly into the categories of strategy, environment and organization. Their basic premise was that successful organizations were those in which these three categories of elements fit together, or complement each other. From their empirical studies, Miller and Friesen identified ten commonly occurring configurations. Six of these were success models, in that the variables were complementary and four of them were failure models, due to misfit between the variables.

So far, the configurations theorists have almost exclusively concentrated on the macro organizational level and have, in general, tended to ignore the more micro level of work units or departments within organizations. Miller and Friesen (1984) acknowledge that configurations could be derived at different levels of the organization and part of the research that is being carried out will consider the concept of configuration at the work unit level and see how this links with Miller's macro-configurations. Work units can be defined as a "subsystem, exhibited in complex organizations as vertically and horizontally differentiated components" (Van De Ven 1976); thus, they can be departments or, where departmental tasks are very diverse or the organization is larger, work groups within a department.

One of the objectives of this research is to use the work unit configurations to synthesize the existing material on contingency theory at the work unit level within organizations. The idea that configurations can be used to synthesize different contingency propositions has also been put forward by Ralph Kilman (1983), although he concentrated at the macro level. Variables which have been previously used to test bivariate relationships are brought together to consider each work unit as a whole rather than dissect it into relationships between a few supposedly independent variables. The aim of the research is not to look for a unidirectional causal link between the variables. Instead an attempt will be made to identify the patterns that occur most often, particularly those associated with the successful organizational configurations. Causation is viewed in the broadest possible terms, "each configuration has to be considered as a system in which each attribute can influence many of the others by being an indispensable part of an integrated whole" (Miller and Friesen, 1984, p19).
The Need to Consider Different Levels Within the Organization

As mentioned previously, configurations writers have tended to concentrate at the macro organizational level. This raises a question about whether it is possible to develop configurations at the micro, work unit level and, if it is possible, what can be gained from doing so? Miller and Friesen (1984) did suggest that configurations could be derived at any level in an organization. After all, a configuration could be seen as a way of benchmarking or categorising, therefore there is no reason why it could not be used at a lower level. As to whether it is worthwhile is a matter of how much detail is required. As Ackoff (1971, p661) notes, "Every system can be conceptualised as part of another and larger system." Indeed, certain authors have argued that many organizational policies are a direct result of the country and the culture within which the company is operating, leaving little room for choice even at the organizational level (Cole, 1985). Other writers (e.g. Hambrick, 1983) have highlighted the similarities found in firms operating within the same industries, questioning the extent to which constraints imposed at industry level determine certain organizational policies.

Organizational configurations, such as those suggested by Mintzberg and Miller, give a very good overview of a company at the macro level, but do they give enough information to provide a complete understanding of an organization? According to Van De Ven (1976, p73) "a thorough assessment of complex organizations requires a theory and method that cut across macro (overall organization) and micro (work unit or department) levels of analyses." Mealia and Lee (1979, p122) also comment that, "Inconsistent research results often are a function of the failure of researchers to separate congruence and contingency at the macro and the micro organizational level."

The purpose of this research is not to reject the whole configurational approach by suggesting that the organization should be broken up into pieces in order to be analysed, but to combine the analysis of the macro and the micro levels. It is accepted that it is important for the organizational analyst to understand the macro level first. However, it is suggested that it would be a useful addition to the work of the organizational configuration advocates if, once that basic understanding of the organization had been gained, the same approach could be used at the next level down in the hierarchy, with each work unit being considered as a whole instead of
being broken down into bivariate relationships, as is presently the case in contingency theory.

Thus, the question of whether configurations are likely to exist at lower hierarchical levels within an organization is of paramount importance to this research. In order to consider this, attention is directed to the work of Blenkinsop and Burns (1992) who have linked Miller and Friesen's (1984) organizational configuration work to Stafford Beer's (1979) Viable Systems Model (VSM). This model is made up of five different systems which must all be present and effective if the organization is to be viable in the long run (a successful configuration). Blenkinsop (1993) has mapped the successful Miller configurations on to the VSM to ensure that they do actually constitute viable organizations in systemic terms. The systems are split up as follows:

**System One** is the operating core where all the primary activities associated with making the product(s) or providing the service(s) are carried out. In theory, System One can be made up of product-markets, divisions, profit centres or functional departments. These are relatively autonomous within the Viable System Model and as such need to be co-ordinated in order to ensure that they are all working towards the same organizational objectives rather than suboptimal departmental goals. **System Two** provides a co-ordinating mechanism in the form of task forces, committees, meetings and so on. **System Three** is the control function of the organization; its purpose is to gather information about the internal operations and maintain internal stability. System Three filters the information flowing up the organization from System One and amplifies the information flowing down the hierarchy from System Five. It interprets the policy decisions of higher management and is responsible for communicating objectives and monitoring performance against these objectives. **System Four** is the scanning function. It plays an intelligence-gathering role, distributing environmental information upwards and downwards as and when necessary. Finally, **System Five** is the policy-making function; it receives information from Systems Three and Four simultaneously and determines organizational policy on the basis of the summarised information it receives. It arbitrates between the antagonistic internal and external demands which are placed on the organization.

The most important aspect of this model, from the point of view of this research, is that it is recursive. Thus, within the operating departments (System 1) we would expect to find the whole viable system repeated. This idea of recursion is prevalent in many of the systems writers' works (Ackoff 1971, Beer 1966, 1979, Kast and
Rosenweig 1979, Ashby 1965), as well as some of the organization theorists (e.g. Kilmann 1983). This suggests that just as there will be configurations of organizations there should also be configurations of work units within the organization.

Interestingly, Mintzberg (1981) appears to be of the opinion that all aspects of work units are almost completely determined by their organizational configuration. One of the aims of this research will be to test this proposition in order to discover whether decisions made at the organizational level effectively determine or constrain the departmental configurations that can exist. This matches closely with Drazin and Van De Ven's (1985, p518) selection approach to fit which assumes that "fit at the micro level is determined by natural or managerial selection at the macro level of organizations." Randolph and Dess (1984) also point out how decisions about product market selections and the resultant environment determine the overall level of task uncertainty that will filter through to the micro organizational level, thus influencing the type of configuration found there, although less directly than postulated by Mintzberg.

In some respects it should be easier to develop configurations at the work unit level of analysis as opposed to the whole organization because departments tend to be more homogeneous technologically and structurally, particularly when they are organized on a functional basis (Dewar and Werbel 1979). This proposition is supported by David et al (1989), who found that it was difficult to derive meaningful results for entire organizations as multiple technologies and diverse structures were in place. Fry (1982) also noted similar problems due to the diversity that can occur between different work units of the same organization, he commented that "there is an assumption in research that work and structural forms across participants and work units are homogeneous. However, it has been shown that differentiation is a characteristic of complex organizations and that work units comprising them may be quite diverse" (1982, p539-540). Even Miller and Friesen admit that "it might be impossible to develop meaningful configurations that pertain to entire organizations that are extremely diverse and internally heterogeneous" (1984, p8). Other authors who stress the advantages of analysing work units rather than whole organizations include: Alexander and Randolph (1985), Campbell and Gingrich (1986), Fry and Slocum (1984), Ito and Peterson (1986), and Kozlowski and Hults (1986).

It is important to note that the purpose of this research is not to replace the organizational configurations but to add to them. By deriving configurations lower
down the organizational hierarchy, we can learn a great deal about how organizations are structured and managed and gain an insight into the relationship between the organization and its work units. This will be discussed in greater depth in the next chapter which considers the concepts of differentiation and integration.
Taxonomies or Typologies?

Both taxonomies and typologies can be used in drawing up configurations. A taxonomy is a grouping or classification that has been empirically derived ... "in an attempt to achieve scientific rigour they struggle to find meaningful and significant clusterings of the data" (Miller and Friesen 1984, p66). A typology, on the other hand, is conceptually derived - "using pre-existing concepts and established habits of pattern recognition typologists impose order upon the world of organizations. They make distinctions and erect relationships on the basis of many years of experience" (Miller and Friesen, 1984, p64). Mintzberg (1981, p113) has defined typologies as "abstract ideals, simplifications of the complex world of organizations." As such, they tend to be neater than taxonomies. They are more likely to compose a small number of ideal types with very obvious distinctions between each configuration. They are also expected to be well constructed and easy to understand. Taxonomies, on the other hand, are likely to be far more messy because they are drawn from the real world. They rely on actual data and are constrained by the patterns to be found within it. As the majority of firms are not of an extreme nature, there will probably be a greater number of configurations and the differences between them may be less clear.

There are dangers associated with relying on either taxonomies or typologies. The choice of variables is of utmost importance to the taxonomist, the wrong variables may lead to inconclusive results. Thus, according to Mckelvey (1978, p1430), "the strength of the numerical taxonomy is that it is empirically based on large samples, rests its classification on the analysis of many, if not all, known attributes, and is relatively objective ..... The principal weakness of numerical taxonomy is that it has no means of separating trivial from significant attributes, with the result that classifications may be partially based on trivial differences." The limitation for typologies, on the other hand, lies not so much with the variables chosen but with the typologist. The usefulness of any typology will depend on the experience, analytical ability and perhaps the imagination of the person deriving them.

In this research it has been decided to attempt to derive taxonomies rather than typologies. One of the reasons for this is that the typologies that exist in the organizational area are fairly limited, generally falling into the mechanistic-organic range. This is somewhat disappointing when, according to Deutsch, "both mechanistic and organismic models were based on experiences and operations known
before 1850. Since then the experience of almost a century of scientific and technical progress has so far not been utilised for any significant new model for the study of organization" (Deutsch 1968, p389). Although these are very interesting conceptual ideas, they have been of little use in practical organizations because very few organizations operate at the extremes of this continuum. By deriving taxonomies, it should be possible to gain a clearer understanding of the reality of organizations. It will then be possible to compare existing typologies with the empirically derived configurations to consider how closely the theory matches with the types of work groups actually existing in this sample. The proposed derivation and use of taxonomies will be discussed further in the chapter 4 which outlines the research methodology.

The Advantages Of Using A Configurations Approach Towards Work Units.

The advantages of using a configuration approach are similar to those stated for the contingency approach in that they overcome the limitations of a universalistic 'one best way' approach. Contingency theory does, however, also have a number of limitations which are overcome by the use of configurations. These are discussed below:

Criticisms of Contingency Theory

Miller (1981, 1984) provides a thorough criticism of contingency theory, considering the more statistically based problems with the approach. He identifies the following major limitations:

1. The focus is on bivariate or sharply circumscribed multivariate analysis. As a result of this, it may ignore critical intervening factors. The use of only two or three variables to represent the whole organization seems to be excessively simplistic. Even if it was possible to represent organizations in this way, problems are likely to arise. For example, Mohr (1971) found no support for the proposition that an organization's effectiveness is determined by the consonance between its technology and social structure, commenting that they are both complex, multidimensional concepts, which we should not expect to be related in a simple manner. In addition, Child (1972, p2) notes "the fact of a statistically established relationship does not 'speak for itself'. At the very least it may mask a more complex set of direct and indirect relationships."
2. Relationships are generally assumed to be linear and unidirectional. This has been shown not to be the case by a number of researchers, for example, Joan Woodward (1970) found a curvilinear relationship between technology and organization. However, the assumption of linearity is still made by many contingency theorists.

3. Contingency research samples vary from being very narrow to very wide. Miller and Friesen (1984) give an example of this when looking at the contingency theorists who have studied size and structure. Blau and Schoenherr (1971) used only data from employment security agencies whereas the Aston studies used a sample 'as different as a large tyre manufacturing firm and the public baths in Birmingham' (Miller and Friesen 1984, p13). Is it any wonder that these researchers produced conflicting results?

An additional limitation resulting from sample size is that the narrower samples which are often used in contingency theory can lead to false generalisations. There is often a tacit assumption by contingency writers that the same relationship between variables will hold in different contexts. A configuration approach overcomes this by specifying different sorts of organizations and accepting that different relationships might exist within each of the different configurations.

4. Only one path to success is assumed to be relevant and is searched for. In fact there may be many ways to succeed in the same environment. This concept was developed by Katz and Kahn (1976) and is called equifinality. It is ignored to a large extent by contingency theorists.

5. The research has also typically proceeded from a distance, usually through questionnaires. This can be impossible to interpret and means that valuable anecdotal information may be lost. In this research, I have tried to overcome this limitation by actually visiting the organizations under study and holding interviews with company personnel.

Schoonhoven (1981), on the other hand, suggests four more fundamental problems with contingency theory:

1. The first problem is that contingency theory does not have the clarity required to be understood as a theory. Words such as fit, match, consistent, appropriate are used without definition or explanation. Thus, Schoonhoven sees contingency theory more
as an 'orienting strategy' than a true theory. Nightingale and Toulouse (1977) note this problem, posing the question "At what point of statistical significance can one say that congruence exists?" (p275). Dewar and Werbel (1979) also discuss the difficulties of operationalising the notion of fit.

2. Due to this lack of clarity, contingency theorists often do not consider the interactive process that they are predicting in enough detail. They assume interactions between two variables in predicting another without really acknowledging what the relationship actually is.

3. Linked to problem 2, contingency theorists seldom make explicit the mathematical function of the implied interaction between variables.

4. Schoonhoven also criticises the use of linear regression and correlation.

Another issue, briefly mentioned by Miller, which I believe to be a major failing of the contingency approach is the specification of controllable and non-controllable variables. It is assumed that an organization adapts to certain contingencies by behaving in a certain way (Thompson 1967, Lawrence and Lorsch 1967, Pugh et al 1972). This assumption does not appear to be warranted, as Weick (1979, p43) notes, "When any two events are related interdependently designating one of them cause and one of them effect is an arbitrary designation." Child (1972) also criticises this assumption, pointing out that contingency theory ignores the essentially political process whereby power holders within the organization decide upon courses of strategic action, including structure and the manipulation of environmental features. Another criticism made by Child (1977, p172) is that "all organizations function within a context of multiple contingencies. To the extent that considerations of contingency theory have force this poses a significant organizational design dilemma because the structural implications of each contingency are unlikely to be the same." Gresov (1989) has also identified the existence of several conflicting contingencies as the cause of possible misfits. This, again, points towards the use of a configurational approach, where patterns of multiple contingencies are taken into account.

Finally, there is a lack of clarity in much of the contingency work as to what level of the organization is being studied (Blau and Schoenherr 1971, Kilmann 1983). This has led to unwarranted generalisations and conflicting research results.
From the preceding section it is easy to see that, although contingency theory is a vast improvement upon past organization theory, a number of drawbacks still remain. The majority of these can be overcome by adopting a more configuration based approach. This does not mean to say that the work of current configurations writers cannot be faulted. There are a number of limitations to Miller and Friesen's (1984) work, not least the reliance on published case study material as a data source and the relatively small sample size. These, however, are criticisms of individual writers not of the approach.

Benefits of Configuration Approach over Contingency Theory

A configurations approach overcomes most of the criticisms that have been levelled at contingency theory. Configurations allow for a large number of qualities, ideally of state, process and situation to be studied simultaneously in order to give a detailed holistic image of reality. Causation in configurations is viewed in the broadest possible terms. "Each configuration has to be considered as a system in which each attribute can influence many of the others by being an indispensable part of the integrated whole" (Miller and Friesen, 1984, p19). There are no purely independent or purely dependant variables within a configuration. Of course, like contingency theory, a configuration will be limited by the sample from which it is drawn. Therefore, a great deal of care will need to be taken in sample definition and in generalising from that sample.

Why is Consistency Important?

The benefits of taking consistency (a vital element of configurations) into account have been noted by a number of authors researching different aspects of organizations. For example, Locke et al (1973) pointed out that participative decision making can only work in situations where there is adequate training, selection, the right sort of supervisory style and so on. Similarly, Seppala (1989) found that autonomous group structures could only be successful where they were reinforced with complementary human resource policies. Aggarwal (1985) also noted, when looking the different production operation systems, that each of the systems has advantages and each has drawbacks. The success of each system will to some extent be dependent on the context in which it is used.
This emphasis on consistency may seem like common sense. However, a surprising number of popular management consultants and writers (see for example Peters and Waterman, 1982) still promote certain activities in all situations, ignoring the concept of consistency or configuration. This may be the reason that we often hear of the failures of techniques such as MRP or Management By Objectives, not because they are useless techniques but because they are not appropriate in certain situations and that to make them work other systems need to be altered to form an effective configuration.

Another trap that is easy to fall into is to believe that any change can be made suitable and can be successfully implemented by taking account of the human side of the problem. Perhaps this is a revolt against past management practice of ignoring this aspect! However, Meg Graham (1991), in her interesting article, "A Tale of two FMSs" discussed case studies of two different firms both trying to introduce flexible manufacturing systems. Firm A placed a great emphasis on the technical side while Firm B placed a great emphasis on the people side. Both of these firms experienced difficulties in their attempts to implement change due to only looking at one side of the problem and not considering the need for consistency between them. As Mintzberg (1981, p103) puts it, "Effective organizations achieve a coherence among their component parts, they do not change one element without considering the consequences to all of the others."

Conclusions: The Approach To Be Taken In The Thesis

One of the main aims of this thesis is to develop a configuration based approach towards work units within organizations. This will be done by synthesizing the current literature that exists in contingency theory. Clusters of cases will be derived based on patterns of variables rather than individual relationships, which should allow a detailed picture to be drawn of common configurations that occur in the sample. These empirically derived taxonomies will then be compared to existing typologies in the literature as part of the validation process.

The purpose of doing this is not to derive configurations of work units that are expected to appear in all organizations, the limited sample which has been used here precludes that. Instead, the aim is to develop the configurational approach by showing that it is possible to derive meaningful configurations at the work unit level and to show how much more we can learn about organizations if we use a more
holistic approach towards the analysis of them. It is hoped that developing this approach can help us to overcome "the problem of the blind men, each of whom touched a different part of the elephant and then argued about the nature of the beast" (Miller and Friesen, 1984, p30). In other words, it is hoped that the research will show that by looking at the whole as opposed to just considering relationships between two or three variables we can get a much better picture of an organization, or a department which can help a great deal in the understanding and design of organizations.

The research will consider the whole concept of fit within work units. In addition to this, the relationship between macro and micro organizational levels will be studied in order to try to ascertain to what extent the micro-configuration is determined at the macro level and how important consistency at the micro level is to macro organizational success. The micro-configurations will also be used to determine the level of organizational differentiation which will then be linked with the level and types of integrating mechanisms used. The concepts of differentiation and integration and the purpose of this aspect of the research will be discussed in the next chapter.
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Chapter 2 Differentiation and Integration in Organizations

Introduction

The purpose of this chapter is to examine the concepts of differentiation and integration and to explain how they will be used in this thesis to help explain the relationship between the macro and the micro-configurations. Levels of differentiation and integration have been recognised as central design criteria in organizations (Lawrence and Lorsch 1967, Galbraith 1973, Kotter et al 1986, Robey 1986, Khandwalla 1973). The concept of differentiation concentrates on dividing the organization up into smaller units (micro-configurations) and organizing each in a manner suitable for the function they are performing, while integration focuses on the co-ordination of each of these units to make sure they are all working towards the organization's corporate aims.

The chapter will begin by giving a brief overview of the history of these concepts. Each will then be described in some detail before looking at the links between them. Finally, an explanation will be given of how these concepts relate to this research and what propositions will be tested.

Introduction to the Concepts

Lawrence and Lorsch (1967) brought the concepts of differentiation and integration to the fore in their landmark study 'Organization and Environment'. It should be noted, however, that these concepts had been in use much earlier: classical theorists, such as Fayol (1925), Gulick (1937), Mooney (1937) and Urwick (1937) have all considered the need for specialisation or differentiation and integration in organizations.

These early writers had a fairly limited view of differentiation. They saw it as being purely the division of labour and did not consider the differences in structure, management systems, goals, orientations and so on that such a division could engender. Similarly, they viewed integration in a very simplistic manner, proposing
that effective integration could always be achieved through the chain of command. This mechanistic attitude neglected the other more fluid or organic integration mechanisms, some of which were highlighted by Lawrence and Lorsch, that will be discussed later in the chapter. This could be because, according to Lawrence and Lorsch, the need for both differentiation and integration is linked to the level of dynamism in the environment. Perhaps at the time of the classical theorist’s writing organizations were facing very stable environments which allowed them to rely on this simplified method of integration.

Although Lawrence and Lorsch can not be credited with the conception of the terms integration and differentiation, they did develop these ideas to a far higher degree of sophistication than had previously been the case. In addition, through empirical research, they showed the effects these two concepts could have on the success of organizations in different environments. As a brief introduction to Lawrence and Lorsch’s work, I will give an overview of what each of the concepts means before discussing how they are linked together.

**Differentiation**

Lawrence and Lorsch (1967a) define differentiation as "the state of segmentation of the organizational system into subsystems, each of which tends to develop particular attributes in relation to the requirements posed by its relevant external environment" (p3). Differentiation equates to some degree with the concept of specialisation or division of labour which was given a great deal of attention by early organization theorists. However, it is somewhat more extensive, as Lawrence and Lorsch suggest that functions will differ in terms of their structure, goals, orientation towards time and interpersonal orientation.

The need for specialisation was originally highlighted by Frederick Taylor (1911). He failed, however, to consider the full implications of specialisation on the level of differentiation and need for integration resulting from this. Early industrial engineers (for example, Gilbreth, quoted in Clegg and Dunkerley 1980) and classical theorists (Mooney 1937, Gulick 1937, Urwick 1937) followed Taylor’s lead, concentrating upon how jobs could be defined and split up into tasks which could be easily measured and valued. As a backlash against this extremely mechanistic approach, the Human Relations school came into being. This school emphasized the need for
participation, trust, delegation and team-working to increase worker satisfaction and hence performance.

The limitation in the work of both of these schools was that they proposed that their approach was the most suitable in all situations. Harold Leavitt, in 1962 wrote an important paper on this subject commenting that neither approach was sufficient alone. He recognised that organizations were differentiated and proposed that participative management was not suitable in all areas of an organization because "many subparts of the organization may perform many different kinds of tasks and therefore may call for many different kinds of management practices" (Leavitt 1962, p97). This was the start of a good deal of research into both differentiation and integration in organizations.

Lawrence and Lorsch put forward a model of organizations as open systems, constantly having to adapt to their environment. They proposed that there is an optimum level of differentiation and integration depending upon the type of environment the company is facing ..."to be effective an organization must approach its environmentally required states of differentiation and integration" (Lawrence and Lorsch, 1967, p132). They suggest that a more dynamic environment requires a higher level of differentiation as the different parts of the organization have to be more specialised and cope with smaller parts of an ever changing environment, or as Thompson (1967, p81) puts it, "organizations facing heterogeneous task environments seek to identify homogeneous segments and establish structural units to deal with each. These units are further subdivided to match surveillance capacity to environmental action which varies with the degree of stability of the environment faced by the unit in question."

Although Lawrence and Lorsch and Thompson view the required level of differentiation as determined by the organization's environment, other writers have linked differentiation with alternative factors, such as size, task and technology. Robey (1986, p183), for example proposes that, "Most differences can be traced to the technologies used by the different departments." This is also indirectly backed up by the contingency theorists who link structure with technology at the work unit level in organizations (see for example Van De Ven and Delbecq 1974, Slocum and Simms 1980, David et al 1989, Comstock and Scott 1977, Van De Ven and Koenig Jnr 1976). Blau (1970, 1972) and Pugh et al (1976, 1976a), on the other hand, link the level of differentiation in an organization with its size, proposing that as an organization grows larger, it has to differentiate in order to remain manageable and
achieve efficiency. Finally, others, such as Hall (1962) and Rice (1958), propose that the type of tasks being performed by different parts of the organization are the causes of differentiation.

This poses some interesting questions about the causes of differentiation in organizations. These are illustrated in figure 2.1 overleaf.

1. Is differentiation caused directly by technology, environment or size?

2. Is differentiation indirectly caused by the environment which effectively requires the unit to be a particular size and use a certain technology in order to be successful, thus specifying the required level of differentiation?

3. Is differentiation the cause of each of the others, for example a firm may choose to have a differentiated structure which will then allow a choice of technologies more suitable to the needs of each function?

4. Or, finally, are these concepts interdependent, linked together in a configurational way, each causing and being caused by each of the others?
Adopting a configurational approach, it seems most likely that these concepts are part of a much larger organizational configuration where many interdependent variables are patterned together in different ways depending upon the situation. Hence, I would agree with Miller and Friesen (1984) that, "Typically organizations must achieve harmony among their elements of structure. That is structural elements such as technology, the distribution of authority, differentiation and integration and spans of
control must be complementary. These elements are interdependent and must be combined into functional configurations to maximise organizational performance" (p209). If we accept the notion of configuration then we accept that choices made with regard to any of these aspects are bound to impinge upon the others. Thus, it would be pointless to try to suggest that any one of these factors is of prime importance in all contexts.

The Basis for Differentiation

Lawrence and Lorsch (1967a) propose that due to the differing needs of the various parts of the environment, an organization will be differentiated into three major functions: sales, production and research and development, commenting that, "In this division of tasks the organization is ordering its environment into three sectors: the market subenvironment, the technical economic subenvironment and the scientific subenvironment" (P5). The split into these three subsystems is also supported by Brown (1958) who proposes that these are the three fundamental functions in any economic organization. Decisions have to be taken as to what will be made, how it will be made and how it will be sold. Brown suggests that all other departments in the organization are there to support or integrate these three core functions. Lawrence and Lorsch (1967) found that the scientific subenvironment was generally the most dynamic, followed by the market subenvironment and finally the technical economic which was generally far more stable. Therefore, they proposed that a more organic structure and participative style of management would be most suitable in the R&D department, whilst a mechanistic approach was appropriate in the production function.

Khandwalla (1972) also sees differentiation and integration primarily as methods of coping with environmental uncertainty, hostility and heterogeneity. However, he does not link this to particular subenvironments considering instead the impact of the total environment. He proposes (as do Lawrence and Lorsch) that, "the greater the environmental uncertainty the more differentiated will the organization tend to be in terms of norms, values, goals, interpersonal orientations, etc." (p302). Khandwalla suggests that differentiation will be a most important tool in a highly heterogeneous market, whilst it will be reduced and integration will be far more important to an organization facing a hostile or malevolent environment. The difference between Khandwalla's work and that of Lawrence and Lorsch is that he views both differentiation and integration to be directly determined by the organizational environment whereas Lawrence and Lorsch (1967a) suggest that, "overall
performance in coping with the external environment will be related to there being a
degree of differentiation among subsystems consistent with the requirements of their
relevant subenvironments and a degree of integration consistent with the requirements
of the total environment" (p11).

Thompson (1967) also relates an organization's need for differentiation to its external
environment. He hypothesizes that in order to achieve efficiency in technical
processes the organization will differentiate into boundary spanning departments
which protect the technical core from environmental uncertainty. Thus,
"differentiation occurs because some departments face outward into the environment
while others face inward" (Robey, 1986, p184). His approach is therefore somewhat
different to Lawrence and Lorsch's who believe that all departments will have to deal
with their own external subenvironment. Nevertheless, the results are very similar as
Thompson sees the sales and R&D (or product development) departments buffering
the production department from the outside world.

Miller (1987) has identified different types of differentiation that an organization
might use in response to different aspects of its environment. Bureaucratic
differentiation includes the use of an increasing number of profit or cost centres and
staff departments. This is likely to be used when a firm is facing a growing number
of predictable or stable contingencies. If, on the other hand, the contingencies facing
the firm are increasing in uncertainty than it will be more likely to use organic
differentiating devices, such as delegation of authority for strategic decisions and
augmenting the power of technocrats and support staff. Although Miller, like
Thompson, does not explicitly state where he sees differentiation being most
appropriate he does appear to imply that it will be in the three basic functions
mentioned earlier.

Differentiation exists, then, because "complex organizations have multiple goals, the
achievement of which often result in conflicting design requirements" (Stoelwinder
and Charms, 1981). It is deemed to be necessary for organizations to succeed,
particularly in more dynamic and heterogeneous markets. There are, however,
dangers associated with it. High levels of differentiation, without a correspondingly
high level of integration, can result in suboptimisation and very high levels of conflict
between functions..."even if every part (of the organization) performs as well as
possible relative to its own objectives the total system will often not perform as well
as possible relative to its objectives" (Ackoff, 1971, p661).
A common area where differentiation has caused many problems within organizations is between the sales/marketing and the production functions. Shapiro (1977) noted four factors which caused this conflict. One of the prime reasons is that the two functions are evaluated on the basis of different criteria and receive rewards for different activities. Hill (1985) has also observed this problem...

In many organizations the managers of different functions are measured in terms of their departmental efficiency (an operational perspective) and not in terms of overall effectiveness (a business perspective). Furthermore, their career prospects are governed by their performance within the functional value system...this leads to managers making trade-offs which are suboptimal for the business as a whole" (page 36)

The second cause, according to Shapiro, lies in the nature of the information used by different functions. As different departments tend to use data which is either hard or soft in nature, it is often difficult to achieve understanding between them. Furthermore, people working in separate functions often have diverse cultural backgrounds and very different lifestyles, which only serves to add to the lack of understanding between them. Finally, the levels of expertise involved means that members of different functions often 'talk a different language'.

Skinner (1986) also recognises the problem, in the 'Productivity Paradox' he shows how manufacturing sees cost reduction as its primary goal, while the remainder of the organization, led by marketing try to pursue a differentiation business strategy. The actions taken by manufacturing to reduce costs could work to suppress many of the activities associated with product differentiation such as flexible scheduling, active product development, quality improvement, and high levels of customer service. Thus, different functions could be working at odds with each other.

Although the preceding discussion may show the negative side of differentiation, it must be kept in mind that differentiation is not necessarily a bad thing, indeed it can be extremely beneficial for an organization facing a dynamic or diverse market (Lawrence and Lorsch 1967, Khandwalla 1972, Galbraith 1973). Problems arise if there is not sufficient emphasis put upon integration and the departments are interdependent. If different areas of the business do not need to work together then differentiation will not cause a problem. If, however, collaboration is required, then the organization must find a way of integrating these disparate functions to ensure that unity of effort is achieved.
Integration

Integration has been defined by Lawrence and Lorsch (1967) as "the quality of the state of collaboration that exists among departments that are required to achieve unity of effort by the demands of the environment" (p11). This is a good definition as it takes into account the fact that not all departments need to be well integrated. As mentioned previously, if the functions do not have to work together then there may be less need for integration. However, it could be criticised for assuming that the requirement for integration comes solely from the environment.

Integration has always been recognised as important in organizational literature, but early classical theorists had a very simplistic view of how this would be achieved (see for example Urwick 1937, Fayol 1925, Gulick 1937). Taylorism suggests that all planning should be separated from the execution of tasks and that managers who are able to see the 'whole picture' should break this down into individual tasks for their workforce. Thus, it is the role of the manager to ensure that the organization remains integrated. The emphasis in this school of thought is very much upon differentiation, with integration assumed to be achieved through the chain of command.

As a backlash against this, the Human Relations school appears to have taken the opposite approach. Lawrence and Lorsch (1967) believe that this school "has placed almost all of its emphasis on realising a high state of integration and has definitely played down the utility and importance of concurrently achieving appropriate differentiation" (p182). Research (for example, Vroom 1964, Turner and Lawrence 1965) has shown, however, that people differ a great deal in their response to certain management practices. It cannot be assumed that any one approach will be suitable in all areas of the organization.

A sufficiently high level of integration may not be easily attainable. Depending upon the circumstances with which it is faced, an organization may have to actively put mechanisms in place to ensure that all parts of the organization are acting with a unity of purpose. The most appropriate method will depend upon the context in which it is being used, as it may be far harder to achieve integration in certain circumstances. Figure 2.2, overleaf, shows a number of factors that researchers have shown can make effective integration difficult.
A number of theorists have considered the variety of integrating or co-ordinating mechanisms that are available to organizations. I will briefly look at each of the approaches suggested by more prominent writers before detailing the approach that is adopted in this thesis.

Lawrence and Lorsch (1967) believed that integration could be achieved in four main ways:
1. Through the use of an integrating department, for example production control.
2. Through cross functional teams, which can be either temporary or permanent in nature.
3. Through the chain of command or management hierarchy.
4. Through the paper system.

In their book Organization and Environment (1967) they tend to concentrate on the use of an integrating department or role and ignore the others to a large extent. Thompson (1967) suggested there are three major ways of achieving integration:

1. **Standardisation.** This, according to Thompson, is most appropriate where situations are relatively stable and repetitive so that the situation can be matched with the appropriate rules.
2. **Co-ordination by Plan.** This was originally suggested by March and Simon (1958) and reflects a slightly less rigid approach than the previous. Schedules are established which govern the actions of interdependent units, without laying down strict rules.

3. **Co-ordination by Mutual Adjustment.** This involves the continuous transmission of information during the process of action and is more appropriate in variable and unpredictable situations.

A similar typology has also been used by Van de Ven et al (1976) and Slocum and Simms (1980) in their studies of co-ordination mechanisms within organizations.

Litterer (1965) suggested that achieving integration was one of the principal functions of top management. He proposed three main means of achieving it: through the hierarchy, through the administrative or control systems and finally through voluntary activities. The extent to which an organization will want to rely on voluntary activities, particularly if integration is vital, could be questioned. This may, however, be most appropriate in smaller, more informal organizations.

Mintzberg (1990) identified six possible methods of achieving integration:

1. **Mutual Adjustment.** This involves continual information interchange between those involved.

2. **Direct Supervision.** Integration is ensured through the chain of command. This is similar to the approach put forward by the classical theorists.

3. **Standardisation of Work Processes.** The methods to be used in performing tasks are predefined. This is well suited to predictable work processes.

4. **Standardisation of Skills and Knowledge.** Members of the organization all have similarly high levels of skills and professionalism which enables them to respect each other and be able to work well together.

5. **Standardisation of Work Outputs.** The results of work are specified instead of the method of achievement. As long as results emphasise wider organizational goals, as opposed to narrow departmental goals, this can be useful in achieving integration.
6. **Standardisation of Ideology.** The different areas of the company are brought together by a common belief about the company mission and what is important in achieving it.

Shapiro (1977) pointed out the need for measurement and reward systems that stress co-operation between the functions. He suggested that good sales forecasting might be rewarded instead of the currently popular approach of rewarding people for going above their sales quota. Galbraith (1973) extended this by proposing that to ensure integration..."the organization should have a reward system that rewards co-operative behaviour, managers who are interpersonally competent, norms which make such collaboration legitimate and clearly visible departmental targets" (p49). He also suggests that there are four major integrating devices. These are:

1. **Direct Contact:** This involves encouraging lower level staff to contact staff from other departments without going through their managers.

2. **Liaison Roles:** These are specialised roles which handle communication between two departments, for example, an engineering liaison officer may be part of the engineering department but situated in the factory.

3. **Task Forces:** Galbraith suggests that these are useful when there is a problem between more than two functions. It will be a temporary group lasting only until a particular problem is solved.

4. **Teams:** These are similar to task forces but are formed on a more permanent basis.

Thus, Galbraith appears to see non-structural factors such as the reward system as prerequisites for effective integration but not as actual integration mechanisms themselves.

In this research, I have chosen to use Kotter et al's (1986) definitions of integration mechanisms. These authors seem to go into greater depth and discuss a wider variety of methods than any of the above theorists. They also recognise that factors such as development and remuneration can be used to promote unity of purpose within an organization and are, therefore, not limited purely to structural integration.
mechanisms, as were many previous theorists. Kotter et al define ten different types of integration mechanisms that can be used in organizations:

1. Management Hierarchy
According to Kotter et al, this is a common solution to integration difficulties. The work units concerned report to the same supervisor who can then ensure effective coordination personally. This is the approach preferred by classical theorists. However, used in isolation, the hierarchy can easily be overloaded. In addition, this method can cause an excessive level of bureaucracy.

2. Staff
The use of specialist staff to assist management can reduce overload upon the hierarchy. The main problem here is that staff units can create integration problems as well as solve them, especially between themselves and line managers in the work units.

3. Rules and Procedures
When decision situations routinely arise that effect two or more parts of an organization, it is possible to establish rules or procedures regarding how they should be handled. This method can be advantageous as it is cheap, the problem is, however, that rules can only really be used when the situation is relatively stable so that the company does not have to constantly change them. Other problems associated with reliance on rules are:
(i) Since rules have to be policed, they can cause stress between managers and workers.
(ii) Since rules tend to specify a minimum acceptable level, behaviour often settles at this level.
(iii) Excessive reliance on rules can lead to goal displacement, where following rules becomes an end in itself rather than a means towards achieving the goals of the organization.

4. Goals and Plans
These can serve a function similar to that of rules and procedures but for a limited time. Kotter et al give an example of the use of goals in this way: by setting exact specifications for modifying a product and by determining timetables for its production, and introduction dates, the engineering, marketing and manufacturing departments of a company can work independently yet be sure that they are working
in an integrated manner. The major drawback to using goals and plans is their cost as it can take a lot of time and energy to develop them.

5. Committees and Task Forces
These are attractive because they can deal with non-routine spur of the moment problems. They can process a lot of information and make fairly quick decisions. There are, however, two drawbacks, the first is the cost and secondly that members of the group need to have group decision making skills, otherwise this method can be very inefficient.

6. Formal Authority
This relates to whether the organization is highly centralised or decentralised. If a company depends on team meetings and task forces, then power should be relatively decentralised. If, however, the company relies almost exclusively on rules and a management hierarchy, then power should be relatively centralised.

7. Measurement and Reward Systems
Integrative measurement and reward systems are set up to measure variables related to the successful co-ordination of certain work units. Whilst they can motivate behaviour that focuses on effective integration, they can have drawbacks: the first is, again, the cost. Another possible problem is the dysfunctional effect these systems can have as people tend to ignore important but unrewarded measures.

8. Selection and Development Systems
These can serve as integrating devices in two ways. First, they can provide an organization with individuals who can play key integrating roles. Second, by providing formal training programmes, they can help build better relations between disparate functions.

9. Physical Setting
Physical proximity makes communication easier. However, it can be very expensive to ensure that the organization has the perfect setting for integration to be effective.

10. Departmentalisation
A final way to reduce integration problems is to redesign work unit boundaries so as to include interdependence within the unit. One of the most common uses of this is the switch from a functional towards a product based structure - "the usual structural choice between organizing work units along functional or product lines presents a
trade-off in our terms between emphasizing differentiation at the expense of integration (functional work units) or vice versa (product work units)" (Lawrence and Lorsch, 1967, p171). Product grouping can also have drawbacks as specialisation may be lost and there may be problems of integration between the product groups.

The choice of which integration mechanisms to use will depend upon circumstances, as Kotter et al (1986, p144) put it... "subunit boundary structure, integrating devices and subunit organizational designs cannot be evaluated in the abstract... they are only appropriate or inappropriate in the light of how well they fit a specific situation." Miller (1987) identified differences between bureaucratic and organic integration mechanisms. Examples of bureaucratic mechanisms are formal controls and integration of decisions. Organic measures, on the other hand, are: task forces, co-ordinative committees, internal communication systems and multiplexity of decisions. Miller hypothesizes that an organization will use the more organic devices when facing a more dynamic and heterogeneous environment and rely on the more bureaucratic measures when the firm is facing an increase in the number of predictable stable contingencies.

Lawrence and Lorsch suggest that when an organization is facing a more dynamic and uncertain environment integration is needed to cope with uncertain and complex problems. This uncertainty means that much of the integration must be carried out at lower levels in the organization. In contrast, more certain environments have fewer problems and therefore more routine integration is carried on at the lower level through the use of scheduling and so on, thus integration (of more complex issues) rests far higher in the hierarchy. This hypothesis is also supported by Galbraith (1973) and will be considered in this research.

**Linking Differentiation and Integration**

Kotter et al (1986) have suggested that when designing an organization there are three basic questions that must be considered:

1. Where do we draw the boundaries that define the organization's major and minor specialised subunits? Exactly what tasks should we assign to each of those subunits?

2. How do we organize each of the major and minor specialised subunits that we have created? That is, how do we structure each of these units and what type of measurement, reward, selection and development systems are appropriate?
3. How do we integrate these subunits so that their individual contributions add up to achieve the company's overall objectives? How do we avoid a situation in which each part performs its role adequately and yet the whole doesn't accomplish its goals?

Thus, differentiation and integration decisions are fundamental to the design of organizations. However, Hrebiniak and Joyce (1984) have added to the Lawrence and Lorsch research "by noting that while differentiation always precedes and often is antagonistic to integration, it is also clear that differentiation decisions, when defining operating structure are usually made simultaneously considering feasible integrating mechanisms. Thus, concerns with differentiation and integration are not always sequential although the actual techniques to achieve the latter follow the former" (Hrebiniak and Joyce, 1984, p14).

Lawrence and Lorsch suggest that the appropriate level of differentiation will be determined by the subenvironments faced by each core department; whilst the appropriate level of integration will be determined by the total environment. They believe that in more dynamic environments differentiation needs will be higher and, as differentiation and integration are essentially antagonistic in nature, this will mean more effort will need to be made to achieve effective integration. Thus, a wider variety of mechanisms will be used. They also propose that, regardless of the level of differentiation, in order to be successful, integration should always be high. However, the ease with which this is achieved and the number of mechanisms used will depend upon the context. In a more stable environment, where differentiation needs are lower, it will be much easier to achieve effective integration.

Miller and Friesen (1984) and Khandwalla (1973) have a different interpretation of differentiation and integration. They suggest a positive association between the two concepts. Thus, when differentiation is low then integration needs will also be low, and vice versa. These authors do not adequately explain whether they are referring to integration as a state or the extent to which integration mechanisms are being used. If they are referring to the former they are contradicting Lawrence and Lorsch. If however, they are referring to the latter then they would actually be agreeing with them as Lawrence and Lorsch recognise that integration is easier to achieve when differentiation is low and that therefore there would be less need for a wide range of devices.
Conclusions: The Relevance of Differentiation and Integration to this Research

This chapter has described the concepts of differentiation and integration and discussed previous research that has been undertaken in this area of organizational theory. These two concepts will be used in this research to aid the understanding of the links between the macro organizational configurations and the micro work unit configurations. The concepts of differentiation and integration are relevant to configurations approach because the need for differentiation mirrors the need for internal consistency within each of the work units. However consistency is also important at the macro-organizational level and hence integration can be used to show what methods are used to ensure that the differentiated units are working towards the organization’s overall corporate goals. The research will also explore the link between each of the concepts and the organizational environment. Although this is somewhat contradictory to a configurational analysis it will allow the testing of a number of the propositions put forward by Lawrence and Lorsch.

The purpose of this chapter and the previous one was to give the reader an overview of the major concepts that form the foundations of this research. As was discussed earlier, the configurational approach is being used to synthesize existing work in the contingency field. The next chapter reviews in detail the variables that have been used in contingency theory and substantiates the use of each of them in the derivation of the micro-configurations. Once this has been done it will be possible to move on and discuss the empirical research that has been undertaken.
References


Galbraith, J. R., (1973), Designing Complex Organizations, Massachussets, Addison-Wesley.


Thompson, J. D., (1967), Organizations In Action, New York, Mcgraw Hill.


Introduction

The previous two chapters have given an introduction to the broad concepts that are to be studied in this thesis. This chapter forms the final part of the literature review and provides a detailed examination of the contingency literature.

The theme throughout this thesis is one of synthesis, pulling together many different areas of organizational theory that have previously been viewed in isolation. Deriving the micro-configurations provides a wonderful opportunity to bring together much of the existing research in the contingency field. The exploratory nature of the research means that there is no obvious group of variables available, therefore, a thorough analysis has been done of the contingency field to identify all of the possible variables that should be included here. The results may show that some of these variables are less important than others, however, at this stage it is necessary to include all possibilities so that a complete synthesis of the contingency literature is performed.

This chapter gives a definition of all of the variable used and reviews research that has been conducted upon them. As there is a very large amount of material to be included, tables have been used to summarise much of the research, in order to easily compare the findings of many different authors.
Task Uncertainty

Technology is considered to have a different meaning in organizational theory than it has in everyday language. As non-production departments are often those under analysis, it would be difficult to consider only the production technology, therefore, technology is defined in more generic terms as: "the actions that an individual performs upon an object with or without the aid of tools or mechanical devices in order to make some change in that object" (Perrow, 1972, p166). Many researchers (Van de Ven 1974, Hage and Aiken 1969, David et al 1989, Ouchi and Macguire 1975) followed Perrow's characterisation of technology as embodying two main aspects, task difficulty or uncertainty and task variability. Later theorists also included interdependence (Slocum and Simms 1980, Van De Ven et al 1976, Mohr 1971) under the heading of technology. Although it is recognised that this may not completely encapsulate technology, these three dimensions have been used extensively in the literature and provide the most complete coverage that has been seen. Each of these dimensions is considered in turn.

Figure 3.1, below, shows some of the major authors who have considered technology in terms of task uncertainty and linked it to other contingent factors:

**Figure 3.1 Contingency Research into Task Uncertainty**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abernathy, M. and Stoelwinder, J. (1991)</td>
<td>Found a three way interaction between task uncertainty, budget use and system goal orientation. Suggest that the level of system goal orientation is a mediating factor between task uncertainty and control systems.</td>
</tr>
<tr>
<td>Barley, S. (1990)</td>
<td>Roles and social networks were found to mediate a technology's structural effects.</td>
</tr>
<tr>
<td>Blauner, R. (1964)</td>
<td>Technology was found to determine the distribution of skill factors and level of integration within a firm.</td>
</tr>
<tr>
<td>Buchanan, D. and Bessant, J. (1985)</td>
<td>Found a strong technological impact upon skill levels, autonomy and training.</td>
</tr>
</tbody>
</table>

Continued over the page
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burack, E. (1967)</td>
<td>As technological complexity increases more complex organizational structures were found to develop.</td>
</tr>
<tr>
<td>Comstock, D. E. and Scott, W. (1977)</td>
<td>Lower levels of task uncertainty were found to correlate with lower levels of qualifications and skills and higher levels of specialisation and differentiation.</td>
</tr>
<tr>
<td>David, F. et al (1989)</td>
<td>Found that group technology/structure fit was a better predictor of work group performance than either technology or structure alone.</td>
</tr>
<tr>
<td>Freeman, J. H. (1973)</td>
<td>Studied 41 manufacturing companies and found that task uncertainty was a mediating factor in the relationship between environment and structure.</td>
</tr>
<tr>
<td>Griffin, R. (1980)</td>
<td>Found significant correlations between individual, task design and leader behaviour variables and facets of satisfaction.</td>
</tr>
<tr>
<td>Grimes, A. J. and Klein, S. M. (1973)</td>
<td>Findings suggested that &quot;technology has a powerful impact on the way units are managed. However, the impact may be attenuated by such things as interpersonal relationships, hierarchy or normative factors embedded in the plant culture.&quot; p587</td>
</tr>
<tr>
<td>Hachen, D. (1988)</td>
<td>Proposed that attempts to determine the causal priority of technology or control are misguided but that a fit between the two is more conducive to performance.</td>
</tr>
<tr>
<td>Hage, J. and Aiken, M. (1969)</td>
<td>Lower levels of task uncertainty resulted in more centralised structure and greater emphasis on quantifiable objective goals.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall, R. H. (1962)</td>
<td>Found that there was considerable intra-organizational structural variation on dimensions such as spans of control, reporting relationships, and emphasis on formal rules. He adduced that these structural differences were due to differences in tasks being performed.</td>
</tr>
<tr>
<td>Harvey, E. (1968)</td>
<td>Found a causal relationship between technology and structure.</td>
</tr>
<tr>
<td>Hayes (1977)</td>
<td>Correlated the use of budgets with more routine tasks.</td>
</tr>
<tr>
<td>Hirst, M. (1981)</td>
<td>Where task uncertainty was high, workers reported an increase in tension as reliance on accounting performance measures increased.</td>
</tr>
<tr>
<td>Hrebinjak, L. (1974)</td>
<td>Found that the control structure and style of supervision were mediators in the relationship between technology and structure.</td>
</tr>
<tr>
<td>Kelley, M. (1990)</td>
<td>Concluded that technology is one of the factors that effects the choice of job design.</td>
</tr>
<tr>
<td>Macintosh, N. B. (1981)</td>
<td>Found that lower levels of task uncertainty were associated with planning, clear cut lines of authority and well-defined rules.</td>
</tr>
<tr>
<td>Ouchi, W. and McGuire, M. (1975)</td>
<td>Linked level of task complexity with different types of control.</td>
</tr>
<tr>
<td>Perrow, C. (1967)</td>
<td>Found that task structures vary with technology and social structure is related to both technology and task structure.</td>
</tr>
</tbody>
</table>

Continued over the page
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reeves, T. K. and Turner, B.</td>
<td>1972</td>
<td>Linked levels of complexity with control mechanisms.</td>
</tr>
<tr>
<td>Slocum, J. and Simms, H.</td>
<td>1980</td>
<td>Developed a model linking workflow predictability, task uncertainty and interdependence with different modes of managerial control and job design.</td>
</tr>
<tr>
<td>Thompson, J. and Bates, F. L.</td>
<td>1957</td>
<td>Linked technology with structure.</td>
</tr>
<tr>
<td>Tushman, M. L.</td>
<td>1979</td>
<td>Found that in high performing subunits communication structure was contingent upon task uncertainty, task environment and interdependence.</td>
</tr>
<tr>
<td>Tushman, M. L and Nadler, D.</td>
<td>1978</td>
<td>Linked task uncertainty to organizational structure, co-ordinating and control mechanisms.</td>
</tr>
<tr>
<td>Van De Ven, A. and Delbecq, A. L.</td>
<td>1974</td>
<td>Linked task difficulty and task variability to 3 basic structural modes, systematised, service and group. The authors stressed that this is a taxonomy, no causation is implied.</td>
</tr>
<tr>
<td>Van De Ven et al</td>
<td>1976</td>
<td>Linked task uncertainty with modes of co-ordination. Higher levels of task uncertainty result in less emphasis on impersonal modes and more on group and personal modes.</td>
</tr>
</tbody>
</table>

As the table shows, the contingency literature tends to concentrate upon linking technology to structure. This literature is, however, far from being one coherent body of work. Different definitions of technology have been used and it has been measured at different levels, for example, some researchers (Woodward 1970, Pugh et al, Thompson 1967) concentrate on the whole organization while others (Van de Van et al 1976, David et al 1989) look only at the work unit level. Thus, it is hardly surprising that the results often conflict. As can be seen from the table, some researchers propose that technology is an independent contextual variable that structure or some other contingent variable must adapt to; others have found that technology is itself contingent upon other factors; while still others view it as a mediating variable, tempering the relationship between another contextual variable (often environment) and the organization's structure.
Additional problems include a lack of standardised measures, and the inability of many researchers to set boundaries between measures. Stanfield (1976, p491) gives an insight into this when he comments:

Mohr (1971) measured technology partly by asking supervisors how much judgement their subordinates exercised which is also a measure of centralisation of authority, and partly by measuring job interdependence. Furthermore, his version of structure included the extent of use of participatory management, which could be viewed as managerial technology. Hage and Aiken (1969) implicitly included managerial participation in decisions in technology and their version of organizational structure included job codification and worker training. Harvey (1968) categorised job specialisation and specificity of output programming in organizational structure. Perrow (1967) included under organizational structure the supervisor's discretion to change production methods, alter subordinate's task interdependence or decide whether to use close supervision methods. Hickson et al (1969) referred to this aspect of structure as operations technology. Fullan included standardisation of tasks and tools, worker skill, degree of division of labour and task interdependence under technology. Fullan also pointed out that automation is a means of centralisation of control, although centralised control of work processes is usually considered organizational structure. The Aston group (Pugh et al 1968, Hickson et al 1969, Child and Mansfield 1972) placed standardisation of procedures, methods of supervision, minuteness of division of labour and task interdependence under organizational structure. Lynch (1974) said that interdepartmental task interdependence should perhaps be structural rather than technological. In short, studies of socio-technical systems vary greatly as to where the line is drawn between technology and organization.

Thus, although a great deal of research has been done in this area, very little concrete knowledge has been gained. We know that there is some link between technology and other variables but the exact nature of the relationship still eludes us. For this reason technology, in terms of the three dimensions listed above, is included in the work unit configuration. It is not given any greater weighting than other variables, even though it has received far more attention in the literature.

This section has concentrated upon the task uncertainty aspect, the next two sections will look at the other two dimensions generally subsumed under the heading technology: work flow uncertainty and interdependence.
Workload Uncertainty

Workload uncertainty, or task variability as it is sometimes called, relates to the number of exceptional cases encountered in the work requiring different methods or procedures (Perrow 1967). This is also considered to be a function of the technology employed. The variable is likely to be scored highly when the work unit's external environment is complex and changing, or when a large number of exceptions are encountered in the job, making it hard for guidelines to include all of the possible variations. Perrow (1967), who originally pointed out the difference between task uncertainty and work flow uncertainty, suggested that it could be measured by looking at the number of exceptional cases encountered. For Thompson (1967), Hickson et al (1969) and Woodward (1965) task variability could be measured as the stability and uniformity of inputs and outputs. It has also been measured as the routinisation, repetitiveness, stability or rigidity of the work (Litwak 1961, Hage and Aiken 1969, Delbecq et al 1969 and Grimes 1970).

In many ways the difference between task uncertainty and work flow uncertainty is intuitively obvious. A person doing a routine, menial task who has no control over the timing of that task (therefore facing work flow uncertainty) would not necessarily require the same style of management as a person doing an uncertain task which required them to do a great deal of thinking about the task they were performing. Workload uncertainty, in particular, has been shown to influence the extent to which work unit activities can be structured in a routinised, systematised or mechanised way (Perrow 1967, Hage and Aiken 1969, Hall 1962, Litwak 1961, Woodward 1965). March and Simon (1958 p143) suggest that task variability directly affects the performance programme or mode of operating (i.e. structure, control systems and management style) within a unit to structure work activities.

The links between task uncertainty and work flow uncertainty remain unclear, Van de Ven and Delbecq (1974) suggest that the two factors are independent but that they will have an interactive effect upon structure. Other authors (Perrow 1967, Hage and Aiken 1969) see the two variables as interdependent dimensions of technology.

The table overleaf lists authors who have conducted research into the effects of work flow uncertainty:
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argote, L. (1982)</td>
<td>Linked input uncertainty with different methods of co-ordination. The higher the uncertainty the less likely programmed means would be used.</td>
</tr>
<tr>
<td>Bell, G. D. (1969)</td>
<td>Found an interaction effect between predictability of work flow and professionalism of the workforce which influenced the degree of rigidity of control.</td>
</tr>
<tr>
<td>Comstock, D. and Scott, W. (1977)</td>
<td>More predictable tasks were associated with less qualified workers and greater specialisation.</td>
</tr>
<tr>
<td>Grimes, A. J. and Klein, S. M. (1973)</td>
<td>Found that task variability influenced levels of autonomy and discretion.</td>
</tr>
<tr>
<td>Hage, J. and Aiken, M. (1969)</td>
<td>Routineness of work was found to influence the level of centralisation of structure.</td>
</tr>
<tr>
<td>Mohr, L. B. (1971)</td>
<td>The more routine the job the more likely that supervisors and subordinates had prior socialisation which lead them to expect non-participation.</td>
</tr>
<tr>
<td>Morse, J. (1970)</td>
<td>Linked predictability and routineness of work and found that this influenced control mechanisms used to motivate worker performance.</td>
</tr>
<tr>
<td>Ouchi, W. and Mcguire, M. A. (1975)</td>
<td>The level of predictability in the work influenced the style of control mechanism used. More routine work resulted in behavioural control being emphasized.</td>
</tr>
</tbody>
</table>

As figure 3.2 shows, the majority of theorists have linked work flow uncertainty with structure or control mechanisms. The surprising fact is that writers have always assumed the relationship to be causal in only one direction. They have ignored the fact that certain structures or controls will impact upon the level of variability faced. For example, within a very bureaucratic style of organization operating with high degrees of specialisation workers often face a lower level of variability. The use of
fact that certain structures or controls will impact upon the level of variability faced. For example, within a very bureaucratic style of organization operating with high degrees of specialisation workers often face a lower level of variability. The use of process control mechanisms and an increase in standardisation may also reduce the level of work flow uncertainty faced. Hence, I would argue that this will not be a purely contextual factor, it can be influenced by a number of other variables. Therefore, work flow uncertainty is included as one of the variables in the work unit configurations.
**Interdependence**

Interdependence reflects the degree to which an individual's output cannot be achieved alone. High levels of interdependence are present when workers must share skills, equipment or materials to achieve the desired output. Figure 3.3, overleaf shows the different types of interdependence that occur in the work environment. Interdependence was first highlighted as an important contingent variable by Thompson (1967). He differentiated between three types: pooled, sequential and reciprocal and suggested that each of these would require different methods of co-ordination and control. This was supported by the research of Cheng and McKinley (1983), who found that as work units varied from pooled to sequential to reciprocal interdependence, there was a greater need for co-ordination and that the mode of co-ordination tended to change from an impersonal to a more personal style. Van De Ven et al (1976) extended Thompson's work by adding a team type of interdependence. They found, however, that the link between interdependence and co-ordination was more complex than Thompson had described and proposed that other factors such as task uncertainty and size would also be contingent factors. This is partially supported by Mohr's (1971) research which found that increases in interdependence coincided with increased participativeness and a more organic structure but that interdependence was not solely responsible for the change, other factors such as task routineness had to be taken into account.
Interdependence is generally viewed as an element of technology rather than a factor in its own right (Mohr 1971, Hrebiniak 1974, David et al 1989). In this way it has often been linked to organizational and work unit structure, for example David et al (1989) found that when technological factors including interdependence were matched with certain structural factors, work units were more effective. Similarly, Slocum and Simms (1980) suggested a typology which linked interdependence, along
with task and work flow uncertainty to structure, control mechanisms and job design. Blau (1972) also proposed that the level of interdependence required by the tasks being performed would impact upon organizational structure.

An interesting study by Janice Klein (1991) has considered the effects of new manufacturing technologies upon interdependence and in turn upon levels of autonomy. She found that Just in Time manufacturing, for example, by reducing buffers, increases the level of interdependence and reduces the level of individual autonomy. Also, the introduction of process controls changed the interdependencies of tasks which in turn impacted upon the level of co-ordination needed and reduced autonomy.

More recent research has concentrated on the effects of the level of interdependence upon the most appropriate management control system. Macintosh and Daft (1987) found that when interdependence was low more emphasis was put upon standard operating procedures, when it was moderate budgets and statistical reports became more important, whereas both of these declined in importance and a more personal approach was taken when interdependence was high. Ito and Peterson (1986), conducting similar research, proposed that the difficulty of the task played an important role in influencing the level of interdependence and the most appropriate method of managing it.

Interdependence can thus be seen as both a contextual (independent) factor influencing the types of control and co-ordination mechanisms that are most appropriate; or it can be seen as a contingent (dependent) variable, influenced by structure and technology. The relationship is obviously complex. Interdependence is therefore included as one of the variables in the current research.
Environment

The environment is now recognised by contingency theorists as a major factor influencing organizational design. This is, however, a fairly recent advance as, although some authors such as Katz and Kahn (1966) and Crozier (1964) had recognised the importance of the external environment and Dill (1958) had made a pioneering study classifying different aspects of the environment, until the 1970's the following criticism made by Smelser and Davis (1968, p65) was fairly accurate:

"Too much theory and research has been based on the model of a single organization and attention has been focused on internal processes by and large... Having become rooted in their social and technological environment organizations find themselves constraining and being constrained by these environments in new ways yet investigators of formal organizations have barely begun to attack these new relationships."

The situation changed in the 1970's, however, when the environment came to be considered by many theorists as the major, if not the sole, factor influencing organizational design. Since then there has been a great deal of work in this area. A problem highlighted by Ford and Slocum (1977), however, is that different theorists have conceptualised and measured the environment in different ways. The table below shows how some different theorists have attempted to measure the environment.

Figure 3.4 Measures of the Environment

<table>
<thead>
<tr>
<th>Author</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldrich, H. (1975)</td>
<td>Heterogeneity and homogeneity</td>
</tr>
<tr>
<td></td>
<td>lack of information, feedback and</td>
</tr>
<tr>
<td></td>
<td>knowledge of outcomes</td>
</tr>
</tbody>
</table>

Continued over the page
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Environment Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duncan, R. (1972, 1973)</td>
<td>Simple-complex, static-dynamic</td>
</tr>
<tr>
<td>Emery, F. and Trist, E. (1965)</td>
<td>Placid-random, placid-clustered, disturbed-reactive and turbulent field</td>
</tr>
<tr>
<td>Freeman, J. H. (1973)</td>
<td>Diversity and dynamism</td>
</tr>
<tr>
<td>Khandwalla, P. (1972)</td>
<td>Malevolence, uncertainty, and heterogeneity</td>
</tr>
<tr>
<td>Lawrence, P. and Lorsch, J. (1967)</td>
<td>Dynamism, level of information, and feedback</td>
</tr>
<tr>
<td>Neghandi, A. and Reimann, B. (1973)</td>
<td>Dynamism</td>
</tr>
<tr>
<td>Terreberry, S. (1968)</td>
<td>Level of turbulence</td>
</tr>
<tr>
<td>Tosi, H. et al (1973)</td>
<td>Dynamism, level of information, and feedback</td>
</tr>
</tbody>
</table>

As figure 3.4 shows, although the environment has been studied by many writers, very few of them have actually measured the same thing! This has meant that many of the studies produced conflicting results that cannot really be compared. Another factor that has made comparisons difficult is the extent to which authors rely on objective or subjective measures of the environment, for example, Tosi et al (1973) attempted to replicate the work of Lawrence and Lorsch (1967) and claimed that they had disproved their hypotheses. However, Tosi et al used different measures, preferring what they considered to be objective measures to Lawrence and Lorsch's perceptual measures. This meant that the two sets of results were not directly comparable and so the Lawrence and Lorsch results could not be discounted.
The majority of more recent theorists have tended to use managerial perceptions of the environment rather than trying to use some more objective measure. See, for example, Huber et al (1975), Duncan (1972, 1973), Downey and Slocum (1975), Lawrence and Lorsch (1967) and Aldrich and Mindlin (1978). Others, such as Tosi et al (1973) and Bourgeois III (1980), have tried to measure the environment objectively by using company records and statistics, although the extent to which they have been able to do this is open to question. Moreover, it is questionable whether company records are always more objective than managers' views. They may be out of date, or rarely followed. In addition, if the organization does not perceive any change in its environment, how can it react to it?

In general, contingency theorists have tended to accept that the link between environment and organization is causal and unidirectional, i.e. that some perceived factor in the environment causes the organization to react in a certain way. There are a few, however, who have shown that causation could be in the opposite direction or that it is more likely that organization and environment can both influence each other. For example, Levine and White (1961), Cook (1977), Thompson (1967), and Wassenberg (1977), all point out how companies can operate in a 'negotiated environment' which gives them a greater degree of influence over factors outside the boundaries of their own organization.

The effects of the environment upon structure have been widely researched (Freeman 1973, Negandi and Reimann 1973, Schmidt and Cummings 1976, Dastmalchian and Boag 1990, Azma and Mansfield 1981, Duncan 1972). Other writers have considered how environment, strategy and structure link together (Miller 1981, 1987, Chandler 1962, Bourgeois III 1980). Child (1972), in particular, followed this approach arguing that many contingency theorists "ignore the essentially political process whereby power-holders within an organization decide upon courses of strategic action" (p2). Some authors have tried to widen the scope of environmental determinism by linking the environment with other variables, for example, Khandwalla (1972) considers its impact upon structure, decision making style, use of controls, culture, and technology. Burns and Stalker (1961) also proposed that the environment determined whether an organization followed a mechanistic or organic style which covered many different factors in addition to structure.

As can be seen above, a good deal has been written about the environment. However, the lack of a common approach has resulted in very confusing research results. Too often the environment has been seen as the sole factor influencing organizations.
More recent work by Miller and Friesen (1984, 1987) has shown that this is unlikely to be the case and has pointed to a more holistic approach viewing the environment as one amongst a number of variables to be taken into account. This is the approach that is being adopted in the current research. The environment is considered in two ways. The macro-organizational environment is considered as part of the overall organizational configuration, whilst the subenvironment is taken into account in each of the micro-configurations. Lawrence and Lorsch's measuring scale has been used to measure the subenvironment for the micro-configurational analysis.
Size

Size has been chosen as a variable in this research primarily as a result of numerous studies that have linked the size of an organization with the resulting structure. Perhaps the best known work in this area is that of Weber (1947, 1948, 1968), who developed theories relating to bureaucracy. He saw bureaucracy as the most efficient way of structuring and managing a very large organization (at the time of Weber's writings the term bureaucracy did not have the negative connotations of inefficiency and overstaffing that it does today).

In more recent research, Peter Blau (1968, 1970, 1973) has been a major proponent of size as a factor determining organizational structure. His research found that as size increased, organizations developed more specialised roles and more distinct groupings of specialists, i.e. it became more complex and a higher level of differentiation occurred as a result of this. Other researchers have substantiated Blau's work in a variety of different settings: Terrien and Mills (1955) found that complexity increased with size in schools; Caplow (1957) and Tsouderos (1955) replicated these findings in manufacturing organizations and Raphael (1967) also found a similar link between size and structure in labour organizations. Finally, Meyer (1972) presented support for Blau's contention that increases in size lead to structural differentiation.

Despite the research discussed above, the evidence with regard to the relationship between size and organizational structure remains confusing. Whilst these authors claim that size increases complexity within organizations, there is an equally large body of researchers who claim the opposite, i.e. that increasing size reduces complexity. For example, Anderson and Warkov (1961), Champion and Bellerton (1974) and Tosi and Pratt (1967) found that functional complexity within hospital units decreased with increasing size. Lidenfeld (1961) found similar results in his study of schools, as did Pondy (1969) in manufacturing organizations. Indik (1964) made an interesting point when he noted that the increase in size would only reduce complexity and the ratio of supervisors if the role of lower level employees remained the same. Thus he recognised, if not explicitly, that other factors such as the task being performed and levels of professionalism would also influence structure.

The most thorough research that has been done into the link between size and organization structure was performed by the Aston group (Pugh et al 1969, 1971;
These researchers tried to link measures of organizational structure with size and technology (they also tested the relationship between location and structure in subsequent works which extended beyond the original national boundaries [Hickson et al 1974]). They found that size was a major factor predicting some aspects of structure, namely standardisation, specialisation and formalisation. In this respect they, at least partially, supported the work of Blau. They did, however, suggest limitations of Blau's findings when they stated

"Larger organizations tend to have more specialisation, more standardisation and more formalisation than smaller organizations. The lack of any relationship between size and the remaining structural dimensions, i.e. concentration of authority ... and line control of work flow was equally striking (Pugh and Hickson 1976 p87)

In addition to these writers, there is another group of researchers who question whether size can be seen as the sole determinant of structure. Kmetz (1977) highlighted the need to understand the complex relationship between different aspects of organization and argued that it is wrong to see size as an independent variable when it could easily be influenced by factors such as the environment and managerial decision making. Beyer and Trice (1979), in their replication of Blau's work, found that technology could be a modifying factor in the link between size and structure, whilst Hrebiniak (1976) argued that the level of professionalism is an important moderating factor.

A number of researchers have reanalysed the Aston data, for example Aldrich (1972) who questioned whether size was the dominant feature, considering technology to be more important. Inkson et al (1964) also shed further doubt on the Aston studies in their abbreviated replication of the work. Others have proposed that size is of no significance, for example Hall et al (1967) concluded from their study of forty-five varied organizations that size was not a significant factor in the determination of either complexity or formalisation. Indeed, Mayhew et al (1962) using a computer programme showed that the relationship between size and complexity found by Blau and Schoenherr (1971) could be derived from a process that assumed random structuring.

In summary, this review of the literature shows that there are a number of conflicting views about the importance of size as a contingent variable. Few researchers believe that it is of no importance, however, when it has been viewed in isolation
contradictory results have occurred. As a result of the great deal of research that has been carried out, size will be included as a variable. It will not, however, be seen as dominant, all variables are equally weighted.
Structure

Structure appears to be the most widely researched aspect of organizations. Perhaps this is due to the emphasis placed upon it by the early classical theorists (Fayol 1949, Urwick 1947). In contingency theory, structure has been considered as both a contextual (Flamholtz 1983, Sutherland 1974, Robey 1986) a contingent variable (Pugh et al 1969, 1971, Van De Ven et al 1976, Harvey 1968, Lynch 1974, etc.) an interdependent variable (Miller and Friesen 1984, Huber et al 1975) and a mediating variable (Blau 1972). Figure 3.5 shows the differences between each of these approaches.

Figure 3.5 Different Approaches to the study of Organizational Structure
The most common approach has been to see structure as contingent upon some other independent variable such as size (Pugh et al 1971) or technology (Woodward 1970). However, although structure has been widely researched, there has been little agreement as to what its causes are, or indeed, to what extent it can determine other variables. According to Stanfield (1976), one reason for this is the differing definitions of structure that have been used. One of the most extensive pieces of research in this area is that of the Aston researchers (Hickson et al 1974, Pugh et al 1969, 1971, 1972, 1976), who considered structure in terms of four factors: formalisation, standardisation, spans of control and centralisation (or levels of discretion afforded to operatives). It is their definitions that I shall draw upon in this research. The list below summarises the most important research that has been done on the subject of organizational structure in recent years.

Figure 3.6 Contingency Research into Organizational Structure

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldrich, H. and Herker, D. (1977)</td>
<td>Whilst the environment is considered to place constraints upon structure, technology was found to be a cause of internal differentiation.</td>
</tr>
<tr>
<td>Barley, S. (1990)</td>
<td>Roles and social network were found to mediate a technology's structural effects.</td>
</tr>
<tr>
<td>Beyer, J. and Trice, H. (1979)</td>
<td>Tried to re-examine the findings of Blau and Schoenherr on the relationship between size and organizational structure. Found some similarities but many differences - concluded that technology may be a modifying factor.</td>
</tr>
<tr>
<td>Blau, P. (1970)</td>
<td>Proposed that increases in size lead to a greater subdivision of responsibilities which facilitates supervision and widens the span of control of supervisors and simultaneously creates structural differentiation and problems of co-ordination that require supervisory attention.</td>
</tr>
</tbody>
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<thead>
<tr>
<th>Reference</th>
<th>Summary</th>
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<tbody>
<tr>
<td>Blau, P. (1972)</td>
<td>Found that larger size promotes structural differentiation and that the level of differentiation mediates the effect of size on the administrative component.</td>
</tr>
<tr>
<td>Blau, P. et al (1976)</td>
<td>The authors studied 110 manufacturing plants and verified the general findings of the Aston studies.</td>
</tr>
<tr>
<td>Blauner, R. (1964)</td>
<td>Found that technology determines the occupational structure, distribution of skill factors and level of integration within an organization.</td>
</tr>
<tr>
<td>Bruns, W. and Waterhouse, J. (1975)</td>
<td>Using data from 25 companies, the authors found an important relationship between structure and the use and effects of budgets.</td>
</tr>
<tr>
<td>Burack, E. (1967)</td>
<td>Concluded that as technological complexity increases more complex organizational structures develop.</td>
</tr>
<tr>
<td>Chakravarthy, B. S. (1982)</td>
<td>The author proposes that managers cope with a firm's external environment through the choice of an appropriate strategy and the design of a matching structure.</td>
</tr>
<tr>
<td>Child, J. (1973)</td>
<td>In this paper, size is examined as a predictor of structure. It was found that the broad outlines of formal structure are predictable from a knowledge of size. However, comparison across industries suggested other factors should be taken into account and that size is not the major determinant.</td>
</tr>
<tr>
<td>Comstock, D. E. and Scott, W. (1977)</td>
<td>Lower levels of task uncertainty were found to correlate with lower levels of qualifications and skills and higher levels of specialisation and differentiation.</td>
</tr>
</tbody>
</table>
Dewar, R. and Simmet, D. (1981)  In this data, neither size nor technology were primary causes of spans of control, person specialisation appeared to be far more important.

Donaldson, L. (1987)  The author proposes a 'Structural adjustment to regain fit' (SARFIT) approach. Under SARFIT the need for structural adjustment comes about as a result of substandard performance, due to misfit between variables rather than as a result of a change in a contingency.

Duncan, R. (1972)  This research confirms the contingency theories of organization formulated by Lawrence and Lorsch (1967) and Pugh et al (1969) indicating that different types of organizational structure are appropriate for different contexts.

Freeman, J. H. (1973)  Found that technology was a mediating factor in the relationship between environment and structure.

Hage, J. and Aiken, M. (1969)  Lower levels of task uncertainty were found to result in a more centralised structure and greater emphasis on quantifiable objective goals.

Hall, R. H. (1962)  Found that there was considerable intra organizational structural variation on dimensions such as span of control, reporting relationships, and emphasis on formal rules. He adduced that these structural differences may be due to differences in technology.

Harvey, E. (1968)  Found a causal relationship between technology and structure.

Hrebinjak, L. (1974)  Found that control structure and supervision were mediators in the relationship between technology and structure.

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<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huber et al (1975)</td>
<td>Linked perceived environmental uncertainty to information load, organization structure and the background of the manager.</td>
</tr>
<tr>
<td>Lawrence, P. and Lorsch, J. (1967)</td>
<td>The authors found a link between the environment and organizational structure. They found that whilst levels of differentiation were dependent upon subenvironmental dynamism. The level of integration necessary was dictated more by macro-environmental factors.</td>
</tr>
<tr>
<td>Meyer, M. W. (1968)</td>
<td>Found that the span of control of first line supervisors sharply dropped as the level of expertise in an organization's subunits increased.</td>
</tr>
<tr>
<td>Pennings, J. M. (1975)</td>
<td>The author analysed the degree of association between measures of structure and environmental uncertainty. He did not support the model that environment has structural correlates except for the variables resourcefulness and complexity.</td>
</tr>
<tr>
<td>Perrów, C. (1967)</td>
<td>Found that task structures varied with technology and social structure was related to both technology and task structure.</td>
</tr>
<tr>
<td>Macintosh, N. B. (1981)</td>
<td>Found that lower levels of task uncertainty were associated with planning, clear cut lines of authority and well defined rules.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Summary</th>
</tr>
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<tbody>
<tr>
<td>Rushing, W. A. (1968)</td>
<td>The author showed that two dimensions of division of labour: structural differentiation and centralisation are related to product hardness. He suggested that production technology mediates these effects.</td>
</tr>
<tr>
<td>Schmidt, S. and Cummings, L. (1976)</td>
<td>The following propositions were supported in a test of 23 units: 1) The greater the magnitude of each of several task environmental dimensions the greater the degree of differentiation. 2) The greater the size of the organization the greater organizational differentiation. 3) The greater the organizational differentiation the less the degree of perceived environmental uncertainty.</td>
</tr>
<tr>
<td>Tracey, P. and Azumi, K. (1976)</td>
<td>The authors found that many relationships linking factors such as organization size and work variability with structure are quite similar to those found in British or American firms despite historical and cultural factors which may be unique to Japanese firms.</td>
</tr>
<tr>
<td>Tushman, M. L. (1979)</td>
<td>In high performing subunits communication structure was contingent upon task uncertainty, task environment and interdependence.</td>
</tr>
<tr>
<td>Van De Ven, A. and Delbecq, A. (1974)</td>
<td>Related task difficulty and task variability to 3 basic structural modes, systematised, service and group. The authors stress that this is a taxonomy, no causation is implied.</td>
</tr>
</tbody>
</table>
The list of researchers studying structure could go on longer. The point is, however, that although a great deal of research has been done, few concrete theories have emerged as much of the research evidence is conflictual. Therefore, I propose that a configurational approach will be more appropriate, perhaps there is no one cause of structure, the whole context of the situation needs to be weighed up and structure viewed as one element among many. It would appear that the simplistic cause-effect approach of the past contingency theorists is not sufficient in the complex organizations of today.
Job Design

As can be seen from the table below, many theorists have looked at the effects of changing job design upon other factors within the organization. A major problem with this research, however, has been that almost all of the studies carried out have been in only one organization, making generalisations impossible. A few theorists, notably Morse (1973), Slocum and Simms (1980), Moncza and Reif (1973) and Kelley (1990), have tried to widen the scope of this area of research by comparing job designs across different organizations, however, they have tended to take a case study approach rather than conduct empirical testing and have rarely considered more than two or three other factors in conjunction with job design.

Figure 3.7, below, gives an overview of research that has been done into job design.

Figure 3.7 Contingency Research into Job Design

<table>
<thead>
<tr>
<th>Author</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotgrove, S. et al (1971)</td>
<td>Found that an increase in autonomy and responsibility necessitated an increase in training.</td>
</tr>
<tr>
<td>Davis, L. and Werling, R. (1960)</td>
<td>A change in job design resulted in changes in skill levels, training and the payment system.</td>
</tr>
<tr>
<td>Doyle, F. (1972)</td>
<td>Changes in task resulted in the need for job redesign.</td>
</tr>
<tr>
<td>Ford, R. N. (1969)</td>
<td>An increase in the extent to which workers perform the whole task, task variety and task significance led to increased communication and improved productivity.</td>
</tr>
<tr>
<td>Friedman, G. (1961)</td>
<td>A change in the extent to which workers performed a whole task necessitated a change in payment system.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kelly, J. (1992)</td>
<td>Found a link between increased autonomy, significance, variety, the extent to which workers performed the whole task and satisfaction.</td>
</tr>
<tr>
<td>Kuriloff, A. (1963)</td>
<td>A change in technology resulted in changes in job design which increased task uncertainty and work flow uncertainty.</td>
</tr>
<tr>
<td>Leigh, A. (1969)</td>
<td>A change in job design resulted in changes in need for training.</td>
</tr>
<tr>
<td>Locke, E. et al (1980)</td>
<td>Stressed the link between job design, payment systems and goal setting.</td>
</tr>
<tr>
<td>Mann, F. and Hoffman, R. (1960)</td>
<td>A change in technology resulted in job redesign which effected employee skill levels.</td>
</tr>
<tr>
<td>Moncza, R. and Reif, W. (1973)</td>
<td>Highlighted the need to match job design with the environment, management style and technology.</td>
</tr>
<tr>
<td>Morse, J. (1973)</td>
<td>Found a strong link between job design, skill levels, technological variables and performance.</td>
</tr>
<tr>
<td>Oldham, G. and Hackman, R. (1980)</td>
<td>Stressed the need to examine the organizational contexts of job design, such as technological, control and personnel systems.</td>
</tr>
<tr>
<td>Pauling, T. P. (1968)</td>
<td>A change in job design resulted in changes to training and payment system.</td>
</tr>
<tr>
<td>Rousseau, D. (1977)</td>
<td>Found a strong link between technology, task and job design.</td>
</tr>
<tr>
<td>Simms, H. et al (1976)</td>
<td>Highlighted the importance of matching management style to job design factors.</td>
</tr>
<tr>
<td>Sirota, D. and Wolfson, A. (1972)</td>
<td>Job redesign resulted in change in task uncertainty levels.</td>
</tr>
<tr>
<td>Slocum, J. and Simms, H. (1980)</td>
<td>Derived typologies showing the link between task uncertainty, work flow uncertainty, interdependence, management style and job design.</td>
</tr>
</tbody>
</table>

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Taylor, L. K. (1972) Changes in job design resulted in changes to task and work flow uncertainty, skill levels, training and promotion prospects.

Trist, E. and Bamforth, K. (1951) The introduction of technology necessitated a change in job design.


Walton, R. (1985) Considered the link between job design and methods of control.

Weed, E. (1971) Changes in task resulted in an increase in feedback, and autonomy necessitated increased training and change to wage system.

Wilkinson, A. (1970) Job redesign required a totally new payment system. It also resulted in changes to task and work flow uncertainty, interdependence, training and skill levels.

The major links that have been discovered in current research, limited as it is, would appear to be with payment systems, approaches to training and management style. The frequent exclusion of other factors such as the task and environment may be because many of the studies cited started from the point when job redesign was introduced and looked at the results of it rather than studying what factors had influenced the decision to redesign jobs. Therefore, it appears that much of the contingency research on job design is incomplete. This variable is being included in the research as, although very little has been conclusively proved, it is a factor that has received a great deal of attention and appears to be linked to others in a far more complex way that has been shown to date. In order to measure job design, I will use the Hackman and Oldham Job diagnostic measuring system as this is the one most frequently used in the literature, (see for example Slocum and Simms 1980, Simms et al 1976, Rousseau 1977 and Kelley 1990). This breaks job design down into five factors: The extent to which workers perform a whole task, the level of task variety, the level of task significance, feedback and autonomy.
Controls

Many Contingency theorists have been interested in the concept of control and how this relates to other aspects of the organization. Control is defined in the dictionary as management or authority. In this context it is defined as "an effective general mechanism for keeping labour hard at work" (Hobsbawm 1975, p221). Several studies have distinguished between two different types of control, behavioural and output (Ouchi and Mcguire 1975, Blau and Scott, 1962, Reeves and Woodward 1970, Turcottte 1974). Behavioural control concentrates on personal supervision and rules and regulations governing the way in which a task is performed. Output control is more concerned with the measurement of outputs through performance records. In other words, behavioural control concentrates on the means whilst output control concentrates on the ends (Ouchi and Macguire 1975). Organizations generally use a combination of output and behavioural controls in different situations.

More recent literature on control systems has shown an increasing awareness of the importance of context (Dunk 1992, Camman 1976, Ansari 1979). The idea that there can be one most suitable type of control system (whether it is based on a participative or autocratic style) has been rejected as the search for 'one best way' has been replaced by a more contextual approach (Ansari 1977, Hofstede 1978).

Many contingency theorists have now concentrated on ascertaining when different styles of control are most appropriate. A number of researchers (Dunk 1992, Hachen 1988, Hirst 1981, 1983, Cheng and Mckinley 1983, Rockness and Shields 1984) have tried to link the use of different control mechanisms to the technology employed by an organization and the resulting levels of task uncertainty. Their general argument has been that an increase in automation with a corresponding decrease in task uncertainty will result in control becoming more standardised. Buchanan and Bessant (1985) in their study of a chemical process plant found that this was not necessarily the case. Machines had taken over much of the routine work which left the operators to cope with more uncertain aspects requiring more thinking than previously. Some authors (Clegg and Dunkerley 1980, Hill 1981, Braverman 1974) have argued that the link between control and technology is causal in the other direction as technology is used as a means of achieving control.

The link between control systems and organizational structure has attracted increasing interest among contingency writers. Other theorists have linked the most appropriate
control system with the organizational structure (Sutherland 1974, Flamholtz 1983). Bruns and Waterhouse (1975), for example, found that control systems tended to be interpersonal in centralised organizations and administrative in more decentralised companies.

The environment has also been identified as an important influence upon control systems: Thompson (1967) argued that organizations facing stable, homogeneous environments should employ standardised rules as control devices. Waterhouse and Tiessen (1978) substantiated this when they found that control was more likely to be delegated in organizations facing a less certain environment. Khandwalla (1972) also linked different types of control with the organizational environment, finding that product competition had the most significant impact. Moreover, Hayes (1977) found that budgets were of more use in departments performing certain tasks, buffered from the external environment than they were in boundary spanning departments. Taking a slightly different approach, Cowen and Middaugh (1990) divided the environment into two types the internal (management style, corporate culture, mission, and goals) and external (political environmental social and technical factors) and argued that both of these would in some way determine the most appropriate style of control mechanism.

Whilst these are the most common areas of research in control systems, they are by no means the only factors that have been considered: Rushing (1966) studied the link between the most appropriate control system and departmental size and level of professionalisation, claiming that both of these factors were important in the design of control mechanisms. Slocum and Simms (1980) considered the impact of task uncertainty, work flow uncertainty and interdependence upon control mechanisms. Macintosh and Daft (1987) also found that interdependence was a major factor determining the most appropriate type of control system. Brownell (1982) argued that it was not enough to match the control system with the organizational structure but that culture should also be taken into account. He also considered the impact of various methods of control upon different personality types (Brownell 1981). This has also been done by Kushnir and Melamed (1991) who found, for example, that type A people were more likely to find high levels of behavioural control stressful. Govindarajan and Gupta (1985) claimed that an organization was more likely to achieve success if the control system was matched to the company strategy; Argyris (1990), however, argued against trying to match control systems with goals at a lower level as he proposed that managers have multiple goals and that it would be impossible to match these with a control system. Finally, Bariff and Galbraith (1978)
linked the style of control system employed to the distribution of power within an organization.

Thus, the issue of control has been widely researched in the contingency field. The problem remains, however, that as control is often linked to only one or two other factors, many of the results found are conflicting or inconclusive. Gordon and Miller (1976) were perhaps the first theorists to try to take a broader view of the design of control systems. They proposed that many different organizational, environmental and management factors should be taken into account. In this way they provided rich descriptions of organizations and suitable control mechanisms rather than developing one causal link.

Control will be included as one of the variables to be measured and attention will be paid to the use of either behavioural or output controls, however, as in the Gordon and Miller case, it will be seen as only one variable among many that helps to shape the work unit being studied. As Macintosh (1985, p145) very succinctly puts it:

"Controls are an important dimension of a wider 'gestalt' of organizational factors. They must be integrated, along with other organizational design factors, into a functional whole with properties not derivable from the summation of the parts"
Performance Measures.

In recent years a great deal of research has been done in the management accounting field, developing a contingent approach towards accounting information systems, including performance measures (see for example: Otley 1980, Hayes 1977, Gordon and Miller 1976). Listed below are the authors who have taken a particular interest in the contingent nature of performance measurement.

Figure 3.8 Contingency Research into Performance Measurement

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birnberg, J. G. et al (1983)</td>
<td>The paper argues that the performance measurement system must be considered in the context of the whole organization.</td>
</tr>
<tr>
<td>Chenhall, R. H. and Morris, D. (1986)</td>
<td>The authors found that structural decentralisation and organizational interdependence had a deterministic influence upon the appropriate management accounting system. In addition, this then influenced the level of perceived environmental uncertainty.</td>
</tr>
<tr>
<td>Daniel, S. and Reitsperger, W. D. (1991)</td>
<td>Performance measurement systems should be designed to fit goals and strategies.</td>
</tr>
<tr>
<td>Ferguson, P. (1989)</td>
<td>The author highlighted the importance of consistency between the performance measurement system and manufacturing technology, proposing that this would lead to improved performance.</td>
</tr>
<tr>
<td>Fry, T. D and Cox, J. F. (1989)</td>
<td>Problems were found to be caused by performance measures that were inconsistent with the organizational context.</td>
</tr>
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<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Govindarajan, V.</td>
<td>1984</td>
<td>The author found a link between the level of environmental uncertainty and the level of subjectivity in performance measurement. He proposed that the level of fit between these two elements influenced performance.</td>
</tr>
<tr>
<td>Hall, R. W. et al</td>
<td>1991</td>
<td>These authors highlighted the dysfunctional effects of performance measures that do not fit with their context.</td>
</tr>
<tr>
<td>Hayes, D. C.</td>
<td>1977</td>
<td>The author identified the importance of taking into account internal and external contingency factors as well as the level of interdependence in the design of performance measures.</td>
</tr>
<tr>
<td>Neely, A. and Wilson, J. R.</td>
<td>1992a</td>
<td>Discovered the importance of the link between performance measurement, goal setting and rewards if organizations are to achieve goal congruence.</td>
</tr>
<tr>
<td>Ouchi, W and Macguire, M.</td>
<td>1975</td>
<td>Found that performance measures were more likely to be used as a form of control in situations that were less certain and where interdependence levels were high.</td>
</tr>
<tr>
<td>Sathe, V.</td>
<td>1978</td>
<td>The author found that accounting based performance measures were good indicators of performance in production departments where internal factors were critical but not in marketing departments where environmental factors were more important.</td>
</tr>
<tr>
<td>Shapiro, B.</td>
<td>1977</td>
<td>Emphasized the extent to which the level of interdependency influences the performance measurement system.</td>
</tr>
<tr>
<td>Woodcock, D.</td>
<td>1989</td>
<td>The author proposed that to maximise performance, measures should be linked to the company's external environment.</td>
</tr>
</tbody>
</table>

This is a relatively recent area for study and the popularity of non-financial measures is adding to the contingency debate amongst the accounting profession. Although a contingency approach has been adopted, there remains little universal agreement as to
what accountancy information systems such as performance measurement are actually contingent upon. So far researchers have considered: structure (Bruns and Waterhouse, 1975), environment (Cowen and Middaugh 1990, Govindarajan 1984, Hayes 1977), strategy (Daniel and Reitsperger 1991), task uncertainty (Abernathy and Stoelwinder, 1991), interdependence (Macintosh and Daft 1987) and goals (Neely and Wilson 1992). It is suggested that a configuration based approach will be able to provide a more coherent approach to this area of study. The current research will pay particular attention to the degree of differentiation or integration in performance measures. That is the extent to which performance measures focus upon narrow operating goals or upon the organizations overall corporate strategy.
Professionalism/Skill levels

Although their work is normally considered to be more concerned with structure, both Burns and Stalker (1961) and Lawrence and Lorsch (1967) showed a positive relationship between complexity and professionalisation. They suggested that communication needs increase with the use of professionals as specialisation leads to greater differentiation and a concomitant need to integrate various specialised activities. Perhaps the earliest writers to consider levels of professionalism in any depth were Thompson and Bates (1957), who hypothesized that the higher the level of professionalisation of jobs the more discretion would be initiated by the worker in completing their tasks. Three years later this hypothesis was tested (Marcson 1960) and it was found that the relationship was maintained when controlled for predictability, rule usage, position within the organization and closeness of supervision.

Professionalisation levels have been linked to a number of other factors, the table below presents a summary of the most important research in this area:

**Figure 3.9 Contingency Research into Professionalism/Skills**

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bell, G. D. (1969)</td>
<td>Found that higher levels of professionalisation encouraged greater degrees of discretion. Also, where work was unpredictable and professionalisation was high there was resistance to rigid controls and centralisation.</td>
</tr>
<tr>
<td>Blau, P. et al (1966)</td>
<td>Organizations which employed a large number of highly skilled or professional people tended to have a lower ratio of non-supervisors to supervisors.</td>
</tr>
<tr>
<td>Blau, P. (1968)</td>
<td>Organizations which employed a high number of experts tended to have a lower average span of control amongst first line supervisors.</td>
</tr>
<tr>
<td>Hrebinjak, L. (1976)</td>
<td>Proposed that professionalisation levels are a mediating factor in the relationship between size and structure.</td>
</tr>
</tbody>
</table>

Continued on the next page
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marcson, S. (1960)</td>
<td></td>
<td>Found that the Thompson/Bates relationship was maintained when predictability, rule usage, position within organizations and closeness of supervision were varied.</td>
</tr>
<tr>
<td>Meyer, M. W. (1968)</td>
<td></td>
<td>Conducted an empirical study of 254 state departments, found that the span of control of first line supervisors sharply drops as the level of professionalism in an organization's subunits increases.</td>
</tr>
<tr>
<td>Robey, D. (1986)</td>
<td></td>
<td>Professionalisation of employee group was a factor to be considered in choosing span of control. In general professionals were less likely to work well under close supervision.</td>
</tr>
<tr>
<td>Rushing, W. (1966)</td>
<td></td>
<td>Found that the relative proportions of different professionalisation levels vary widely with size.</td>
</tr>
<tr>
<td>Thompson, J. and Bates, F. (1957)</td>
<td></td>
<td>Hypothesized that the higher the level of professionalisation of jobs the more discretion is initiated by the worker in completing his tasks.</td>
</tr>
</tbody>
</table>

The table shows that the majority of research has considered the relationship between levels of professionalism and the amount of discretion afforded to workers. However, some structural factors have also been taken into account. A link between professionalisation/skill levels and control systems also seems to be intuitively obvious. This variable is being measured using Van De Ven and Ferry's (1980) guide-lines in their organizational assessment book.
Training And Remuneration.

In recent years, a more contingent approach towards Human Resource Management (HRM) has been proposed in the literature. This has been pursued under the guise of strategic HRM and policies have been linked with structure (Dastmalchian and Blyton 1992, Beer et al 1984), technology (Goodridge 1992), environmental uncertainty (Milliman et al 1991) and strategy (Fombrun et al 1984, Lengnick Hall and Lengnick Hall 1988, Thomason 1992). These writers have tended to view human resource management in fairly general terms and have not considered factors such as training and remuneration in sufficient detail, although they are obviously included under the general heading of HRM.

The table below illustrates authors who have looked in more detail at the contingent influences upon training and payment systems. These two factors have often been considered together and for this reason the table is split into three sections; firstly those looking at both aspects, then those considering only payment systems and finally those looking only at training.

**Figure 3.10 Contingency Research into Remuneration and Training**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buchanan, D. and Preston, D. (1991)</td>
<td>The impact of cellular technology upon training and compensation was found to be significant.</td>
</tr>
<tr>
<td>Blumberg, C. and Alber, D. (1982)</td>
<td>Changes in tasks performed due to the introduction of more flexible manufacturing systems required changes in compensation and training to be effective.</td>
</tr>
<tr>
<td>Kotter, J. et al (1986)</td>
<td>Discovered the important influence of a subunits task upon the payment system and methods of development in use.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>Bishop, J.</td>
<td>1987</td>
</tr>
<tr>
<td>Cummings, T.</td>
<td>1978</td>
</tr>
<tr>
<td>Duerr, E. C.</td>
<td>1974</td>
</tr>
<tr>
<td>Ehrenberg, R.</td>
<td>1990</td>
</tr>
<tr>
<td>Govindarajan, V. and Gupta, A.</td>
<td>1985</td>
</tr>
<tr>
<td>Harrick, E.</td>
<td>1990</td>
</tr>
<tr>
<td>Hatcher, L. and Ross, T.</td>
<td>1991</td>
</tr>
<tr>
<td>Husband, T. and Schofield, A.</td>
<td>1975</td>
</tr>
<tr>
<td>Lupton, T and Gowler, D.</td>
<td>1969</td>
</tr>
</tbody>
</table>

Continued on the next page
Neely, A. and Wilson, J. (1992a)  
Found a link between payment systems, performance measurement and goal congruence. Proposed that to be effective, payment and measurement systems should complement organizational goals.

Salter, M. (1973)  
The author proposed that there is no single best incentive system and that to be effective an incentive system should fit with organizational goals.

Figure 3.12 Contingency Research into Training

The authors found that suitable training was a vital ingredient in participative management.

Seppala, P. (1989)  
Found that the changes in structure resulting from the introduction of group work resulted in a need to change the approach towards training.

Different types of technology require different types of training. The type of technology is a major determinant of training.

The use of contingency theory in this field is relatively new. Theorists still seem to adopt a moral stance towards these aspects, either following a human relations type approach or the less popular classical approach. Hence the 'one best way' attitude is still prevalent. Certain theorists have criticised the bivariate contingency approach, as Jacques puts it: "Problems with contingency theory are largely mirrored by the failure of incentive and bonus schemes which presuppose simplistic cause-effect relationships which have not borne out in practice" (1979 p13). The adoption of a broader based contingency approach does, however, appear to be taking place, with HRM policies coming to be increasingly seen as part of an overall organizational framework (for a more detailed discussion see Duberley and Blenkinsop 1992, Duberley and Burns 1993).
Management Style

The most well known theorist in this area is Fred Fiedler (1972). He proposed a contingency theory of leadership that tried to specify conditions under which various types of leaders would be more or less effective. The dimensions he saw as effecting leadership style are: (i) warmth of leader/follower relations, (ii) task structure, and (iii) the amount of power held by leader. Other authors have also viewed managerial style in contingency terms, particularly the amount of participation that is allowed in decision making (Brownell 1981, Cammann 1976, Locke and Schweiger 1973, McMahon and Ivancevich 1976, Pearson 1987). Some of these writers have considered the influence of a number of factors on managerial style, according to George and Von der Embse (1971, p325): "How an effective manager behaves, whether consultatively or directly, depends upon several factors: the kind of production or operating system; whether a company's production engineering and marketing are characterised by rapid changes or relative stability, the levels and types of skill and education of the work group and the degree of structure that emerges as a result of these factors."

This has been a significant advance from early research on management style conducted by Likert (1961), who assumed a linear relationship between dimensions of supervisor's behaviour and subordinate performance, i.e. that there is one best way to supervise. Based upon the work of the human relations school, Likert suggested that competent supervisors were always:-

(1) active in tasks which differentiated them from their subordinates
(2) less frequent in checking up on their subordinates performance
(3) more likely to be perceived as employee centred rather than production oriented.

Criticisms of this type of approach originally came from Vroom (1964), who found that authoritarian styles of workers preferred an authoritarian supervisor and Goldethorpe et al (1968), who found that in British car manufacturing the most popular supervisor was one who left you alone! Following on from this, more research into the contingency approach towards management style was undertaken.

The table overleaf shows some of the more important contributions to research on management style
Figure 3.13 Contingency Research into Management Style

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blau, P. and Scott, W. (1962)</td>
<td>Found that the style of supervision effected the structure of the work group and levels of control. This depends upon the extent to which the supervisor perceives himself to be dependent.</td>
</tr>
<tr>
<td>Brownell, P. (1981)</td>
<td>This author showed the importance of personality characteristics when studying the effects of participative supervision.</td>
</tr>
<tr>
<td>Bruns, W. and Waterhouse, T. (1975)</td>
<td>The authors found that organizational structure influenced the most appropriate style of management. A more decentralised structure necessitated more participative management.</td>
</tr>
<tr>
<td>Cammann, C. (1976)</td>
<td>Found that the level of job difficulty moderated the extent to which participation in supervisory decisions was effective.</td>
</tr>
<tr>
<td>French, J. R. and Raven, B. (1959)</td>
<td>Found that the more wide ranging a supervisor's basis of control, the greater the probability of being able to affect interaction and such group characteristic as structure and climate.</td>
</tr>
<tr>
<td>Galbraith, J. (1973)</td>
<td>Higher levels of task uncertainty need a more participative management style.</td>
</tr>
<tr>
<td>George, N. and Von Der Embse, T. J. (1971)</td>
<td>Identified the following factors as contextual factors influencing the most appropriate style of leadership: Production system, dynamism of subenvironments, skills and education levels of work group and structure.</td>
</tr>
</tbody>
</table>

Continued on the next page
The writers in the table above have concentrated on factors within the firm that have influenced the most appropriate style of management. Another group of researchers has highlighted the importance of more macro factors in determining levels of participation. For example, legal factors (King and Van de Vall 1978, IDEIRG 1978) or cultural factors (Melman 1970, French et al 1960). However, in general, influences within an organization are seen as more important by the contingency theorists.
Thus, management style has been shown to be of importance in organization theory and has been viewed as both a contextual and a contingent variable. Therefore it is included in this study. Particular attention will be paid to the extent to which managers encourage participative decision making as this is the area which has received most attention.
Goals

Many theorists (for example: Blumenfield and Leidy 1969, Burke and Wilcox 1969, Ivancevich et al 1970, Dachler and Mobley 1973) have tried to link the use of goal setting with employee satisfaction and performance. These authors have tended to assume that results will be the same irrespective of the tasks employees are performing, the structure of the organization or management style. This has meant that much of the research which has been done in this area is not really of a contingency nature, researchers have focused on finding out whether goal setting improves performance not upon what types of goal setting are most appropriate in different situations.

Although some theorists have started to take one or two contingent factors into account, they have often only considered factors such as participation and feedback. Some of the researchers in this group are shown in the table below:

Figure 3.14 Researchers linking goal setting with participation and feedback.

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duttagupta, D. (1975)</td>
<td>Compared goal setting with participation and feedback to without.</td>
</tr>
<tr>
<td>Lawrence, L. and Smith, P. (1955)</td>
<td>Compared the effect of goal setting with participation to goal setting without.</td>
</tr>
</tbody>
</table>
Thus, until fairly recently goals were not explicitly included in contingency theory. They were present in some of the theorists' works but were often not considered as a factor on their own. For example, there was a good deal of difference in the types of goals used in Burns and Stalker’s (1961) environmentally determined mechanistic and organic organizations. Organic organizations were considered to have much longer term vaguer goals than more mechanistic types. This, however, was subsumed under the heading structure.

One of the theorists who did explicitly look at goals as a contingency variable was Charles Perrow (1961, 1970). The framework he derived was based on the premise that while technology may predict task structure reasonably well, technology and task structure will predict social structure less well and technology, task structure and social structure will only set broad limits upon the range of goals available. Thus, he proposed that goals are not determined by these factors but that they may be constrained. This variable was also considered by Lawrence and Lorsch (1969), in their landmark study which linked the clarity and time span covered by goals (amongst other things) to the subenvironment faced by different departments within an organization.

Other factors that have been considered as contingency variables which influence or are influenced by goals are: the control system (Turcotte 1972, Abernathy and Stoelwinder 1991); job design (Umstot et al 1976. Locke et al 1980); the payment system (Pritchard and Curtis 1973, Locke et al 1970, 1980); structure (Hage and Aiken 1969, Robey 1986); task uncertainty (Abernathy and Stoelwinder 1991, Hage and Aiken 1969, Lawrence and Lorsch 1969, Mccaskey 1974) and management style (House 1972, Ronan et al 1973, Latham and Yukl 1975). Therefore, although this area of research is relatively recent and there are fewer studies available than for many of the other contingency variables, goals have been linked with a broad range of factors. The problem with much of this work, however, is that it has not been empirically tested to the extent that some other factors have. Nevertheless, this has been shown to be an important variable which should be included in my analysis.

The research will consider explicit departmental goals in terms of the extent to which they focus on narrow short term operating objectives or wider more long term organizational objectives.
Summary

An extensive review of the contingency theory literature has been undertaken to identify the variables that should be included in the micro-configurational analysis. This has also served to highlight the criticisms made in earlier chapters with regard to the lack of consistency in the contingency field. All of the variables have been researched by contingency writers, yet the lack of any universal measurement system and the bivariate approach that has been adopted has meant that much of the research is contradictory and few theories have actually been developed and substantiated.

This chapter forms the final part of the literature survey. Having identified the variables that are to be used in determining the micro-configurations, the next stage is to pull out the specific propositions which are to be tested and discuss the research methodology, which is done in the next chapter.
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Chapter 4 The Research Methodology

Introduction

The purpose of this chapter is to explain the approach that has been taken towards conducting the research. The chapter is divided into four main sections. The first section explains the research methodology and outlines the stages undertaken. The second focuses on the sample, explaining how it was chosen and discussing the possible limitations of having a relatively small sample. Section three outlines the approach taken towards data collection and explains why this was thought to be appropriate. Finally, section four discusses the methods used to analyse the data.

Fourteen propositions have been derived from the preceding literature review to be considered in the research. These are outlined below.

Proposition 1: The variables used in determining configurations are not independent as each of them will be open to influence from other variables. Thus, the search for one variable of absolute importance in all situations is pointless. This proposition lies at the very heart of the configurational approach and is therefore of major importance to the research.

Proposition 2: The sample can be grouped into homogeneous clusters. This proposition is also of major importance to configurational theory. If this is not the case and relatively dissimilar cases are being grouped together then generalisations cannot be made and the whole approach must be called into question.

Proposition 3: The clusters will be generic, i.e. independent of function. This proposition contradicts much of the current work in organizational theory, suggesting that the function being performed will not necessarily determine the style of organization.

Proposition 4: It will be possible to identify variables that have a stronger or weaker role in determining the configuration. Although the configurational approach rejects the idea of one overriding variable in all situations, it is accepted that in certain situations some variables may exert a greater influence than others. The research will
attempt to identify which variables, if any, have exerted the strongest and weakest influences in this sample.

Proposition 5: The micro-configurations derived will be valid and stable. Validity tests will be carried out in order to show that the configurations derived here are likely to be found in any similar sample.

Proposition 6: It will be possible to place the micro-configurations along a continuum ranging from mechanistic to organic. Micro-configurations typifying production departments will concentrate at the mechanistic end of the scale and those of R&D will tend to be found at the organic end, with sales functions falling in the middle. Obviously, if proposition three is found to be correct then the second half of this proposition will be immediately disproved. However, if clusters do approximate to particular functions, it will be interesting to see if these fall into the traditional pattern outlined above.

Proposition 7: The macro-configurations identified will determine the micro-configurations. The purpose of this proposition is to test whether particular organizational configurations require certain micro-configurations.

Proposition 8: The micro-configurations identified will constrain or determine the macro-configurations. As an alternative to proposition seven, this test will attempt to identify the extent to which lower level units exert pressure upon the overall macro-configuration.

Proposition 9: The types of integrating mechanism used will be closely related with each other. It is suggested that the choice of any method of integration is not a one-off decision but that integration mechanisms will be chosen (either explicitly or implicitly) as a pattern.

Proposition 10: The macro-configuration identified will determine the nature of the integrating mechanism used. The purpose of this proposition is to test whether decisions made at the organizational level determine the style of integration mechanisms or whether other factors, as highlighted in the next two propositions, come into play.

Proposition 11: The level of macro-environmental dynamism will determine the nature of the integrating mechanism. Many organizational theorists have linked
environmental dynamism with organizational structure (see for example Lawrence and Lorsch 1967, Freeman 1973, Negandi and Reimann 1973, Schmidt and Cummings 1976, Dastmalchian and Boag 1990, Azma and Mansfield 1981, Duncan 1972). It is expected that this proposition will be disproved as it is suggested that the situation is much more complex than has previously been assumed and that other factors will influence the level of integration.

**Proposition 12:** Certain styles of micro-configuration will require particular styles of integrating mechanisms. Again, it is expected that although this may be a major influence other factors will also influence the methods of integration that are used.

**Proposition 13:** The level of differentiation will be determined by the level of environmental dynamism. This is a replication of one of Lawrence and Lorsch's hypotheses and its purpose is to try to give a greater understanding of the concept and causes of differentiation.

**Proposition 14:** The level of differentiation will determine the level of integration. Again, this is a test of one of Lawrence and Lorsch's hypotheses.

Having outlined the propositions, the next step is to discuss the methodology which is done in section one overleaf.
Section One The Research Methodology

Riley (1963) has suggested that "the research process starts with a conceptual model or an organizational image of the phenomena to be investigated" (p5). The conceptual model that was adopted in this research is shown diagrammatically below.

Figure 4.1 The Conceptual Model

Thus, the conceptual model underlying this research sees work units as open systems operating within organizations that are also open systems, operating within the environment. Following systems theory (Beer 1966, Kast and Rosenweig 1979), it is suggested that for optimum performance, each level has to function effectively in its own right and also interact effectively with the other levels.

Drawing upon this conceptual model, the research methodology breaks down into eight stages. The first four of these are concerned with data collection and the final four concentrate upon the analysis of the data.
STAGE ONE
This involves the identification of the organizational configuration using Miller and Friesen's organizational configuration questionnaire, a copy of which can be found in appendix one. The organization is approximated to one of ten possible organizational types, six successes and four failures. A description of each of these configurations is given in appendix two. The following thirty-one variables are assessed in order to make this approximation:

Past Environmental Dynamism
Current Environmental Dynamism
Past Environmental Heterogeneity
Current Environmental Heterogeneity
Past Environmental Hostility
Current Environmental Hostility
Scanning
Delegation Of Operating Authority
Centralisation Of Strategy Making Power
Resource Availability
Management Tenure
Conflict
Controls
Team Spirit
Internal Communication System
Organizational Differentiation
Technocratisation
Initial Success Of Company Strategies
Product Market Innovation
Integration Of Decisions
Analysis Of Major Decisions
Multiplexity Of Decisions
Futurity Of Decisions
Proactiveness Of Decisions
Industry Expertise Of Top Managers
Risk Taking
Consciousness Of Strategies
Traditions
Past Success
Current Success
STAGE 2
This involves the measurement of the organizational transition, using the Miller and Friesen transition questionnaire. The transition state is measured using twenty-four variables. A brief description of each transition state is given in appendix three.

Environmental Dynamism
Environmental Hostility
Environmental Heterogeneity
Scanning
Controls
Communication
Centralisation
Delegation
Technocratisation
Resources
Proactiveness Of Decisions
Risk Taking
Product Market Innovation
Analysis Of Decisions
Multiplexity Of Decisions
Integration
Futurity
Consciousness Of Strategy
Tenure
Differentiation
Adaptiveness
Industrial Expertise
Success
Traditions

STAGE THREE
This stage includes the measurement of the variables of the three core departments of sales, production and R&D. Definitions of the variables and a rationale for the inclusion of each in the research were provided in the previous chapter. The questionnaire used for data collection can be found in appendix four. These variables can be split into four categories, discussed overleaf:

---

1The companies in this sample had a product development function rather than a pure R&D department. Therefore, the terms product development and R&D are used interchangeably throughout the text.
i. The variables used to measure Task/Technology are:
   Task Uncertainty
   Work flow uncertainty
   Job Interdependence

ii. The variables used to measure Subenvironment Certainty are:
   Dynamism in the environment
   Level of information about the subenvironment
   Time span for feedback from the environment

iii. The variables to measure Departmental Characteristics are:
   Size
   Focus (i.e. function or product)
   Standardisation
   Specialisation
   Discretion
   Spans of Control
   Skills/professionalism

iv. The variables used to measure Departmental Management are:
   Job Design
   Controls
   Performance Measures
   Remuneration
   Training
   Management style
   Goals

STAGE FOUR
The extent to which the following integration mechanisms are used within the organization will be identified. This will be measured using Kotter's integrating mechanisms questionnaire, shown in appendix 5.

Management hierarchy
Staff
Rules and Procedures
Goals and Plans
Committees and Task Forces
Integrating roles
Formal Authority
Measurement and Reward Systems
Selection and Development systems
Physical Setting
Departmentalization

**STAGE 5**
Derivation (and validation) of micro-configurations, using hierarchical clustering procedures. This will be discussed more fully in the data analysis section

**STAGE 6**
Assessment of the relationship between the macro organizational configurations and transitions and the micro departmental configurations.

**STAGE 7**
Assessment of the relationship between the macro-configurations and transitions and the integrating mechanisms in use.

**STAGE 8**
Assessment of the relationship between the micro departmental configurations and the integrating mechanisms in use.

**STAGE 9**
Calculation of the level of differentiation between the micro-configurations and assessment of the relationship between differentiation and integration.

**Section Two  The Sample**

As discussed in chapter one, it has been decided to empirically derive taxonomies rather than use theoretical typologies. Obviously, as a result of this, it was necessary to collect data from organizations. In order to do this, a total of one hundred and fifty-three companies were contacted and asked to take part in a one day research study (A copy of the letter sent out can be found in appendix six). This resulted in eighteen industrial visits, a response rate of 12%, which highlights the difficulties of gaining access to companies to conduct this type of research. This problem does not appear to be new, as Delany (1960) noted "systematic research into a range of theoretically significant problems is seriously limited by the relative inaccessibility of
organizations for research purposes" (p449) and many other authors have discussed similar difficulties (see for example Jacobson et al 1951, Form 1969, Bowles 1976, Feldman 1976). The visits took place in two phases, the first between April and June 1992 and the second between September and November 1992. In return for allowing the research to take place, the company was given a consultancy style report of the findings entitled "Does Your Organization Get a Clean Bill of Health?" This method of gaining entrance to the companies may account for the large sample of S1a firms. It may be that managers in this type of archetype felt they had most to gain from a study like this. The low level of failure configurations tends to indicate that less successful organizations did not wish to take part.

The sample of firms was drawn from the Kompass company directory (1992). In selecting companies I controlled for the following variables: turnover (less than £50m), Number of employees (less than 800), type (manufacturing), and location (Midlands and South Yorkshire). The major reason behind controlling for these particular factors was to ensure the practicality of the visit. As companies seemed to prefer shorter visits, it was important that the firms being studied were not too complex, and that travelling time would not be prohibitive. In addition, it was necessary to control for some of the diversity that could have been encountered as, "the world is too complex for us to combine very different types of firms and yet say anything very useful about what they have or should have in common" (Miller and Friesen, 1984, p125). All of the companies visited were involved in manufacturing although there was a good deal of diversity and some were also involved in distribution. Some of the firms were part of a multinational group, others were part of UK groups while a few were owner managed. The table overleaf gives a basic description of the firms visited.
In addition to this, a further three companies were visited to validate and test the departmental configurations. These are shown in the table overleaf.
As can be seen, the sample size for deriving the micro-configurations was 53 units. These were then tested upon a further nine units in order to assess their validity (this will be discussed in a later section). The sample size for testing the links between macro-configurations, micro-configurations and integrating mechanisms was eighteen. Although this is somewhat smaller, figure 4.4 overleaf shows that a large proportion of these were S1a configurations which means that less variation was expected and the research could be more focused within this group. It was also possible to compare the differences within the S1a group to those found across the sample as a whole. Obviously, however, it would be dangerous to generalise the findings here to much larger organizations where the other configurations are likely to be better represented.
Thus, although the sample is not as large as I would ideally like it to be, the fact that a large proportion of the firms visited were of the S1a type meant that the research was targeted within a more homogeneous set. In addition, the benefit of actually visiting the companies rather than relying upon questionnaire answers has enabled more detailed information to be gathered which ultimately allowed a far clearer picture to be gained of the organizations under study. Therefore, it could be argued that the quality of the information outweighed the limitations of quantity. Furthermore, some of the landmark studies in the organizational field have used similar numbers of cases to derive their propositions (see for example Burns and Stalker 1962 and Lawrence and Lorsch 1969).

There appears to be a trade-off in organizational research between those who conduct questionnaire based surveys and those who conduct case studies. Using the former approach allows large quantities of data to be collected, however, this can be of questionable quality for comparison, particularly if perceptual data is being collected. The latter, on the other hand, gains the maximum level of detail on one case from which there can be no generalisation. The extent to which either of these approaches is appropriate depends on the research paradigm being followed. If a positivist

2The main characteristics of a positivist approach are: observer independence, value freedom, attempts to identify causal relations, concepts have to be measured quantitatively, reductionism, large sample sizes in order to enable generalisation, cross-sectional analysis. (Easterby-Smith et al 1992)
approach is being undertaken then large samples of data are required and the former approach is most appropriate. A phenomenological approach, however, relies far more on qualitative data and for this the latter method is most suitable. This research has attempted a trade-off between these two extremes in order to enable the collection of a moderate number of cases to be surveyed in higher levels of detail.

Section Three Data Collection

As mentioned previously, data was collected during a one day visit to the organization. Information was collected through structured interviews with senior managers (macro-configuration), departmental managers and supervisors (micro-configuration), and the personnel manager (integrating mechanisms). This was then backed up by observation of the departments under study and discussions with operatives. Copies of interview schedules are given in appendices 4, 5 and 6. During each interview respondents were read a definition of each variable under consideration and asked to comment on it in relation to their department. They were then asked a number of back-up questions to ensure that they had understood the definition and the researcher had understood their explanation. The researcher took note of their replies and, either then or directly afterwards, scored each variable according to a seven point scale. The process of data collection is shown diagrammatically overleaf.

3The main characteristics of a phenomenological approach are: The idea that reality is socially constructed rather than objectively determined, attempts to understand and explain why people have different experiences rather than search for fundamental laws, an acceptance that science is not value free, examination of the totality of the situation, small samples investigated in depth (Easterby-Smith et al 1992).
Figure 4.5 The Research Methodology

STEP ONE

IDENTIFICATION OF ORGANISATIONAL CONFIGURATION

MILLER'S MACRO-CONFIG QUESTIONNAIRE
INTERVIEWEES
SENIOR MANAGERS/DIRECTORS FROM MANUFACTURING AND SALES & MARKETING

STEP TWO

IDENTIFICATION OF ORGANISTIONAL TRANSITION

MILLER'S TRANSITION QUESTIONNAIRE
INTERVIEWEES
SENIOR MANAGERS/DIRECTORS FROM MANUFACTURING AND SALES & MARKETING

STEP THREE

IDENTIFICATION OF DEPARTMENTAL CONFIGURATION

MICRO-CONFIGURATION QUESTIONNAIRE
INTERVIEWEES
DEPARTMENTAL MANAGERS OR SUPERVISORS

STEP FOUR

IDENTIFICATION OF INTEGRATING MECHANISMS

KOTTER'S INTEGRATING MECHANISMS QUESTIONNAIRE
INTERVIEWEES
PERSONNEL MANAGER

The macro-configurational questionnaire and the integration mechanisms questionnaire are existing tools that were picked up and used as recommended by their authors. In developing the micro-configurations questionnaire, the aim was to make this as compatible as possible with the other two but also, if possible, to improve upon them. For this reason a scoring mechanism was developed in order to assist in the rating of the variables and ensure that a standard approach was maintained. The scoring mechanism basically gives guidance to the scorer as to what constitutes a particular score on each variable, this is shown in appendix seven. Inter-rater reliability tests were performed to assess the extent to which this mechanism helped raters to standardise their scores.
In discussing the approach that was taken towards data collection, a number of major issues need to be addressed:

i. The use of objective and perceptual variables

ii. Ensuring objectivity in data collection

iii. Development of the questionnaires and scoring mechanism

Each of these will be considered individually.

**The Use of Perceptual or Objective Measures**

There has been some debate in the organizational field for a number of years as to whether subjective or objective measures are more appropriate, whether indeed it is possible to ever get a totally objective measure. The field seems to be split fairly evenly between those who believe that complete objectivity is desirable and those who claim that perceptions are more important. The table below gives an overview of the literature showing the split between the use of objective and perceptual measures:

<table>
<thead>
<tr>
<th>Theorist</th>
<th>Variable Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldrich 1972</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Blau et al 1976</td>
<td>Structure</td>
</tr>
<tr>
<td>Blau and Schoenherr 1971</td>
<td>Structure</td>
</tr>
<tr>
<td>Child 1972</td>
<td>Structure</td>
</tr>
<tr>
<td>Freeman 1973</td>
<td>Environment</td>
</tr>
<tr>
<td>Harvey 1968</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Hickson et al 1974</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Hickson et al 1969</td>
<td>Structure</td>
</tr>
<tr>
<td>Inkson et al 1970</td>
<td>Structure</td>
</tr>
<tr>
<td>Khandwalla 1974</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Neghandi and Reimann 1973</td>
<td>Structure</td>
</tr>
<tr>
<td>Pugh et al 1969</td>
<td>Technology, Size, Structure</td>
</tr>
<tr>
<td>Reimann 1977</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Tosi et al 1973</td>
<td>Environment, Structure</td>
</tr>
<tr>
<td>Tracy and Azumi 1976</td>
<td>Control Systems</td>
</tr>
<tr>
<td>Woodward 1965</td>
<td>Technology, Structure</td>
</tr>
</tbody>
</table>
Although every effort has been made to maintain objectivity on the part of the researcher, it has been necessary to collect some perceptual information, using structured interviews as a means of collecting the data. Perceptual data has been required for some variables for a number of reasons: in the first instance, it has been questioned how appropriate objective measures are to the operational level of the organization... "objective measures of the type used by the Aston researchers have no meaningful interpretation at the operative level of the organization" (Kmetz, 1977 p140); or, as Johnson (1975) puts it, "the social reality making up the field of the

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**PERCEPTUAL**

<table>
<thead>
<tr>
<th>Theorist</th>
<th>Variable Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dastmalchian And Boag 1990</td>
<td>Environment</td>
</tr>
<tr>
<td>Glisson 1978</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Griffin 1980</td>
<td>Task, Management Style</td>
</tr>
<tr>
<td>Hall 1962</td>
<td>Structure</td>
</tr>
<tr>
<td>Hirst 1983</td>
<td>Task Uncertainty, Performance Measures</td>
</tr>
<tr>
<td>Hrebiniak 1974</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Ito and Peterson 1986</td>
<td>Task Uncertainty, Interdependence, Structure</td>
</tr>
<tr>
<td>Lawrence and Lorsch 1967</td>
<td>Environment, Structure</td>
</tr>
<tr>
<td>Lynch 1974</td>
<td>Technology</td>
</tr>
<tr>
<td>Mohr 1971</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Schmidt And Cummings</td>
<td>Environmental Uncertainty</td>
</tr>
<tr>
<td>Sutton and Rousseau 1979</td>
<td>Structure, Technology</td>
</tr>
<tr>
<td>Tushman 1979</td>
<td>Task, Structure</td>
</tr>
<tr>
<td>Van de Ven et al 1976, Van De</td>
<td>Task Uncertainty, Work flow Uncertainty, Structure</td>
</tr>
<tr>
<td>Ven and Delbecq 1976</td>
<td></td>
</tr>
</tbody>
</table>

**BOTH OBJECTIVE AND PERCEPTUAL**

<table>
<thead>
<tr>
<th>Theorist</th>
<th>Variable Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billings et al 1977</td>
<td>Technology, Job Design</td>
</tr>
<tr>
<td>David et al 1989</td>
<td>Technology, Structure</td>
</tr>
<tr>
<td>Fullan 1970</td>
<td>Technology</td>
</tr>
<tr>
<td>Grimes and Klein 1973</td>
<td>Task Uncertainty, Structure</td>
</tr>
<tr>
<td>Hage and Aiken 1969</td>
<td>Technology, Structure, Goals</td>
</tr>
<tr>
<td>Keller 1978</td>
<td>Management Style</td>
</tr>
<tr>
<td>Kmetz 1977</td>
<td>Size, Technology, Structure</td>
</tr>
<tr>
<td>Perrow 1967</td>
<td>Technology, Goals</td>
</tr>
</tbody>
</table>
A social scientist is not inherently objective in nature. It exists only insofar as it is interpreted as a subjectively meaningful experience by living human beings" (p83). A second problem comes when trying to identify what we consider to be objective. It has been argued (Pennings 1973) that company rules, records and so on could provide some objective information, but how can we accept these as valid if we have no proof that they adequately reflect the actual workings of a particular department? As John Cambell (1977) notes, "Any objective measure is a subjective measure once removed."

There have been cases in the literature when the terms subjective and objective appear to have become somewhat confused. Hackman and Oldham, for example, when testing their job diagnostic survey, argued that both subjective and objective measures were necessary. They suggested that the subjective measure should be obtained from interviewing operatives, whilst for an objective view departmental managers or supervisors should be interviewed. It seems a little surprising to suggest that these people are able to give an objective view as it could be argued that an opinion is subjective no matter whom it belongs to!

Barnard (1938) and Sathe (1975) have suggested that both perceptual and objective measures of the same factors should be obtained in order to identify both the designed (formal) and the emergent (informal) structure. The usefulness of this is, however, open to considerable question. Certain authors (Fry 1982, Venkatraman and Ramaniyam 1987) have found that the use of either perceptual or objective measures has made little, if any, difference to the results. Others (Pennings 1973, Tosi et al 1973) found that the use of objective measures did not back up previous research using perceptual measures. The reason for this appears to be simple, if we take the Tosi et al (1973) case where the authors attempted to replicate the Lawrence and Lorsch (1969) work, it becomes obvious that the two sets of authors measured completely different variables. Whilst Lawrence and Lorsch were measuring managers' perceptions of subenvironmental uncertainty, Tosi et al were using global, statistical measures of environmental volatility taken from the Standard and Poors Compustat tapes for New York stock exchange firms. Perhaps unsurprisingly, little correlation was found between their results and those of Lawrence and Lorsch. Their assumption that this meant the work of Lawrence and Lorsch was flawed is more surprising given the fact that they admit "strictly speaking the measures we use are of a different context than Lawrence and Lorsch's" (Tosi et al 1973, p27).
The exploratory nature of this research and that fact that it is set within organizations rather than in a laboratory has made it impossible to remove all subjectivity. Indeed, some researchers would argue that to do so would be undesirable (Romesburg 1984, Thomas and Tymon 1982, Susman and Evered 1978). Organizations and their members are not objective entities that can be manipulated, they are living beings who have their own perceptions. How can an organization (or a person for that matter) adapt to something if it has no perception of it? Would we say that a worker has autonomy if he does not believe this to be the case? The very nature of the research being carried out means that we have to accept a certain amount of subjectivity in the data being collected. This does not, however, mean that we should not strive for objectivity in other areas, for example in the data collection process and the standardisation of data for comparison, which will be discussed in the next section. Hence the research has attempted to achieve a balance between subjectivity and objectivity which means that, although some of the data collected may in certain respects be subjective as it is based on peoples' perceptions, the method of collection and analysis should always be objective.
Objectivity In Data Collection

Although some of the variables measured are subjective in nature, the methods of data collection used have attempted to ensure that the actual collection and analysis of data have been as objective as possible. This has been done in a number of ways:

Structured Interviews
Firstly, instead of just sending out questionnaires and assuming that the people replying have the same understanding of the questions as the author, structured interviews have been carried out. This has made it possible to ensure that all interviewees are asked the same questions. It also means that the interviewer can try to make sure that respondents understand the meaning of the questions (Ackroyd and Hughes 1981). According to Stone and Harris (1984), other benefits of this approach include:

i) Any problems of wording will be consistent throughout
ii) Responses can be compared and aggregated

The subjective nature of the data being collected was such that relying on questionnaires could have resulted in a great deal of misunderstanding whilst unstructured interviews could have resulted in different data being collected in each organization and a lack of comparability across organizations. Hence, the structured interview approach appeared the most suitable. Wherever possible the answers given in the structured interview were substantiated by observation and discussions with other members of the department.

Scoring Mechanism
After collecting the data, answers were scored along a seven point Likert type scale. A scoring mechanism (shown in appendix seven) was developed for the new micro-configurational questionnaire to allow the standardisation of scores. This ensured a degree of objectivity in that it checks that, for example, what one person rated as a four should also be scored four by anybody else. As each department was assessed using this scoring mechanism, it helped to ensure that a standard approach to scoring was used across all of the units under study. It is accepted that the scoring mechanism may require further development, particularly if it is to be used for a wider variety of organizations. However, it is seen by the author as a vast improvement on the current practice of organizational researchers of scoring variables
and giving no explanation of what each score means or what the difference is between one score and another.

**Inter-rater Reliability Tests**

Both the macro and the micro-configuration questionnaires were tested by two researchers sitting in on interviews and scoring the variables and then comparing scores. The results of the seven tests carried out can be seen in figure 4.6 overleaf. The graph for each interview compares the scores of two researchers over all variables. As you can see, the results for each interview are very close. The largest differences appear to be in the macro organizational configurations which suggests that the use of a scoring mechanism may be a useful addition to ensure a standard approach. The biggest difference is of two units and this only occurs once. These minor variances had no effect upon the configuration identified. Thus, it would appear that it has been possible to measure the variables in a reasonably standard way.
Figure 4.6 Seven Tests of Inter-rater Reliability

KEY
JCB/1 = JCB Ltd, Respondent 1
JCB/2 = JCB Ltd, Respondent 2
CAL/1 = Caledonian Airmotive, Respondent 1
CAL/2 = Caledonian Airmotive, Respondent 2
BVL = Biwater Valves Ltd.
Development of the Questionnaires and Scoring Mechanism

The macro-configuration questionnaire and the integration mechanisms questionnaire, were pre-existing tools that were simply picked up and used as recommended by their authors. This section discusses the development of the micro-configuration questionnaire.

As the emphasis in this thesis is one of synthesis, every attempt has been made to use existing measures in the field of organization theory. The decision was made that rather than try to derive questions that suitably matched the variables, following Miller, a description of the variable would be used. If, however, there was a lack of understanding on the part of the interviewee, back up questions were available. Wherever possible, these were taken from existing published works in the field so that to some extent their validity was already proven, for example the measures for task uncertainty come from Perrow's (1967) seminal work. After the first draft of the questionnaire was written it was discussed with colleagues from both this university and others. This led to a number of minor changes being made. It was then tested at Davy Morris Hoist Ltd and at Caledonian Airmotive Ltd, the results being discussed both with colleagues and managers at Caledonian Airmotive Ltd before being used at other industrial sites. This process of questionnaire development was recommended by Heather and Stone (1985).

The scoring mechanism was developed in a similar way. After having carried out the work at Davy Morris Hoist and Caledonian Airmotive, it was possible to get a feel for the possible range of answers and these were translated into a seven point scale. Again, this was discussed with colleagues who suggested some minor changes. The scale is more generic than the current research in that it could be used for much larger companies/departments.

Section Four Data Analysis

This section breaks down into two major areas. The first and arguably most important to the thesis, considers how micro-configurations were derived. The statistics package SPSS-X was used extensively in the analysis of the data. Each of the techniques used will be discussed and compared to other techniques available. The second part looks at the analysis that took place once the micro-configurations
had been derived and discusses the different tests used to consider the levels of association between macro and micro-configurations and integration mechanisms.

**Derivation of Micro-configurations**

The identification of micro-configurations is fundamental to the thesis as all of the other propositions rely on the assumption of their existence. The concept of configuration rests upon the premise that the variables are interrelated with each other. In order to test this, a correlation matrix was computed, if there had been little or no correlation between the different variables then this assumption would have had to be rejected, and a configurational approach would have no longer have been deemed appropriate. The Kaiser-Meyer-Olkin score (Kaiser 1974), which is a measure of sampling adequacy, was also used to measure the level of interdependence between the variables. According to Kaiser, small values for the KMO score indicate that correlations between pairs of variables cannot be explained by other variables, in other words that interdependence is low, whereas a high score indicates high levels of interdependency.

There are a number of different approaches that can be used to derive configurations. The nature of the data collected meant that, unfortunately, some of these methods were no longer suitable, for example factor analysis or principle components analysis which require ratio or interval type data. The table overleaf gives a summary of the popular grouping methods available and the constraints that each imposes:
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Method</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyeballing</td>
<td>D</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td>E</td>
</tr>
<tr>
<td>Similarity Matrices</td>
<td>D</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td></td>
<td>E</td>
</tr>
<tr>
<td>Algorithm</td>
<td>D</td>
<td>O*</td>
<td>N*</td>
<td>N</td>
<td></td>
<td>E</td>
</tr>
<tr>
<td>Cluster Analysis</td>
<td>R</td>
<td>O</td>
<td>N</td>
<td>Y</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Hierarchical Clustering</td>
<td>D</td>
<td>O</td>
<td>N</td>
<td>N</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Factor Analysis</td>
<td>R</td>
<td>I</td>
<td>Y</td>
<td>N</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Multidimensional Scaling</td>
<td>D</td>
<td>O</td>
<td>N**</td>
<td>N**</td>
<td>H</td>
<td></td>
</tr>
</tbody>
</table>

(Modified from Miller 1978)

**Key**

1 Input Data  
R = Cross product, covariance or correlation coefficients required, or preferred  
D = Any data are suitable

2 Variable Scales  
I = interval scale required  
O = ordinal or better  
N = nominal or better

3 Sample Size Limits  
Y = yes, sample should be < 50  
N = sample can be > 50

4 Number of variables limit  
Y = yes number of variables should be < 20  
N = number can be > 20

5 Ease of Interpretation  
E = usually easy  
M = moderate  
H = hard

* Depends on the algorithm used  
** Yes, if used as a grouping method
As a result of the type of data (ordinal) and the size of each of the cases, hierarchical clustering was chosen as the method for deriving the micro-configurations. One of the benefits of this is that the clusters derived were polythetic (Romesburg 1984), i.e. members could be different on some attributes so long as they are similar when judged over all attributes. Consequently it was possible to look at the data and highlight which, if any, variables were less important in determining the configuration. Another benefit is that the impact of each grouping step could be seen which, according to Miller (1978), helps to guide the researcher as to when to stop clustering. A number of hierarchical cluster methods have been tried, a brief description of each (from SPSS-X Advanced Statistics pp 180-181) is given below:

**Single Linkage**
This is one of the simplest methods for joining clusters, sometimes called the nearest neighbour method. The first two cases combined are those with the smallest distance or greatest similarity between them. The distance between the new cluster and each case is then computed as the minimum distance between an individual case and a case in the cluster. The distances between cases that have not been joined do not change. At every step the distance between the two clusters is taken to be the distance between their two closest points.

**Complete Linkage**
This is a similar method to single linkage, the difference being that in this method the distance between two clusters is calculated as the distance between their two furthest points. Hence, it is sometimes called the furthest neighbour technique.

**Average Linkage Between Groups**
This method defines the distance between two clusters as the average of the distances between all pairs of clusters in which one member of the pair is from each of the clusters. This differs from the linkage method in that it uses information about all pairs of distances not just the nearest or furthest.

**Average Linkage Within Groups**
This is a variant of the average linkage between groups method. Whereas that method considers only distances between pairs of cases in different clusters, the average linkage within groups method combines clusters so that the average distance between all cases in the resulting cluster is as small as possible. Thus, the distance between two clusters is taken to be the average of the distances between all possible pairs of cases in the resulting cluster.
**Ward's Method**
In this method, the means for all variables are calculated for each cluster. Then for each case the squared euclidean distance to the cluster means is calculated. These distances are summed for all of the cases. At each step, the two clusters that merge are those that result in the smallest increase in the overall sum of the squared within-cluster distances.

**Centroid Method**
This method calculates the distance between two clusters as the distance between their means for all variables. The centroid of a merged cluster is a weighted combination of the centroids of two individual clusters where the weights are proportional to the size of the clusters. One disadvantage of the centroid method is that the distance at which clusters are combined can actually decrease from one step to the next. Since clusters merged at later stages are more dissimilar than those merged at earlier stages, this is an undesirable property.

**Median Method**
The median method is similar to the centroid method. The major difference is that the two clusters being combined are weighted evenly in the computation of the centroid, regardless of the number of cases in each. This allows small groups to have equal effect on the characterisation of larger clusters into which they are merged.

Within each of these methods there will also be a choice of the most appropriate proximity measure. The measures that have been used in this research include the following:

**Squared Euclidean Distance**
This is the only method that can be used with the centroid, median and Ward's method. The difference between cases is calculated as the sum of the squared differences in values for each variable.

\[
\text{Distance}(X, Y) = \sum_{i} (X_i - Y_i)^2
\]
**City Block or Manhattan Distances**

The distance between two cases is calculated as the sum of the absolute distances in values for each variable:

\[
\text{Distance (X, Y) } = \sum_{i} |X_i - Y_i|
\]

**Cosine of Vectors of Variables**

This is a pattern similarity measure, computed as shown below

\[
\text{Similarity (X, Y) } = \frac{\sum_{i} X_i Y_i}{\sqrt{\sum_{i} X_i^2 \sum_{i} Y_i^2}}
\]

The chart below shows which methods and measures have been used together in this research.

**Figure 4.7 Methods and Measures Used in the Cluster Analysis**

<table>
<thead>
<tr>
<th>Method/Measure</th>
<th>Seuclid</th>
<th>Block</th>
<th>Cosine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Linkage</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Complete Linkage</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Average Linkage Between Groups</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Average Linkage Within Groups</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Ward's</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centroid</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The most useful method was found to be Ward's method. This, like other methods, follows a series of clustering steps that begin with T clusters and end with one cluster containing all objects. At each step it makes whichever merger of two clusters that will result in the smallest increase in value of an index E called the sum of squares index or variance. This means that at each clustering step all possible mergers of two clusters are tried, the smallest value of E computed for each and that one whose value of E is the smallest is selected to be merged. Then we go on to the next clustering step and repeat the process.
For each tentative set of clusters, E is computed as follows: First, the mean of each cluster is calculated. The cluster mean is a fictitious object whose attribute values are the average of the attribute values for the objects in the given cluster. Second, the differences between each object in a given cluster and its cluster mean are computed. Third, for each cluster the differences that have been computed above are squared. These are then added for every cluster, giving a sum of squares value for each cluster. Finally, the value of E is computed by adding the sum of squares values for all of the clusters.

Ward's method was selected for use on the basis of a number of factors. Firstly, it has been widely used in the social sciences. Some of the other methods have been used only in biology and the extent to which they are suitable for a social science application is unknown (Aldenderfer 1984). Another factor is that, according to Romesburg (1984), Ward's method generally provides well-defined clusters. Kuiper and Fisher (1975) also found that if complete coverage of classification is required and the data have relatively few outliers, Ward's method provides a superior recovery of cluster structure to any of the other clustering methods and it will also outperform other methods in cases where there could be cluster overlap (Bayne et al 1980). One of the other reasons for choosing this approach is that other techniques such as median or single linkage give rise to a property known as chaining, which refers to the tendency of the methods to cluster together relatively low level objects linked by chains of intermediates (Everitt 1980). Chaining did occur with this data set when using these methods, thus making it impossible to pick up any useful clusters. Finally, this particular method produced clusters that were more intuitively appealing than the other methods, although, as will be shown in the validation results section, many of the clusters appeared regardless of the method used.

Choosing When to Stop Clustering

The choice of the number of clusters that exist in any data sample is, "among the as yet unsolved problems of cluster analysis" (Aldenderfer 1984 p53). According to Romesburg (1984), the choice of the number of clusters resolves the trade-off between the desire for detail (many classes) and the desire for generality and simplicity (few classes). He suggests that this decision is always subjective.

Aldenderfer (1984) proposed a more formal but still heuristic approach. This is to graph the number of clusters implied by the hierarchical tree against the
amalgamation coefficient. If there is a point where the graph becomes steeper (i.e. there is a significant jump in value of the coefficient) this is where clustering should stop, as clusters with very few similarities are now being merged together. This has been done for the micro-configuration data to see if there is any obvious point where clustering should stop. The results of this can be seen in the next chapter.

Validating the Configurations

Validity can be differentiated into primary and secondary validity. How well a cluster analysis achieves its research goal and generates interesting and useful conclusions is a measure of its primary validity. The following, according to Romesburg (1984), are measures of secondary validity:

1. Obtaining well structured clusters
2. Agreement with existing classifications
3. Agreement with expert intuition
4. Agreement on different multivariate methods
5. Agreement of classifications based on split samples of the data
6. Demonstration of stability and robustness (through testing on more data)
7. Agreement with researchers prior expectations

The majority of these tests of secondary validity have been carried out in the research. Particular emphasis was given to the less subjective tests. For example: the data was split in two and re-clustered to ensure that the same results were obtained; a further nine departments were tested in order to see whether they fitted into the clusters that were derived and the clusters derived using Ward's methods were compared with those from other hierarchical clustering methods and different proximity measures to assess the stability of the clusters. Miller and Friesen (1984) stress the importance of validating cluster solutions, but also recognise the fact that, apart from using the subjective methods, very few researchers in the social sciences have ever bothered to do this.

Assessing The Links Between Macro-configurations and Micro-configurations

Once the micro-configurations were derived and validated it was possible to test the propositions discussed in chapter 2 about levels of differentiation and integration. In order to do this, the links between macro and micro-configuration were assessed by
using a number of different measures of association. No single measure adequately summarises all possible types of association, therefore it was necessary to try different measures, however, the choice was limited as the nature of the data meant that some of the more popular (for example Pearson's product moment correlation, multivariate analysis of variance and multiple regression) were inappropriate.

The first stage in this assessment was to cross tabulate the data to see if there were any obvious linkages which could be seen by scanning the data. In addition, the following statistical measures were calculated:

**CORRELATION**
The fact that the data collected was ordinal in nature limited the types of correlation analysis that could be carried out. For example, Pearson Product-Moment correlation which is the most common method could not be used as it assumes interval level data and a normal distribution (Norussis 1988a, p142). The method used here is Spearman's correlation coefficient. This is a symmetric measure, which does not imply causation. Variables are positively correlated if cases with low values for one variable also tend to have low variables for the other variable and cases with high values on one also tend to be high on the other. Negatively correlated variables show the opposite relationship: the higher the first variable the lower the second tends to be. The value will always be between -1 and 1, where one indicates perfect correlation and -1 indicates perfect negative correlation.

**GOODMAN AND KRUSKAL'S LAMBDA**
This measure is based on the idea of proportional reduction in error. It is essentially a ratio of the measure of error in predicting the values of one variable based on the knowledge of that variable alone and the same measure of error applied to predictions based on the knowledge of an additional variable (Goodman and Kruskal 1954).

Lambda always ranges between 0 and 1. A value of 0 means that the independent variable is of no help in predicting the dependent variable. A value of 1 means that the independent variable perfectly specifies the categories of the dependent variable. This was used to see whether knowledge of configuration made it easier to predict each of the configurations for production, sales and R&D. This test was also performed for configuration plus transition to find out whether the added knowledge of the organizational transition state made prediction of micro-configuration any
easier. Finally, the test was performed the other way around to see if macro-configuration or transition were at all dependent upon the micro-configurations identified.

**ETA**\(^2\)

Eta\(^2\) is an asymmetric measure which does not assume a linear relationship between variables. It can be interpreted as the proportion of the total variability in the dependent variable that can be accounted for by knowing the values of the independent variable (Norussis 1988). This measure was used with both macro-configuration and micro-configuration viewed as dependent in order to try to assess which had the greater influence in determining the other. Like the lambda test, this was also performed for the configuration plus transition to see whether the added information was of any use in determining the micro-configurations.

**Assessing the Links Between Macro-configurations, Micro-configurations and Integrating Mechanisms**

In order to identify whether there is any linkage between each of the integrating mechanisms, correlation analysis was undertaken. As there appeared to be high levels of interrelationship, the mechanisms were clustered using Ward’s method in order to find commonly occurring patterns of integrating mechanisms. The statistics described above were then computed and used to assess the relationship between the macro-configurations and integrating mechanisms and the relationship between micro-configurations and integrating mechanisms for both individual integrating mechanisms and clusters of integrating mechanisms. The level of differentiation was assessed by measuring the squared euclidean distances of the modes of all variables in each cluster against every other cluster. Thus, differentiation was calculated over all of the variables being measured. The higher the value of the squared euclidean distance, the higher the level of differentiation between the two cases. Following Lawrence and Lorsch (1967), the level of differentiation within each organization was then roughly calculated by adding together the level of differentiation between each of the three departments under study. This allowed a comparison to be made between the overall level of differentiation and the types of integration mechanisms being used.
Summary

This chapter has discussed the research methodology in some detail. It has shown how data was collected and analysed in order to test the propositions outlined at the beginning of the chapter. The chapter has also aimed to show that although total objectivity may be virtually impossible to achieve in analysing organizations, by utilising a systematic approach towards research it is possible to ensure that data collected will be standardised and therefore comparable.

The next two chapters will report the results that have been achieved in the research. Chapter five will concentrate on the derivation and validation of the micro-configurations. Chapter six will then build upon this to analyse the relationships between macro and micro-configurations and the levels of differentiation and integration.
References


Chapter 5 Micro-Configurations Results

Introduction

The purpose of this chapter is to consider the derivation and validation of micro-configurations. Previous chapters have discussed the rationale for the existence of micro-configurations and the methodology that has been used to derive them. This chapter will attempt to measure the degree of success that was achieved.

This chapter specifically considers the following issues:

1. The level of interdependency between the variables used to derive configurations.

2. The determination of the number of clusters and, hence, the number of configurations.

3. Descriptions of the configurations derived.

4. The identification of variables playing a more or less important role in determining the configuration.

5. The validation of the micro-configurations.

The entire thesis rests upon the concept of configuration. Thus, these results are fundamental to the research, not only in showing that the approach towards organization theory can be improved by studying work units as patterns of variables rather than in terms of bivariate relationships, but also as the basis for the later work on differentiation and integration.
Section One Interdependency of the Variables

The concept of configuration presupposes that the variables under consideration are inter-related in some way (Miller 1978, Miller and Friesen 1984). In other words, variables are not independent. The approach also assumes that relationships between some variables may be stronger than others and that the strength of any relationship can vary according to the context of each configuration. However, although certain variables may be more important than others in some situations, it is argued that each has a part to play in determining the configuration. In order to test this assumption, a correlation analysis of each variable with all others was undertaken. This is a fairly crude approximation as it fails to take account of the mediating effects of other variables on each relationship and the influence of non-linear relationships, however, it does serve to highlight that the variables are related to each other.

The correlation matrix below displays the scores for each variable correlated with all of the others. This shows that over fifty percent of the variables had a correlation of over 0.3 which, according to Miller (1978), is high enough for us to assume that they are sufficiently interdependent to be used in the derivation of configurations. The key is given overleaf.

Figure 5.1 Correlation Matrix of all Micro-configuration Variables

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Variable 8, the type of department, is blank as all departments analysed in this research were functionally organized.

A more sophisticated method of assessing the interdependence of the variables was undertaken using the Kaiser-Meyer-Olkin measure of sampling adequacy (Kaiser 1974). This is computed using the following formula:

\[
\frac{\sum \sum r^2_{ij}}{\sum \sum r^2_{ij} + \sum \sum a^2_{ij}}
\]

Where \( r_{ij} \) is the simple correlation coefficient between variables i and j and \( a_{ij} \) is the partial correlation coefficient between variables i and j. If the sum of the squared partial correlation coefficients between all variables is small when compared to the sum of the squared correlation coefficients, the KMO measure is close to one. Small values for the KMO measure indicate that correlations between pairs of variables cannot be explained by other variables, in other words interdependence is low. Kaiser (1974) characterised measures in the 0.90's as marvellous, in the 0.80's as meritorious, in the 0.70's as middling, in the 0.60's as mediocre, in the 0.50's as miserable and those below 0.5 as unacceptable.

The KMO score for this data set was 0.8435, which indicated that there was a relatively high level of interdependence between the variables. This ensured that the
data was suitable to be used to derive configurations. If there had been little or no correlation between the variables then it would have been pointless to perform the cluster analysis as clusters would have had little meaning as configurations for two reasons:

i) It could be argued that a lack of interdependence meant that any patterning in the data was coincidental and therefore would be unlikely to re-occur.

ii) The patterning could have been due to another factor or group of factors that were not being measured, hence the configurations would be incomplete.

The results found here enabled the research to continue and the derivation of micro-configurations to be undertaken.

Section Two Determining the Number of Clusters

The previous chapter discussed in some depth the problems that can arise in attempting to define the number of clusters that are suitable in different research situations. A survey of cluster analytical research (Aldenderfer 1984) has shown that most authors appear to rely on their intuition in choosing the point at which to stop clustering. The author suggests that this situation is unsatisfactory as the decision is almost certainly going to be biased towards the needs and opinions of the researcher. Thus, although intuition has played a part in assessing the number of clusters derived in this analysis, a more formal approach suggested by Aldenderfer has also been used. The graph in figure 5.2 overleaf plots the cluster coefficient against each stage in the clustering procedure. The purpose of this is that as less similar clusters are merged, the coefficient gets larger. A point where there is an obvious jump in the magnitude of the coefficient highlights an unsuitable merging taking place. Therefore, it is here that clustering should stop.

As can be seen from the diagram, the curve becomes significantly steeper at stage 46, at which point the data has been segmented into eight clusters. Once the number of clusters had been derived in this way, the clusters were considered in terms of whether they were intuitively appealing - did the division appear to make sense or would more or fewer clusters represent the data better? To answer this question the results of nine and seven clusters were considered to see if they represented the data in a more appropriate manner. It was decided, however, that eight clusters was the most suitable division of the data.
Figure 5.2 Cluster Coefficients

The next section gives a brief description of each of the clusters found in the data.
Section Three Descriptions of the Clusters

The most salient characteristics of each cluster are described under the headings: task, subenvironment, characteristics and management, and a graph is shown of the range of values and modal score of the variables for each cluster. The clusters are then compared at the end of the section. No attempt has been made to identify the clusters (or micro-configurations) as success or failure models. The reason for this is that it would be very difficult to come up with an objective measure of success that could be used for all of the work units. In addition, what is successful in one situation may not be successful in another and the level of success may be attributable to the pattern of micro-configurations rather than any one. Finally, it could be argued that success should be measured at the macro organizational level since it is at this level that the organization must be viable if it is to avoid extinction. Nevertheless, where a particular cluster was often perceived as being less effective by the people working within it this will be mentioned, although it should be remembered that this was only based on perceptions.
Cluster 1

(11% of the sample)
Most often seen in: Product Development/R&D

Figure 5.3 Variable Ranges for Cluster 1

Task
Cluster 1 is the closest to the organic form presented by Burns and Stalker (1961) that we come to in this research. Task uncertainty is high and work flow uncertainty is also fairly high. Members of the department often spend a large proportion of their time working in teams.

Subenvironment
These departments face a fairly dynamic subenvironment and, although efforts are made to try to ensure that good information about the environment is made available, they can only attain a moderate level of information. It takes them a very long time to get any information with regard to their performance from the environment. This could be because they are often working on longer term projects that take many years to be completed and launched.
Characteristics
A matrix structure is not unusual in these types of configurations. The departments are usually small and as a result of the necessity for dealing with a changing environment the level of standardisation is low. Skill levels are high and there is some specialisation, as not everybody in the department could have the same levels of knowledge in all areas, hence the need for team work. Spans of control are very small but supervisors are seen as facilitators and advisers with workers having a large amount of discretion themselves.

Management
Jobs in this department score highly on Hackman and Oldham's (1980) motivating potential score. Workers often perform a whole task, in that much of their work is project based and they will stay on a project until the end. Task variety is moderate to high, although this will depend to some extent on the variety of products the firm wishes to design and produce. Task significance is also fairly high, although autonomy is only moderate for each individual worker as they have to operate as part of a team.

Due to the long term nature of the work, the level of objective feedback is fairly low, however managers usually maintain close relationships with their workers and discuss any problem areas with them. There are few controls upon workers in this department, those that are emphasize behavioural factors rather than output based measures. The department generally has some form of performance measures upon it although these tend to be highly subjective in nature. Efforts are made to ensure that the performance measures are aligned with overall corporate goals.

Salaries are loosely linked to performance through the annual salary review. This is carried out by the departmental manager, who has, through his close interaction with his workers, a good idea of how well each individual is performing. Training is only moderate as these departments tend to recruit highly skilled workers who do not require a very high level of training. It is, however, supplied whenever necessary. There is a high level of delegation and most major decisions are discussed within the group prior to a decision being made. Finally, goals within this department are long term and reflect the objectives of the organization as a whole.
CLUSTER 2

(11% of the sample)
Most often seen in: Product Development/R&D

Figure 5.4 Variable Ranges for Cluster 2

Task
Cluster 2 is similar to cluster 1 in some ways, however this cluster could, in many situations, be seen as less successful. This configuration often characterises a product development function in organizations that put limited resources into this area.

The configuration faces a high level of task uncertainty. However, this could be reduced if the organization carried out more scanning of the environment and got better information regarding customers, competitors and so on. Work flow uncertainty also tends to be high and interdependence is usually pooled (see appendix seven for definition).
**Subenvironment**

Dynamism appears to be only moderate, yet the level of information perceived by workers is low. As a result of the lack of information about the market, there is a risk that this department will become nothing more than a design department that customises products for existing customers. This means that, as the organization has little control over its customers, work flow uncertainty can also be high.

**Characteristics**

The department is likely to be very small, in some cases only one or two people. Hence, spans of control are very small. Standardisation is low, skill levels are very high and there are a moderate to high levels of discretion.

**Management**

There is generally no control exercised over workers in this department and no performance measures are used. In some respects the workers have high levels of discretion and may score highly on many of the job motivation factors such as the opportunity to perform the whole task and task variety. Workers may, however, often be frustrated and feel that they are working in something of a vacuum. They often feel that, even if they do develop a new product, the likelihood that it will be produced is fairly low. Longer term projects are often shelved, as more urgent work for customers takes precedence. In this way goals tend to become divorced from the longer term corporate objectives and concentrate more on day to day issues.

Although skill levels are high, very little if any training is carried out. Rewards are not seen as being effectively linked to performance. There is a discretionary management style in that workers are to a large extent left to their own devices. This can add to the frustration mentioned above as workers can feel they lack direction.
CLUSTER 3

(19% of the sample)
Most often seen in: Product development and sales & marketing

Figure 5.5 Variable Ranges for Cluster 3

Task
This cluster differs from the previous two as it has far more sophisticated management systems. Task uncertainty is fairly high, however, work flow uncertainty is slightly lower than clusters one and two, due to managerial attempts to prevent a continual stop and start approach to the job. Workers can either work alone or as part of a team, depending upon the size of the project.

Subenvironment
The department faces a similar level of environmental dynamism as cluster one but there is a greater emphasis on guidelines and procedures to deal with this. They have a reasonable level of information regarding the environment. Feedback from the environment is moderate and reasonably quick in comparison to clusters 1 and 2.
Characteristics

The department is generally fairly small, there are moderate levels of standardisation and specialisation and a fairly high degree of discretion. Workers may have certain specialisms but generally will be able to cover for each other when necessary. Spans of control are fairly small in this department which allows managers to effectively co-ordinate the work and ensure that communication is good. The decision making style of the department is consultative, and meetings regularly take place. Skill levels are high and the approach is very professional with workers being given a good deal of discretion in most areas of their work.

Management

As the work of different members of the department needs to be co-ordinated, managers monitor them quite closely. The jobs in this unit score moderate to high on all of the job motivation factors, particularly task variety, task significance and the extent to which workers perform a whole task. There is more emphasis put on control in this cluster than the previous two. Workers are subject to both behavioural and output controls. The emphasis on each varies according to the function being performed, the sales and marketing departments are more likely to be measured on output whilst those involved in product development emphasize behavioural factors.

Performance measurement is also used in this department and this will stress the longer term needs and goals of the business as a whole rather than emphasizing purely functional operational areas. Salaries are usually related to performance through a formal annual performance appraisal. Although the level of training is only moderate, this is the highest that has been seen in any of the configurations (the low priority put on training could be due to the size of the firms visited and the effects of the current recession). Finally, the management style is consultative.
CLUSTER 4

(7% of the sample)
Most often seen in: Sales, particularly sales order processing

Figure 5.6 Variable Ranges for Cluster 4

Task
Cluster four is often found in very certain sales environments, particularly those that are more involved with sales order processing than actual proactive selling. This includes order processing groups within the sales department or, as was seen in the research, sales departments of companies which sell standard goods from a catalogue. Task uncertainty is low, standard procedures are in place that cover most enquiries and the work being performed is basically clerical in nature. Work flow uncertainty, on the other hand, is very high as this department may have to deal with many fluctuations in the level of work, depending upon the whims of customers. Interdependence is usually pooled.

Subenvironment
The subenvironment facing this department can be moderately dynamic, due to changes in customers and so on. There are high levels of information regarding the environment and a short timespan for feedback.
Characteristics
The department is usually small, there are high levels of standardisation and generally low levels of discretion. Spans of control are small, although this seems to be more related to the fact that the department is small and workers often have low levels of discretion than the complexity of the work involved. Skill levels are often quite low but some staff may need foreign language skills, depending upon their customer base.

Management
The jobs score low to moderate on the motivating potential scores. The mechanical nature of the jobs means that task variety, significance and autonomy are low. Feedback, on the other hand, scores highly. A strong emphasis is placed on controls and a mixture of behavioural and output based controls are used. The emphasis is generally put on output based controls if workers are external sales people, working off the company premises.

Remuneration is often not linked to rewards as the jobs are viewed more as clerical than as traditional sales jobs. Very little training is carried out and, in fairness, it is probably not necessary. Finally, goals tend to be short term in nature, rarely being seen in the context of the corporate strategy.
CLUSTER 5

(19% of the sample)
Most often seen in: external sales force

Figure 5.7 Variable Ranges for Cluster 5

Task
Most traditionally organized external sales forces in the research sample fell into cluster 5. Task uncertainty is moderate and work flow uncertainty is moderate to high. Members of these departments tend to work alone. They will generally be split up according to region or to product. A great deal of time is spent 'on the road' visiting existing customers and making new contacts in attempts to sell the company's goods.

Subenvironment
Much of the information that is held about the environment is informal and little if any systematic environmental scanning is done. This can work well if the organization has a separate marketing department but can be very dangerous if it does not. This cluster is often found in the F4 'Aftermath' configuration, where a lack of scanning causes considerable problems.
Characteristics

Standardisation is low to moderate and sales people often have fairly high levels of discretion once outside the firm. Because of the need to develop contacts in a particular area, specialisation is fairly high. Skill levels vary quite widely in this configuration, depending upon the nature of the product being sold.

Management

The jobs found in this work-unit score moderate to high on the motivating potential scores. Organizations differ with regard to the emphasis they put on control in this area although generally some behavioural controls such as time-sheets and forward plans will be used. Most importance is generally placed on output controls and turnover generated by sales people is the most common performance measure. The danger in this department is that all emphasis will be put onto generating higher turnover and not enough consideration will be given to factors such as profitability, due date performance and so on. This is particularly the case in the majority of units in which sales people are paid commission depending upon turnover achieved. This can cause conflict between this function and others within the company.

The management style of the work unit is often fairly consultative, although the degree to which managers communicate with their workers does vary markedly. The more successful departments tend to be those where communication is good and workers are involved in drawing up their own targets for the year. They are also those that take a more long term, business oriented view rather than focusing on very short term goals.
CLUSTER 6

(13% of the sample)
Most often seen in: Production

Figure 5.8 Variable ranges for Cluster 6

Task
This configuration is common in production departments which are perceived to be less successful. Task uncertainty is fairly low, although work flow uncertainty is higher than would be expected, often due to the need to cope with shortages and bottle-necks on the shopfloor. Interdependence tends to be sequential.

Subenvironment
Dynamism is generally low. There are moderate to high levels of information from the subenvironment, however, fluctuations sometimes occur, for example, due to poor relationships with suppliers.

Characteristics
Standardisation is often lower than might be expected for a relatively certain task because workers often have to cope with old, inaccurate machinery and poor working conditions which means they frequently have to ignore standard operating procedures.
The department is large and spans of control are moderate. These are lower than expected but the need for constant 'fire-fighting' means that workers need to have supervisors on hand to help them with problems as they arise. Skill levels vary although generally, in the sample visited, both 'time served' and semi-skilled workers were employed. Specialisation remains fairly high although some of the firms are attempting to increase the level of multi-skilling.

**Management**

The jobs score low to moderate on motivating potential factors due to the low levels of autonomy and the limited extent to which workers performed a whole task. Moderate behavioural and output controls are in place on the shopfloor although these are not as tight as might be expected. On the behavioural side, clocking on and work sheets, are common whilst the most popular output control is upon volume. Performance measures tend to concentrate on differentiating rather than integrating factors, although it is not uncommon for these workers to be measured on the sales value of their output. This can have dysfunctional consequences such as the rescheduling of work close to month ends to maximise the value of output, which only serves to reinforce the 'fire-fighting' type of approach and increase work flow uncertainty.

Remuneration is often dependent upon departmental or group performance measured in the way described above. Management style tends to be fairly autocratic, often described as a 'benevolent dictator'. Communication follows a fairly traditional pattern through unions or works committees.

It would appear that the production departments in this cluster are often constrained by their organizations. Many of the production managers recognised that the situation was far from ideal but few were able to change much due to a lack of resources.
CLUSTER 7

(9% of the sample)
Most often seen in: Production departments

Figure 5.9 Variable Ranges for Cluster 7

Task
This configuration represents the closest approximation to Burns and Stalker's mechanistic style of organization. Most of the units in this cluster perform assembly work. Task uncertainty is very low and work flow uncertainty is low as most fluctuations are smoothed out by scheduling. The division of labour is high and interdependence is sequential.

Subenvironment.
Dynamism in the subenvironment is low, information is moderate to high, and timespan for feedback is short.

Characteristics
These departments tend to be large, standardisation is very high and specialisation is low to moderate. This may be higher than expected but can be explained by the fact that many of these departments operate an individual incentive bonus scheme and
workers may resist moving jobs as their bonus may decrease if they are less experienced in that task. Some of the units within this cluster appear to be starting to expect more flexibility from their workforce.

Management
Workers have a low level of discretion, most situations are governed by rules and procedures. The high level of standardisation means that spans of control can be large. The jobs score low on all of the motivating potential factors and perhaps this is why a financial incentive scheme is in operation. Both behavioural and output based controls are used and these are generally strict.

Performance measures focus on short term operating objectives. The level of training is low, any necessary job training is generally carried out by the supervisor as soon as the workers start the job. The management style is autocratic. Communication tends to take place through very traditional mechanisms and is mainly one way, from managers to workers. In companies where these departments are predominantly male they are usually heavily unionised, this does not tend to be the case where they are predominantly female.
CLUSTER 8

(11% of the sample)
Most often seen in: Production departments

Figure 5.10 Variable Ranges for Cluster 8

Task
Departments in this cluster are generally concerned with production although this does not have to be the case. Task uncertainty is moderate as is work flow uncertainty. In many of the companies visited this had previously been a more traditionally organized production area and the level of uncertainty was to some extent increased by giving workers a greater degree of discretion over work processes. Interdependence is team based and the traditional role of supervisor is diminishing in importance in some organizations as production teams take control of their own areas.

Subenvironment
Dynamism is slightly higher than in other production configurations, the level of information from the subenvironment is high and timespan for feedback is short.
**Characteristics**

Standardisation is moderate to high and specialisation is low, as team members are encouraged to become multi-skilled by moving around jobs. Discretion and spans of control are both moderate. These spans of control, however, refer to the team leaders, who are part of the team and work alongside other team members, rather than to supervisors.

**Management**

If supervisors are employed, their role is as a facilitator and adviser to the groups, they do not direct the work. Jobs score moderately on all of the motivating potential scores, particularly task variety. There is a high emphasis on performance measures, and more localised, non-financial performance measures are often in use. Behavioural controls tend to be looser than in more traditional production functions as the organizations often rely on peer group pressure to ensure that workers are performing adequately.

The level of training is far higher than in any of the other production type configurations as workers are given more training to become multi-skilled and they may also have team skills training. Team leaders are also usually trained to ensure that they are effective. The supervisory style is participative and communication appears to be very good within the teams, although it may be poor between teams.
Summary

The graphs accompanying the descriptions show that not only do the configurations differ according to their actual scores but also in their breadth. For example, cluster two is a far tighter configuration than cluster three, particularly with regard to performance measures and controls. While there are some differences in the cases making up cluster 3, those in cluster 2 are identical on these attributes. Thus, the shape of these configurations can differ markedly, with cluster five showing the widest range and thus taking up the largest area, if measured in multi-dimensional space, and cluster 2 the narrowest.

To enable an easy comparison of the clusters a simplified table is shown below. This serves to show that each of the configurations are distinctly different.

**Figure 5.11 Comparison of Configurations**

<table>
<thead>
<tr>
<th>Variable No.</th>
<th>Clust 1</th>
<th>Clust 2</th>
<th>Clust 3</th>
<th>Clust 4</th>
<th>Clust 5</th>
<th>Clust 6</th>
<th>Clust 7</th>
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<td>syst</td>
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</table>

The numbers in the left hand column represent the variables. The key is given overleaf.
As will be shown in the validation section, the clusters appear to fall along a continuum between the Burns and Stalker organic and mechanistic types. The concept of configuration relies on the assumption of consistency or 'fit'. The extent to which variables making up each of the configurations fit together in a way that would be expected to be effective (according to the literature) differs. The micro-configurations which appear to achieve the highest levels of internal consistency are: clusters 1, 3, 7 and 8. Thus, it might be expected that these would be the most successful configurations. However, as mentioned earlier the degree of success achieved by any of the micro-configurations will depend to a large degree on the context. The other clusters may be equally effective, indeed it could be that the only reason clusters 2, 4, 5 and 6 seem less internally cohesive is because they are being viewed in a traditional organic/mechanistic light, which may no longer be appropriate. Alternatively, they could be undergoing some sort of transition whereby they will follow a more traditional pattern of consistency.

Proposition three, outlined in the methodology section, stated that the clusters would be independent of function, in other words that it would be possible to see different functions in any one cluster. Figure 5.12 overleaf shows the number of different functions in each cluster. With the exception of cluster 3, each cluster is predominantly made up of one particular function. Thus, it is easy to see that the
clusters are not completely independent of function, although it is impossible to say how large a part function has played in determining the configuration identified.

Figure 5.12 Functional Breakdown of Clusters

![Functional Breakdown of Clusters](image)

Key
- D = Product Development/R&D
- S = Sales
- P = Production

Interestingly, there is some functional overlap between sales and product development but only one case of overlap between either of these functions and production. This could be because production departments are fundamentally different to the other two, for example in terms of size. Alternatively, the cause could be bias on the part of the researcher. For example, it may be difficult to characterise production jobs in the same way as staff functions. I would propose that this is unlikely as the scoring mechanism should filter out this type of bias. Finally, another reason could be bias on the part of the respondent, due to the nature of their relationship to the workers. Whilst the sales and product development supervisors seemed to respect the jobs being done by their workforce, the production supervisors...
were more likely to talk about their workers as subordinates and perhaps gave a more condescending view of the types of work being done in their department. Thus, unless these functions are fundamentally different, this highlights a possible limitation in the method of collecting data used in this research.

On the whole, however, the proposition that micro-configurations are independent of function cannot be upheld. Although it is impossible to say whether function determines micro-configuration, or vice-versa, it is apparent that there is a high level of inter-relation between them, which substantiates the work of St John (1991), Shapiro (1977), Magnusen (1977) and Lawrence and Lorsch (1967). The extension of this research to product based departments would be useful to see whether they would approximate to one of the existing configurations or whether they would form a cluster of their own.

Section Four  Identification of Stronger and Weaker Variables

According to Romesburg (1984), the cluster analysis which has been performed here produces polythetic classes. Thus, similarity of members of a class is defined on the basis of their shared overall similarity, which means that cases can be dissimilar on some attributes so long as they are alike when judged over all attributes. The polythetic nature of these clusters will allow consideration of the strength of certain variables in defining each cluster. It may be, for example, that some are of very little importance, and that therefore it is not worth including them in the configurational analysis.

The nature of the data precluded the use of factor analysis. Therefore, in order to assess the importance of each variable, the ranges for each cluster were studied to see whether any of the variables had a wide range over all clusters, i.e. that, whatever the score recorded, it would fit into most clusters. The table overleaf shows that five variables appear to have the widest range across the clusters (a range of 3 or more), however even looking just at those with this limited range only includes five or six clusters, not all eight, therefore in certain situations their range will be narrower.
In addition, as can be seen from the table, none of these have the same range for all clusters which means that if they fall into certain scores, for example if standardisation is higher than 6, it will then play a part in determining the configuration. Therefore, on the basis of this analysis, none of these variables can be discounted from the analysis.

Interestingly, variables with the widest range differed according to the cluster being looked at. The variables with a range of five units or more for each cluster were:

Cluster 1: Performance measures
Cluster 2: Job interdependence
Cluster 3: Timespan of feedback from the environment
Cluster 4: -
Cluster 5: Job interdependence, controls and goals
Cluster 6: Performance measures
Cluster 7: -
Cluster 8: Size

This tends to indicate that these variables were less important in determining these particular clusters. It does not, however, show that any particular variable is less or more important overall.

A final test to assess the role played by certain variables in determining cluster membership was performed by studying the variances of the modal scores for each
variable across the eight clusters. A low variance would show that these variables
differ very little across clusters and hence that they can be of only limited importance
in determining whether a case approximates to a particular cluster. The table below
shows the results of this analysis.

Figure 5.14 Variance of Modal Scores Across Configurations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
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</thead>
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<tr>
<td>Work flow Uncertainty</td>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Specialization</td>
<td>4.750</td>
<td>1.114</td>
<td>1.245</td>
</tr>
<tr>
<td>Discretion</td>
<td>3.875</td>
<td>1.452</td>
<td>2.110</td>
</tr>
<tr>
<td>Spans of Control</td>
<td>2.500</td>
<td>1.581</td>
<td>2.499</td>
</tr>
<tr>
<td>Skill level</td>
<td>3.500</td>
<td>1.511</td>
<td>2.492</td>
</tr>
<tr>
<td>Whole task</td>
<td>4.125</td>
<td>1.536</td>
<td>2.359</td>
</tr>
<tr>
<td>Task Variety</td>
<td>4.125</td>
<td>1.053</td>
<td>1.095</td>
</tr>
<tr>
<td>Task Significance</td>
<td>4.125</td>
<td>1.166</td>
<td>1.359</td>
</tr>
<tr>
<td>Feedback</td>
<td>4.000</td>
<td>0.797</td>
<td>0.499</td>
</tr>
<tr>
<td>Autonomy</td>
<td>3.625</td>
<td>1.495</td>
<td>2.335</td>
</tr>
<tr>
<td>Controls</td>
<td>3.750</td>
<td>1.639</td>
<td>2.686</td>
</tr>
<tr>
<td>Performance Mean (D)</td>
<td>4.250</td>
<td>1.479</td>
<td>2.217</td>
</tr>
<tr>
<td>Performance Mean (D)</td>
<td>3.750</td>
<td>1.290</td>
<td>1.687</td>
</tr>
<tr>
<td>Remuneration</td>
<td>4.500</td>
<td>2.449</td>
<td>5.997</td>
</tr>
<tr>
<td>Training</td>
<td>3.125</td>
<td>0.972</td>
<td>0.949</td>
</tr>
<tr>
<td>Management Style</td>
<td>3.625</td>
<td>1.177</td>
<td>1.245</td>
</tr>
<tr>
<td>Goals</td>
<td>4.000</td>
<td>1.871</td>
<td>3.500</td>
</tr>
</tbody>
</table>

Key

* = variance less than 1
O = all departments surveyed were functional therefore no variance

Four variables are highlighted (with a variance of less than one):

Work flow uncertainty
Level of information from the subenvironment
Feedback
Training

The least surprising of these is training because, as mentioned earlier, perhaps due to
the size of the companies visited or the current recession, very little training was
carried out by any of the companies in any function. The other three are somewhat
more surprising. It would be expected that work flow would be far more certain in a
mechanistic production type department than in a sales department dealing with the
external environment. Again, this may be due to the size of the firms and the nature
of their manufacturing processes. Most of the production departments considered did
have to cope with considerable work flow uncertainty through problems such as
shortages. The main difference between departments concerned how the methods
they used for coping with the uncertainty. In production departments work flow
uncertainty was supposed to be the exception not the rule and hence supervisors
would tend to deal with it rather than the workers themselves. In sales or product
development, on the other hand, work flow uncertainty was expected and workers themselves would be more likely to decide how to cope with the fluctuations in the level of work. Therefore this variable could be of importance, particularly in larger more mechanised firms where the differences in scores may be greater. It must be pointed out here that this analysis uses the modal score. Therefore it does not necessarily mean that all of the production departments faced higher than expected levels of work flow uncertainty, a look at the range of scores will show that this is clearly not the case. However, the mode represents the most common score, hence it is fair to say that many of the cases did.

The modal score for level of information from the environment tended towards moderate in all of the different functions. This may have been expected to be higher in the production functions but the lack of forecasting and a 'fire-fighting approach' taken in many organizations visited meant that this was more akin to a less certain environment. Again, this does not mean that all firms faced the same level of subenvironmental uncertainty, if we compare the ranges it is possible to see that in some cases information was very good, however the modal scores show that, in many cases, this variable differed very little across the core functions.

Finally, the modal score for feedback varied little across the different clusters. This also tended to be moderate in most of the configurations, as, in the clusters performing less certain tasks, managers and other workers would try to provide feedback that was not readily available simply from doing the work. The growth in more formal methods of feedback such as performance appraisal in the staff functions also meant that these workers were given more information about their performance.

Therefore, it seems unwise to discount any of these variables in the derivation of the micro-configurations. Although their modal scores varied little across the different clusters, this does not mean that the range of scores available is any less wide. For example, two configurations may both have a moderate modal score on one particular variable but where one has a range of 1-5 the other might be 3-7. Hence, although the mode may be the same, a score of 1, 2, 6 or 7 would differentiate between these clusters.

Thus, the results of this section do not identify any variable that can be discounted. Apparently, some variables may exert a stronger influence over the choice of configuration than others, but the strength of any variable appears to differ according
to the context of each configuration, making it impossible to exclude any of them from the analysis.

Section Five Validity Tests

According to Miller (1984), many researchers see the derivation of clusters as the end point of their research. This, however, should not be the case. Clusters have to be validated in order to show that they are stable and are therefore a good representation of the data that is likely to be repeated if another sample was collected. The previous chapter listed seven different methods to validate clusters:

1. Obtaining well structured classes
2. Agreement with existing classifications
3. Agreement with expert intuition
4. Agreement on different multivariate methods
5. Agreement of classifications based on split samples of the data
6. Demonstration of stability and robustness through testing on more data
7. Agreement with researchers prior expectations

The use of each of these is described below.

1. Obtaining Well Structured Classes

Herrin and Oliver (1974) suggested that in order to judge how well structured clusters are, they should be compared to what an ideal situation with well structured clusters would look like. This has not been done for this data set as the purpose of this research is to learn from what exists not to decide what should exist, in terms of some ideal type. In addition, any ideal type would inevitably be derived from existing organizational theory which has already been shown to be extremely limited.

2. Agreement with existing classifications

Many of the existing schemes have been used solely at the macro organizational level (Mintzberg 1990, Miller 1984, Miles and Snow 1978), which makes it impossible to use them for comparison. Some of the writers working at the organizational level (Woodward 1970, Burns and Stalker 1961) either implicitly or explicitly consider the implications of their typologies/taxonomies for work units and these writers will be considered here, along with others who have attempted to derive typologies of the work unit level. The fact that there are very few examples of this means that this comparison will be fairly limited. However, it will show how this research compares to the current field of organization theory.
The following works will be considered:

**Typologies**
Burns and Stalker (1961)
Slocum and Simms (1980)
Ouchi (1979)
Winfield (1991)
Litwak (1961)

**Taxonomies**
Van De Ven et al (1974)
Lawrence and Lorsch (1967)
Woodward (1970)
Pinto and Pinder (1972)

**Burns and Stalker (1961)**
Burns and Stalker divided organizations into two distinct types, mechanistic and organic, and identified eleven different properties of each. These are detailed below and a comparison is made with the micro-configurations that have been derived.

*Properties of a Mechanised Management System*
(taken from Burns and Stalker, 1961, p120)

1. The specialised differentiation of functional tasks into which the problems and tasks facing the concern as a whole are broken down.

2. The abstract nature of each individual function which is pursued with techniques and purposes more or less distinct from those of the concern as a whole; i.e. the functionaries tend to pursue the technical improvement of means, rather than the accomplishment of the ends of the concern.

3. The reconciliation, for each level in the hierarchy, of these distinct performances by the immediate superiors who are also in turn responsible for seeing that each is relevant in his own special part of the main task.

4. The precise definition of rights and obligations and technical methods attached to each functional role.
5. The translation of rights and obligations and methods into the responsibilities of a functional position.

6. Hierarchic structure of control, authority and communication.

7. A reinforcement of the hierarchic structure by the location of knowledge of actualities exclusively at the top of the hierarchy, where the final reconciliation of distinct tasks and assessment of relevance is made.

8. A tendency for interaction between members of the concern to be vertical, i.e. between superior and subordinate.

9. A tendency for operations and working behaviour to be governed by the instructions and decisions issued by superiors.

10. Insistence on loyalty to the concern and obedience to superiors as a condition of membership.

11. A greater importance and prestige attaching to internal (local) than to general (cosmopolitan) knowledge experience and skill.

Properties of an Organic Management System (taken from Burns and Stalker 1961 p121)

1. The contributive nature of special knowledge and experience to the common task of the concern.

2. The realistic nature of the individual task, which is seen as set by the total situation of the concern.

3. The adjustment and continual re-definition of individual tasks through interaction with others.

4. The shedding of responsibility as a limited field of rights, obligations and methods. (Problems may not be posted upwards, downwards or sideways as being someone else's responsibility).

5. The spread of commitment to the concern beyond any technical definition.
6. A network structure of control, authority and communication. The sanctions which apply to the individual's conduct in his working role derive more from presumed community of interest with the rest of the working organization in the survival and growth of the firm and less from a contractual relationship between himself and a non-personal corporation, represented for him by an immediate superior.

7. Omniscience no longer imputed to the head of the concern, knowledge about the technical or commercial nature of the here and now task may be located anywhere in the network; this location becoming the ad hoc centre of control authority and communication.

8. A lateral rather than a vertical direction of communication through the organization, communication between people of different rank also resembling consultation rather than command.

9. A content of communications which consists of information and advice rather than instructions and decisions.

10. Commitment to the concern's tasks and to the technological ethos of material progress and expansion is more highly valued than loyalty and obedience.

11. Importance and prestige attach to affiliations and expertise valid in the industrial and technical and commercial milieu external to the firm.

Obviously, the Burns and Stalker typology represents a whole organization, however, I think it is easy to think of these factors in terms of work units or departments. Unfortunately, Burns and Stalker characterise only two extreme types, leaving us to guess what may occur in the majority of units/organizations that fall between these two extremes. If the micro-configurations are each compared to these two types it is easy to see that cluster 1 approximates closely to the organic style whilst cluster 7 and perhaps cluster 4 approximate closely with the mechanistic style of production. Clusters 2, 3, 5, 6 and 8 fall somewhere between these two styles, each having elements of both types to differing extents. This can be illustrated diagrammatically by placing the clusters along a continuum between mechanistic and organic styles of organization, as shown over the page.
The literature (for example Magnusen 1977) would lead us to expect that the development functions would provide the closest approximation to organic, and production functions the closest to the mechanistic form of organization, with sales falling in between the two. Although at the extremes this is true, the mixture of production and sales functions in the middle of the continuum shows that there is an element of choice in organizational design. Production departments are not necessarily managed in a more mechanistic style than staff functions.

Slocum and Simms (1980)
The Slocum and Simms typology is the most complete typology of work units that has been seen in this research. Unfortunately, it has not been empirically tested but, nevertheless, it is intuitively appealing. Slocum and Simms suggested eight different types of work-units illustrated from A to H below:

**Figure 5.15 Slocum and Simms Typology**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
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<tbody>
<tr>
<td>work flow</td>
<td>low</td>
<td>high</td>
<td>low</td>
<td>high</td>
<td>low</td>
<td>high</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>uncertainty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>task</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>high</td>
</tr>
<tr>
<td>uncertainty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>job inter-</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>dependence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type of interdep</td>
<td>seq</td>
<td>seq</td>
<td>recp</td>
<td>recp</td>
<td>pool</td>
<td>pool</td>
<td>pool</td>
<td>pool</td>
</tr>
<tr>
<td>managerial control</td>
<td>syst</td>
<td>syst</td>
<td>devl</td>
<td>devl</td>
<td>syst</td>
<td>disc</td>
<td>disc</td>
<td>devl</td>
</tr>
<tr>
<td>self-regulation</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>med</td>
<td>med</td>
<td>high</td>
</tr>
</tbody>
</table>

The key is given overleaf
Key
Seq - Sequential interdependence
Recp - Reciprocal interdependence
Pool - Pooled interdependence
Syst - a systematised style of management entails:
   i) a detailed set of procedures to be followed by the employee
   ii) the standards to be attained at each step in the transformation
   iii) built in monitoring devices that allow the manager to detect deviations from standards so that corrections can be made

Devl - A developmental style of management entails:
   i) general goals to be achieved within a specified time
   ii) a set of norms and expectations regarding the general nature of behaviours and interactions among employees

Disc - A discretionary style of management entails:
   i) a repertoire of alternative plans for handling various problems
   ii) a set of guidelines for exercising discretion in these situations
   iii) the specification of an expected quantity and quality of outputs to be achieved by the employee

As mentioned in the literature survey, typologies tend to be far neater than empirically derived taxonomies, each different case is very distinct from all of the others and is easy to picture. Taxonomies, on the other hand, tend to be messier and the distinctions between them more blurred. This point is demonstrated in the comparison of this typology with the empirically derived micro-configurations.

The table overleaf shows which of the cases in the Slocum and Simms typology can be approximated to the micro-configurations derived. In some respects this approximation may appear a little contrived as many more factors are measured in the micro-configuration than in this typology, however it is possible to map those variables that are measured in both methods together. In addition, Slocum and Simms infer a great deal from their managerial control methods which gives greater information for use in the comparison.
As the table shows, five of the clusters can be easily matched with the Slocum and Simms types. It is not surprising that all of the clusters can not be matched if we consider the crude method of scoring adopted by Slocum and Simms, for example, task uncertainty, work flow uncertainty and job interdependence can only be either high or low, thus work units falling more towards the middle of the range are not included in their categorisation.

**Ouchi**

Ouchi's (1979) classification is primarily for use at the organizational level. He identifies three different styles of organization: market, bureaucracy and clan. Brief descriptions of these are given below:

**MARKET**

*Social requirements:* NORM OF RECIPROCITY  
*Informational requirements:* PRICES  
*Characteristics:* Regulates exchange through competitive pressures that relate the value of a good or service to its price.  
Used where internal markets can be identified as with profit centres.  
Internalisation form of commitment is required in order for success.

**BUREAUCRACY**

*Social requirements:* NORM OF RECIPROCITY  
*LEGITIMATE AUTHORITY*  
*Informational requirements:* RULES
Characteristics: Regulates exchanges with rules which determine who can interact with whom; and co-ordinators who have formal authority to allocate goods and services among parties. Uses formal controls extensively. Used where tasks are certain and workers are independent. Compliance form of commitment is required for success.

CLAN

Social requirements: NORM OF RECIPROCITY
LEgITIMATE AUTHORITY
SHARED VALUES, BELIEFS

Informational requirements: TRADITIONS

Characteristics: Regulates exchanges through a system of shared values and traditions
Uses trust and common values
Used in small units where formal controls and markets are inadequate
Identification form of commitment is required for success.

Elements of all three approaches can be seen in the various micro-configurations. It would be hard, however, to claim that any of the configurations represented one of these types in their pure form. The closest to the bureaucracy style of management is probably cluster 7, whilst the closest to the clan is cluster 1. There are elements of the market style in cluster 5, which most commonly represents external sales staff, and to an extent in cluster 6, where incentive payment systems are present. However, to varying degrees, both of these clusters also incorporate elements of the bureaucracy type. Thus, it is difficult to clearly match the micro-configurations on to Ouchi's organizational typology, although some elements are similar in each of the methods.
Winfield (1991)

Figure 5.16 Winfield typology

<table>
<thead>
<tr>
<th>LOW LEVEL OF PRODUCT VARIABILITY</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>ORGANIZATION DESIGN</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Dedicated production plant and systems, (oil refineries) (mass production)</td>
<td>Mechanistic Organization</td>
</tr>
<tr>
<td></td>
<td>High level of functional differentiation</td>
</tr>
<tr>
<td></td>
<td>Centralised formal planning and co-ordination</td>
</tr>
<tr>
<td>CAD with CAM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Q U A N T I T Y OF TOTAL PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>SMALL</td>
<td></td>
</tr>
<tr>
<td>Conventional machinery, (specialist parts manufacturer)</td>
<td>Semi-skilled Labour, Simple hierarchical structure, centralised planning by manager or group. First line supervisors handle shopfloor issues</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Winfield has provided an organizational typology based upon the number of total products and the level of product variability. He gives a limited view of the effects of these factors upon the organization, shown in the diagram above. It is difficult to compare these with the configurations that have been derived as such little information is given about them. Winfield classifies the first of his typologies as mechanistic organization which, as has already been discussed above, does approximate very well to one of the configurations. The second grouping consists of decentralised cross functional groups and teams. None of the clusters identified in this research map neatly on to this as they are all functionally based. The closest match would be with cluster 3 which often utilised a matrix style structure and a project management approach, however, there is too little detail to say how close this comparison would be. The third grouping in the typology, consisting of semi-skilled labour and a simple hierarchical structure, appears to match well with cluster 6, again though, without more information, it is impossible to say whether it is a close representation of this configuration. Finally, the fourth grouping is considered by
Winfield to be flexible, with decentralised operational control and role integration. This could be represented by cluster 8 which is a team based design, however once again, the insufficient level of organizational information given by Winfield prevents a complete comparison. Thus, although it is possible to see similarities, Winfield concentrates on production issues and the lack of organizational information means that it is impossible to say how well his typology matches the taxonomy developed in this thesis.

Litwak (1961)

Litwak suggests three possible models of organization, Weber's model of bureaucracy, the Human Relations model, and a professional model. The differences between these three are shown in the diagram below.

*According to Litwak, the bureaucratic style is most efficient where tasks are uniform and involve traditional areas of knowledge*
According to Litwak, the human relations style is most appropriate where tasks are not uniform and/or involve social skills.

According to Litwak, the professional style is most appropriate when jobs involve both uniform and non-uniform events or with social skills as well as traditional areas of knowledge.

This typology can be matched with the configurations described reasonably well, the bureaucratic model is very similar to Burns and Stalker's mechanistic model which, as discussed earlier, matches with cluster 7. The human relations model appears to be more similar to an organic style of management and, therefore, approximates most closely to cluster 1. Finally, the professional model appears most closely related to cluster three where control tends to be exercised over routine matters yet high levels of discretion and creativity can be found. Like the preceding typologies (with the exception perhaps of Slocum and Simms), Litwak does not really give enough information for a complete comparison to be done which means that any analysis is somewhat limited.

As mentioned at the start of this section, many of the typologies in this field are concentrated at the macro organizational level. Those that are not seem to be fairly limited in the numbers of variables that they have considered. In addition, the majority of writers have appeared to follow the Burns and Stalker typology of organic and mechanistic, even if they have used slightly different names for it. Thus, I will now turn to the writers who have attempted to derive taxonomies within organizations. The novelty of this approach (as discussed in the literature survey) means that there are few with which to compare, particularly as most taxonomic work (Miller 1984, Hambrick 1983) has concentrated on organizations instead of work units.
Taxonomies

Van De Ven et al (1974)
These authors did not so much generate taxonomies of organization as empirically
test typologies. However, the very fact that they did used empirical data in deriving
(groupings makes them very different from the typologists discussed in the previous
section. Van de Ven et al distinguished between three organizational structures at the
work unit level in organizations. These are described below

Systematised mode
Low task variability
Low to medium task difficulty
Mechanistic structure

Service Mode
Intermediate task variability
Low to high difficulty
Discretionary control - personnel apply the appropriate strategies after analysing the
tasks
Unit members independent

Group Mode
Medium to high task difficulty
High variability
Unit members often organized into teams
Tasks typically temporary
Flexible structure
Supervisors act as a group co-ordinator

These categorisations have obvious similarities with the taxonomies derived in this
thesis. The systematised mode is most appropriate to cluster 7, although cluster 6
may also fall into this. The service mode appears to be most appropriate for cluster 5,
while the group mode is similar to cluster 3. The problem is that, by only considering
three possibilities, Van de Ven et al cannot go into a great deal of detail on each, thus
their descriptions are very general. As a result the comparisons are once again
limited.
Lawrence and Lorsch (1967)
The work of Lawrence and Lorsch has already been discussed at some length in the thesis, and will form an important part of the next chapter. These authors tested the assumptions that the three core departments would develop different structural and staff orientations. They expected that the differences would be as follows:

**Sales**
*Subenvironmental uncertainty:* Moderate  
*Formality of structure:* Moderate  
*Interpersonal Orientation:* Relationship oriented  
*Time orientation:* Short/moderate  
*Goal Orientation:* Market

**Production**
*Subenvironmental uncertainty:* Low  
*Formality of structure:* High  
*Interpersonal Orientation:* Task oriented  
*Time orientation:* Short  
*Goal Orientation:* Techno-economic

**Development**
*Subenvironmental uncertainty:* High  
*Formality of structure:* Low  
*Interpersonal Orientation:* Task and relationship oriented  
*Time orientation:* Long  
*Goal Orientation:* Techno-economic/Scientific

The extent to which these compare with the configurations will be discussed in more detail in a later chapter concerned with differentiation and integration. Suffice it to say at this point that the subenvironmental and structural variables seem to match reasonably well with the clusters and that these clusters also appear to be roughly functionally based, the only exception to this being cluster 3. Thus, the Lawrence and Lorsch production grouping matches well with one of the production micro-configurations, cluster 7, however, there are other production micro-configurations which differ from the Lawrence and Lorsch type. The exclusively development micro-configurations (clusters 1 and 2) match well with the Lawrence and Lorsch development departments, although the more applied R&D functions which fell into cluster 3 differ somewhat. Finally, one of the sales micro-configurations - cluster 5
matches well with the Lawrence and Lorsch sales department, however, others such as cluster 4 and cluster 3 differ in certain respects.

Hence, the problem of comparison has more to do with the level of detail which each researcher goes into than any methodological problem. Lawrence and Lorsch, in common with many others, differentiate between only three types. This means that while some of the micro-configurations derived here can be matched with them the level of detail gone into in this current research makes it very difficult to compare them all.

Woodward
Although Woodward's technological taxonomy is based at the macro organizational level, she also considered the effects of this for the three core departments of sales, production and product development. Unfortunately, the description given of each is fairly limited, as shown below.

Unit and Small Batch Production

Sales department
- High levels of technical knowledge
- Often not described as sales more marketing or customer service oriented.
- Close integration with staff from other functions

Product Development
- This is the central and critical activity in this particular typology
- The function is closely linked with production engineering
- Low emphasis on control

Production
- Low levels of qualification
- Financial incentives are not appropriate

Integration in this type of firm depends almost entirely upon personal contacts. Managers are as aware of corporate goals as they are their own functional goals.
Large batch and Mass Production

Product Development
- There is an occasional confusion of roles between product development and product engineering
- Hostility between development and the production department
- Tend to have longer term objectives
- Less interested in profit than the production department

Production
- This is the critical and central activity in this type of organization
- Often there are difficulties in the level of control due to problems with shortages etc.

Sales
- Uneasy relationship with production
- Little technical knowledge
- Highly specialised

Process Production

Product Development
- This department is often spilt between pure research and product development
- The department is totally divorced from production
- A very long term approach is taken towards managing and measuring the work

Marketing
- Importance of securing markets prior to bulk manufacture
- This is the central and critical function
- High levels of qualification

Production
- High levels of control and predictability

More independence exists between these three functions than in any other type of firm.

As can be seen from the descriptions above, insufficient information is given to easily compare Woodward's departments with the micro-configurations derived in this thesis. In fact more information appears to be given with regard to the levels and
method of integration. It is interesting to note, however, that Woodward did recognise that the very different tasks being performed in these departments would effect their management and perhaps structure within the technological imperative, something she is not generally given credit for in the literature.

Pinto and Pinder
The approach used by Pinto and Pinder is the most similar to that used in this thesis in terms of data analysis. They also developed eight different clusterings of work units within organizations. The difference between their approach and that used here lies in the variables used to measure each of the cases. Pinto and Pinder utilised twelve variables and concentrated on measures of organizational effectiveness in deriving their clusters. They also used a wider variety of organizations, including non-manufacturing ones to derive their clusters. Thus, although they have the same number of clusters, it is impossible to gauge the similarity between their results and those found here as the measures used are completely different.

Summary
The typologies and taxonomies outlined above differ considerably in the extent of detail they go into and thus the degree to which they can be successfully compared with the micro-configurations. Perhaps the most suitable comparison is with the Slocum and Simms (1980) typology which matches five of the micro-configurations. Although none of the works discussed in this section provide a complete validation of the micro-configurations, the section does show how the micro-configurational approach is an advancement upon currently existing work in the field. The implication of this could be that this is not really a very good way of validating the work, as it would be extremely limiting if all new research was expected to come up with similar results to past work. The fact that elements of each of the methods discussed can be seen in the micro-configurational approach shows how this can be used as a synthesis of past research, even if differences in the level of detail prohibit complete comparison.
3. Agreement with expert intuition

The easiest way to compare the clusters found here with expert opinion is to compare them to the typologies that have been developed in the literature, because as discussed earlier typologies are based on intuition. This has been done in the previous section. Less emphasis has been given to this method of validation as it is purely subjective.

4. Agreement on different multivariate methods

Miller (1984) suggested that one method of testing the stability of clusters would be to use different methods on the same data and see whether the same clusters were derived. As discussed in chapter four, the nature of the data meant that many techniques, for example: factor analysis, multivariate analysis of variance, and discriminant analysis had to be discounted. The table below shows how the results obtained using Ward’s method compared with those found using other hierarchical clustering methods.

**Figure 5.18 Stability of Ward’s Method Clusters Across Other Methods**

<table>
<thead>
<tr>
<th>Method</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
<th>C8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waverage (Block)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Baverage (Block)</td>
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<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<td></td>
<td>*</td>
</tr>
<tr>
<td>Complete (Block)</td>
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<td>*</td>
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<td>*</td>
</tr>
<tr>
<td>Waverage (Seuclid)</td>
<td></td>
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<tr>
<td>Baverage (Seuclid)</td>
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<tr>
<td>Complete (Seuclid)</td>
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<tr>
<td>Waverage (Cosine)</td>
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<tr>
<td>Baverage (Cosine)</td>
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<td>Complete (Cosine)</td>
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<td>*</td>
<td>*</td>
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<tr>
<td>Median  ☢</td>
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<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Centroid ☢</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Single (Block) ☢</td>
<td></td>
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<td></td>
<td>*</td>
</tr>
<tr>
<td>Single (Seuclid) ☢</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

**KEY**

* = Cluster identified using this method

☢ = Chaining occurred therefore this method is discounted
The bottom four methods all produced a chaining effect (discussed in chapter 4) which means that they had to be discounted. Although Miller suggests that it is a good test of a cluster to see if it appears when using another method, he does not suggest how many other methods should be tried and how many reappearances are necessary for us to accept the validity of a cluster. Of the nine methods tried here (thirteen if we accept the chaining methods) each of the clusters is reproduced a number of times. The closest match to Ward's method appears to be the complete method using a cosine measure. It is important to point out that in order to accept a cluster as having reappeared it was necessary for all of the firms included in the Ward's method answer to also be in that of any of the other methods. This meant that only if a cluster was exactly the same would it be included, some of the clusters were similar except for one or two cases but these were not counted, if they had been the number of reappearances would have been much higher. Notwithstanding this, the results appear to validate the clusters derived, although in some respects I question how useful this particular test is. As the methods and measures group cases together according to different characteristics and patterns, is it really surprising that they do not match exactly? I propose that a better test of the clusters would be to collect data on more firms and see whether they fit into the configurations that have been derived, which is done in part 4.

5. Agreement of classifications based on split samples of the data

Miller (1984) and Romesburg (1988) both suggest that one test of the clusters derived is to randomly split the sample into two and recluster in order to try to ascertain whether the same clusters appear. This was performed on the data and the table overleaf shows the results. By comparing clusters found in the complete sample and those formed in the two split samples it becomes obvious that in sample one these are exactly the same. Sample two, however has three anomalies, highlighted in the table overleaf. On examining the scores for each particular case and comparing them to the range of the cluster that they are in, it became apparent that the differences are small involving between three variables (Crosby D) and eight variables (Elequip S) and that these differences are generally of only one point. Thus they have very little, if any, effect upon the configurations derived. The table overleaf shows the clusters derived in the two halves of the sample. At the bottom they are matched with the complete sample clusters. A tick is given if there is an exact match.
It would seem preferable to have split the sample prior to clustering for the first time to see whether the same clusters appeared in the two samples. However, this was not
possible in this exercise as the samples would have been too small to realistically derive the same number of configurations. This then raises the question as to whether, had the sample been larger, more clusters would have been evident. Future research should be directed towards achieving much larger samples to test this proposition.

6. Demonstration of stability and robustness through testing on more data

In order to further test the micro-configurations, three additional organizations were visited and the three core departments of each were analysed, giving a test sample of nine. Although this is fairly small, I believe that this can still be used to substantiate the configurations derived for a number of reasons:

i) It is still unusual for researchers to validate taxonomies at all and so this is a significant advance upon much taxonomic work in the organizational field (Miller 1978, Sneath and Sokal 1973, Miller and Friesen 1984).

ii) This is not the only method being used to validate the configurations, it is one of a range of techniques being used.

The data collected at the test sites is compared to the configuration scores in two ways:

1. A comparison is made of the score on each variable with the range for that variable in each configuration. The configuration where the test score most closely fits within the ranges for all variables is the best approximation of that case.

2. The square of the distance between the modal score for each variable and the score given to the variable at the test site is computed. This is then totalled for each cluster. The cluster with the smallest overall variance is the closest approximation to the test site.

These methods are the same as those used in determining the appropriate macro-configuration.

This process was done for each of the departments studied at the test sites. Each department was very closely matched to one of the configurations, in that each of
them fitted within the ranges of one configuration. The variances of the modal scores with those of the configuration chosen were also very small (below 17).

The departments for each of the firms were identified as the following configurations:

Figure 5.20 Results of Testing Configurations at Other Sites

<table>
<thead>
<tr>
<th>PRODUCTION</th>
<th>SALES</th>
<th>DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biwater Ltd</td>
<td>C6</td>
<td>C4</td>
</tr>
<tr>
<td>Spencer Foundry Ltd</td>
<td>C6</td>
<td>C5</td>
</tr>
<tr>
<td>Slater Thermal Ltd</td>
<td>C7</td>
<td>C5</td>
</tr>
</tbody>
</table>

It was clear in each case which configuration was appropriate, particularly when considering the differences from the modal scores. This is an improvement on the Miller macro analysis, where at times it can be very difficult to choose between two possible configurations, using either the range or the modal score method (see Blenkinsop 1993 for a discussion of this).

7. Agreement with researchers prior expectations

In many respects, the clusters derived were intuitively sensible and did meet my expectations. I had expected a continuum to exist between mechanistic and organic styles of management with a large area between these two extremes that was open to a variety of different management styles.

<table>
<thead>
<tr>
<th>AREA OF CHOICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORGANIC</td>
</tr>
</tbody>
</table>

As shown in an earlier section, the clusters derived do fall broadly along this line. The surprising factor for me was the extent to which the clusters were functionally based. I had expected that the configurations derived would be more generic across the functions than has proved to be the case. I had also expected, perhaps from
reading typologies in the literature, that the differences between each of the clusters would be more distinct. However, perhaps as a result of the number of variables being measured and the number of configurations derived, this is not the case.

In summary, a number of different methods have been used here to validate the micro-configurations. It is difficult to assess the success of the validity tests as no benchmark is provided as to what should be achieved. Nevertheless, from the above tests it seems fair to say that the micro-configurations are stable and valid, in that they represent the data well and are likely to occur in any similar sample.
Summary

This chapter has presented the results of the micro-configurational analysis. The chapter began by showing how the data collected was checked to ensure suitability for a configurational approach. It then moved on to show that, although some variables appeared to exert a stronger influence upon the configuration than others, none could be excluded from the analysis. The second section considered how the number of configurations which most suitably represented the sample was decided. Eight different clusters were derived using hierarchical cluster analysis and each was described in some detail. Finally, the clusters were validated, using a number of different methods. The success of the validation depended upon the method being used, some were more useful than others. However, by utilising five methods, a reasonably high level of substantiation for the configurations was achieved, although difficulties arise due to the lack of any benchmark as to what should be achieved in order to accept validity.

The following chapter will build upon this work to consider the relationship between the macro and micro-configurations and also the implications of this work for the concepts of differentiation and integration discussed in chapter 2.
References


Chapter 6 The Links between Macro and Micro-Configurations

Introduction

This chapter builds upon the previous one and considers the relationship between Miller and Friesen's macro-configurations and the micro-configurations that have been developed. It also shows how the micro-configurations have been used to investigate the concepts of differentiation and integration, as characterised by Lawrence and Lorsch (1967). Three major issues will be covered:

1. The link between macro and micro-configurations
Tests will be done to investigate the relationship between these two groupings. In particular, I will consider the following propositions:

Proposition 7: The macro-configurations identified constrain/determine the possible micro-configurations.

Proposition 8: The micro-configurations identified constrain/determine the possible macro-configurations.

2. The link between macro-configurations and integrating mechanisms
Lawrence and Lorsch proposed that an organization's external environment determines the necessary level of integration in a company. Although the sample here is somewhat limited, I will attempt to ascertain whether this is the case. Attention will also be given to the concept of causality, is the relationship symmetric or does one aspect of the organization cause the other. Thus, the following propositions will be considered:

Proposition 9: The types of integrating mechanisms used are closely related to each other.

Proposition 10: The macro-configuration identified determines the nature of the integrating mechanisms used.
Proposition 11: The level of environmental dynamism determines the nature of the integrating mechanisms.

3. The link between micro-configurations and integrating mechanisms
Lawrence and Lorsch suggested that highly differentiated firms are more difficult to integrate and, hence, that complex integrating mechanisms are required. Thus, tests will be carried out to investigate the following propositions:

Proposition 12: Certain types of micro-configurations require particular styles of integrating mechanisms. Hence, micro-configurations determine or influence the integrating mechanisms.

Proposition 13: The level of differentiation is determined by the level of environmental dynamism.

Proposition 14: The level of differentiation determines the level of integration.

The chapter will then bring these three aspects of the research together to consider the relationships between organization, differentiation and integration. Although the sample for this part of the thesis appears somewhat small, it should be recognised that this is actually a slightly larger sample than was originally used by Lawrence and Lorsch (1967) in their landmark study and, thus, should be suitable for comparison with their work.

Section One The Link Between Macro and Micro-configurations

One point that must be highlighted before proceeding into this results section is that, as shown in the methodology chapter, the sample of macro-configurations was fairly limited, being predominantly of the S1A type. Such a large subsample of S1As limits the extent to which the results here can be generalised over all configurations. However, a possible advantage is that it provides a relatively homogeneous subset within which to test the relationship between micro and macro-configurations.

In chapter two I discussed at some length the concepts of differentiation and integration. Lawrence and Lorsch (1967) suggested that different departments within
an organization developed different modes of operation, structures and styles of management. They claimed that this was dependent upon the subenvironment that each department faced. As I hope has been demonstrated in the previous chapter, it is somewhat simplistic to suggest that this one variable determines all others in every situation. Instead, I have put forward a more holistic approach considering the patterning of a number of variables. Nevertheless, it is recognised that an organization's environment is an important factor which should be taken into account in any analysis. The question that must be considered is do we study the macro organizational environment or the micro subenvironment - which has the greater influence over the development of a particular micro-configuration? One of the purposes of this section is to consider this issue. The subenvironment has been included within the micro organizational analysis. However, as yet, no thought has been given to the macro-organizational environment and the role that this may play.

In addition, by assessing the relationship between the macro and the micro organizational configurations, it will be possible to test the assumption made by so many organization theorists (for example Woodward 1970, Pugh et al 1976) that decisions made at the macro level effectively constrain, if not completely determine, the organization of the micro level.

**Measuring Association**

A number of different methods have been used in order to try to understand the relationship between macro and micro-configurations.

**Scanning the Data**

The first method used was to scan the data to see whether any discernible pattern could be found. Figure 6.1 overleaf shows the micro-configurations that occurred in each of the different macro-configurations.
This gave some insights, for example all of the F4 configurations had a C5 sales function, which could be because a major failure of the F4 configuration is the lack of any environmental scanning. The more successful configurations which also had this style of sales function tended to operate a separate marketing function, whereas the failures did not. Similarly, F4 configurations appeared to be more likely to have C6 production functions than any other. The C4 sales function only occurred in successful configurations and the C3 also appeared to predominate in successful macro-configurations. Obviously, although it was possible get a feel for the data from this type of analysis, it failed to provide any picture of the strength of the link between macro and micro, hence the need for more sophisticated statistical techniques.

**Correlation**

The first statistical method used to assess the strength of the relationship between macro and micro-configurations was Spearman's correlation coefficient. This is a
symmetric measure which does not imply causation. The measure ranges from -1 to 1, a measure of 0 implies no linear relationship, whereas a value of 1 (or -1) implies that all points fall exactly on a line. Figure 6.2 below shows the correlation coefficients between the macro-configuration and the micro-configurations determined for each department. This was then extended to compare these with the correlation coefficients for the transition and the micro-configurations and finally the configuration combined with transition and the micro-configurations. In this way it was possible to ascertain whether, by narrowing the focus at the macro level, we could see a stronger correlation with the micro level.

The results from this correlation analysis were somewhat surprising. It had been expected (and indeed was shown to be the case with the other methods) that the highest correlations would occur when both the configuration and the transition were taken into account, as this provided a more complete view of the organization. From the graph, it can be seen that in the case of the sales department the link was far stronger with the configuration than it was with the transition or the combination of configuration and transition. The production department had a very weak link with the configuration, transition and the combination of both. The development function,
on the other hand, was most strongly linked with the organizational transition, had almost no correlation with the configuration and very little with the combination of both configuration and transition. The correlations were generally low, particularly for the production department where the relationship with any of the macro-configurations appeared to be almost non-existent. However, this does not necessarily mean that the configurations were not related to each other, all that it means is that their relationship was not linear. Hence, other measures of association had to be considered before any conclusions could be made.

As discussed in the methodology chapter, the measures of association that have been used are the lambda and eta². These measures were first computed for the whole sample and then for a more focused sample of just the S1A configurations. As both of these measures are asymmetric in nature, the tests have been conducted in both causal directions to see which of the macro and micro-configurations was more important in determining the other.

**Micro-configuration Dependent Upon Macro-configuration**

(Complete Sample)

**Eta²**

The eta² score differs from the correlation coefficients in two major ways: Firstly, it does not assume a linear relationship between the variables and secondly, it is asymmetric and therefore considers one factor to be independent and the other to be dependent. The score varies between 1 and 0 and can be interpreted as the proportion of the total variability in the dependent variable that can be accounted for by knowing the values of the independent variable.

Figure 6.3 shows the extent to which the micro-configurations found in each department were dependent upon the macro-configuration, transition and combination of macro-configuration and transition, using the eta² score. The general trend was that more information at the macro level (i.e. the knowledge of both configuration and transition) provided a greater association with the micro level. The weakest linkage appeared to be with the production department which varied between 0.16 and 0.35. This effectively meant that the organizational configuration and transition accounted for at most approximately 35% of the variation in the production micro-configurations. Possible reasons for the lower association between production and the macro-configuration could be:
(i) According to Thompson (1967), the production department is protected from the environment (which is a major input to the macro-configuration) by boundary spanning departments like sales. Thus, perhaps it is shielded from many of the macro level influences.

(ii) Other factors which are not included in Miller's macro-configurations, such as the operating technology, may have a greater impact upon the production micro-configuration than the other functions observed.

The sales micro-configuration had the highest level of association with the macro-configuration, ranging from 0.28 to 0.71, it was consistently higher than production or product development. It was also more strongly related to transition than it was to current configuration, perhaps because this function was most likely to carry out the increased scanning that was necessitated by the majority of the transitions. The level of association between the macro-configuration and the product development micro-configuration also increased as more information was made available at the macro level. Like sales this was noticeably higher for the transition than the current organizational configuration. A possible explanation could be that transition may, to a degree, be constrained by the level of innovation in new products.
Figure 6.3 Eta² Scores for Micro-configurations dependent upon Macro-configurations

Lambda

Lambda measures the proportional reduction in error of predicting the value of a particular variable, given the value of another variable, compared to predicting it without such knowledge. The measure is always between 0 and 1. A value of 0 means the independent variable is of no use in predicting the dependent variable,
whereas a measure of 1 means that the independent variable perfectly specifies the categories of the dependent variable.

Although the value of the lambda coefficient for this sample was smaller than the $\eta^2$, the overall trends shown were very similar. An increase in the amount of information (i.e. using both the configuration and the transition) at the macro level provided an improved ability to predict the micro level. However, the lambda scores differed from the $\eta^2$ in a number of ways. The product development function had a consistently higher level of association than the other two, which could be because a more dynamic organizational environment requires much greater activity in this function. This said, the major difference was not in the product development function, whose score was only slightly higher, but in the sales function which was significantly smaller for the transition and the configuration combined with the transition using this score. Hence it could be argued that, although the macro-configuration accounts for a good deal of the variability in the sales micro-configuration, it is of less use in predicting the actual nature of the micro-configuration.
These results indicate that, although the macro level accounted for a high proportion of the variability in the micro, this relationship was not necessarily deterministic in nature and other factors almost certainly had a role to play. Therefore, it has not been possible to derive a deterministic link between the two levels.
Macro-configuration Dependent Upon Micro-configuration
(Complete Sample)

Having considered the impact of the macro-configuration upon the micro-configuration, the next stage in the analysis was to turn this around and investigate the impact of the micro-configurations upon the macro level. This could only be done using \( \eta^2 \) and lambda as the correlation coefficient is a symmetric measure and so remains the same.

\( \eta^2 \)

Figure 6.5 overleaf shows the \( \eta^2 \) score when the macro organizational configuration was assumed to be dependent upon each of the micro-configurations. The disadvantage encountered in this analysis was that the link was assumed to be between only one micro-configuration and the macro-configuration. There was no consideration of the effects that patterns of micro-configurations could have upon the macro level. As in previous sections, the analysis considered the configuration, the transition and then the combination of the two. The results showed generally lower scores than when the micro level was considered to be dependent upon the macro. The production department had the lowest level of association, below 0.1 for all cases. Again, this may be explained by the fact that Miller does not really incorporate the style of manufacturing into his macro organizational configurations. The greatest association was between the sales department and the macro level. Perhaps surprisingly this was highest for the configuration alone. Thus, the sales micro-configuration accounted for over 30% of the variation in organizational configurations in the sample. This relationship was lower for the organizational transition and, thus, the combination of the configuration and transition. As mentioned earlier, a reason for this could be that a particular type of sales function appeared synonymous with the F4 configuration. Product development, on the other hand, was highest for the transition, although the relationship was still very weak at 0.204. A possible reason for this is the intuitively obvious link between product development and transition, with the latter being to some extent constrained by the former.
Figure 6.5 $\eta^2$ Scores for Macro-Configuration Dependent Upon Micro-configuration
The lambda scores show quite clearly that the proportional reduction in error in identifying the macro given the micro was lower than the other way round. Figure 6.6 overleaf demonstrates that, if we consider the configuration alone, only the sales department had any relationship and that was very weak at only 0.125. The link with the transition was somewhat higher and the development function was also related, perhaps because, as mentioned earlier, any transition may be constrained to a degree by the nature of the company's products and the level of innovation. The scores were similar for the combination of configuration and transition. The relationship between the production department and the macro-configuration with macro viewed as dependent upon micro had a lambda score of 0 in all cases. This does not necessarily mean that there was no relationship, but that if there was it was not of this type. Once again this may highlight a weakness in the Miller configurations in that manufacturing processes are excluded from the analysis, which is particularly surprising given the amount of attention they have received from other theorists. In summary, when considering the whole sample, these scores indicate that knowledge of macro-configuration is a much stronger predictor of micro-configuration than vice versa. However it has not been possible to identify a completely deterministic link.
As a result of this analysis it is possible to say that (with the possible exception of the sales micro-configurations) the existence of certain micro-configurations within these organizations did not determine the nature of the macro-configurations, although they may have been one factor amongst many that influenced it.
The SIA Sample

Having studied the link between macro and micro-configurations for the whole sample, the next stage in the analysis was to single out the SIA configurations which, as mentioned earlier, made up a large subsample within the group. The measures were then recomputed, in order to see whether the levels of variation were reduced at the micro level when the organization was constrained to only one type of configuration.

Scanning The Data

As in the previous section, the sample was examined to try to identify any obvious trends. As the table below shows, all of the micro-configurations were represented within the SIA configuration. There were no obvious links between the SIA configuration and the micro-configurations in any of the functions.

Table 6.7 Micro-configurations Found In The SIA Archetype

<table>
<thead>
<tr>
<th>Company</th>
<th>Production</th>
<th>Sales</th>
<th>R&amp;D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caledonian Airmotive</td>
<td>C8</td>
<td>C3</td>
<td>C3</td>
</tr>
<tr>
<td>Crosby</td>
<td>C7, C8</td>
<td>C5</td>
<td>C3</td>
</tr>
<tr>
<td>Desford</td>
<td>C6</td>
<td>C1</td>
<td>C1</td>
</tr>
<tr>
<td>Druck</td>
<td>C6</td>
<td>C5</td>
<td>C1</td>
</tr>
<tr>
<td>Kaby</td>
<td>C6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mettler</td>
<td>C5</td>
<td>C5</td>
<td>C1</td>
</tr>
<tr>
<td>Avery</td>
<td>C8</td>
<td>C5, C4</td>
<td>C3</td>
</tr>
<tr>
<td>Barworth</td>
<td>C6</td>
<td>C4</td>
<td>-</td>
</tr>
<tr>
<td>Brakelinings</td>
<td>C8</td>
<td>C3</td>
<td>C2</td>
</tr>
<tr>
<td>Elson &amp; Robbins</td>
<td>C7</td>
<td>C4</td>
<td>C2</td>
</tr>
</tbody>
</table>

$\eta^2$

As the organizational configuration was being held constant, this test could only be applied in one direction, for micro dependent upon macro (although variation did occur at the macro level due to the different transitions being approached by the configurations). Figure 6.8 overleaf shows the results of this analysis compared to
the scores derived for the complete sample using the combination of configuration and transition. The scores were slightly higher for the S1A sample than for the complete sample. This was particularly so in the development function.

**Figure 6.8 Eta² Score for Micro-configuration Dependent on Macro-configuration - Comparison of S1A and Complete Sample**

![Diagram showing comparison of S1A and Complete Sample scores across different departments.](image-url)
The increases in the \( \eta^2 \) scores from using the complete sample to the S1A sample alone were very small, ranging from 0.01 to 0.12. This tends to indicate that the level of variation within the S1A sample was still relatively high and, thus, that the identification of this particular macro-configuration was unlikely to determine the outcome of the micro-configuration. The relative lack of improvement of this relationship in the production function may highlight a problem peculiar to the S1A archetype. A study (Peoples 1993) comparing Miller's organizational configurations with other manufacturing company categorisation tools found that, whereas some of the configurations could be matched with a particular style of manufacturing, the S1A archetype encompassed a wide variety of manufacturing processes and levels of technology.

**Lambda**

The lambda scores are illustrated in figure 6.9 overleaf. The results of this analysis were perhaps surprising. As mentioned earlier, Lambda measures the proportional reduction in error of predicting one variable given the other. In this case, given that the macro-configuration was an S1A, what was the reduction in error for predicting the micro-configurations? The chart overleaf shows that there was relatively more variation within the S1A sample than if we took the sample as a whole. Perhaps this was because the other configurations in the sample were more deterministic in nature, particularly in the product development and the production functions. The variation in production was not surprising and was substantiated by a study mentioned earlier (Peoples 1992). In both sales and product development there was less variation in the F4 and the S1B archetypes, that also occurred in the sample, than in the S1A which could account for the diminished reduction in error when only S1A organizations were under consideration. Unfortunately, the sample of each of these was too small to test.
Figure 6.9 Lambda Scores for Micro-configuration Dependent on Macro-configuration- Comparison of S1A and Complete Sample
Summary

This section, although limited by the sample size, does appear to question some fundamental assumptions that have been made by organization theorists in the past, namely that decisions made at the macro level constrain the micro to such an extent that there is very little opportunity for variation. This may be the case in certain types of organization but it was certainly not so in the S1A archetype that has been considered here. This said, there does appear to be a relationship between the macro and the micro-configurations with the macro being a more powerful predictor of the micro than vice versa. Certain functions were obviously identified as having a greater linkage, with the production department being consistently lower than the other two, which tends to substantiate Thompson's claim that this department is shielded by boundary spanning departments. It also highlights a possible weakness of the Miller and Friesen configurations in that they fail to take account of manufacturing process. Perhaps this is an area where useful further research could be done.

The transition appeared to provide a stronger link to the micro-configuration in certain functions whilst the configuration did in others. Overall the best results were obtained when both the configuration and the transition were taken into account. Thus, neither proposition seven nor eight effectively describe the situation as both fail to take into account the complexity of the link between macro and micro-configurations. However, there is more support for proposition seven that the macro-configuration determines the micro than for proposition eight that the micro-configurations determine the macro.

In summary, although, as a result of this research, we are able to state that there is a relationship between the two levels, it seems unlikely that this is deterministic in nature. The research has shown that the relationship is complex and that other factors need to be taken into account if a complete understanding is to be gained of the forces shaping organizations.
Section Two The Relationship Between Macro-configurations and Integrating Mechanisms

The purpose of this part of the chapter is to consider the linkage between the macro organizational configuration and the integrating mechanisms used by the organization. In particular, an attempt will be made to shed more light upon Lawrence and Lorsch's (1967) and Galbraith's (1973) proposition that organizations facing a more dynamic environment will utilise a wider variety of integrating mechanisms.

A number of methods have been used to consider the interrelationships of the integrating mechanisms with the macro-configurations and the level of dynamism in the environment. The fact that eleven different mechanisms were considered for each of the nineteen cases precluded a useful optical examination of the data. Instead, the integrating mechanisms were clustered, in a similar manner to the micro- configurations, to see which of the organizations utilised the same pattern of methods. Analysis was also undertaken to identify which clusters fell into which configurations, to see whether any patterns were discernible and whether this was linked to the nature of the environment faced by that particular type of organization.

Correlation analysis was carried out between the different integration methods and the configuration to identify the degree to which these different methods were interrelated and the extent to which each of them was related to the organizational configuration. In addition, the eta^2 and lambda scores were generated for the configuration and the integrating mechanisms in both directions, in order to attempt to ascertain which was a more powerful predictor of the other.

Clustering the Integration Mechanisms

The purpose of deriving integration clusters was very different to that of the micro-configurations. Instead of providing a basis for classification and the justification of a configurational approach, all that was being attempted here was to make the data more manageable and to try and discern patterns in it. Hence, much less emphasis was put on validation of these clusters.

As in the micro-configurational analysis, Ward's method was chosen to cluster the integration mechanisms, (a rationale for the use of this method can be found in the methodology chapter). The decision to stop clustering was made with reference to
the clustering coefficients. Unfortunately, however, in this case the method was of little use. Figure 6.10 below shows that it was very difficult to identify a stage where there was a significant jump in the coefficient. Thus, the decision relied upon intuitive appeal, which was felt to be acceptable as the clusters were not being proposed as configurations that would occur in other situations. It was decided that five clusters gave a reasonable split of the sample, little more could be learned by splitting it further, but that the difference between four and five clusters was an important one.

**Figure 6.10 Clustering Coefficients for Integration Clusters**

![Graph showing clustering coefficients](image)

Figure 6.11, overleaf, shows the ranges of each cluster. It was not really appropriate to calculate the modes as a number of the clusters have only one or two cases in them. From the ranges it was possible to ascertain the key characteristics of each cluster, which are detailed below the table.
Cluster one
These were the smaller organizations in the sample and were owner-managed. The owner kept a very tight grip over what was going on in the firm personally and all major decisions (and many minor ones) were made by him or her. This style of organization was very similar to that described by Handy (1976) as a web culture. The level of delegation was very low and the use of committees to make decisions was rare. The organization was often run on a relatively informal basis so the emphasis on rules and regulations was also low. Personnel systems such as selection and development and reward systems were under-developed. In other words, very few integration mechanisms were used because all decisions tended to flow from the chief executive who was able to ensure that actions complied with organizational goals.

Cluster two
This cluster appears to have picked out the organizations where the level of integration was relatively poor. All of the mechanisms were scored low to moderate, hierarchy being the only one that was used to any great extent in any of the organizations.
Cluster three
Both of the firms falling into this cluster had reasonably well developed integration mechanisms. In particular, with regard to selection and development systems which were scored moderate to high, perhaps because both of these companies had a personnel representative in the executive team. According to the human resource strategy writers, this is likely to improve the level of integration (see for example Guest 1987, Storey 1990, Legge 1978). Integration problems arose for both companies in this cluster as a result of their location. As both firms operated on two different sites, certain sections of the firm tended not to meet as often as in other companies and failed to build up informal relationships.

Cluster four
This organization was by far the most sophisticated in terms of integration so it was not surprising that it formed a cluster on its own. Extensive use was made of goals, plans, committees, measurement and reward systems, delegation of authority and selection and development systems designed to improve integration. The managing director was attempting to put a team culture into place and every effort was made to ensure that each team knew their contribution to corporate goals.

Cluster five
These organizations achieved a fairly high level of integration through a variety of means. Particular emphasis was given to goals and plans, rules, the delegation of authority, measurement and reward and selection and development systems. In general these firms were well integrated, although they were not as effective in their use of integrating mechanisms as cluster four.

Scanning the Data
Having derived these clusters, it was possible to consider the extent to which they matched with particular organizational configurations. The first method of doing this was, as in previous sections, a matter of scanning the data to see whether any obvious patterns could be identified.

As can be seen from figure 6.12 overleaf, all of the failure configurations fell into cluster 2, although this also contained some successful configurations. The firm operating the most sophisticated integration mechanisms in cluster 4 was an S1B model which is considered by Miller and Friesen (1984) to be facing a more hostile
and heterogeneous environment, possibly indicating there may be a link between environment and integrating mechanisms. Cluster 5 and cluster 3 were predominantly of the S1A type, while cluster one contained an S4 and an S1A. It is interesting to note that the style of integration and indeed the structure of the organization may have had a good deal to do with ownership, a factor that is not taken into account in the macro-configurations (see Walley, Blenkinsop and Duberley 1993 for a discussion of the importance of ownership as a contingent factor in these cases).

Figure 6.12 Linking Integration Mechanisms with Macro-configurations

<table>
<thead>
<tr>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
<th>Cluster 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>S4 + T2</td>
<td>S5 + T2</td>
<td>S1A + T2</td>
<td>S1B + T2</td>
<td>S1B + T2</td>
</tr>
<tr>
<td>S1A + T5</td>
<td>F4 + T1</td>
<td>S1A + T2</td>
<td>S1A + T8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4 + T8</td>
<td></td>
<td></td>
<td>S1A + T8</td>
</tr>
<tr>
<td></td>
<td>S1A + T8</td>
<td></td>
<td></td>
<td>S1A + T2</td>
</tr>
<tr>
<td></td>
<td>S1A + T2</td>
<td></td>
<td></td>
<td>S1A + T2</td>
</tr>
<tr>
<td></td>
<td>S1A + T9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4 + T1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4 + T4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A scan of the data can show us that there may be certain patterns present, however to analyse these further, more sophisticated statistical techniques had to be employed. Thus, as discussed in the methodology, different measures of association were used to try to ascertain the types of relationship that were present in the data.

Correlations

In the first instance a correlation analysis was carried out of all the different integrating mechanisms with each other and with the organizational configuration. The table below shows the results of this analysis. Although there were a number of significant relationships, the only integrating factor that had a particularly strong correlation with the organizational configuration was the degree to which rules and regulations were used, i.e. the level of bureaucratisation.
In accordance with Moroney (1951) and Fumeaux et al (1973), a probability level of 0.01 was classified as significant and a level of 0.05 was accepted as probably significant. Thus, the most significant relationships were as follows:

i) The level of decentralisation of authority with the use of staff specialists. A possible reason for this is that when authority is delegated further down the hierarchy line managers have to rely more on advice from staff specialists in making decisions, in order to prevent 'information overload' (Kotter et al 1986).

ii) The use of selection and development systems with the use of staff specialists. This may be because the staff specialists themselves require development to ensure not only expertise in their field but also that they are able to work towards corporate objectives. In addition, in some of the organizations the staff specialists in question were personnel professionals who had developed more sophisticated selection and development systems.

iii) The extent to which goals and plans emphasized integration with the extent to which staff or functional specialists were used to assist line managers in achieving integration. This may be because functional specialists need to be given integrated

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### Figure 6.13 Correlations between Integrating Mechanisms

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>H</th>
<th>S</th>
<th>R</th>
<th>G</th>
<th>C</th>
<th>R</th>
<th>A</th>
<th>M</th>
<th>S</th>
<th>S</th>
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<td></td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td></td>
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</tr>
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<td>0.32</td>
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<td></td>
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</tr>
<tr>
<td>COMM</td>
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<td>-0.359</td>
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<td>0.259</td>
<td>0.561^</td>
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<tr>
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<td>0.416</td>
<td>0.038</td>
<td>0.376</td>
<td>0.446</td>
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<tr>
<td>AUTHOR</td>
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<td>-0.568^</td>
<td>0.6*</td>
<td>0.532^</td>
<td>0.428</td>
<td>0.689*</td>
<td>0.422</td>
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<td></td>
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<td>-0.328</td>
<td>0.581^</td>
<td>0.445</td>
<td>0.656*</td>
<td>0.446</td>
<td>0.432</td>
<td>0.383</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SELEC</td>
<td>-0.46</td>
<td>-0.581^</td>
<td>0.627^</td>
<td>0.643*</td>
<td>0.438</td>
<td>0.566*</td>
<td>0.375</td>
<td>0.838*</td>
<td>0.331</td>
<td>1.0</td>
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<td>-0.100</td>
<td>0.122</td>
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<td>0.274</td>
<td>0.075</td>
<td>-0.02</td>
<td>-0.015</td>
<td>0.245</td>
<td>-0.089</td>
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<tr>
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<td>-0.033</td>
<td>0.44</td>
<td>0.099</td>
<td>0.437</td>
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<td>0.382</td>
<td>0.126</td>
<td>0.323</td>
<td>0.451</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**KEY**

* p < 0.05

* p < 0.01
goals and plans to ensure that their work is in line with and supports corporate objectives.

iv) The use of selection and development systems promoting integration with the use of rules and regulations. A possible reason for this could be that workers need to be trained to ensure that they understand and work within organizational rules. Also, a reliance on rules and regulations may require a certain type of worker which will have implications for selection and development.

v) The use of integrated measurement and reward systems with the extent to which goals and plans were used. This seems an intuitively obvious link in that organizations which have developed integrated measures will use these in conjunction with setting goals and plans for the future.

vi) The level of decentralisation of authority with the use of committees. Again, this appears to be intuitively obvious. If committees are to be used to ensure effective integration, they will need to be given the necessary level of authority for decision making.

vii) The use of selection and development systems with the extent to which authority was delegated. This would appear to suggest that if authority is to be delegated, managers need to have been selected and developed to take on added responsibility and ensure that decisions made support corporate objectives.

The correlation analysis showed that, not surprisingly, a number of the integrating mechanisms were strongly linked with each other. They did not individually, however, appear to be highly associated with the organizational configuration (except in the case of rules and procedures which was discussed earlier). It must be remembered, though, that correlation analysis only measures linear association which may have been inappropriate for the type of data used here, hence the need to consider other measures. As discussed in the methodology chapter, the measures used were $\eta^2$, and lambda (for definitions of these please refer to the methodology chapter). By using these measures, the relationships were analysed in two ways: firstly, each mechanism was considered separately in terms of its relationship with the macro organizational level. In addition, the association between the macro level and the clusters of integration mechanisms was studied. This built upon the correlation analysis by treating integration mechanisms as a pattern of variables that were interrelated with each other rather than considering each in isolation.
Linking Individual Integrating Mechanisms with Macro-configurations

\( \text{E} \tau^2 \)

Figure 6.14, below, shows the strength of the relationship between each of the integrating mechanisms and the organizational configuration, transition and combination of configuration and transition. Causality was considered in both directions, firstly with the macro-configuration dependent upon integration mechanisms and then the other way around. As discussed in chapter 4, \( \text{E} \tau^2 \) considers the level of variability in one variable which can be attributed to the other variable. The results show that the strength of association differed widely, however, all of the variables followed a common trend in that the strongest link was found when the integration mechanism was considered to be dependent upon the combination of configuration and transition. For some of the variables this link was very strong (for example, 0.93 for selection and development, 0.87 for delegation of authority, 0.82 for rules). In others the relationship was weaker (for example, the use of integrating roles 0.56, and setting 0.66), although this was still strong in relation to previous analyses.

**Figure 6.14 \( \text{E} \tau^2 \) Scores for Link between Integrating Mechanisms and Macro-Configuration**

<table>
<thead>
<tr>
<th></th>
<th>Config Macro dependent</th>
<th>Config Integ dependent</th>
<th>Tran Macro dependent</th>
<th>Tran Integ dependent</th>
<th>Config+tran Macro dependent</th>
<th>Config+tran Integ dependent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hierarchy</td>
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<td>0.3</td>
<td>0.2</td>
<td>0.71</td>
<td>0.46</td>
<td>0.72</td>
</tr>
<tr>
<td>Staff</td>
<td>0.58</td>
<td>0.56</td>
<td>0.52</td>
<td>0.7</td>
<td>0.56</td>
<td>0.76</td>
</tr>
<tr>
<td>Rules</td>
<td>0.57</td>
<td>0.71</td>
<td>0.22</td>
<td>0.53</td>
<td>0.58</td>
<td>0.82</td>
</tr>
<tr>
<td>Goals &amp; plans</td>
<td>0.41</td>
<td>0.61</td>
<td>0.44</td>
<td>0.57</td>
<td>0.34</td>
<td>0.81</td>
</tr>
<tr>
<td>Committee</td>
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<td>0.55</td>
<td>0.45</td>
<td>0.31</td>
<td>0.50</td>
<td>0.70</td>
</tr>
<tr>
<td>Roles</td>
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<td>0.44</td>
<td>0.37</td>
<td>0.03</td>
<td>0.49</td>
<td>0.56</td>
</tr>
<tr>
<td>Authority</td>
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<td>0.56</td>
<td>0.25</td>
<td>0.65</td>
<td>0.54</td>
<td>0.88</td>
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<td>0.39</td>
<td>0.58</td>
<td>0.46</td>
<td>0.46</td>
<td>0.39</td>
<td>0.69</td>
</tr>
<tr>
<td>Selection &amp; devel</td>
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<td>0.68</td>
<td>0.57</td>
<td>0.65</td>
<td>0.74</td>
<td>0.94</td>
</tr>
<tr>
<td>Setting</td>
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<td>0.47</td>
<td>0.48</td>
<td>0.28</td>
<td>0.47</td>
<td>0.66</td>
</tr>
<tr>
<td>Depart'n</td>
<td>0.11</td>
<td>0.61</td>
<td>0.16</td>
<td>0.47</td>
<td>0.06</td>
<td>0.73</td>
</tr>
</tbody>
</table>

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Lambda

As discussed in chapter 4, lambda is a proportional reduction in error score. The lambda associations for this sample were not as strong as those found using the eta$^2$ score, however they followed a roughly similar pattern with the combination of configuration and transition producing the strongest linkage in the majority of cases. As with the eta$^2$ score, the highest association was between the combination of configuration and transition and the selection and development systems, with the latter as the dependent variable. This relationship was somewhat weaker, however, at 0.62. The weakest associations were with measurement and reward systems (0.36), departmentalisation (0.25), and setting (0.38), which again followed a similar pattern to the eta$^2$ score, although the use of integration roles appeared to be comparatively more important using lambda than eta$^2$.

Figure 6.15 Lambda Scores for Link between Integrating Mechanisms and Macro-configuration

<table>
<thead>
<tr>
<th></th>
<th>Config Macro Dependent</th>
<th>Config Integ Dependent</th>
<th>Tran Macro Dependent</th>
<th>Tran Integ Dependent</th>
<th>Config+tran Macro Dependent</th>
<th>Config+tran Integ Dependent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hierarchy</td>
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<td>0.1</td>
<td>0.11</td>
<td>0.3</td>
<td>0.21</td>
<td>0.4</td>
</tr>
<tr>
<td>Staff</td>
<td>0.25</td>
<td>0.22</td>
<td>0.22</td>
<td>0.11</td>
<td>0.29</td>
<td>0.44</td>
</tr>
<tr>
<td>Rules</td>
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<td>0</td>
<td>0.36</td>
<td>0.07</td>
<td>0.55</td>
</tr>
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<td>0.22</td>
<td>0.43</td>
<td>0.21</td>
<td>0.57</td>
</tr>
<tr>
<td>Committee</td>
<td>0.13</td>
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<td>0.22</td>
<td>0.25</td>
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<tr>
<td>Roles</td>
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<td>0.11</td>
<td>0.2</td>
<td>0.14</td>
<td>0.5</td>
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<td>0.45</td>
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<tr>
<td>Measure &amp; Reward</td>
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<td>0.11</td>
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<tr>
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<tr>
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<td>0</td>
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<td>0.14</td>
<td>0.25</td>
</tr>
</tbody>
</table>

This analysis tended to indicate that the combination of macro-configuration and transition played an important role in the choice of individual integrating...
mechanisms. The next question to be considered was whether integrating mechanisms were chosen as a pattern or individually. The correlation analysis undertaken earlier would tend to suggest that some of the mechanisms were closely related to each other and, hence, that having one necessitated or made the presence of certain others more likely. In order to consider this, the next stage in the approach was to look at the linkage between the clusters of all integrating mechanisms, which were derived earlier, and the macro organization. Again the $\eta^2$ and the lambda scores were used.

**Linking the Clusters of Integration Mechanisms with the Macro-configurations**

$\eta^2$

Figure 6.16, overleaf, shows the links between the macro-configuration, transition, and the combination of both with the integration mechanisms employed by the organization. The surprising aspect of this analysis is that the relationship appeared to be stronger with the configuration dependent than with the integrating mechanisms dependent. The situation changed, however, for the transition and the combination of configuration and transition when the opposite was true. As in previous sections, the relationship appeared to be strongest when a combination of configuration and transition was used. This provided a strong level of association with almost 80% of the variation in the set of integrating mechanisms used being accounted for by the combination of configuration and transition.
Figure 6.16 Linking the Macro level and Clusters of Integration Mechanisms using $\eta^2$
Lambda

As shown in figure 6.17, the results followed a similar pattern to the \( \eta^2 \) scores, although at a slightly lower level. Interestingly, with both the lambda and the \( \eta^2 \) score, if we considered only the configuration the score was higher for this dependent upon the integrating mechanism than vice versa, indicating that the direction of the relationship is not necessarily one way.

Figure 6.17 Links between Integration Clusters and Macro-configuration using Lambda

The scores were slightly lower when considering the link between the clusters of integrating mechanisms and the macro-organization than they were for some of the individual integrating mechanisms. This may be because, although some of the individual mechanisms correlated significantly with each other, this was not the case for all of them. Thus, the patterns of all eleven integrating mechanisms may not have been as strong. Nevertheless, the linkage between macro-configuration and integrating mechanisms was still high, and indicates that there is certainly a relationship between these two factors, even if this may not be strictly deterministic in nature.
Links Between the Environment and Integrating Mechanisms

As discussed in the introduction, certain writers, including Galbraith (1973) and Lawrence and Lorsch (1967), have suggested that the level of integration required in an organization is determined by the environment. Figure 6.18, below, shows the environmental scores for each firm visited, in terms of dynamism, heterogeneity and hostility. These scores formed part of the information gathered for the Miller macro-configurational analysis and were collected during interviews with senior management.

According to Galbraith, an increase in the amount of dynamism in the environment will result in overload of the chain of command and the need for more sophisticated integration mechanisms. If we consider those firms facing a more dynamic environment (i.e. with scores of 6 or 7), we can see that the incidence of integrating clusters was as follows:
The incidence of integration cluster 1 was not surprising as it represented the entrepreneur who typically dealt in dynamic markets and was likely to keep much of the organizational power to himself. Thus, the major (and sometimes only) method of integration was centralisation of authority. Similarly, cluster 5 represented those firms that had made significant attempts to integrate which, according to Lawrence and Lorsch (1967), would be expected in a dynamic environment. The appearance of integration cluster 2, however, was much more surprising as this represented those organizations which appeared to place less emphasis on integration.

Figure 6.19 shows the lambda and $\eta^2$ scores for the three environmental attributes and the integration mechanisms, with the latter considered to be dependent. The scores were highest for dynamism with $\eta^2$ reaching 0.696 and lambda 0.33. This would appear to contradict Galbraith's argument however, as, for this sample at least, it would appear that higher levels of dynamism were likely to be connected with poorer or less sophisticated methods of integration. Of course, this could be because managers in less well integrated firms perceived higher degrees of dynamism.

<table>
<thead>
<tr>
<th>Company</th>
<th>Dynamism Score</th>
<th>Integration Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARMEKO</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>FIRTH</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>ELSON</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>PEKTRON</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

Summary

The results of this section of the chapter indicate a strong relationship between the macro organization and integrating mechanisms. This relationship becomes stronger the more information that we have at the macro level, hence when we consider configuration and transition we have a much higher linkage. This association appeared to be stronger when integrating mechanisms were viewed as the dependent
variable, although the relationship was obviously not just one way as the score was still relatively high when the macro level was considered dependent. Indeed, if we take only current configuration into account the score was usually slightly higher when the macro level was dependent upon integrating mechanisms.

The analysis has considered the relationships between the macro level and individual integrating mechanisms and also between the latter and clusters or patterns of all of the integrating mechanisms. The linkage was, understandably, clearer for some of the individual mechanisms, however the level of interrelationship between each mechanism indicated that it may be preferable to consider them as a group. Although the relationship was perhaps more complex, there still appears to be a high level of association when using the integration clusters.

Section Three The Relationship Between the Micro-Configurations and The Integrating Mechanisms

The results for this section are split into two major areas. The first considers the linkage between individual micro-configurations and integrating mechanisms in use within an organization. The second considers the Lawrence and Lorsch proposition that organizations facing more dynamic environments will need to become more highly differentiated and that this will necessitate improved integration through the use of more sophisticated techniques.

The Links Between Micro-configurations and Integrating Mechanisms.

Scanning the Data

In the first instance, the data was scanned to try to identify any obvious relationships between the micro-configurations and the integration mechanism clusters. Although it was difficult to identify many patterns, a number of observations could be made. Firstly, considering the production micro-configurations, whenever production was a C6 type the integrating mechanisms were likely to be in the I2 cluster. When the production department was a C8 type, on the other hand, integration mechanisms were likely to be of the I4 or I5 type. Looking at product development, whenever this was a C3 type, integrating mechanisms were likely to be I4 or I5. It was harder to discern a pattern for the sales function, however, it appears that if the sales function was a C3 type the integrating mechanisms were more likely to be of the I4 or I5 type.
From just scanning the data, it was possible to see that there may be relationships between certain micro-configurations and integrating mechanisms. However, it was impossible to ascertain the strength of these relationships without using more sophisticated statistical techniques. As in previous sections, the $\eta^2$ and the lambda scores were used to consider relationships between these two aspects of the organization.

$\eta^2$

Figure 6.21, overleaf, shows the $\eta^2$ score for the relationship between each of the micro-configurations and the cluster of integrating mechanisms. The relationship appeared to be strongest with the production micro-configuration, followed by product development and finally sales. Interestingly, whereas for production and product development the relationship was strongest when the micro-configuration...
was dependent, this relationship was reversed for the sales micro-configuration. The benefit of calculating this score in both directions was that it showed us that we should not assume a one-way causal direction. The relationship was obviously more complex than that. However, the results enabled us to see that a fairly strong relationship existed between the integrating mechanisms and the micro-configurations using this measure of association.

Figure 6.21 Links Between Micro-configurations and Integrating mechanisms Using Eta^2

![Bar chart showing links between micro-configurations and integrating mechanisms](chart.png)

Lambda

As in previous examples, the lambda scores followed a similar pattern to the eta^2 scores but at a lower level. This is illustrated in figure 6.22, over the page. One difference from the eta^2 analysis is that whereas production had the strongest relationship using that measure, this was now slightly lower than product development. This did not appear to be of major importance, however as both were relatively high and it was obvious that none of them were the sole determinant.
The results for this section show a moderate relationship between the integration mechanisms and micro-configurations. The direction of this relationship varies depending on the micro-configuration. For production and product development the relationship is strongest when the micro-configuration is viewed as dependent, whereas for sales the relationship is reversed.

Thus, a reasonably strong relationship appears to exist between integrating mechanisms and micro-configurations. Unfortunately this analysis is limited to using each micro-configuration individually. The relationship may be much stronger if we could consider patterns of micro-configurations. To do this effectively, however, would require a much larger sample size. These results show us that there is a high level of inter-relationship between macro-configurations, micro-configurations and integrating mechanisms. They also highlight the futility of trying to identify one of these factors as independent and suggest that all others are determined by it. To further illustrate this point the next section goes on to consider some of Lawrence and Lorsch's hypotheses with regard to differentiation and integration.
The Concepts of Differentiation and Integration

Lawrence and Lorsch viewed differentiation to be 'differences in orientation and formality of structure' (Lawrence and Lorsch 1967: p10) between units. A more extensive measure of differentiation was obtained by comparing the differences between the micro-configurations over all attributes. This was done using the squared euclidean distance of the mode of each variable from the corresponding variable for all other configurations.

Hence, the difference between configurations was calculated as:

\[ \text{Distance } (X, Y) = \sum (X_i - Y_i)^2 \]

Using this method it was possible to identify which of the configurations were most differentiated from each other. The table below shows the squared euclidean distances for each of the pairs of configurations.

Figure 6.23 Squared Euclidean Distances Between the Micro-Configurations

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
<th>C8</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>-</td>
<td>81</td>
<td>65</td>
<td>126</td>
<td>91</td>
<td>152</td>
<td>271</td>
<td>113</td>
</tr>
<tr>
<td>C2</td>
<td>-</td>
<td>-</td>
<td>52</td>
<td>79</td>
<td>116</td>
<td>154</td>
<td>288</td>
<td>126</td>
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<td>-</td>
<td>77</td>
<td>97</td>
<td>160</td>
<td>289</td>
<td>124</td>
</tr>
<tr>
<td>C4</td>
<td>126</td>
<td>79</td>
<td>77</td>
<td>-</td>
<td>65</td>
<td>75</td>
<td>151</td>
<td>73</td>
</tr>
<tr>
<td>C5</td>
<td>91</td>
<td>116</td>
<td>97</td>
<td>65</td>
<td>-</td>
<td>92</td>
<td>120</td>
<td>134</td>
</tr>
<tr>
<td>C6</td>
<td>152</td>
<td>154</td>
<td>160</td>
<td>75</td>
<td>92</td>
<td>-</td>
<td>58</td>
<td>-</td>
</tr>
<tr>
<td>C7</td>
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<td>288</td>
<td>289</td>
<td>151</td>
<td>120</td>
<td>58</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C8</td>
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<td>124</td>
<td>73</td>
<td>134</td>
<td>60</td>
<td>54</td>
<td>-</td>
</tr>
</tbody>
</table>

This table enabled a list to be drawn up for each of the micro-configurations showing which others they were most differentiated from. This is displayed in figure 6.24, overleaf. For each cluster the table shows which other clusters they were most differentiated from in descending order with the squared euclidean distance given in brackets.
In some respects this substantiates Lawrence and Lorsch's proposition that differentiation will be highest between production and product development departments due to the very different nature of their work. However, if we look at cluster eight which represented a more modern approach towards manufacturing, incorporating cells and semi-autonomous teams, this was not the case, indeed it was most highly differentiated from another production cluster. Perhaps Lawrence and Lorsch can be forgiven for not recognising the differences which more modern approaches towards manufacturing might bring as their research was carried out in 1967.

The Link Between Differentiation and the External Environment

One of the hypotheses put forward by Lawrence and Lorsch is that organizations facing more dynamic external environments will have an increased level of differentiation. Following Lawrence and Lorsch, as a very rough measure of overall differentiation I have added the differentiation scores between each of the

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**Figure 6.24 Levels of Differentiation Between The Micro-configurations**

<table>
<thead>
<tr>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
<th>Cluster 5</th>
<th>Cluster 6</th>
<th>Cluster 7</th>
<th>Cluster 8</th>
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<tbody>
<tr>
<td>C7</td>
<td>C7</td>
<td>C7</td>
<td>C7</td>
<td>C8</td>
<td>C3</td>
<td>C3</td>
<td>C7</td>
</tr>
<tr>
<td>(271)</td>
<td>(288)</td>
<td>(289)</td>
<td>(151)</td>
<td>(134)</td>
<td>(160)</td>
<td>(289)</td>
<td>(154)</td>
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<td>C6</td>
<td>C1</td>
<td>C7</td>
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<td>C2</td>
<td>C5</td>
</tr>
<tr>
<td>(156)</td>
<td>(154)</td>
<td>(160)</td>
<td>(126)</td>
<td>(120)</td>
<td>(154)</td>
<td>(288)</td>
<td>(134)</td>
</tr>
<tr>
<td>C4</td>
<td>C8</td>
<td>C8</td>
<td>C2</td>
<td>C2</td>
<td>C1</td>
<td>C1</td>
<td>C2</td>
</tr>
<tr>
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<td>(126)</td>
<td>(124)</td>
<td>(79)</td>
<td>(116)</td>
<td>(152)</td>
<td>(271)</td>
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</tr>
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<td>(77)</td>
<td>(97)</td>
<td>(92)</td>
<td>(154)</td>
<td>(124)</td>
</tr>
<tr>
<td>C5</td>
<td>C1</td>
<td>C4</td>
<td>C6</td>
<td>C6</td>
<td>C4</td>
<td>C4</td>
<td>C1</td>
</tr>
<tr>
<td>(91)</td>
<td>(81)</td>
<td>(77)</td>
<td>(75)</td>
<td>(92)</td>
<td>(75)</td>
<td>(151)</td>
<td>(113)</td>
</tr>
<tr>
<td>C2</td>
<td>C4</td>
<td>C1</td>
<td>C8</td>
<td>C1</td>
<td>C8</td>
<td>C5</td>
<td>C4</td>
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<td>(81)</td>
<td>(77)</td>
<td>(65)</td>
<td>(73)</td>
<td>(91)</td>
<td>(60)</td>
<td>(120)</td>
<td>(76)</td>
</tr>
<tr>
<td>C3</td>
<td>C3</td>
<td>C2</td>
<td>C5</td>
<td>C4</td>
<td>C7</td>
<td>C6</td>
<td>C6</td>
</tr>
<tr>
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<td>(52)</td>
<td>(52)</td>
<td>(65)</td>
<td>(65)</td>
<td>(58)</td>
<td>(58)</td>
<td>(60)</td>
</tr>
</tbody>
</table>


departments to give one overall score. In figure 6.25 this is compared to the organizational configuration, to see if companies operating in more dynamic environments do indeed have higher levels of differentiation.

**Figure 6.25 The Link between Differentiation and The Environment**

<table>
<thead>
<tr>
<th>Company</th>
<th>Config</th>
<th>Tran</th>
<th>Environ'l Dynamism</th>
<th>Environ'l Heterogeneity</th>
<th>Environ'l Hostility</th>
<th>Different'n Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>METTLER</td>
<td>S1A</td>
<td>T2</td>
<td>3</td>
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<td>6</td>
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</tr>
<tr>
<td>HARBORO</td>
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<td>6</td>
<td>248</td>
</tr>
<tr>
<td>CAL</td>
<td>S1A</td>
<td>T2</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>248</td>
</tr>
<tr>
<td>AVERY</td>
<td>S1A</td>
<td>T2</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>268</td>
</tr>
<tr>
<td>BRAKE</td>
<td>S1A</td>
<td>T8</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>302</td>
</tr>
<tr>
<td>DESFORD</td>
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<td>T8</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>304</td>
</tr>
<tr>
<td>DRUCK</td>
<td>S1A</td>
<td>T2</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>335</td>
</tr>
<tr>
<td>PARMEMKO</td>
<td>S1A</td>
<td>T2</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>335</td>
</tr>
<tr>
<td>ELEQUIP</td>
<td>F4</td>
<td>T8</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>338</td>
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<td>BESTOBELL</td>
<td>F4</td>
<td>T1</td>
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<td>3</td>
<td>5</td>
<td>349</td>
</tr>
<tr>
<td>HOIST</td>
<td>F4</td>
<td>T4</td>
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<td>3</td>
<td>4</td>
<td>362</td>
</tr>
<tr>
<td>CROSBY</td>
<td>S1A</td>
<td>T8</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>506</td>
</tr>
<tr>
<td>FIRTH</td>
<td>S1B</td>
<td>T2</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>517</td>
</tr>
<tr>
<td>FARR</td>
<td>F4</td>
<td>T1</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>524</td>
</tr>
<tr>
<td>ELSON</td>
<td>S1A</td>
<td>T2</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>555</td>
</tr>
<tr>
<td>PEKTRON</td>
<td>S5</td>
<td>T2</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>576</td>
</tr>
</tbody>
</table>

Two companies were excluded from this analysis as only one or two departments were measured, thus the differentiation score would not have been comparable. Where four micro-configurations were analysed for an organization, only the three major ones were included in the analysis.

The chart overleaf shows three different methods of measuring the level of association between differentiation and macro level factors. Of particular interest in this section is the extent to which differentiation was linked to the three environmental factors measured by Miller et al in their configuration analysis. Unfortunately it is hard to draw conclusions from this as each different method of measurement gave not only different scores but also a slightly different trend overall.
Looking first at the lambda score, the level of association using this measure was weak. Environmental dynamism had the highest score but even this was only 0.36. Hence, the proportional reduction in error of predicting the level of differentiation, given the level of environmental dynamism was low. The eta² score provided a higher level of relationship for each of the factors, ranging from a low of 0.24 for heterogeneity to a fairly strong relationship of 0.77 for environmental dynamism. Hence, the level of dynamism explained a reasonable proportion of the variation in the level of differentiation. Finally, the correlation score was given between each set of factors. This had the benefit over the other two approaches as it showed the direction of linkage (i.e. whether it is positive or negative) however, it must be remembered that this particular measure only considers linear relationships. Using this method, hostility had the highest association of 0.66. This, however, was an inverse relationship indicating that as hostility increased, the level of differentiation was likely to decrease. Heterogeneity also had a negative association, although this was weaker at 0.24. Dynamism on the other hand had a positive association of 0.3, hence organizations facing more dynamic environments were likely to be those with higher levels of differentiation. However, the weakness of this link suggests that other factors also play a role here.

To conclude, the results could be interpreted as giving some backing to the Lawrence and Lorsch proposition. However, I suggest a more suitable interpretation is to recognise that the environment is far more complex than has been assumed by these authors and hence, that other factors should be taken into account in any attempt to assess the links between an organization and its environment. Furthermore, if we are to accept the configuration approach, we must recognise that organizations are made up of many interrelated factors and therefore the level of differentiation will be
influenced by a number of other variables which may not have been included in this analysis.

**Links Between the Level of Differentiation and the Level of Integration**

Although the degree to which the level of differentiation is determined by the environment is open to question, theorists seem to be unanimous in their support for the proposition that differentiation and integration are inextricably linked (Miller 1984, Robey 1986, Galbraith 1973, Kotter 1986). Lawrence and Lorsch propose that this link is causal, that a higher level of differentiation requires the use of more sophisticated methods to integrate if the firm is to succeed. The table below shows the relative scores for lambda, $\eta^2$ and the correlation coefficient, looking at the relationship between differentiation and integration. The scores for $\eta^2$ and lambda followed a similar pattern with the lambda scores slightly lower than the $\eta^2$. The results showed a very strong relationship between integration and differentiation, particularly when the level of integration was dependent upon the level of differentiation. The correlation coefficient was much lower and negative, however, which would tend to indicate that the relationship was in the opposite direction to that expected. In other words that decreases in differentiation were coupled with increases in the use of integration mechanisms and vice versa.

![Figure 6.27 The Relationship between Differentiation and Integration](image)

<table>
<thead>
<tr>
<th>Differentiation</th>
<th>Integration</th>
<th>Symmetric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambda</td>
<td>0.21</td>
<td>0.78</td>
</tr>
<tr>
<td>$\eta^2$</td>
<td>0.54</td>
<td>0.96</td>
</tr>
<tr>
<td>Correlation</td>
<td></td>
<td>(0.39)</td>
</tr>
</tbody>
</table>

These results suggest a slightly different approach to differentiation and integration than was advocated by Lawrence and Lorsch. It seems that these two aspects were strongly linked together, however it would appear that, as Lawrence and Lorsch admit, they were antagonistic. Organizations in this sample seemed to choose to emphasize either integration or differentiation rather than combining the two. Obviously this is a weighty conclusion to draw from a relatively small sample, however it does pose questions about the Lawrence and Lorsch research, hence the need for further research into this area.
Summary

This section has attempted to shed light upon the complex issues of differentiation and integration. Firstly, consideration was given to whether the incidence of certain micro-configurations required certain integrating mechanisms. Although a linkage was found, the results were limited due to an inability to consider the effects of particular patterns of micro-configurations upon integrating mechanisms. Differentiation scores have been computed for each of the cases and these were related to the integration mechanisms which organizations used. A strong relationship appeared to exist between the level of differentiation and integration, however, this appeared to be negative in nature. It seems that, instead of achieving a balance between differentiation and integration, many organizations emphasized either one factor or the other. Whether the emphasis was on differentiation or integration appeared to be determined to a large extent by the level of differentiation. In other words, Lawrence and Lorsch's (1967) assumption that differentiation precedes integration appears to have been upheld.
Summary

In order to draw conclusions, it will be helpful to review the propositions which were outlined at the beginning of the chapter and consider whether they have been substantiated by the analysis.

Firstly, propositions seven and eight considered the link between macro and micro organizational configurations. It was found that although a relationship does exist between the macro and the micro levels (particularly when micro was viewed as dependent upon macro) it could not be proved that this was deterministic in either direction. It would appear that the relationship is more complex than has been assumed in these propositions and other factors which may have not been considered here have a part to play in the determination of micro-configurations. This result is not at all surprising from a configurational view-point, it helps to substantiate the configurational approach which suggests that many different factors inter-relate to influence the design of organizations.

The second set of propositions related to the integrating mechanisms that companies employed. Integrating mechanisms were found to correlate fairly highly with each other and patterns of mechanisms were identified through cluster analysis. A strong relationship was found to exist between the macro-configuration identified and the integration mechanisms. Although not completely deterministic, this relationship was stronger when integrating mechanisms were assumed to be dependent upon the configuration than vice-versa. A surprising result, which goes against proposition eleven was that those organizations with worse integration mechanisms often faced more dynamic environments. There are four possible reasons for this:

(i) Lower levels of dynamism allow lower levels of differentiation which makes integration easier.

(ii) That managers in less well integrated organizations perceived higher levels of dynamism in the environment.

(iii) That managers facing higher levels of dynamism perceived a greater need for integration and judged their organization more critically for not achieving this.

(iv) There is no link between integration mechanisms and environmental dynamism.
Further research would be required to give a full explanation of the link between environment and integration. These results, do however, call into question the simplistic relationship which was assumed by Lawrence and Lorsch.

Finally, the third set of propositions attempted to explore the concept of differentiation and link this to the integration mechanisms already discussed. The results of this third section of the analysis indicated a moderate relationship between the external macro environment and the level of differentiation and a very strong relationship between the level of differentiation and the level of integration. The results here have questioned some of the results achieved in the Lawrence and Lorsch (1967) work. Although Lawrence and Lorsch accept that differentiation and integration are antagonistic in nature, they believe that successful organizations will manage to achieve a balance between the two, i.e. that those having higher levels of differentiation will utilise more integrating devices to ensure that they can maintain integration. Instead of achieving this balance, the companies in this sample tended to emphasize either one aspect or the other. They were either highly differentiated and less well integrated or highly integrated and less well differentiated.

Interestingly, the organizations identified as failure configurations tended to be those that had the lowest levels of integration and were also all in the top half of the sample with regard to levels of differentiation. This may indicate that higher levels of integration are more often seen in successful companies. It does not however necessarily mean that integration leads to success, perhaps more successful companies are those that can afford to implement new procedures and ways of working that emphasize integration.

By analysing relationships between combinations of variables it has been possible to show that none of these can be viewed as independent or completely dependent. Many different factors work together to influence the design of organizations. The configurational approach used here has attempted to include as many of these as possible however it is likely that other factors (and indeed other levels of study such as industry and individual) would need to be considered before we can begin to fully understand the complexities of organizations.

The next chapter will discuss these results in more detail, considering them in the light of past research and highlighting possible areas for future research that have been identified as a result of this analysis.
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Introduction

The purpose of this chapter is to briefly summarise the results of the previous two chapters and to discuss them in the context of earlier studies, before moving on to discuss the implications of this work for future research. In order to do this, each of the propositions is summarised below and the results are discussed in relation to past studies in the area. I will then move on to discuss some of the limitations of this research and suggest areas for future research.

Overview of the Results

Proposition 1: The variables used in determining configurations are not independent.

The use of correlation analysis and the Kaiser-Meyer-Olkin score showed that the variables were interdependent, although of course certain variables were more highly inter-related than others. According to Miller and Friesen (1984), the fact that the variables were interdependent meant that they could be used to derive configurations. This result helps to reinforce the idea of configuration and illustrates how difficult it would be to separate two variables from the rest and assume a direct relationship between them.

This result questions the assumptions implicitly, if not explicitly, made by contingency theorists who consider bivariate relationships within organizations (see for example, Anderson and Warkov 1961, Argote 1982, Freeman 1973, Hage and Aiken 1969, Meyer 1968). As Child (1977) notes, "Contingency theorists have not generally recognised a further problem: that multiple contingencies will be present at the same time. Most researchers have so far failed to adopt a multivariate analysis of contingent or contextual variables in relation to structural design and performance" (p175). More recent organization theorists, such as Van De Ven and Drazin (1985), have recognised the problems with contingency theory in relation to choice of variables. Scott (1977), for example, criticised several tests of contingency...
predictions that have been carried out because they uncritically selected context variables and structure and control variables and then rejected the perspective if consonance between any of these did not predict a variety of performance variables. Although seemingly aware of the criticisms, few contingency theorists appear to have developed an alternative approach and those that have (Van De Ven and Drazin 1985 and Slocum and Simms 1980), have concentrated on typologies and have failed to empirically test them. The only exception to this appears to be the work of Pinto and Pinder which was discussed in chapter one of the thesis. The results found here show that it is pointless to continue analysing organizations in terms of only two variables, organizations can be better understood if a multivariate approach is taken.

Proposition 2: The sample can be grouped into fairly homogeneous clusters.

By using the clustering coefficient, it was possible to identify that eight clusters provided the best separation of the data. On studying the clusters, it became apparent that each was distinctly different from the others, having a character of its own. This supports Miller and Friesen's (1984) hypothesis that "a relatively small number of these configurations are believed to encompass quite a large fraction of the population of organizations" (p1). The descriptions of the clusters given in chapter 5 show that a much richer picture can be gained by adopting a configurational approach rather than looking purely at statistical relationships between two or three variables.

The clusters differed in the extent to which they were internally homogeneous. Some had a far tighter definition than others, for example cluster 2 was more internally homogeneous than cluster 5. However, they were all distinctly different from each other. By splitting the sample into eight types, as opposed to three, which has often been done in the literature (Litwak 1961, Lawrence and Lorsch 1967, Ouchi 1979), a greater level of detail and a higher level of homogeneity within each of the clusters has been achieved.

Proposition 3: The clusters will be generic, i.e. independent of function.

This proposition was not proven. In fact, the data suggests that it is extremely unlikely that clusters are independent of function. The majority of the configurations were made up of predominantly one function, indicating that this plays a large part in determining the micro-configuration identified. The area where there was some
functional overlap was between sales and product development. This highlights a difference between the research carried out here and that of Lawrence and Lorsch. Perhaps due to their size or the nature of the industry, many of the companies in this sample did not have pure research and development functions, tending instead to have more applied product development functions. These may be more similar to other organizational functions than a pure R&D function would have been.

In general, this research backs up Lawrence and Lorsch's (1967) proposition that the core functions are fundamentally different. Unlike Lawrence and Lorsch's work, however, here the difference is viewed over many different variables and is not seen as dependent specifically upon the subenvironment. Other writers, including Thompson (1967), Brown (1960), Shapiro (1977) and St John (1990) have also highlighted the differences that often exist between these core functions. Hence, the results found here are in line with what would have been expected from the literature. However, the changes in approach to management and organization of the production function do tend to indicate that this situation could be changing. The increased emphasis which companies appear to be placing on integration and approaches such as TQM, job enrichment and harmonisation of terms and conditions could blur the distinction between these functions and perhaps in the future micro-configurations will be related far less to the function under consideration. It would be interesting to undertake this research in product organized groups and departments to see how the configurations change when they are not functionally divided.

**Proposition 4:** It will be possible to identify variables that play a more or less important role in determining the configuration.

The purpose of attempting to identify particularly strong or weak variables was to try to gain a tighter definition of the configurations, only measuring those variables that had an impact on the determination of the configuration. Although it was possible to identify variables that appeared to be of less importance in determining certain of the configurations, these tended to differ according to which configuration was under consideration, making it impossible to exclude any variables from the research. This substantiates Miller and Friesen's claim that the degree to which any variable acts in a deterministic manner is dependent upon the context and also that causation should be viewed in the broadest possible terms ... "each configuration has to be considered as a system in which each attribute can influence many of the others by being an indispensable part of an integrated whole" (Miller and Friesen, 1984, p19). This
finding also serves to contradict much of the contingency work that has relied upon simple bivariate analysis by showing that the situation is much more complicated and that patterns of many different variables come into play in the configurations.

**Proposition 5: The micro-configurations will be valid and stable.**

A number of tests were performed to ensure the validity of the configurations, including: comparing the micro-configurations with past research, using a variety of clustering methods, testing the micro-configurations on new data and splitting the sample and reclustering. As a result of these tests, it seems fair to say that the micro-configurations are stable and valid, although an obvious problem with these validation tests is that no benchmark is set to define exactly what should be achieved before clusters can be considered valid. In addition, although these clusters appear to represent the situation in small and medium sized companies, it would be very dangerous to generalise from this sample to other types of organization. Hence, an obvious area for future research is to attempt to derive micro-configurations in a much wider sample, although Miller (1981) does warn that there are dangers in trying to characterise configurations over a wide sample as each configuration may then contain very different cases, making it hard to provide a meaningful description of them.

**Proposition 6: It will be possible to place the micro-configurations along a continuum ranging from mechanistic to organic. Micro-configurations typifying production departments will concentrate at the mechanistic end of the scale and those of R&D will tend to be found at the organic end, with sales functions falling in the middle.**

This proposition was partially supported in that it was possible to place the micro-configurations along a continuum ranging from organic to mechanistic, with R&D at one end of the continuum and production at the other. However, away from these extremes the situation was less clear cut, for example a team based production group was found to be further away from the mechanistic end than a sales order processing group. There is very little literature in the organization field which has explicitly looked at the different styles of organization in these functions, and those that have (Lawrence and Lorsch 1967, Shapiro 1977) have tended to consider sales in terms of a very creative function, ignoring the more mundane aspects of the sales process.
Thus, although the assumption in some of the literature that an R&D department is organized and managed in a more organic way than a production department (Kennedy 1956) seems to have been upheld, the distinction is less obvious when comparing either the production and sales departments or the R&D and sales departments.

Interestingly, most theorists have used the terms mechanistic or organic to refer to entire organizations rather than departments or groups within organizations. This research, along with that of Lawrence and Lorsch (1967), shows that there is considerable room for variety within an organization and therefore tends to support Van De Ven and Ferry's (1980) proposition that "attempts to examine these different units from a macro-organizational perspective inherently present a distorted assessment because whereas some organizational units may be highly structured others may be very organic and any overall profile of these differently structured units is an inaccurate summary of both" (p155).

Proposition 7: The macro-configurations identified will determine the micro-configurations.
Proposition 8: The micro-configurations identified will determine the macro-configurations.

Neither proposition 7 or 8 were completely supported as both failed to take account of the complexity of the relationship between the macro and the micro-configurations. Although the statistics showed that an association did exist between the two levels, particularly when micro-configurations were viewed as dependent upon macro-configurations, this was not a simple, one way, deterministic relationship. Thus, although the macro-configuration may constrain the style of micro-configuration, it will not necessarily determine it. Having adopted a configurational approach, perhaps we should not be surprised at this finding, indeed it may have been a little foolish to expect that such a simple relationship would have existed.

The results suggested that the amount of variation found in the micro-configurations was higher in some organizational archetypes than it was in others. Therefore it is possible to suggest that certain macro-configurations may be more deterministic of the micro level than others. This sample was predominantly S1a which appears, both from this research and others (Peoples and Carrie 1993), to allow for the highest level of variety. Better results were found when the combination of configuration and
transition were taken into account at the macro level. The lack of a deterministic relationship is perhaps contrary to the work of Van De Ven and Drazin (1985) and Mealiea and Lee (1979) which proposes that decisions made at a macro level determine the micro level. This research tends to indicate that a more suitable approach is to accept that the macro level constrains the options available at the micro level but that other factors such as technology and environment also have a role to play. Once again, then, this is a rejection of traditional contingency theory and an adoption of the more holistic, complex approach offered by the configurational method.

The testing of the impact of micro-configurations upon the macro level does not appear to have been done by previous theorists. Perhaps understandably, the direction of causation has always been assumed to be from the macro to the micro. The purpose of this research was to identify patterns rather than causation, however by looking in this opposite direction it was possible to show that the relationship is far more complex than has previously been assumed to be the case. Although the link is fairly weak it does highlight the need to consider interrelationship and suggests that it would be inappropriate to concentrate purely upon the effects of the macro level upon the micro.

**Proposition 9: The types of integrating mechanism used will be closely related with each other.**

A correlation analysis was undertaken between each of the integrating mechanisms. This showed a high level of interrelationship between them which tends to indicate that organizations choose a system of integrating methods rather than just choosing each independently.

The theorists who have looked at possible integration mechanisms do not appear to have given much consideration to the extent to which these are inter-related. Instead, each has investigated the effects of contextual factors such as uncertainty upon the types of mechanisms chosen. Galbraith (1973), for example, discusses how when uncertainty increases there is likely to be an increase in discretion which will require more complex integration mechanisms. He fails to consider how the different types of mechanism relate to each other, for example, when one sort of mechanism increases is another likely to decrease? This research found that integration mechanisms were highly inter-related. As a result of this, cluster analysis was
undertaken which showed that integration mechanisms followed certain patterns and each pattern placed a different emphasis on particular mechanisms. This is an area where much more useful research could be carried out, looking into how organizations can achieve co-ordination between their different sections, whether these be product or functionally based.

**Proposition 10:** The macro-configuration identified will determine the nature of the integrating mechanism used.

A strong relationship was identified between the macro-configuration and the integrating mechanisms. This relationship was found to be stronger when more information was available at the macro level (i.e. when configuration and transition were combined). Although the level of association was stronger when integration mechanisms were considered to be dependent upon macro-configuration than vice versa, it is impossible to say that the relationship is causal in only one direction.

An attempt was made to identify a pattern between the type of firms and the integrating mechanisms used. A strong pattern was found which shows the importance of context to the choice of integrating mechanism. Unfortunately, this cannot really be compared to past research as this has been a development in the way of looking at integration. Prior to this it was assumed that integration happened as a result of: increasing uncertainty (Kotter et al 1986, Galbraith 1973), levels of differentiation and environmental uncertainty (Lawrence and Lorsch 1967) or levels of interdependence (Robey 1986), and no consideration was given to other contextual variables. Little research appears to have been done into the different options available to achieve integration and when these are most likely to be used. The work reported here shows, however, that context is very important and that particular patterns of integration mechanisms are more likely to appear in certain context configurations.

**Proposition 11:** The level of macro-environmental dynamism will determine the nature of the integrating mechanism.

There does appear to be some relationship between the level of environmental dynamism and integration. However, this is not of the type predicted by Lawrence and Lorsch (1967) as it appears that higher levels of dynamism are often connected
with poorer or less sophisticated integration mechanisms. Thus the results fail to substantiate those found by Lawrence and Lorsch, and suggests that other factors should be taken into account if we are to understand the reasons why integrating mechanisms vary in different situations. These could be environmental factors, for example Khandwalla (1972) linked environmental uncertainty, hostility and heterogeneity to levels of integration. Alternatively, types and levels of integrating mechanisms may be related to the nature of the organization, in terms of both macro and micro levels.

**Proposition 12: Certain styles of micro-configuration will require particular styles of integrating mechanisms.**

The relationship between micro-configurations and integration mechanisms is complex. A stronger association was found when integrating mechanisms were viewed as dependent upon either production or R&D. This is reversed when considering the sales function where the relationship was stronger with the micro-configuration viewed as dependent. Although the level of association is quite high, the research is limited as it cannot show the relationship between different patterns of micro-configurations and integrating mechanisms.

This was an attempt to cover all aspects of the organization that may have an impact upon the types of integrating mechanisms used. As with the last proposition, it cannot be compared to previous research due to the lack of studies in the area. This serves to back up the results and discussion for the previous proposition by showing that the types of micro-configurations will have some impact upon the integration mechanisms. Once again, this highlights the multi-faceted nature of organizations, the fact that many different factors influence and are influenced by any decision that is made with regard to structure, management practices and so on. Integration mechanisms are affected by a multitude of factors, not least the level of differentiation, as discussed in proposition 14 below.

**Proposition 13: The level of differentiation will be determined by the level of environmental dynamism.**

Differentiation was calculated using the squared euclidean distance of the modes of each variable in the configurations. A fairly weak relationship was found between
environmental dynamism and the level of differentiation. The direction of the relationship was positive, suggesting that as environmental dynamism increases the level of differentiation also increases. However, it would appear that other factors should be taken into account. Again, from the past discussion this hardly seems surprising. A number of theorists have suggested other variables that may influence the level of differentiation, for example size (Blau 1970, 1972, Pugh et al 1976) technology (Robey 1986) and task (Rice 1958, Hall 1962). The results here suggest that it is foolish to search for one deterministic factor in the study of organizations, only by adopting a configuration based approach and accepting the interdependence of many variables can we gain a real understanding of the nature of organizations.

**Proposition 14: The level of differentiation will determine the level of integration.**

A strong relationship existed between the levels of differentiation and integration. This, however, appeared to be inverse in nature, in other words higher levels of differentiation were associated with lower levels of integration and vice versa. This is an interesting result, showing that differentiation and integration are inextricably linked. The result also supports the findings of Lawrence and Lorsch when they suggest that "other things being equal, differentiation and integration are essentially antagonistic and that one can only be obtained at the expense of the other" (1967, p48). However, Lawrence and Lorsch go on to argue that successful organizations will find a way of balancing high levels of differentiation and high levels of integration. This was not found to be the case in this study. Here it was found that the more successful companies appeared to have sacrificed a certain amount of differentiation and were instead focusing upon integration. Again, to a degree this corresponds with Lawrence and Lorsch's ideas that to be successful a firm has to be well integrated, but it fails to support their other contention with respect to high levels of differentiation being associated with an increase in integrating mechanisms.

It should be noted that in no way is it being suggested here that a high level of integration leads to success. It could be that organizations which are successful configurations can afford to put expensive integrating mechanisms in place and focus more on the long term objectives of the company. In addition, this would involve lengthy discussion and analysis of what was meant by organizational success, an area that has caused much difficulty for organization theorists (see for example Connolly et al 1980, Ford and Schellenberg 1982). All that can really be determined here is that organizations identified as successful configurations were more likely to place a
higher emphasis on integration and less on differentiation than those identified as failures.

Conclusions To Be Drawn From This Research

A number of very important conclusions can be drawn from this research. The work can be divided into two areas, the first of these is more exploratory in nature and is concerned with deriving research propositions rather than testing a narrowly defined set of hypotheses. The second builds upon the results of the first and extends them in order to test some of the best known, if little tested, propositions in organization theory.

Thus, the first and perhaps most important set of results relates to the notion of configuration and the extent to which this can be used to synthesize contingency work. The configuration approach has been successfully applied at the work unit level in organizations and has demonstrated the weakness of previous contingency theory which has failed to take into account the wider context of the organization. Although the configurations derived in this sample could not be generalised to all organizations, they do appear to be relevant to small and medium sized manufacturing enterprises. In addition, it has been shown that a much more detailed picture of work units and organizations can be achieved if we consider patterns of variables rather than using sharply circumscribed bivariate data.

The research has also shown that there is considerable room for intra-organizational variation. Different styles of organization were apparent in departments within organizations. This calls into question the assumption frequently made that companies have an over-riding structure and culture. It would appear that although the type of organization is a strong input to the design of work units or departments, it is by no means the only one and that each of these units develops a character and method of operating contingent upon various factors, including the task being performed, the subenvironment, size and so on. Thus, a thorough analysis of organizations must include consideration of the more micro level.

The second aspect of the research has attempted to shed light on the concepts of differentiation and integration, showing them to be far more complex than has been assumed in much of the previous research. A high level of correlation between integration mechanisms meant that they tended to appear in patterns as a system of integration rather than as a series of one-off choices, as seems to have been implicitly
assumed by certain theorists (Galbraith 1973, Thompson 1967). Differentiation was also shown to exist over many variables rather than just the few that were measured by Lawrence and Lorsch. The research showed that many different factors come into play in determining the levels of differentiation and integration but that these were essentially antagonistic in nature with more successful configurations appearing to trade off a certain amount of differentiation in order to achieve high levels of integration.

**Limitations of This Research**

One of the most obvious drawbacks of this research is the limited sample size. It is notoriously difficult to persuade organizations to take part in organizational research. Indeed, most of the companies that participated in this study did so on the basis that they would receive a free consultancy type report in return. The sample here compares very favourably with other research which has involved interviews and observation within the companies (for example Lawrence and Lorsch 1967, Burns and Stalker 1969) rather than relying upon questionnaire methods. However, in order to derive meaningful configurations it would be preferable to increase the sample size and the range of organizations so that better consideration could be given to the different types of micro-configurations corresponding with different macro-configurations. This would also allow consideration of the impact of patterns of micro-configurations upon the macro level. It is suggested that an increase in sample size should not be achieved through the use of more detached research methods (such as mail-shot questionnaires) as the type of data that is being collected requires careful interpretation if it is to be comparable across different cases.

This particular research and the derivation of micro-configurations here was limited to some extent by the studies that already existed in the contingency field. It was felt that the approach should be used to try to synthesize the research already existing rather than trying to bring in new variables that had not been tested in previous studies. It seems obvious, however, that some of the variables that have been used overlap which means they may not all be necessary. In addition, other interesting and important variables may exist which have not been included in this analysis. Every effort should be made to incorporate them in future research. A possible method of looking for alternative variables would be to start the research from a different viewpoint. Whereas this research began in the literature, synthesizing past works, perhaps future research should start by performing analysis of organizations to
identify which variables are perceived to be of greatest importance. The comparison would be very interesting.

Although this research has extended the configurational approach to the work unit level, other levels remain where configuration approaches may be useful but have not yet been considered. For example, although the individual is considered in the micro-configurations through variables such as skills and job design, these do not take into account the different configurations of individuals (or behaviour) that may be found in each micro-configuration which was highlighted by Shapiro (1977) and Lawrence and Lorsch (1967). In addition, it may be possible to derive configurations of the whole supply chain or at the industry level. By extending the approach in this way it is hoped that a better understanding could be gained of the factors influencing the design of organizations at all levels.

A limitation that may be to an extent unavoidable is due to the nature of the measures used. As variables are measured according to an ordinal scale, more sophisticated statistical methods, such as factor analysis, multivariate analysis of variance and so on, have been excluded. Perhaps future research may try to overcome this by deriving different measuring scales or exploring the statistical aspect of the work in more depth. The use of complex multivariate statistics is very unusual in organization theory, indeed it could be suggested that one of the reasons that a bivariate approach to contingency theory has lasted so long is the inability of researchers to adopt complex methods. However, if the field is to move further forward a more sophisticated approach towards statistics will become necessary. More thought should also be given to the weighting of the variables. The current research has weighted each variable equally. It may be preferable to weight certain of them more highly, although care must be taken not to assume deterministic links in all contexts.

Another limitation of the current research is that it fails to address the issue of change. The reason for this is that interviews were carried out in one particular time period. Miller has derived a questionnaire for measuring the transition at the organizational level which did prove useful in assessing the relationship between macro and micro-configurations, however I would suggest that there are limitations with this. Miller's use of static measures in the transition questionnaire seems totally unacceptable. Surely, it would be much more appropriate to use trends over time. Thus, a transition questionnaire has not been developed for the micro-configurations as I would argue that it is methodologically flawed. However, it would seem to be a very useful
addition to the research if in future researchers could attempt to carry out longitudinal studies and thereby gain data about how the micro-configurations change over time in relation to the macro-configurations. Understanding the dynamics of the situation would open up many opportunities for modelling organizations which would be extremely valuable for use in their design.

Finally, another possible problem area in the research has been brought about because of weaknesses in Miller and Friesen's macro-configurations. This is caused by the very general nature of the macro-configurations. The fact that they relied on existing case study material, and also attempted to cover very diverse types of organizations, with a relatively small sample size to derive these macro-configurations means that to an extent they have had to make the configurations very wide and loosely defined. This could be part of the reason for the relationship between macro and micro-configurations being weaker than might have been expected.

Implications for Future Research

The exploratory nature of this research means that it has, in effect, raised many more questions that it has answered. By reviewing the results and the limitations of the research, it is possible to highlight a number of avenues available to future researchers.

One of the limitations mentioned earlier was the size of the sample. Much more could be learned if the research was carried out for a larger sample, incorporating all of the different Miller configurations. This would enable a far more detailed and thorough consideration of the links between macro and micro-configurations in different contexts. It would also be useful to further test the concepts of differentiation and integration on a much larger sample. Excluding this current research, these concepts have only been tested on small samples of American companies (Lawrence and Lorsch 1967, Tosi et al 1973).

As mentioned earlier, Shapiro (1977) and Lawrence and Lorsch (1967) found that different types of people worked in each of these functions. A very useful extension of the research would be to incorporate configurations or patterns of individuals or behaviour found working within each of the micro-configurations. Analysis could then be undertaken between organizational, work group and individual levels. This has not been done here as the classification and data collection would require detailed psychological knowledge that is not possessed by the author.
A great deal more could be learned about organizations if we looked at them over a longer time period. This would enable testing of the configurational approach towards change, i.e. that 'when change comes it will be revolutionary' Miller and Friesen, 1984, p209). Thus, the development of a longitudinal research study would enable consideration of the concept of transition and shed further light on the relationship between the macro and micro-configurations. This would also give opportunities for modelling organizations which, as discussed earlier, would be of great use in designing organizations of the future.

Although the departments chosen to be configured here are thought to be the core organizational departments (Brown 1960, Woodward 1970, Lawrence and Lorsch 1967), it would seem sensible, if we are to get a better understanding of the whole organization, to look at every department in the organization and analyse links between them. It would also be interesting to extend the research to non-manufacturing organizations which would allow us to see the influence of industry type upon macro and micro-configurations.

Finally, although the macro-configurations were used here as a more complete way of assessing the organization than any other that was available, there are limitations to Miller's configurations that should be overcome to make the whole approach more coherent. Firstly the macro-configurations could be re-derived for UK firms to ensure that they are suitable in this country. This was partially done by a colleague (Blenkinsop 1993), however, a far larger sample would be necessary to effectively achieve this. Secondly, it may be useful for macro level researchers to attempt to define a classification method similar to that which has been done for the micro-configurations in order to ensure a degree of objectivity in data collection. Finally, if macro-configurations were derived through actually visiting and collecting real data about firms this could make them more tightly defined which could then have implications for the relationship between macro and micro-configurations. The use of taxonomies in organizational research is recommended as this should ensure that the theory of organizations matches the practice. In addition as mentioned earlier, by asking people in the organizations what variables they feel are important rather than relying on previous contingency literature, it may be possible to identify other variables that should be taken into account in the development of taxonomies.

Thus, there are many issues raised in this work for future researchers to tackle. At the moment configurational theory is underdeveloped and has been used very little. Only
if the limitations discussed here are addressed can the configurational approach move forward to a more prominent position in organizational theory.
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APPENDIX ONE

MILLER AND FRIESEN'S ORGANIZATION CONFIGURATION QUESTIONNAIRE
MILLER AND FRIESEN MACRO-CONFIGURATION QUESTIONNAIRE\(^1\)
(DEFINITIONS)

ENVIRONMENT

dynamism - in the environment this is manifested by the amount and unpredictability of change in customer tastes, production or service technologies, and the modes of competition in the firm's principal industries.

past dynamism - refers to dynamism that existed five years ago

heterogeneity in the environment concerns the differences in competitive tactics, customer tastes, product lines, channels of distribution, and so on, across the firm's respective markets. These differences are only significant to the extent that they require very different marketing, production and administrative practices.

past heterogeneity - five years ago

hostility - in the environment this is characterised by price, product, technological and distribution competition, severe regulatory restrictions, shortages of labour or raw materials, and unfavourable demographic trends (such as the drying up of markets).

past hostility - five years ago

ORGANISATION

scanning - involves the search for problems and opportunities in the external environment of the firm. Firms are to be scored in terms of the amount of tracking performed of consumer tastes/preferences, competition, technological and administrative developments, and the like. Scanning may be done by staff departments, executives, the sales force or others. The greater the number of factors tracked and the more widespread the participation in scanning activity, the higher the rating (score).

delegation of operating authority - concerns the amount of authority transferred to lower and middle levels of management for administration of the day-to-day operation of the business. Operating decisions involve equipment replacement, production planning, adjustment of prices of goods, inventory purchases, hiring of lower-level personnel, and so on.

centralization of strategy-making power - involves the distribution of power for making strategic decisions regarding acquisitions, diversification, major new product introductions, long-term goals and so forth. Centralization is high if the top executives alone make most of the decisions with a minimum of consultation; low if

resource availability - concerns the state of the firm's material and human resources. Evidence of resource shortages are labour scarcity, poor raw material supply, inadequate sources of capital, poor production facilities, and so on. If resources are abundant, score this scale high.

management tenure - measures the length of time the most important (top) strategist or executive of the firm has been at the helm. If it is more than five years, score 2; if less, score 1.

conflict - gauges the amount of dissent, overt or covert dissatisfaction, and hostility among members of the firm at and above middle management level. Conflict may concern organisational goals and means. It may be indicated if it takes very long to arrive at a consensus on courses of action, if management turnover is high, if there is much politicking and so forth.

controls - monitor the internal trends and incidents relevant to organisational performance, MIS, employee performance appraisals, quality controls, cost and profit centres, budgeting and cost accounting are types of control devices. Score high if there is much emphasis on such controls.

team spirit - involves the desire on the part of managers to work unusually diligently to achieve organisational objectives and to do so in concert with others, so that team goals take precedence over individual needs.

internal communication system - concerns the openness and fidelity of information channels in the organisation. A high score is given when information reaches decision makers quickly, when it is relevant and undistorted, and when communication flows readily in top-down, bottom-up and lateral directions.

organisational differentiation - measures the degree of difference among organisational divisions in terms of their overall goals, marketing and production methods, and decision-making styles. The more disparate the divisions, the higher the score. Even functionally organised firms with only one division may have high levels of differentiation if there exist many different styles of behaviour, management and the like across respective departments owing to the nature of products and markets.

technocratization - do there appear to be a great many staff specialists and professionally qualified people (accountants, engineers, scientists, doctors) as a percentage of the number of employees? If yes, score high.

initial success of company strategies - the initial strategy is either that formulated by the founder of the firm, or the basic product-market orientation that existed at least five years ago. Was this strategy quite intelligent and sound (score high), or did it seem destined to failure from the start?
STRATEGY-MAKING

**product-market innovation** - does the firm seem particularly innovative in terms of the number and novelty of new products and services that are introduced and the new markets that are entered?

**adaptiveness of decisions** - concerns the responsiveness and appropriateness of decisions to external environmental conditions. For example, an adaptive pricing decision would take into account competitive strategies, customer buying habits, government regulations and so on. Unadaptive decisions (score low) would consistently neglect an important set of external factors.

**integration of decisions** - are actions in one area of the firm complementary or supportive of those in other areas (divisions, functions), or are they conflicting and mutually inhibiting? High integration would result in (or from) a concerted and well-coordinated strategy, whereas low integration might be manifested by fragmented or clashing tactics (for instance, acquiring new companies when there is inadequate ability to finance or run them; selling products that compete against each other.)

**analysis of major decisions** - do decision makers devote much reflective thought and deliberation to a problem and the array of proposed responses? The time spent on interrelating symptoms to get at the root cause of problems, and the effort spent to generate solutions (good or bad), are examples of the analytical process. A low score would be given when there is a very rapid intuitive response to an issue (this response could be ideal or the worst possible). Evidence of analysis comprises time delays, frequent meetings and discussions, the use of staff specialists, the writing of lengthy reports and the like.

**multiplexity of decisions** - do top managers address a broad range of factors in making strategic decisions, or merely a narrow set of factors (low score)? For example, in deciding whether to acquire a company, a multiplex strategist would consider marketing, financial, production, demographic, administrative and other complementarities and problems, whereas low multiplexity would be evidenced by a focus on, say, marketing factors alone.

**futurity of decisions** - concerns how far ahead the firm looks into the future in planning its strategies and operations. A relatively long time horizon (five years) warrants a high score. A focus on crisis decision making and staving off disasters warrants a low score.

**proactiveness of decisions** - does the firm react to trends in the environment, or does it shape the environment by introducing new products, technologies, or administrative techniques? A reactive firm (low proactiveness) follows the leader; a proactive firm is the first to act.

**industry expertise of top managers** - are top managers very familiar with their products and markets? That is, are they in a position to make the most routine decisions because of their excellent knowledge of internal operations and the outside environment, or are managers removed from the field of action and cognizant only of the very gross aspects of the big picture (score low)?
risk taking - is there evidence that top managers are risk-averse (score low), or does the firm frequently make large and risky resource commitments - those that have a reasonable chance of costly failure?

consciousness of strategies - concerns the degree of top managers’ conscious commitment to an explicit corporate strategy (that is, a set of objectives coupled with a number of stated favoured means for attaining these.) A low score is evidenced by unclear goals and the firm’s muddling through.

traditions - does the firm often rethink its strategies (objectives and means for their attainment), or are these tied largely to precedent (high score)?

SUCCESS

success - is measured in terms of growth in profits and sales, stability of profits, and returns on equity relative to other firms in the same industry.

past success - five years ago
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APPENDIX TWO

DESCRIPTIONS OF MILLER AND FRIESEN'S ORGANIZATION CONFIGURATIONS
DESCRIPTIONS OF MACRO-CONFIGURATIONS

S_{1A}: The Adaptive Firm under Moderate Challenge (13% of the Total Sample)

These simple and undiversified firms are dominated by a powerful chief executive. In dealings with a competitive but stable market, the major weapons are the low prices or convenience of the products and services offered. Most innovations are marginal and incremental, although firms are always slightly ahead of the competition. Decision making is informed by a good knowledge of markets and costs and is characterized by the leader's informally consulting with his subordinates. Structures are organized by function, quite centralized, and in the main undifferentiated but well and informally integrated.

In recent years, S_{1A} firms have encountered increasing levels of challenge in their external environments. Dynamism has been boosted slowly by the greater number of product and service innovations in the industry, and hostility, particularly as manifested by price competition and tougher economic conditions, has also intensified. Indeed, hostility has reached a fairly high level, so that the firm is continually challenged in its interaction with competitors. What is most significant about these environmental trends, however, is that in spite of the changes, the environments have remained relatively placid and predictable, and also quite undiversified. Typically, firms tend to be in very well established industries such as banking, machine-tool manufacturing, and automobile retailing, where the level of product or service innovation is moderate. The main challenges come from service and price competition and business-cycle fluctuations.

The two main strategies of these firms are to keep prices down and to develop attractive products. In making products appealing, the emphasis is not, however, on major design or technological improvements or on radical departures from tradition, but on catering to the wishes of customers. This is done by establishing better product warranties, situating sales outlets in convenient locations, providing good after-sales service, and tailoring products to the needs of specifically defined groups of customers. For example, one bank introduced special financial services for clients in the volatile construction industry, and a car dealer provided excellent service facilities. Because the firms exist in relatively stable settings, product-market innovation is of a gradual and incremental nature. Although relative to competitors,

\footnote{Taken from Miller, D. and Friesen, P., (1984), Organizations A Quantum View, Englewood Cliffs, New Jersey, Prentice Hall.}
such firms are innovative and given to being the first out with most changes, these are not major departures from established business methods, product lines, or markets. They mainly complement previous orientations.

In S1A firms, the chief executive plays a highly central role, not only because of his formal authority but through his personal influence. First, strategies are created almost entirely by the leader and are often closely tied to his goals and expertise. Firms whose leaders possess marketing backgrounds emphasize advertising and sales promotion, whereas those run by accountants focus on cost control and the maintenance of profit margins. Also, the leader acts as the central co-ordinator, ensuring through personal intervention that the different subunits operate in harmony. His own directives, more than any formal rules, policies, or committees, unite the efforts of departments to achieve the most salient goals. Clearly, then, the administrative focal point is the leader. Thus, strengths and weaknesses of the firm closely parallel those of its central actor.

In order to devise more responsive strategies to cope with environmental challenges, rudimentary but effective intelligence systems are employed. The predominant emphasis is upon vigilance through formal cost controls. Because competitive conditions place financial resources at a premium, costs are closely monitored to maintain efficiency and margins. Controls have the added advantage of allowing prices to be trimmed to the most competitive levels. Another practice of S1A firms is to informally scan their environments to discover competitive threats and customer buying habits. This is usually done by top managers and enables them to tailor products to market conditions. However, because the stable environments are easy to monitor, controls play a more crucial role than scanning in the intelligence effort. Firms also benefit from free and open internal communications in which the leader seeks out the opinions of well-informed lower-level managers to help in making strategy. Managers, in turn, frequently approach the leader with their own suggestions and ideas.

The structure of the S1A firms are simple and only moderately bureaucratic. Because the environment is predictable and homogeneous and because product lines are not very broad or differentiated, the organization itself tends to be somewhat monolithic. There is not much need for scientists, engineers, or other technocrats so necessary to the more innovative enterprises. Therefore, goals, methods, and decision-making orientations do not differ a great deal from one department to the next. This keeps down the amount of conflict among subunits. The relative simplicity of operations
also makes it quite functional for power to be highly centralized in the hands of the top executive and perhaps a handful of close administrative associates.

In spite of this centralization, well-established policies and clear strategies ensure that line managers receive very few countermanding orders from the leader when making operating decisions. Strategies are formulated consciously and pursued explicitly. They are carefully selected on the basis of the industry parameters within which the firm must operate. However, strategies are not inflexible or tradition-bound and are subject to regular but contained reassessments. Analyses of past practices and broad considerations of their adequacy in the light of evolving market conditions are surprisingly frequent. These often take the form of bull sessions involving several tiers of managers and have the effect of ensuring that strategies are adaptive - that is, responsive to external events and trends.

**S1B: The Adaptive Firm in a Very Challenging Environment (12% of the Sample)**

These are rather complex organizations that exist in competitive and dynamic industries. The emphasis is upon dramatic product innovations that involve complicated and risky projects and pioneering technologies. This requires a sophisticated but flexible organization structure and the recruitment of a diverse group of consultants, managers, and scientists. The emphasis is upon fruitful collaboration that results in the firms becoming leading innovators in very challenging markets.

The S1B firms are bold and aggressive innovators operating in environments that are exceptionally challenging and turbulent. Typically, they are found in industries such as semiconductors, military electronics and aircraft, and artificial fibres and chemicals. Such environments are very dynamic and unpredictable, and the main competitive weapon of firms is their ability to rapidly and effectively produce innovations in product designs as well as production technologies. Indeed, the major preoccupation of the S1B firms have settled upon their product lines, market niches, and modus operandi, things are not so ordered and stable for members of the S1B archetype. Outside, the environment is a very dynamic, and this condition has been in effect for quite a while. The dynamism is caused by rapid changes in the product lines of the competitors and the shifting needs and desires of customers. It is also caused by the rapidly changing production technologies. Environmental hostility too
is a challenge, particularly where firms race to beat each other to the marketplace in introducing wide-ranging innovations, or try to outbid one another on large contracts that involve the design and production of new products.

There are three principal methods used in S1B to cope with this environment: They are reflected by the firm's information-processing behaviour, its structure, and its strategy-making processes. Let us look at the last of these factors first. Innovation is pursued with a vigour not found in any of the other archetypes. It is manifested not by small, incremental design changes but by assertive, radical, and dramatic ones. The introduction of nylon and the advent of the first microprocessor computer chips are illustrative of the innovations pursued. Often, products are so distinctive that entirely new production processes must be created and new markets opened up and cultivated. The emphasis is on leading competitors, not following them, and great financial risks are taken in the attempt to accomplish this. Fortunately, resources are plentiful, so that major projects can be funded.

The process of strategy making that gives rise to such innovation is a highly participative one, with different functional areas and levels of the hierarchy collaborating intensively to solve the myriad problems that arise. The emphasis is on analysis rather than intuition, as much time is spent on feasibility studies, pilot projects, and the careful planning of each stage of the innovation. It may seem strange that long planning horizons are adopted in turbulent environments, but these are quite necessary, given the complexity of some of the innovations and the time required to commercialize them and bring them to market.

In order to innovate effectively and cope with new environmental challenges, S1B firms have adopted rather special structural and information-processing devices. Structures are of an organic nature. Much power is centred in the hands who are responsible for research and development. The innovative task and administrative burdens are too complex and weighty for power to be tightly centralized. Although the top executive maintains control over strategy the general policies are the province of middle-line managers. Delegation of authority for routine operating matters is complete. Aside from decentralization and delegation of authority, another structural feature is the great number of, and heavy reliance upon, technocrats such as scientists, engineers, accountants, and consultants. These people help shoulder the burdens of innovation. Structures tend to be very highly differentiated in that the methods, time horizons, goals, and procedures are very different among departments. Scientists in the R&D department have very little in common with production supervisors or
marketing managers in the way they must carry out their jobs. But collaboration is necessary among all these individuals owing to the broad scope of the innovations being worked upon. Products are often so novel that they impose new production and marketing parameters, and these must be worked out jointly by the different departments. Thus, there is much use of standing cross-functional committees and task forces to facilitate inter-departmental collaboration.

Information-processing systems also tend to be very highly developed in S1B firms. Substantial efforts are devoted to scanning the environment, developing sensitive management controls, and facilitating internal communications across different levels of the hierarchy. The scanning is done formally as well as informally to keep abreast of new technologies and to track customer and competitor behaviour. Market and industry surveys are performed, and technocrats are recruited who are intimately familiar with the complex technologies and sciences relevant to the firm. Management controls take the form of cost centres, elaborate cost-accounting systems, sophisticated capital-budgeting procedures, and rigorous program-planning and evaluation procedures. Finally, communications among departments and between the various levels of management are open and frequent. Complex innovation projects involve many false starts, problems, and reversals, and these can be resolved only by quick, free, and generally informal collaboration among different experts and managers.

S2: The Dominant Firm (7.5% of the Sample)

Dominant firms, the largest, strongest, and most established firms in their industries, are generally immune from very serious challenges by competitors. They have glowing performance records, key patent rights, and are dominated by a top tier of executives whose power is largely based on their past successes. The consequence is that structures are highly centralized, and that strategies of the past are adhered to rather closely. Since initial strategies involved product innovation, this tradition tends to be continued, ensuring that product lines are usually kept very much up to date.

The dominant firms are not as common as many of our other types. Indeed, they are probably over-represented in our sample because of the extent to which they have been glamorized in the business literature. As their name would suggest, dominant firms exert a good deal of control over their markets. They are far bigger than their competitors and also more experienced, and this has allowed them to enjoy a good
deal of success. So has their treasury of long-running patents on key products and processes. Indeed, it is not uncommon for such firms to have high price-earnings multiples for their shares precisely because of their excellent past records. These firms are infused with confidence in their ability to continue to lead their markets. Moreover, whereas the $S_{1A}$ and, to a lesser extent the $S_{1B}$ firms worked hard to respond to their external environment, $S_2$ firms act upon and to a degree control and manipulate their environments. They are the big fish that the competitors must worry about.

Although dominant firms tend to be large and powerful, they are not very diversified and operate in fairly homogeneous environments. Some of these firms are in moderately dynamic industries such as computers and office equipment, but the dynamism is created mostly by the firms themselves rather than by the competition. Indeed, the external sources of challenges and complexity are quite mild compared to those existing in other archetypes.

The past successes, great resource strength, and simple environments of the $S_2$ firms have important repercussions upon their strategies and structures. First, they allow the leaders to play a very dominant role. Their brilliant performance records contribute to their unchallenged authority, making them enshrined heroes. Moreover, an absence of competitive and economic threat makes it possible for the leaders to hoard much of their authority. They are not in a position of having to surrender power to others in order to get help coping with crises. In fact, although these firms are large, it is not uncommon for the top executives to interfere directly in the handling of some minor operating problems. Indeed, a preoccupation with hierarchically derived power often filters down to the lowest levels. The dominance of the leaders is much like that which occurs in the $S_{1A}$ archetype, the major differences being the larger size of the $S_2$ firms and the greater tendency for their executives to meddle in the most routine matters.

Another repercussion of the favourable history and relative strength of the $S_2$ firms is their tendency to extrapolate past strategies. Success breeds imitation, and in this case, the firms imitate themselves. This is not to say that they do not innovate to alter their product lines. It simply means that they continue to pursue their previous strategic orientations. In this case, it is one that actually stresses technological and product improvement. $S_2$ firms may be the first out with new and sometimes quite novel products. But these innovations, unlike those of the $S_{1B}$ firms, are not made in response to competitor or customer demands. They are mainly an expression and
affirmation of the credo or corporate philosophy of the top executives. This credo and its resulting strategy are quite explicit. They permeate the company and are continually reinforced by slogans, meetings, and internal literature. In short, the firm is ideologically committed to an established strategy of product innovation.

Innovations are not, however, made blindly. Although they may at times be a bit superfluous and absorb a good deal of the firms' rather sizeable reserves of slack resources, product-line changes are in fact quite responsive to the needs of customers. Considerable effort is devoted to the careful design of products so that they incorporate features that thorough market research has shown to be attractive. Also, there is a great deal of emphasis placed on providing customers with quick and reliable after-sales service. Customer loyalty is most ardently pursued. Finally, marketing is very aggressive - much attention is paid to preserving the lion's share of eligible clients.

Turning to the information-processing apparatus, we find that it is somewhat less developed than that of the S1B archetype, particularly when it comes to internal communications. Communications are mainly in a top-down direction because of the emphasis placed upon hierarchy. Also, the actions of competitors are not tracked all that closely, so occasionally, the firms receive some nasty surprises. Finally, despite a myriad of formal controls and sophisticated budgeting procedures, the overriding innovation philosophy allows cost overruns to be quite common. But we must be careful not to paint too negative a picture of information processing in the S2 archetype. Upward communication may sometimes be impeded, but cross-functional collaboration necessary for the execution of complex innovation tasks tends to be quite good. As for environmental scanning, the firm compensates for its ignorance of competitor behaviour with its excellent knowledge of customer needs. Finally, it is not the absence of management controls but rather the grandiosity of some of the ventures that causes cost overruns.

S3: The Giant under Fire (5% of the Sample)

Giants are among the most complex and elaborate firms in our sample. They operate in many mature markets, most of which are highly competitive and quite different from one another. These firms are decentralized, so that a good deal of power falls into the hands of the managers of product divisions. Much effort goes into controlling and co-ordinating divisions through the use of sophisticated information systems, task forces and co-ordinating committees. The result is that strategies never
change very rapidly or boldly, and much analysis and discussion precedes any innovations. Then caution causes such firms to mostly be followers rather than leaders in their industries.

In no other successful archetype must firms face such a dramatically escalated level of challenge in the environment. Nowhere else are the dangers and complexity facing the firms so difficult to deal with. First, S3 firms are in traditional industries such as packaged foods, automobiles, and chemicals, where the rate of growth is slow and markets are nearly saturated. Second, economic conditions have made the firms increasingly vulnerable to foreign competition and business-cycle fluctuations. Finally, for the first time in years, consumer tastes are shifting in a major way, making it difficult for the firms to avoid implementing major changes in their product lines. In other words, dynamism and hostility have grown. Another important challenge comes from the fairly high levels of heterogeneity in markets. There is substantial geographical dispersion and much product diversification, so that different production and marketing techniques are required in different markets.

In spite of these rather substantial difficulties, these firms seem to be coping reasonably well. They possess a number of advantages that allow them to do this. First, they are large and somewhat diversified. Their size provides them with the resources necessary to take them through periods of adversity, and their diversification allows them to be nurtured by at least some of their markets during such intervals. Another advantage is that the firms are well established and have favourable reputations. This gives them some superiority over most of their adversaries, particularly in the segments of the market where brand loyalty exists. Also, like the S2 firms, those in S3 tend to be richer and more diversified than their domestic competitors. They are better able to survive under tough circumstances and, in fact, often take market share away from competitors during the lean years. However, S3 firms cannot dominate their markets the way their S2 counterparts can: Their size and resource advantages are limited, and they lack crucial patents.

But these size and resource factors are not the only ones that allow S3 firms to succeed. Their strategies and particularly their structures seem to help as well. Because markets are diverse, structures are generally decentralized: the firm is divided into semiautonomous divisions whose managers are responsible for many strategic as well as operating decisions. These managers are experts in their particular markets, and they have substantial authority for selecting the product lines and marketing practices of their divisions. The control exercised by the head office is
principally of a financial nature. Large-scale capital projects must be approved centrally. Also, the head office closely assesses the profitability of the divisions, changing top-level personnel when necessary. The structures of S3 firms correspond closely to the divisionalised form of organisation.

Because of the decentralized nature of operations and the high levels of challenge, great stress is placed on the development of effective information-processing systems. But these systems are more formal than those of most other archetypes. Scanning is done through market-research studies and is often performed by departments at the head office and divisional level that have been especially established for this purpose. Management controls take the form of sophisticated and computerized information systems of regimented capital-budgeting and planning apparatus, and detailed cost-accounting systems. These systems tend to be the province of multiple departments and are the chief means by which the head office exercises control over and coordinates the efforts of the divisions. Finally, there is an elaborate system of communications - but the emphasis is upon cross-functional rather than interdivisional or hierarchical communication. These communications tend to be highly formalized through the use of specialized standing committees that meet regularly to discuss specific problems or projects. There are also frequent meetings between head-office and divisional personnel, mostly for the purposes of assessing major projects or reviewing performance. In order to maintain this elaborate system, many technocrats such as financial experts, information-systems designers, cost accountants and management consultants are needed. In essence then, in the S3 archetype the information-processing network serves not only to inform managers of external conditions, but to integrate, co-ordinate, and control the efforts of the many diverse subunits. Indeed, to a large degree, the formal information-processing network of the S3 firms plays an integrative role similar to that of the leader in the S1A firms.

The strategy and strategy-making modes are rather consistent with the elaborate structure. As we noted earlier, it was the initial strategy of product-market diversification that necessitated the divisionalized structure to begin with. Once the structure is set up, however, it seems itself to begin to influence strategy and strategy making. Because of the division of the firm into semiautonomous parts, and because there is centralized financial control, no one individual has enough power to single-handedly determine strategy. Risky and dramatic moves are thwarted by a system of checks and balances and the elaborate committee structure that plays a role in major decisions. The firm tends to be as bold as its most conservative committee. Thus, adherence is in large part to traditional product-market strategies: changes are
generally of an incremental nature. For example, moves to diversify are always tentative and usually take the form of small alterations to existing lines of products or limited geographical expansion rather than the introduction of radically new lines. Strategies become institutionalized by years of tradition and by the many written policies and guidelines that attest to their very explicit and conscious nature. This conservatism is reinforced by hostile environments that can mete out severe punishments for impulsive and risky ventures and therefore demand that resources be used sparingly.

Decision making is characterized by reason and thoroughness. Care is taken to analyse projects by subjecting them to the scrutiny of staff experts and the full weight of the committee structure. This is true for divisions at the head office and at the divisional levels. The collective expertise of a great many managers is brought to bear in making major decisions. Although this reduces dangers, it also seems to act as something of a damper on risk taking and proactiveness. There is more conservatism, a greater tendency to let other firms lead the way with innovations. But by the same token, \textit{S3} firms make certain that innovations are imitated if and when they should prove to be successful for competitors. In that way, they remain adaptive while letting others take the greatest risks.

\textbf{S4: The Entrepreneurial conglomerate (7.5\% of the Sample)}

These firms are in many ways extensions of the rather bold and ingenious men who built and continue to run them. The emphasis is upon rapid growth through the acquisition of other firms, and this generally brings an extremely divers set of markets. It also requires divisionalized structures and the extensive delegation of operating authority. Elaborate control and information-processing systems are employed to ensure unity of effort.

The sagas recounting the development of these firms make interesting reading. Typically, they begin with a young entrepreneur obsessed with a dream of building a business, and culminate in the description of a great enterprise that has achieved remarkable rates of growth under the direction of the very same man.

The most interesting aspects of these organizations are their strategies. The dominant emphasis is upon rapid growth in lucrative markets through the acquisition of other firms. Growth rates accelerate, causing the price-earnings multiples of the shares to
rise. This enables the growth strategy to continue, as it becomes cheaper to buy firms with lower multiples through the exchange of stock. The strategy is pursued until the firms become extremely large and diversified, and this is their status when they become members of the S4 archetype.

Here again we have an example of firms acting upon and manipulating rather than (or at least more than) reacting to their environments. The entrepreneur looks for attractive industries to enter and, upon finding them, begins to purchase firms that have already established themselves in these industries. Sometimes there is an effort to find the most successful firms that can be purchased, but often, especially when cash resources are scarce and managerial resources plentiful, the entrepreneur will take over firms that are in trouble. The management of these companies is replaced, usually by bright young professional managers who are then charged with turning the firms around.

Frequently, S4 firms are highly levered, as entrepreneurs are by no means reluctant to take calculated risks. Because these leaders have a large share of ownership in their firms and have established excellent track records, their power for strategy making goes unchallenged. The charisma of the leaders also contributes to their influence. Thus, no one interferes as the entrepreneur undertakes chancy and large-scale projects. The more entrepreneurial the top executive, the more entrepreneurial the S4 firm. So personality is a key factor determining the nature of this archetype.

Because these firms have grown complex and diversified, they have had to evolve and elaborate structure, one that is in some respects like that of the S3 firms. First, the organization is split into divisions specializing in particular industries, with the top divisional manager responsible for the direction of production, marketing, and personnel functions. Second, there is a reliance upon head-office planning groups and inter divisional performance. Finally, extensive use is made of financial and MIS consultants and sophisticated information systems to allow the head office to control and monitor its divisions. Close scrutiny is given to the operating results of divisions and to their capital projects, and meetings between head-office and divisional personnel are frequent.

But there are also major differences between the S4 and S3 structures. The most important is that S4 firms are quite centralized, particularly in terms of power for strategy making. The entrepreneur hoards much of this power, sometimes causing conflicts with independent-minded divisional executives. Although there may be an
extensive head-office advisory staff of experts in finance, marketing, and venture
management, they have very little formal authority, and their influence on the
entrepreneur fluctuates with that person's preferences and interests. Also, divisional
managers are mostly charged with looking after the normal functioning of their
divisions. Large expenditures, attempts at diversification, or new product/service
innovations not only must be approved by the entrepreneur; they are generally
initiated upon and designed according to his or her instructions.

Another key difference between S₃ and S₄ is in the purpose of the information­
processing apparatus. In S₄ there is far more emphasis on scanning the environment
to identify attractive new markets, industries, and candidates for acquisition. The
goal is not so much to discover what current customers want or what competitors are
doing as to find attractive new areas where competition is weak and markets are
growing rapidly. The control systems are oriented to giving the entrepreneurs the
information they need about the performance of their portfolio of divisions. These
systems are designed more for head-office than for divisional use. Also,
communications systems in S₄ firms are a bit more informal than they are in S₃
firms. The entrepreneurs often initiate divisional visits and meeting spontaneously.
Their long personal acquaintances with divisional managers have established a high
degree of rapport with these people, who themselves often initiate contacts with the
entrepreneurs. The tendency is to meet informally and to organize conferences and
temporary task forces, rather than to evolve the formal, sophisticated, and permanent
committee structure of the S₃ companies.

Finally, we come to the mode of strategy formulation. We have already mentioned
the proactiveness and riskiness of many decisions. What is notable is that these
decisions, although they are often initiated and approved by one central actor, are not
usually made impulsively. There is a great deal of effort devoted to analysing
projects and potential acquisitions and in planning their integration with the company.
A highly trained head office staff helps the entrepreneur to ensure that major
decisions are carefully appraised. Sophisticated techniques of financial and market
analysis are carried out, and as much as possible is done to make bold decisions less
hazardous.

S₅: The Innovator (5% of the Sample)

These are typically smaller companies whose strategy is to find and occupy a niche of
the market that has been left open by competitors. Firms enter areas of the market
where their size and inexperience are not disadvantageous. They typically remain simple and undiversified, ensuring that they continue to dominate their niches through the frequent generation of product innovations.

It is interesting that although the environments of $S_{1A}$ and $S_5$ firms are somewhat similar, the strategies for coping with them are very different. Instead of closely tracking and adapting to what the competitors are doing or meeting competitors head-on with price cutting and small product or service modifications, $S_5$ firms have decided to side-step the competition. Because they are generally smaller and weaker than their competitors, and because they have not established any solid reputation in the markets dominated by competitors, a decision is taken to avoid any direct confrontation with the competition by sticking to a carefully defined peripheral segment of the market.

Firms appear to succeed not only because they have avoided segments of the market where they would have been at a disadvantage, but also because they have elected to cultivate segments where they have strengths that can be maintained for a long time. These usually take the form of a superior ability to design products and innovate for a small niche of the market. This talent and its focused application to a narrow set of customers make it undesirable for larger and more diversified competitors to compete directly with $S_5$ firms. The competition thus concentrates on a broader market that is less troublesome to serve.

The $S_5$ firm is very much under the control of its top executive, often the founder of the firm and the originator of the niche strategy. Thus, power to make strategic decisions is highly centralized, and this degree of centralization is facilitated by the leader’s intimate knowledge of the market. Also, since the firm remains quite undiversified, there is no real pressure for divisionalization or administrative decentralization.

However, because of the emphasis placed on product innovation, there is much need to give scientists, engineers, and other technocrats and middle-level managers a good deal of discretion over their work. The experts must be free to pursue their ideas and to work in a climate that fosters creativity. This requires that they have authority and are not encumbered by bureaucratic strictures. These considerations drive structures to incorporate some of the informality, extensive delegation, and open communication characteristic of the $S_{1B}$ archetype, although important differences remain between the two types. For example, $S_5$ firms are far more centralized and
directed from the top. The chief executive is the custodian of the niche strategy and he guards that role very zealously. Others must innovate within the bounds dictated by this strategy and this strategist. In that sense, the firm in encephalized, since most of the intelligence and guiding function are situated at the very apex of the structure.

The information-processing functions of the S5 firms are very different from those of the other successful archetypes. First, they are informal and relatively unsophisticated. In fact, they are de-emphasised. Since these firms have avoided the competition, there seems to be no need to monitor their behaviour very carefully. Thus, scanning is not an important activity except as performed by the R&D department to identify promising scientific or technological developments. Second, there is not much need for sophisticated formal controls - costs do not have to be carefully monitored, since profit margins are usually high. Also there are no diverse or differentiated operations whose performance must be measured, since a functional basis for organization prevails. Finally internal communications take place informally. There are task forces and spontaneous cross-functional and interlevel consultations but not many regularly scheduled committees. The innovations of the S5 firms require flexible and quick consultation and collaboration, not an elaborate co-ordinating apparatus.

More than for any other archetype, strategy and decision making are performed intuitively rather than analytically. When the leader likes an idea, it tends to get implemented, without much thought being given to master plans, cost-benefit analyses, or the generation of alternatives.

In some cases, it seems clear that innovation occurs simply for its own sake and because it falls within the image or ideology that the leader has for the firm. Because of this image, the design and R&D departments are the strongest functional areas, and this helps place the balance of power firmly behind innovation. Any cautionary gestures from the more cost-conscious production and marketing departments can thus be easily ignored. Strategy is determined here mainly by ideology and the uneven distribution of power. This allows firms to be extremely innovative, risk-embracing, and proactive, facilitating continued dominance of the niche. But it also allows for too little planning and too narrow a point of view in making key decisions.

**F1: The Impulsive Firm (13.5% of the Total Sample)**
The firms illustrate what happens when controls and structures are too primitive for the level of expansion and diversification. Tremendous growth has dramatically escalated the environmental challenges and administrative complexity facing firms. But structures and information systems are inadequate, in large part because the firms continue to be dominated by a few top men who are too busy to do anything about mounting problems and who are reluctant to share the management job with others.

This most dramatic failure archetype is also one of the most common. The scenario is simple. A highly centralized firm, dominated by an aggressive leader, has grown rapidly and diversified broadly, often through the acquisition of companies in new industries. At first the strategy is successful. Care is taken in evaluating new prospects, which are normally in closely related industries. Every move is critical at this early stage, and this elicits much scrutiny in approaching new ventures. Also, the firm is still sufficiently simple and the entrepreneur or leader quite knowledgeable about its industries and markets. But things begin to change. The success of expansion and diversification strategy leads to unwarranted and uncritical confidence in its merits. New acquisition targets are not examined as closely as before, and there is more of a tendency to purchase weaker companies in unrelated industries. These require a good deal of work and investment to make them successful and to integrate them with existing operations. Firms also establish divisions in other countries and introduce new products, the prime goal being rapid growth. Finally, executives eager for expansion move into far more turbulent developing markets, markets for which the firms are not designed. The net effect of these measures is to make the environment very challenging and complex. New markets and industries are often much more dynamic and competitive than the old ones, and they collectively encompass much more heterogeneity in consumer tastes, production technologies, and competitive behaviour.

By taking these bold risks, the companies have in many ways badly overextended themselves. The powerful leaders have single-handedly evolved a rather complex patchwork of new companies, markets, and products that are quite difficult to control and monitor given the meagre administrative framework. Because growth has occurred rapidly and, of late, haphazardly, mistakes are made and resources become depleted by misguided ventures. Also, there is not enough managerial talent to administer the expanded enterprise. Bold expansion and reckless major projects have caused the firm to face serious new challenges that it is not prepared to meet.
But why has this condition been reached? The issues of power and control appear to be central. The leader is reluctant to let others have an influence in strategy formation, and he frequently tries to intervene in administrative matters that he simply hasn't the time or ability to pursue. He and a few of his top-level advisers cannot alone control, monitor, or effectively administer the empire they have built. Yet they are reluctant to delegate responsibility and necessary authority to other levels of management. A vicious circle occurs: Top managers do not delegate, therefore they are extremely overworked, thus they cannot make effective decisions about acquisitions and new ventures: as a result, these ventures run into trouble - requiring still more time from the top managers. In spite of the growing problems with failing subsidiaries and disastrous new product ventures, the program to acquire and expand continues unabated, further eroding precious resources and leading to still greater administrative problems.

Other reasons for the difficulties of the \( F_1 \) firms are their inappropriate structural and ineffective information systems. We have just mentioned the problems of overcentralization and lack of delegation. These are particularly serious because the highly differentiated nature of departments and divisions often cause them to work at cross-purposes. Their efforts are not integrated by an effective committee structure or by anything else. When departments and divisions run into trouble, their problems are beyond the talents and knowledge of the top levels of management. Also divisional managers fulfil only an operating role; they generally haven't either the ability or the authority to deal with the problems posed by the increasingly competitive and dynamic environments.

The information-processing system contributes to these difficulties. There are no effective controls to apprise top managers of the problems in the divisions. So expansionary behaviour goes on at the top when resources are already being seriously depleted by divisional operating problems. Financial and management information systems are badly needed. Also, even though scanning of the environment does occur, it is of the wrong variety. Scanning is done by head office staff searching for more acquisitions and diversification prospects. But it is rarely performed by the divisions themselves to discover customer wants and competitor innovations, or to guide the development of more relevant strategies. Finally, internal communications are poor. Lower-level managers resent their powerlessness and fear that the poor performance of their divisions will cost them their jobs. They are more interested in concealing than in supplying information to top managers.
A final problem of $F_1$ firms resides in the nature of their strategy making. Because top executives are overworked and must handle many problems and crises, decisions are made quickly and impulsively: The seat-of-the-pants style of management prevails. There is much risk taking but very little attempt to analyse risks or appraise the strengths and weaknesses of individual projects. Since only few people are involved in policy making, mistaken assumptions tend to go unquestioned, and carelessness goes unchecked. Finally, decisions are often disjointed because they are made so impulsively and because strategies are too vague to guide actions. Little effort is made to plan or to integrate decisions across ventures or over time.

**$F_2$: The Stagnant Bureaucracy (12% of the Sample)**

These are highly bureaucratic organizations that have become bound up with past traditions and outdated product lines. A previously placid and simple environment has lulled the firm to sleep. The top management is emotionally committed to the old strategies, and the information systems are too feeble to provide it with evidence of the need to change. The lower-tier managers who are convinced of this need are ignored and alienated.

These firms have become tottering anachronisms. Their managers are bent upon selling products that have long fallen out of favour, or are committed to serving declining markets. Typically, the competition have long since changed their offerings or have gone on to more lucrative endeavours.

A part of the problem might be that markets had remained stable, simple, and uncompetitive for so long. Firms tended to be well positioned in these stable environments, quite often holding on to a very substantial share of the market. There were no real incentives to innovate, since high profits were forthcoming when the firm was simply adhering to a standard and narrow product line and producing this line as efficiently as possible. Operations were accordingly made quite routinized, standard and formal, the orientation being much like that of the machine bureaucracy. Because operations were simple and stable, there was no need to delegate decision-making authority. So power in these functionally organized firms is quite centralized. In the absence of the need for change, this structure can be very efficient. Resources are not wasted in the pursuit of superfluous administrative innovations or product novelties.
When the market changes, however, this orientation becomes a very great liability, particularly because it entails an *internal* focus that is exclusively bound up with efficiency. This precludes an awareness of the external conditions that necessitate change. In other words, the bureaucratic orientation, however functional in the short run, may contain within it the seeds of organizational stagnation. Another reason why managers fail to see the need for extensive change is that the firms have done so well with their old ways over long periods. Any environmental changes that the managers do become aware of are written off as fads or anomalies that will quickly pass and allow the firm eventually to succeed once more with its traditional approach. Moreover, the power to change resides in the hands of veteran managers who have vested interests in the old strategy and so are least likely to change it. Change would involve something of an admission of past incompetence.

A very high level of conflict is generated between older, upper-level and younger, lower-level managers in these organizations. It is the younger line managers who are closest to the customers and markets and who are therefore most keenly convinced of the need to change. But because power is centralized, they must obtain approval to initiate any significant innovations. This they almost inevitably fail to get because of the conservative attitudes at the top. As a result, disillusionment sets in, and the firm loses some of its most promising middle managers to more progressive competitors.

The information-processing system of the firm is also deficient, in part because of the mechanistic legacies of the past, and in part because lower levels despair at the attitudes of their superiors. For example, although some scanning of markets is done at lower levels, this information is not acted upon. There is little use in sending the information up the line, and too little authority resides at lower levels to allow significant changes to be made in response to the information. As for organizational controls, they exist to provide upper levels with information on production efficiency. They do not, however, supply data that point to the real problem facing the companies - namely, the lack of an up-to-date product mix. Firms are *already* expert in the efficient manufacture or provision of products or services that won't sell. Finally, internal communications are poorer than in any other archetype. This is due to the divergence in values at the different levels of the firm, and the mechanistic orientation that emphasizes forms, memos, and reports rather than face-to-face contacts or meetings.

As we have already mentioned, strategy making is characterized by extreme conservatism, a strong bias against innovation, and dominance by a number of old-
line executives who share their decision-making power with very few others. It is hard to determine whether decisions are made analytically or intuitively, since so few important decisions actually get made. Suffice it so say that established traditions dominate and guide decisions far more than do any contemporary deliberation or discussion. There is a very conscious product-market and production strategy and a great reluctance to deviate from it.

**F3 The Headless Giant (8% of the Sample)**

*F3* firms are loosely coupled and diversified organizations comprising highly independent departments or divisions. There is a grave dearth of leadership, and consequently, no clear strategy emerges to guide the firms or to chart their future. There is a tendency to drift without any sense of direction or mission. The parts of the firm pursue endeavours that are by no means complementary and operate without much regard for one another. No central authority exists to control, monitor, or correct operations that have gone awry.

These firms are more legal entities that true organizations. Their parts are unified by common ownership and control rather than by any concerted goals, operating interdependencies, or collaborative relationships. What is unique about these corporations is their leaderlessness. There is no one to take charge of the extensive and diverse operations. The firms are large, internally differentiated, and often geographically, dispersed. They are no longer run by the people who built them or even by those who presided over any important projects or transitional periods. In some sense, these firms are between true leaders, and consequently, they are in a state of limbo in which they drift aimlessly. The focus is exclusively on routine, day-to-day matters, much as it is in the stagnant *F2* firms. Little innovation or change takes place, and the firms muddle through, functioning with blind automaticity.

Most of the administrative activity takes place at the divisional departmental levels. The managers of this echelon are highly independent - so much so that subunits often operate at cross-purposes without any interference from higher-level administrators. For example, divisions will introduce new products that compete with those of other divisions, duplicating costly developmental expenditures and narrowing the potential breadth of target markets. In cases where firms are structured according to function rather than by industry there is a great deal of difficulty in getting managers to co-operate with one another. The department heads are about equally
powerful and each may have ambitions for filling the leadership vacuum at the top. This competitive spirit, coupled with the absence of any authority to thwart it, channel it, or arbitrate in disputes, founder or are avoided. This restricts the firm to intrafunctional changes that are at best minor and inconsequential, and at worst downright disruptive of other departments. The tendency is therefore to muddle through with existing methods, markets, and products. Firms drift, and nothing much changes except the external environment.

Much in line with the description above, the information-processing and co-ordinating apparatus of such firms is quite underdeveloped. Information in the $F_3$ archetype is seen as a source of power, as something middle-management careerists can use to make themselves seem superior to their adversaries in other departments. Knowledge is used as a weapon to obtain more resources from the head office or to move up the hierarchy. It is far too rarely used for combating the external competition. Although some divisions and departments may individually have adequate information systems, the reluctance to share information ensures that the company wide information networks are badly neglected. Little information flows to the top, and even when it does reach that level, there is no one with enough inclination or capacity to act upon it. Communications between departments and divisions are particularly rare, there being an absence of any co-ordinating apparatus that serves anything but a symbolic function.

Because of these internal weaknesses, the firm is unable to adapt to an environment that has become much more competitive, dynamic, and heterogeneous. The fragmented departments of the firm try to deal with problems as they arise. But they haven't the financial, technical, managerial, or knowledge resources individually to make changes of sufficient scope to ameliorate the most pressing conditions.

We have delayed discussing strategy, since no strategy can be identified. All we see are individual decisions being made, but these do not unite into any intelligible or consistent pattern. Some divisions or departments try to expand or innovate, while others consolidate or stagnate. In either case, very little is accomplished, because necessary collaboration is thwarted and resources are not forthcoming. Top managers are merely caretakers, and they hoard resources and veto most significant projects.

Some generalizations can be made, however, concerning the process of strategy making: Little innovation takes place in products or services offered; there is almost no effort to adapt to changes in the markets; crises are handled sequentially as they
decisions are made from a sub-unit rather than a corporate perspective; and it appears that decisions at the divisional level are often driven by political ends. Long-range planning is absent, as is any explicit consideration of product-market strategy. The head-office staff are mainly concerned with financial, legal, and personnel matters and with statutory reporting and government lobbying. They simply do not focus on the analysis or selection of products or markets.

\textbf{F}_4: \textit{The Aftermath (5\% of the Sample)}

These firms have been in trouble for quite a long time. They have already suffered severe damage in the form of depletion of resources, loss of markets and reputation, and occasionally, the departure of managerial talent. A new team has taken over and is trying to effect a turnaround and restore corporate health. But scarce resources, the inexperience of the new executives, and an inadequate administrative infrastructure seem to doom efforts at revival.

The histories of the firms vary considerably. They have all got themselves into trouble, but in rather different ways. Some have gone through the \(F_1\) stage, in which thoughtless expansion has badly depleted resources and impelled entry into highly threatening or unprofitable markets. Others have passed through the stagnant \(F_2\) phase and have allowed competitors to pass them by. They have spent so long catering to a declining segment of the market that they find themselves left with too few financial, production, or administrative resources to allow an easy recovery. Whatever, their history, all \(F_4\) companies are now very weak.

As a result of executive retirements, a corporate take-over, or a revolt among the shareholders, a new team of managers takes control. Top executives are replaced, as are the heads of some departments. Unfortunately, the new team of managers is generally inexperienced, often coming from outside the industry or being propelled to the top of the organization before having had much training. Typically, because a crisis requiring decisive action has been reached, a few of the new executives are placed firmly in charge and given the power to make all key decisions. In other words, power is tightly centralized at the top of the firm, in the hands of one or two newcomers.

Because of the crisis situation, there is a great need to act - in some cases, to consolidate product lines and get out of weak markets; in others to raise capital,
rebuild plant and equipment, or introduce a more up-to-date and competitive line of products and services. But it is very difficult to accomplish these things given the dearth of available resources. Consequently, the only changes that can be made must be inexpensive and piece-meal. For example, part of a production process may be changed, or a single product may be redesigned. A new promotional campaign might be initiated, or an extremely inefficient plant shut down. But unless they are very wisely selected, these stopgap measures accomplish too little to materially affect performance. Many of these actions might have helped had they been implemented five years earlier; but they are either too peripheral or too costly to be effective now.

The problem of a very narrow range of possible remedies is aggravated by the inexperience of the new managers and their failure to listen to some of the old hands who have remained with the company. The veterans are often wrongly held to be responsible for the state of the firm and the current problems. Their advice is therefore not taken seriously, even when it shows a good deal of sagacity about the nature of the industry and customers. Experienced managers are thus lost as a potentially valuable resource. This loss is not insignificant, since the inexperienced group prove unequal to their task, not simply because they lack resources but because they know so little about what it takes to restore effectiveness.

The new managers are impulsive, and because they are faced with a crisis, they jump at making immediate changes without first trying to uncover the roots of their problems or to predict the consequences of their actions. The result is that too many resources are squandered making ineffective peripheral changes, while scant attention is paid to the most crucial weaknesses. For example, one firm went into a completely new and highly risky line of business in order to quickly recoup losses. It forfeited a small fortune in the process and was forced into receivership. Another company introduced a new product that required entirely different marketing procedures. Adherence to the old ways of selling prevented the new offering from becoming profitable.

These examples show two flaws in the strategies pursued in the $F_4$ archetype. The first is that too many risks are taken in making changes that may not be at all critical to success. The second is the incompleteness of the changes. New elements are grafted piecewise onto what is essentially the old strategy, and a rather incongruous and conflicting melange of methods and approaches results. There is not integration of the old and the new, while of course, resources are insufficient to allow wholesale replacement of the old. Ultimately, a bad situation deteriorates still further.
Although it may be secondary in explaining the $F_4$ syndrome, it is interesting to look at the administrative climate. Typically, a sharp division is made between new managers and veterans. The first group has all the power; the second, although nominally left in charge of some rather vital functions, has almost none. In other words, power is centralized. Also, the two groups are rather different in orientation: The new people often have backgrounds in finance and accounting; the veterans are experts in production and marketing. The goals, methods and values of these groups are quite different, so that in a sense, there is a high degree of differentiation in the structure. But the imposed power inequalities, coupled with the lack of effective coordination and integrative devices, allow differentiation to serve as a divisive force rather than as a managerial resource. The new group locks itself away, making decisions without the benefit of advice from those who know best. Moreover, it meddles incessantly in low-level operating matters that it should be leaving to others. There are also problems with information-processing practices. Scanning of markets is minimal, since executives are in too much of a hurry to act and are not sure of what environmental conditions they should be looking at to begin with. The state of management controls is primitive, and even though efforts are being made to implement more of these, the new controls are ineffective. First, there is resistance to them from old-line managers. But perhaps more important, the controls gather only financial data that tell executives what they already know. What is lacking is the qualitative information that reveals which things are going wrong and why, the type of information that is most easily conveyed in meetings and face-to-face contacts among members of different departments. But the conflicts and communication barriers created by the distrust and the power imbalance among new and old managers prevent the generation or change of this kind of information.
APPENDIX THREE

DESCRIPTIONS OF MILLER AND FRIESEN'S ORGANIZATION TRANSITIONS
DESCRIPTIONS OF MACRO TRANSITION STATES

T₁ Fragmentation (3% of the Sample)

The T₁ archetype is given the appellation Fragmentation because it represents a disintegrative phase of corporate history. The subunits of the organization acquire more power, and there is less leadership and direction coming from the top. This leads to a decline in communication among units, each of which has more tendency to become an independent domain paying less attention to integrating its decisions to ensure complementarity. Often the leadership vacuum is caused by the departure of a strong manager, who is replaced by a much less experienced and less forceful team. Because subunits are not used to making top-level strategy, there is more concern for operating matters than for strategic decisions and plans. Strategies all tend to be based on tradition, past practices, and intuition. They are therefore less adaptive, less multiplex and less analytical.

T₂: Entrepreneurial Revitalization (32% of the Sample)

The T₂ transition describes the comprehensive and often dramatic movement away from traditions, conservatism, and rigidity and toward adaptiveness, vigilance, innovation, and diversification. The incentives for change may be very great. Sometimes corporate profitability has declined as a result of the firm's failure to keep its product lines and administrative practices up to par. Products may not be suitable to new competitive conditions and customer needs, and so market share begins to dwindle.

Occasionally the incumbent CEOs recognize the need for change; more frequently this realization comes to their successors. At first, these executives arrogate more power to themselves and attempt to get more information about the sources of the difficulties. They set up new or improved control and information systems and encourage internal communications. Different divisions or functional areas are put in closer touch with one another to deal with the problems. Perhaps most important, there is a concerted effort to track the external environment - to discover the new market forces in order to be able to adapt to them.

Although intelligence activity may stem from a recognition of the need to address vague, undefined difficulties, it seems to result in a more focused conception of what the problems really are. It also serves as a forceful impetus to develop a new set of strategies and to change, often drastically, the nature of the firm's business and its structure.

The greatest changes involve the modes of response to the external environment. Companies become more aggressive and innovative in dealing with competitors and more imaginative in meeting the needs of customers. That is, proactiveness and product-market innovation are increased. Moreover, there is less aversion to taking risks. As a consequence, product lines become broader and more diverse and change more frequently. This increases the administrative complexity of the task of running the firm. It is not surprising, then, that we find more delegation of authority to lower levels, more technocratization, and more extensive and highly developed intelligence systems.

The informal intelligence devices established to more clearly define the problem become formalized and institutionalized. For example, spontaneous scanning procedures developed out of individual initiatives are transformed into a more formalized set of information-gathering and processing programs. Adhoc committees become standing committees, and executive performance appraisals become routine and systematized. These activities usually call for a higher level of expertise than was hitherto available to the firm, and so the level of technocratization (professional staff as a percentage of total employees) increases.

This increased administrative sophistication and awareness of problems seems to result in a more analytical and multiplex decision-making style. In other words, the pressures for change and the administrative (intelligence and structural) devices established to implement change result in a more considered and thorough approach to making key decisions. If the attitudes and devices that prompt or facilitate the initial changes become firmly established, the organization can become more adaptive and sensitive to market forces for a long time.

It is interesting to contemplate how the $T_2$ transition may relate to the particular static archetypes. Certainly, it is possible for many types of firms to pass through each kind of transition. But we feel that there exist some natural polarities that may serve as more frequent starting and ending points for each archetype. For example, since $T_2$ reveals increases in innovation, diversity, centralization, information processing, and
analysis, it seems to represent a movement towards the S₄ archetype - that is, toward the Entrepreneurial firm. The latter is highly centralized, is in the process of constant expansion, innovation, and diversification, and has rather sophisticated intelligence systems. Companies moving from the F₃ Headless Giant, the S₃ Giant Under Fire, or even the F₄ Aftermath toward the S₄ Entrepreneurial firm might all be undergoing the entrepreneurial revitalization of T₂. Power becomes more consolidated under a leader who desires more innovation and diversification but who, at the same time, wants to avoid costly mistakes. So analytical, integrative, and information-processing activities are enhanced to cope with the risk and complexity of the new projects.

The F₃ Headless Giants seem especially in need of entrepreneurial revitalization, since they may be missing precisely what the S₄ firms have the most of: strong leadership, and aggressive and unified product-market strategy, and an information-processing system that effectively controls and integrates the efforts of subunits and division.

T₃: Consolidation (6% of the Sample)

The objective is to conserve resources and to stem losses. Unprofitable products are abandoned and market scope is reduced. This is facilitated by improved cost controls and greater attention to budgeting. Conservatism increases and power disperses as entrepreneurs are replaced by teams and committees.

The T₃ scenario is usually triggered by a perceived need to retrench and consolidate. For example, the firm may have diversified too quickly into several unprofitable areas, or resources may have been taxed owing to over expansion. The decline in profits and the sense that the firm is out of control causes the realization that some sort of change is necessary. For some firms, it is the bankers who become alarmed at the consequences of a rash expansion and acquisition program. For others, shareholders are the instigators of a more conservative policy. Still a third type of organization relies on the natural succession processes to replace an aggressive, entrepreneurial leader with a chief executive who perceives a need for greater conservatism.

Once the entrepreneur is replaced, decision-making power becomes more dispersed throughout the firm. The organization builder is often replaced by a more conservative professional manager or 'inside man'. Sometimes, more than one
executive is needed to replace the entrepreneur, and occasionally, several committees are formed to make decisions that had been the exclusive prerogative of the chief executive.

The new group recognizes the need to slow down and consolidate operations. Often a period of growth and diversification has left the firm with a number of unprofitable subsidiaries or product lines. Managers are aware that internal controls are needed to identify the weak operations, and these are implemented soon after the new managers arrive. Controls increase the complementarity of decisions, since key actions are placed under the scrutiny of multifunctional committees or other bodies, ensuring that plans and actions of different departments do not conflict. Also, numerous staff experts are recruited. Because the emphasis is on becoming more efficient, operations that are not complementary to the main lines of business or are unproductive may be terminated. The intent is to curtail expansion into new product lines or new markets until corporate health has been restored. Thus, the level of product-market innovation usually decreases considerably. New managers are less proactive. They are still learning the business and are more inclined to follow rather than lead competitors. So it is not surprising that the new group of professional managers take fewer risks than the entrepreneurs who preceded them. They are consolidators, not builders. Whereas the entrepreneurs had a conscious and relatively explicit corporate strategy, the new team of executives is less sure of what corporate objectives should be and is too busy attempting to stabilize the company to develop a clear new strategy. Because the policies of expansion and diversification give way to a more placid orientation, strategies become less explicit and less conscious. The placid orientation, strategies become less explicit and less conscious. The emphasis is on short-term measures rather than long-term master plans.

Again there appear to be natural associations between the static archetypes and T3. In particular, the F1 Impulsive firms seem to be much in need of a phase of consolidation. Many have expanded and diversified too rapidly, and their leaders have hoarded too much power and too many tasks. It has become essential to weck out poor products and unprofitable divisions, to recruit a larger and more influential head-office staff, and to allot more decision-making authority to divisional and functional managers. All of this happens during consolidation. Other appropriate consolidating measures that occur in T3 and that should benefit Impulsive firms are boosting intelligence activities and attenuating the level of risk taking. The first change ensures greater awareness of problems and inefficiencies in the diversified operations and allows better control over divisions. The second avoids the
commitment of substantial resources to ventures that the company can no longer afford.

Occasionally, $S_4$ Entrepreneurial firms and $S_5$ Innovative firms might also benefit from a period of consolidation. Both types are so highly centralized that some of their top executives are overloaded with work. Also, the $S_4$ firms may diversify excessively, while the $S_3$ firms tend to perform too much product innovation. In both cases, there may be a need to further delegate power, recruit more executive talent, and consolidate product lines and markets. In the $S_5$ type, there may also be improvements necessary in the intelligence network to provide better data on the environment, and in $S_4$, a boost in intelligence could be useful in the form of more formal control and information systems to monitor and channel divisional activities.

Although $F_1$, $S_4$, and $S_5$ might have a natural and functional tendency to consolidate, the process of consolidation itself may lead firms to become more like the $S_3$ Giant Under Fire, and, in extreme cases, more like the $F_3$ Headless Giant. This can occur as a result of the dispersion of power and the avoidance of risk or innovation. Strictly speaking, the $F_3$ position should not be reached via consolidation from $S_4$ or $S_5$, since this would require a decline in organizational intelligence, something that does not happen during consolidation. But starting from $F_1$, which has a very low level of intelligence, consolidation might lead to $F_3$ because of the decentralization and reduction in risk and innovation. Thus, although the effects of consolidation may often be salutary, this is not always the case. To take the most extreme example, what a debacle it would be if the $F_2$ Stagnant Bureaucracy or the $F_3$ Headless Giant were to consolidate. Stagnation and leaderlessness would be severely aggravated in each case.

$T_4$: Toward Stagnation (16% of the Sample)

A weaker, more conservative group of leaders push the firm towards stagnation. Strategies become unresponsive and vague, as structures become more mechanical. Passivity reigns. Adaptation is neglected, markets are ignored, vigilance declines, and administrative units begin to drift apart.

The $T_4$ transition archetype centres around a change in leadership; bolder, more assertive leaders give way to more passive, conservative ones. Sometimes a change occurs in the personality of the top manager, who growing older, becomes more
content with past practices and is less willing to change the organizations or its product-market orientation to better meet new conditions. More often, however, the T₄ transition is initiated under change of CEOs. New executives take a "wait and see" attitude. Their reaction to their ignorance of the firm and its environment is very different from that of managers presiding over the T₂ or T₃ transitions. Whereas the latter respond by carefully studying the organizations and the administrative task, gathering information wherever possible, the T₄ executives abdicate some of their responsibility and power to those who report to them and are more conservative in their approach to new projects.

The immediate consequence of such an attitudes is diminished control over operations. Departments become more independent. As a result, they are more likely to pursue mutually conflicting policies, since the leadership vacuum reduces the amount of co-ordination and guidance from the top. There is also less exploration of the environment, since the top level of management performs a caretaker role more than a strategic one. Instead of ensuring that the firm is in the right areas of the market by examining emergent trends and opportunities, managers are more likely to handle routine operating problems or crises as they develop. The result is a decrease in adaptiveness and market expertise.

Other interesting aspects of the T₄ archetype are the reduced emphasis on product-market innovation, risk taking, and proactiveness, and the increase in traditions. Again, it appears that the reduced expertise and the growing insecurity or complacency of top management play an important role in boosting conservatism. Insecurity stems from the ignorance of a new CEO; complacency is usually the product of a commitment to past practices by an executive who implemented them and enjoyed their initial success. In either case, the CEO is reluctant to initiate or direct meaningful reorientations of the firm. Normally, since such decisions were made at the top in the past, there is a time lag before divisions take over the innovation and strategy-making initiative. Meanwhile, the firm tends to drift. To the extent that the environment changes, strategies become anachronistic.

As increasingly alienated and independent divisions bear a greater amount of the innovation and strategy-making burden, conflicting decisions and plans become more prevalent. Where the adaptive effort is carried out by lower-level units rather than a central authority, innovations tend to be more piecemeal and incremental. A CEO can decide to enter a radically new market, but a division manager may only be
allowed to "fill out" his product line, and a marketing manager may only modify a product subject to the limitations placed on him by his production counterpart.

A final point of interest is the reduced analysis and multiplexity of strategic decision making. Restricted information processing (less scanning, controls, and communication) may account in part for this. More information might trigger better analysis and broaden perspectives of problems. A dearth of information seems to occasion the reverse. But the issue is more complex than this. In a central office that deals explicitly with strategy-making and corporate reorientation, there is frequently a good deal of thought devoted to the conceptualization and execution of major decisions. In contrast, where a caretaker attitude prevails, most decisions are apt to be of an operating nature and require less intensive study. Unfortunately, this passive, unreflective approach tends to be extended to the occasional major decisions that arise.

The stagnation transition can represent a movement toward the F2 Headless Giant archetype. Weakened or conservative leadership, reduced information processing, declining innovation, and redistribution of power to the divisions are very consistent with the characteristics of F3. Therefore, the progression toward stagnation might be quite a dangerous one. Of course, this need not always be the case. Successful archetypes such as the Entrepreneurial S4 firm or the Adaptive S1B firm might actually benefit from a reduction in the rate of expansion or innovation, and S4 in particular might benefit from greater dispersion of decision-making power. Probably neither firm would benefit, however, from the reduction of information-processing and decision-making rationality that occurs during the move toward stagnation. Only in cases of dramatic risk taking and centralization would the benefits from reducing these excesses more than offset the costs of reduced intelligence.

T5: Toward Centralization, Boldness, and Abandon (14% of the Sample)

The spirit of entrepreneurship grows as innovation, diversification, and expansion take on greater importance. But caution and intelligence activity decline and strategies begin to mirror more closely the personal goals of a powerful leader rather than the realities of the marketplace.

The T5 archetype has its roots in the consolidation of leadership power by an executive or group of executives who have extensive experience with the company.
and to apply less scrutiny to new projects and decisions. This is especially likely to happen if competitors weaken, or if past successes boost resources so much that the firm can more readily dominate its markets.

The movement from the \( S_3 \) Giant to the \( S_4 \) Entrepreneurial archetype may also be reflected by the \( T_3 \) transition. A change in leadership may allow a new group to consolidate power and to reverse the firm's conservative orientation. Here, the emphasis is upon diversification into new markets. A potential danger is that the new group of executives might favour informal \((S_4)\) over formal \((S_3)\) information systems at a time when the expansion and complexification of markets could render the former inadequate.

To summarize, the \( T_3 \) transition can lead to organizational growth and renewal in the hands of a bold cadre of leaders. But it can be taken to extremes, crippling organizational intelligence and overtaxing resources.

**\( T_6: \) Initiation by Fire (6% of the Sample)**

Major tribulations may be suffered by firms that must deal with great and discontinues changes in their environments, particularly when the firms are not used to having to change their methods, structures, and strategies. Environmental dynamism, hostility, and heterogeneity have increased, and some relatively inexperienced managers are trying to cope. They begin to scan their environments to more precisely define the threats, to delegate more power to knowledgeable people, and to innovate more to adapt to the new conditions. Managerial inexperience is evidenced by the spottiness of the adaptive effort. Delegation of operating authority is slow to come about, few improvements are made in internal control and communication systems, and intuitive, short-run tactics preclude the development of a more conscious and integrated strategy. Normally these omissions might not be critical, but here the more challenging environment takes its toll in spite of the firm's efforts.

**\( T_7: \) Maturation (10% of the Sample)**

As firms mature they face more challenging, complex, and diverse environments. They respond by increasing the sophistication of the administrative structure -
establishing profit centres, divisions, co-ordinating committees, and elaborate information systems. This entails decentralization which often makes for a more gradual and cautious adaptive effort.

The $T_1$ archetype represents a maturation of sorts. It heralds the transition to a more professional management approach, often from an entrepreneurial one. As firms grow older and larger, and face more complex environments, there is a greater need to delegate some of the decision-making tasks to functional and lower-level managers, to professionalize and institutionalize the intelligence-gathering and information-processing functions, and to integrate the efforts of decision makers by formal means such as committees and planning sessions. It is not only the organizational growth and development sequence that causes this transformation. The new approach may also be motivated by the ill effects of a period of rapid diversification or a major new-product introduction. Such events often prompt the setting up of new divisions that require a greater degree of autonomy than the more established departments, particularly if the new area of endeavour is very different from the old ones.

The $T_1$ firms are most adept at assuming the mantle of maturity. The formerly dominant CEOs or their replacements recognize the need for major changes in the structure and modus operandi of the firm. This awareness is very prominent, lucid, and compelling, and concerted efforts are devoted to effecting the required transition. A multifaceted plan is adopted to change the organization.

The first change that normally occurs is the boosting of the intelligence system. Whereas managers may have gathered information quite informally on their own, systems and departments are set up to gather certain types of information routinely and to disseminate this information to the appropriate decision makers. Also, formal inventory controls, profit centres, cost-accounting systems and departments are set up to gather certain types of information routinely and to disseminate this information to the appropriate decision makers. Also, formal inventory controls, profit centres, cost-accounting systems, and quality controls are implemented. To improve cross-functional communications, various committees - ad hoc and standing - are established. The elaborated intelligence system is useful given the firm's decentralization and diversification. It helps monitor the new operations and educates the new divisional makers. Another major change that takes place involves the style of decision making. Whereas in the past, entrepreneurs would make bold and intuitive decisions mostly on their own, the decision-making process now becomes
increasingly decentralized and analytical, with divisional or departmental personnel deciding most issues within their sphere of expertise and devoting more time and effort to these tasks. Where issues require a broader perspective, committees are convened so that a variety of viewpoints are brought to bear. This increases the multiplexity of decisions and ensures that actions in different areas are complementary. Also, the interaction among decision makers encourages discussion of overall goals and plans, and, as a result, strategies become more conscious and more clearly defined.

Not all trends in the T_7 archetype have positive connotations. Some of the initiative and leadership of the company is lost as decision makers become more risk-averse. There is less likelihood that the firm will be proactive and beat competitors to the punch in introducing new products and broaching new markets. The routinization and systematization of functions bring bureaucratic momentum, traditions, and resistance to change. Also, the greater tendency to subject decisions or proposed courses of action to a forum introduces a measure of conservatism, since managers must come prepared to defend their actions.

The T_7 transition leads in the direction of the S_3 Giant archetype. It represents the movement toward a more divisionalised decentralized, and well-integrated organization. S_3 can be reached via T_7 as S_{IA} or S_{IB} adaptive firms become more conservative and differentiated, or as S_2 or S_3 firms become more decentralized and diversified while developing their information-processing apparatus. It is a common transition to make for firms that have become more diversified and complex and must move toward a divisional structure. Thus we should find that S_3 is reached from many successful archetypes by moving through T_7.

The types of firms that might benefit most from the T_7 transition are overcentralized, too aggressive, excessively diversified for their administrative structure, and inadequately integrated. The F_1 Impulsive firms fits this description. Those attempting to effect a turnaround strategy for the Impulsive firm might do well to study the T_7 transition.

T_8 Troubleshooting (6% of the Sample)

Troubleshooting often occurs after a firm has undergone a major shock - a financial loss, a sharp reduction in sales, or an aborted take-over bid. The emphasis is on
finding out what went wrong and why. A top executive or committee is accorded much power to carry out its investigation and to take preliminary corrective action.

The period of troubleshooting is somewhat similar to that of consolidation, but there are major differences. During the former period, there is a greater increase in the centralization of power by the chief executive and a more pronounced improvement in intelligence effort devoted to discovering just what is wrong with the firm. Whereas the consolidators escalate their fire fighting activity, trouble-shooters, under the direction of a strong leader, begin to work harder to uncover the roots of the difficulties. This is done by doing more scanning, priming control systems, and improving internal communications. Interestingly, delegation of authority for operating matters is reduced, usually because middle managers cannot be fully trusted to discharge their functions competently. Decision making becomes more analytical, and the resultant decisions are better unified and much more complementary. They also tend to take into account more viewpoints and considerations than was true in the past. Risk taking, innovation, and proactiveness are reduced, as in the case of consolidation, and strategies are left vague pending the outcome of the investigation.

$T_8$ seems to be a general-purpose transition for firms that find themselves in trouble because of a lack of leadership, poorly conceived innovations, over expansion, or failing divisions or product lines. We should thus find troubleshooting occurring from time to time in many static archetypes, particularly those that are diversified, innovative, decentralized, or lacking in controls. The $F_3$ Headless firms might benefit from the emphasis on more centralized leadership, better controls, and integration. There might be occasions when excessive innovation in $S_{1B}$ Adaptive firms requires a similar transition.

$T_9$: Formalization and Stability (8% of the Sample)

There is very little change evidenced in this last archetype. Existing strategies and procedures become formalized and standardized, so that operating authority can be delegated further. Managers become more experienced with the stable organizational practices and can therefore be trusted to perform in line with expectations. Also, concrete standards can be set up to discover and correct deviations in managerial behaviour because of the predictability of the operations. past and mounting success and the resultant build-up in resources are in part responsible for the greater
reluctance to change and to take risks. The more enduring terms in office of the top executives may be another reason for the continuity.

It should be remembered that since we are dealing with transition scores along the variables, the periods may be very diverse in their raw scores. That is, firms that are bold, centralized, or intuitive can undergo the very same transitions as those that are conservative, decentralized, or analytical.
APPENDIX FOUR

MICRO-CONFIGURATION QUESTIONNAIRE
MICRO-CONFIGURATIONS QUESTIONNAIRE

General Question
Could you please briefly explain the work that is done in the department?

Task Complexity/Uncertainty
Task uncertainty refers to the degree to which there is a known procedure to follow in doing the task. This variable is likely to score highly when there is incomplete technical knowledge about how to accomplish the task, either because the task is unpredictable or a great deal of thought needs to go into performing it. It will score low if the task is well understood and easy to perform.

Questions:
To what extent is there a clearly defined body of knowledge or subject matter that can guide you/the members of your department doing your work?

Is there an understandable sequence of steps that workers can follow doing their work?

During the course of their work do they often come across specific difficult problems that they don't know how to solve?

If there is something they don't understand in the work to what extent can they go to someone else for an answer to the problem?
On average how long is it before members of the department know whether their work effort has been successful?

**Task Variability and Workload Uncertainty**
This refers to the number of different tasks to be performed and the degree of knowledge about when they will arrive. This variable is likely to be scored highly when the work unit's external environment is complex and changing, or when a large number of exceptions are encountered in the job making it hard for guidelines to include all of the possible variations.

**Questions**
How many different sorts of tasks do people in this department normally encounter in their working day?

To what extent are the methods of carrying out different tasks the same? Do workers perform repetitive activities?

Would you say the work of the department is routine?

Do workers often have to stop doing one task for reasons out of their control and start doing another?

**Interdependence**
Interdependence is the degree to which an individual's output cannot be achieved alone. This is present when workers must share skills, equipment and materials to achieve the desired output. From figure one overleaf, the different types of interdependency can be seen. The amount of work falling into the different types of interdependency will effect the type of co-ordination needed in the unit.

**Questions**
Please look at the diagram overleaf to what extent does the work flowing through the department follow any of these pictures?
DIFFERENT TYPES OF INTERDEPENDENCE

(1) POOLED INTERDEPENDENCE

(2) SEQUENTIAL INTERDEPENDENCE

(3) RECIPROCAL INTERDEPENDENCE

(4) TEAM INTERDEPENDENCE
Subenvironment Certainty
The certainty of the subenvironment is defined in terms of the dynamism of the subenvironment, the certainty of information about environmental conditions and the time span needed for feedback from the environment. If the environment is relatively stable, there is information about it and the span of time for feedback about how the task has been performed is relatively short then the environment can be classified as relatively certain. Certainty may also be a factor of whether the department spans organizational boundaries or not, departments that have dealings with the outside world are often less certain.

Questions
How dynamic would you say the environment with which you deal with is?

To what extent have there been major modifications in the following activities over the last 5 years?
(a) in your product line?
(b) in your sales and marketing techniques?
(c) in your manufacturing facilities?
(d) in the amount and direction of your research effort?
(e) in the background, training, and technical skills of your employees?

Do you have good information about the environment?

What types of information that you would find useful are you unable to get?

Do you get feedback on the work of the department from the environment? For example, the sales department may be able to determine at the end of each day how successful the selling effort was by examining the total sales reported by salesmen in that day. On the other hand, they may have to wait until the end of the month if sales people are working on much larger projects.

Size
This variable measures the total number of people working in the work unit or department involved in the primary task of that department. It does not include support or administration staff.

Questions
How many people make up the department?

How many people report directly to you?

Focus
This variable relates to whether the department is a functional one such as a sales department or whether it is a product one, whereby members of the department perform different functions and are organised according to which part of the market they serve.
**Unit Structure**
Group structure is a complex variable that can not be measured solely according to one aspect, it will be considered in terms of the degree of standardization, specialization, spans of control and the level of discretion (centralization of authority).

**Standardization**
This variable is a measure of the extent to which rules, policies and procedures have been formalized and the amount of detail in them. Standardization is high when rules and procedures are codified and specified leaving little room for discretion.

**Questions**
How many written rules and procedures exist for doing the task?

How precisely do these rules and procedures specify how major tasks are to be done?

To what extent are standard operating used?

**Specialization**
Specialisation refers to the number of different jobs and tasks delegated to an individual work unit and the degree of functional specialism within the unit. If there is a high degree of interchangeability of jobs within the unit then specialisation is low.

**Questions**
Do people in this department have definite roles or are they likely to move around jobs as and when necessary?

Are the people in this department specialists or are they multi skilled?

How many different sorts of tasks are delegated to the department? Do they generally call for the same skills?

**Discretion**
This is a measure of the extent to which workers are able to make decisions regarding:

a) how the work is to be done
b) how exceptions are to be handled
c) how well tasks are performed

**Questions**
How much discretion are workers allowed as to how they perform their work? and what order they perform tasks in?

How much discretion is allowed for workers to decide how to handle exceptions or do they immediately report to a superior on finding an exception?
How much discretion are workers allowed to judge the necessary quality of the work or does this have to be checked with a superior?

*Span of Control*
This is a measure of the average number of subordinates reporting to a supervisor. The fewer subordinates there are the smaller the span of control.

*Questions*
How many workers report directly to you?

How many hierarchical levels are there in the department?

If more than two levels exist, how many workers report to those who report to you?

*Skills / Professionalism*
This is a measure of the number of skills and qualifications held by the members of the department. It should take into account the education of the workers, the length of job entry training and the amount of on the job training given.

*Questions*
What is the average skill level of members of the department?

Is it necessary for members of the department to be members of a professional body?

When a new person begins work in this department how long a period of orientation and training do they receive directly related to the tasks in the unit?

*Job Design*
This variable refers to the individual jobs of the people in the department in terms of their variety, the extent to which workers perform a whole task, task significance, autonomy, and the level of feedback. It is suggested (by Hackman and Oldham) that when these factors are high there will be a greater degree of satisfaction and motivating potential in the work.

*Questions*
To what extent do the jobs of people in the department involve doing a whole piece of work i.e. are the jobs a complete piece of work that have an obvious beginning and an end or are they only a small part of the overall piece of work which is finished by other people and machines?

How much variety is there in the work? Are workers required to use a variety of skills and talents?

In general how significant is the work? Are the results of the work recognised as important by the organisation?
To what extent do managers and co-workers let each other know how well they are doing on the job?

To what extent does performance of the job itself give workers information about their performance?

Controls
Two different types of control are being measured, behavioural and output. Behavioural control measures the extent to which workers in the department are subject to rules and regulations governing how they do their work, or that there behaviour come under close supervision from their supervisor. Output controls, on the other hand, considers the extent to which workers are monitored according to the end product of their work rather than how they achieve it. In other words, behavioural control concentrates on the means while output control concentrates on the ends.

Questions
Are the workers within the department subject to behaviour controls such as rules and regulations governing how they do their work or output controls such as targets that they are expected to meet?

How strict are these controls?

Performance Measures
Performance measures are the measures that are taken about the output of the department. What aspects of performance are reported and considered to be important? Performance measures give management information as to how the organisation is performing. These measures can also be used to motivate workers.

Questions
How does the organisation measure the work of the department?

Are the measures on the department purely financial or are there qualitative measures as well - which are the most important?

How often is individual performance reviewed? Do you have performance appraisals?

If performance appraisals are done are they used to set goals and objectives for the next period or are they purely for assessing past performance?

If no appraisal is carried out, how do you know if you have done good work?

Reward Mechanisms
Reward mechanisms are methods used by the organisation to compensate and motivate their workers. There are various types of methods including the
remuneration policy, promotion, and praise. What different methods of reward are used in the work-unit?

Questions
Are rewards such as a pay rise or promotion in this organisation contingent upon having worked well?

How are workers in the department paid? salaried, waged

Does the department operate any sort of incentive payment or bonus scheme? If so what does the bonus reward?

Is the organisation regarded as being a good payer by its employees?

Training
Training can be off the job courses or on the job planned work experience. Both the availability and type of training will be considered.

Questions
Is training widely available in the department?

How much training is given on commencement of a job in this department?

What sort of training is given - Is it job related?

Are workers in this department given enough training in order to do their jobs properly?

Does the firm help workers to develop and broaden their skills?

When training does take place is it of a high quality?

Supervisory style
Supervisory style looks at the decision making and management style of the first line supervisor. This includes the amount of participation allowed in supervisory decision making and the general accessibility of the supervisor.

Questions
When an important matter comes up that concerns the workers in the department do you seek their ideas before making a decision?

Do you generally accept the opinions of the department in decisions about job related matters?

Do the workers get any opportunity to participate in supervisory decisions?
Do members of the department often make suggestions for improvements to the work process?

**Goals**
Explicit departmental goals will be considered in terms of their clarity and the extent to which people understand them and are committed to them. Implicit goals are those which are not stated but which can be very important to the workers in the department.

**Questions**
What are the department's main goals or objectives?

Are departmental goals clear?

Are they realistic?

Are they challenging?

Are they accepted by everyone?
APPENDIX FIVE

INTEGRATION MECHANISMS QUESTIONNAIRE
INTEGRATION MECHANISMS QUESTIONNAIRE

How is the work between departments co-ordinated?

How does the company make sure that all of the departments are working together?
To what extent are the following mechanisms used to ensure unity of purpose?

To what extent and how successfully are the following mechanisms used?

1. Management hierarchy
Perhaps the most common solution to solving an integration problem among two or more work units has been to have them report to the same supervisor who can see to it that their activities are properly integrated by facilitating communication, resolving conflicts and so on.

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2. Staff
By giving the line managers assistants or functional specialists it is possible to increase the amount of information that position in the hierarchy can process, the number of decisions it can make and the amount of conflict it can resolve. This can allow line managers to play a more effective integrating role.

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3. Rules and procedures.
When decision situations regularly arise that effect two or more parts of an organisation it is sometimes possible to establish rules or procedures regarding how they should be handled. Thus ensuring that actions taken in one part of the organisation do not conflict with those taken in another.

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4. Goals and plans
Goals and plans can serve a similar function to rules and procedures. Once established they allow two or more parts of an organisation to operate relatively independently and yet have their outputs integrated. For example, by setting exact specifications for modifying a product and by determining timetables for its production and introduction dates the marketing, engineering and manufacturing departments can work independently on their part of the new product development task and at the same time be assured that it will fit with the other parts.

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5. Committees and task forces
These include the use of meetings between members of different functions and joint problem solving teams.

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6. Integrating roles
In some circumstances organisations may create special integrating roles or departments. Typically the integrator does not have direct authority over the personnel he or she co-ordinates. Examples of integrating roles include product managers and project managers.

7. Formal authority
The level of centralisation will have an influence on the level of integration. To facilitate integration authority should be distributed so that people or groups who have information relevant for making integrating decisions also have the power to make the decisions.

8. Measurement and reward systems
Measurement and reward systems are often used as integrating devices. In such cases systems are set up to measure the variables relating to the successful integration of certain work units. This information is then sent to those decision makers who have the most control over the successful integration of these work units and their rewards are made partially contingent on their success at achieving it.

9. Selection and development systems
Selection and development systems can serve as integrating devices in two different ways. First they can provide the organisation with individuals who are capable of effectively playing key integrating roles. Second by providing formal training programmes, they can help build better relationships between individuals or groups whose work units require integration.

10. Physical setting
Because physical proximity makes communication easier, some organisations design their offices conference areas and open space with an eye toward critical integration needs.
11. Departmentalization
A final way that managers can solve integration problems is to redesign work unit boundaries so as to include the required interdependence within the new work unit boundaries where it can easily be managed. One of the most common examples of this is an organisation which switches from an functional to a product structure.

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APPENDIX SIX

LETTER ASKING COMPANIES TO PARTICIPATE
Mr A. N. Other
Managing Director
Company X Ltd.
Brightside Lane
East Midlands
LE12 1XY

Dear sir,

At Loughborough University, we are undertaking research into manufacturing organisation and would like to offer you the opportunity to take part. The objective of the study, which is being carried out in 50 different manufacturing enterprises, is to determine your organisation's current state.

Having completed our one day investigation at your firm, we would present you with a confidential report entitled

**Does your organisation get a clean bill of health?**

This document will contain an assessment of your organisation (with an identification of its inherent strengths and weaknesses); it will look at the compatibility of your existing manufacturing and accounting systems and will determine the current level of integration. NO CHARGE will be levied for this analysis.

The study will entail a one day visit from 2/3 members of the university's research staff each of whom will be looking at the organisation from a different viewpoint. Interviews of approximately one hour will need to be undertaken with at least one senior manager and several functional managers.

The results of the study will be totally confidential. The information gathered from all 50 visits will be used to make general inferences about manufacturing organisations and no specific reference to any single firm will be used in published material without prior permission.

Yours faithfully,

Professor N. D. Burns
APPENDIX SEVEN

MICRO-CONFIGURATION SCORING MECHANISM
SCORES FOR VARIABLES

TASK COMPLEXITY AND UNCERTAINTY

1 = Task is completely understood, there is a simple sequence of steps which is always followed to the letter when performing the task. There are very few, if any, exceptions when performing the task. If there are any then the supervisor is called immediately.

2 = Task is well understood, there is an easy sequence of steps to be followed. Occasionally very minor exceptions may occur which the person performing the task will generally be able to sort out although the supervisor will be on hand should he be needed.

3 = Most aspects of the task are well understood, and in the majority of cases a sequence of steps can be followed. Rules do exist but these do not cover every eventuality and workers are expected to think for themselves if any exceptions occur.

4 = The task is sometimes quite complex, although there are no fixed rules and procedures, there are a set of guide-lines which can help in the performance of the task.

5 = The task is quite complex, guide-lines are provided but these leave a lot to the knowledge and experience of the worker. There is not really a sequence of steps to be followed in every case.

6 = A complex and uncertain task, there are no rules or guide-lines to be followed. The job requires a lot of brain work from the workers. If there really is a serious problem that they cannot work out the answer to then they can go elsewhere to find the answer.

7 = The job is extremely complex and uncertain, workers are given no guidance at all they have to think through the answers themselves. As they are the specialists in the area, if they can't find the answer it is unlikely anybody else will so they just have to give it more thought.

4. TASK VARIABILITY AND WORK FLOW UNCERTAINTY

1 = Workers do the same task everyday, they have the same methods for doing each task, the work is routine and continuous. Workers know what they will be doing all day.

2 = Workers do the same task ever day, occasionally they may have to use slightly different methods to do the task, the work is routine. It easy to plan what will be done in the day and rarely is the plan wrong.
3 = Workers do a few different tasks every day, they generally follow the same methods to do each and occasionally they have to stop doing one task and start doing another for reasons out of their control, although generally they know what order their work will come in and can plan what they will be doing that day.

4 = Workers do a few different tasks every day. Although there is a routine element which makes up over half of their work, they can generally plan which tasks are going to arrive when and know what they will be doing for that day.

5 = Workers do quite a few different tasks everyday, there is a routine element to their work which accounts for about 25% of their time. They frequently have to use different methods for dealing with different tasks.

6 = Workers do many different tasks everyday, the routine element of their job is between 10 and 25%. they often have to stop doing one thing and start doing another, using different methods.

7 = Workers have many different tasks they can perform, they have no say as to when these tasks will arrive and thus are constantly changing tasks the routine element of the job accounts for below 10% of the time.

5. INTERDEPENDENCE

1. low pooled
2. low reciprocal
3. low sequential
4. medium sequential
5. medium reciprocal
6. medium team
7. high sequential
8. high reciprocal
9. high team
DIFFERENT TYPES OF INTERDEPENDENCE

(1) POOLED INTERDEPENDENCE

(2) SEQUENTIAL INTERDEPENDENCE

(3) RECIPROCAL INTERDEPENDENCE

(4) TEAM INTERDEPENDENCE
SUBENVIRONMENT CERTAINTY

Dynamism in the subenvironment

1. The subenvironment faced by this department is completely stable, there have been few, if any changes in the recent past and none are expected.

2 = The rate of change of the subenvironment is very low, this subenvironment is very stable although small changes may be expected.

3 = The rate of change in the subenvironment is fairly low, changes happen rarely and can easily be foreseen.

4 = The rate of change in the subenvironment is moderate, changes do occur occasionally, but the department is easily able to keep up with these changes.

5 = The rate of change in the subenvironment is moderate, the department is constantly striving to keep up with new developments.

6 = The subenvironment faced by the department is relatively dynamic, changes are commonly occurring which might antiquate present methods and products.

7 = The department operates in an extremely dynamic subenvironment, new developments are constantly occurring, making it very difficult for the department to keep up with what is going on.

The certainty of the information

1 = The information held about the subenvironment is very uncertain, the department has no definite information about the subenvironment. There is much reliance on intuition.

2 = There is very little certain information regarding the subenvironment.

3 = There is little certain information regarding the subenvironment.

4 = The information regarding the subenvironment can be viewed as reasonably certain.

5 = The certainty of information regarding the subenvironment is reasonably high.

6 = The certainty of information regarding the subenvironment is high, the department has good knowledge of the subenvironment.

7 = The certainty of the information regarding the subenvironment at any given time is extremely high. The department has complete knowledge of the subenvironment.
Time span of definitive feedback

1 = Feedback from the subenvironment regarding decisions made and actions taken is almost automatic, within a day.

2 = Feedback from the subenvironment is very quick, generally about a day.

3 = Feedback from the environment is quick, generally within a week.

4 = Feedback from the subenvironment is relatively quick although it may sometimes take longer, between a week and a month.

5 = Feedback from the environment is relatively slow, it can be anything up to six months before any feedback is given.

6 = Feedback from the environment is very slow. It may take up to a year before it is possible to see the effects of decisions made.

7 = There is very little feedback from the environment, only once a project is finished is it possible to evaluate the departments success in coping with its subenvironment. This can up to three years.

SIZE

1 = 1-7
2 = 7-14
3 = 15-21
4 = 21-28
5 = 28-42
6 = 43-49
7 = 50+

FOCUS

1 = function
2 = product

DEPARTMENTAL STRUCTURE

Standardization

1 = There are no rules and procedures for this department and people are given almost total discretion to choose how they go about performing the task.

2 = Rules and procedures are rarely used in this department. Only if something out of the ordinary happens might they use the procedures to see if they give any guidance. workers are allowed a lot of discretion and are expected to use their own judgement.
3 = The rules and procedures are loose, allowing for greater discretion by the worker.

4 = Rules policies and procedures are in existence. They are used more as guide-lines than as strict operating rules. There is a certain amount of discretion allowed to the worker.

5 = Although rules policies and procedures are in existence specifying how to do the tasks, they are not always followed to the book. There is room for a little discretion in following operating procedures.

6 = Rules policies and procedures are formalised, specifying how to do a task but not in great detail, standard operating procedures are generally followed.

7 = Rules policies and procedures are completely formalised, they specify exactly how to do a task in great detail. Standard operating procedures are followed by everyone in the department.

Specialisation

1 = Each member of the department is multi-skilled, they are not given definite roles but move from job to job.

2 = Members of the department are able to switch roles and jobs are regularly rotated across groups of workers as well as within groups of workers.

3 = Members of the department are able to switch roles, and jobs are regularly rotated within groups of workers, but not across different groups.

4 = Each member of the department can do most of the jobs that are done by other members of the same grade and will switch tasks either as the need arises, or out of choice.

5 = Each member of the department can do a few of the jobs done by other members and workers will switch jobs when necessary.

6 = Members of the department all have specific skills although most workers can do one other person's job if necessary. They only have to do this when someone is absent.

7 = Each member of the department has specific skills which means that they cannot change jobs.

Discretion

1 = Workers in this department are allowed virtually no discretion, they do as their supervisor instructs them, or follow the rules and regulations which strictly lay out task procedure. Authority is completely centralised.
2 = Workers in the department are allowed little discretion as to how they do the work although they are given some discretion as to what order to perform it in.

3 = Workers in the department are allowed some discretion as to when they perform the work and also allowed to judge the quality of their own work, only occasionally having to check this with their supervisor.

4 = Workers in the department are allowed discretion as to what order they perform the work and the quality of the work and also some discretion as to how to handle exceptions.

5 = Workers in the department are allowed quite a lot of discretion over all aspects of their job.

6 = Workers in the department are allowed a great deal of discretion over most aspects of the job.

7 = Workers in the department are allowed total discretion. Authority is completely decentralised.
Span of Control

1 = Very narrow spans of control (1 - 3)
2 = Narrow spans of control (4 - 6)
3 = Quite narrow spans of control (7 - 10)
4 = Moderate spans of control (10 - 14)
5 = Quite wide spans of control (15 - 19)
6 = Wide spans of control (20 - 24)
7 = Very wide spans of control (25+)

SKILLS / PROFESSIONALISM

1 = The average skill level is low, no qualifications required and little training is carried out.
2 = The average skill level is low to medium, there are no qualification requirements, some training will be given upon starting the job.
3 = The average skill level is medium, there is a qualification that can be gained for doing this job but it is not essential. A week or more training is given when starting this work in this department.
4 = The average skill level is moderate, entry requirements at GCE level or above, training is ongoing during the first few months in the job.
5 = Skill levels are quite high entry requirements of BTech or above, a relevant qualification is necessary to do the job. Membership of a professional body may be available but is not generally required.
6 = Skill levels are high degree or above is an entry requirement, training is ongoing and membership of a professional body may be necessary for career progression.
7. Skill levels are very high, entry requirements degree or above plus professional qualification (there may be some people working towards this professional qualification in the department). Training is continuous and can take a number of years.
9. JOB DESIGN

Degree to which each person performs a whole task

1 = Each person performs only a very small part of the overall task of the department, they do not see the finished product of the group.

2 = Workers in the department generally each perform a small part of the whole task of the department.

3 = Although workers in the department do not generally perform the whole task, they do perform a significant part of it and will be able to see their contribution to the whole.

4 = Each worker in the department will be called upon to sometimes do whole tasks and sometimes perform part of a task depending on their experience. They will spend the majority of their time doing smaller parts of jobs.

5 = Each person in the department will generally be called upon to perform the whole task, in cases where the task is quite small and also parts of larger tasks. They will almost always be able to see their contribution to the whole.

6 = Each person in the department generally performs a whole task from start (when the work enters the department) to finish (when the work leaves the department).

7 = Each person working in the department always performs a whole task which they see through from the start (entering the department) through to the finish (leaving the department).

Task variety

1 = Very low, workers always perform the same task.

2 = Low, workers generally perform the same task, although they may occasionally be called upon to perform different tasks.

3 = Quite low, workers perform a very small range of tasks. These are unlikely to differ very much.

4 = Moderate, workers perform a reasonable range of tasks.

5 = Quite high, workers perform quite a large range of tasks. Some of these may be quite different from others, requiring slightly different skills.

6 = High, workers perform a very large range of tasks. Many of these are different, requiring different types of skills.

7 = Very high, workers are always being called upon to perform different tasks, requiring completely different skills.
Task Significance

1 = Task is extremely low in significance, it is not considered to be of any importance to the overall success of the company.

2 = Task is very low in significance. People performing this function are often forgotten. There is very little career progression.

3 = Task is low in significance. This function is often undervalued by the company.

4 = Task is of medium significance. Although it is recognised that the task is important, it is not viewed as the most important function in the company.

5 = Task is of quite high significance. People performing this function are held in reasonable esteem. It is recognised that this task has an important role to play in the success of the business, however it is sometimes overlooked.

6 = Task is of high significance. People performing this function are generally seen as important. The task is viewed as one of the most important to the overall success of the company.

7 = Task is of very high significance. It is commonly viewed as the most important function in the company.

Feedback about the job

1 = No feedback is available from either the job itself or co-workers.

2 = Very little feedback is available from the job but some feedback is given by co-workers.

3 = Some feedback is available from the job but very little from co-workers.

4 = Moderate feedback is available from both the job and co-workers.

5 = Quite good feedback is available from the job but none from co-workers.

6 = Good feedback from co-workers but none from the job.

7 = Good feedback from the job and from co-workers.

Autonomy

1 = No autonomy. Workers are highly interdependent and can make no decisions alone.

2 = Very little autonomy. Workers can make very few decisions about their work as other workers depend upon them. They will have to check almost all decisions with a supervisor.
3 = Little autonomy. Workers operate as part of a team. Although the team may have some autonomy to make decisions, individual workers do not. Therefore, they must check any decisions with other team members.

4 = Moderate autonomy. Workers spend some of their time working alone and some as part of a team. They will be able to organize and make decisions about some aspects of their work, particularly the more routine aspects but they will have to check with supervisors or other team members about other aspects.

5 = Quite high autonomy. Workers generally work alone and on a day to day basis they will organize their own work. However, as other people depend upon their output, they will be given targets to achieve and will be monitored on a weekly basis.

6 = High autonomy. Workers work alone with very little supervision and are responsible for organizing most aspects of their work. They will be monitored, however this will be over long time periods.

7 = Total autonomy. Workers operate alone with no supervision and are responsible for organizing all aspects of their own work.

PERFORMANCE MEASURES (Differentiating)

1 = There is no specific operational measure upon the department.

2 = The measures are not very differentiating the measure is only marginally under the control of workers from that function.

3 = The measures in use are not really differentiating, although partially under the control of the department, they can be effected by other external factors.

4 = The measure is differentiating, it is easy to measure and is felt to be generally under the control of workers in the department.

5 = The majority of measures are well related to the tasks performed in the function.

6 = Very differentiating, measures relate almost totally to the function performed with little consideration of other functions.

7 = Totally differentiated, performance measures relate solely to operational objectives of that function.

PERFORMANCE MEASURES (Integrating)

1 = The performance measures, if they exist, are totally unrelated to the needs of other departments and the business objectives.

2 = Performance measures do exist however they are unrelated to strategy and the needs of other functions.
3 = The performance measures are not directly related to the strategy of the organization but are standard across different functions.

4 = The performance measures are moderately integrating, in that everybody knows what the prime measures are, however there is some disagreement as to whether the right things are being measured.

5 = The performance measures are directly related to the strategy of the organization but do not really take the interdependencies of other functions into account.

6 = The performance measures are directly related to the strategy of the firm and take into account the interdependencies of other functions.

7 = The performance measures are totally aligned to the business objectives and promote integration throughout the organization.

**CONTROLS**

1 = There are no controls used in the department.

2 = Loose behavioural controls are used in the department.

3 = Loose output controls are used in the department.

4 = A mixture of behavioural and output controls used, these are quite loose.

5 = Strict behavioural controls are used in the department.

6 = Strict output controls are used in the department.

7 = A mixture of behavioural and output controls used, they are fairly strict.
REWARD MECHANISMS

1 = Rewards are directly dependent on individual performance measured in narrow operational (differentiating terms).

2 = Rewards are directly linked to individual performance, measured in wider terms relating to business objectives (integrating).

3 = Rewards are indirectly dependent on individual performance, e.g. through yearly salary review.

4 = Rewards are directly dependent on departmental performance measured narrow operational (differentiating) terms.

5 = Rewards are dependent on departmental performance measured in wider terms relating to business objectives (integrating).

6 = Rewards are directly linked to organization performance.

7 = Rewards are unrelated to performance.

14. TRAINING

1 = No training is given.

2 = Very little training is given all at the beginning upon taking the post.

3 = There is little training but some job related training will be available to workers in the department.

4 = There is quite a lot of training available, mostly job related.

5 = There is quite a lot of training available, both job related and developmental.

6 = There is a good deal of training available to help workers in their current jobs and develop new skills to aid their career progression.

7 = There is the opportunity for a great deal of training if the worker wants it, both job related, training for career progression and also courses which may not be of immediately obvious use but are thought to develop the person.

MANAGEMENT STYLE

1 = Systematized, autocratic management style.

2 = Systematized 'benevolent dictator' approach.
3 = Discretionary, workers are consulted but the supervisor will take any major decisions alone.

4 = Discretionary, consultation is allowed on most decisions affecting the workers, suggestions from the workers are generally welcomed.

5 = Developmental, workers given increased decision making power, supervisor acts more in an advisory capacity, although he will still be responsible for the final decisions.

6 = Developmental, workers are allowed to make even the more major decisions with advice from supervisors only when requested.

7 = Open, all are decisions made by workers.

15. GOALS

1 = One goal overrides all others. It is very clear, emphasizing differentiating factors, i.e. relating to narrow operating objectives of the department.

2 = A few goals exist, they are all fairly clear emphasizing narrow operating objectives of the department.

3 = Differentiating goals exist, relating to operating objectives but derived from the company's vision.

4 = Short term goals relating to narrow operating objectives are in place along with longer term goals relating more to business objectives.

5 = Goals are generally long term but they are fairly clear emphasizing integrating factors within the company.

6 = Goals are very clear emphasizing integrating factors, i.e. related to business objectives of the firm.

7 = No specific goal for the department, all members work to the company's stated mission.