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**Citation:** DANI, S., BACKHOUSE, C.J. and BURNS, N.D., 2004. Application of transactional analysis in supply chain networks: a potential holonic mediating tool. Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture, 218(5), pp. 571-580.

### **Additional Information:**

- This article has been published in the journal, Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture [© PEP]. The definitive version is available at: <http://journals.pepublishing.com/content/119784>

**Metadata Record:** <https://dspace.lboro.ac.uk/2134/4566>

**Version:** Published

**Publisher:** © IMechE / Professional Engineering Publishing

Please cite the published version.

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# Application of transactional analysis in supply chain networks: a potential holonic mediating tool

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**Abstract:** The aim of the research detailed in this paper is to model and ultimately to improve the relationships that occur between individuals transacting across organization boundaries in supply chain networks and/or virtual partnerships. Opportunistic behaviour and/or repetitive patterns of behavioural actions, resulting in gamesmanship, are explored to determine whether, under certain situations, the behaviours lead to win-lose situations and reduced trust. Transactional analysis (TA) is used to model games, which have been identified and observed in collaborating industrial partners. The experiments carried out to date have led to the formation of a preliminary relationship model which can be used, firstly, to identify correlations to the established library of TA games and hence, secondly, to investigate methods of mitigating the effect of some of the more negative form of games. It is proposed that this technique can be used as a mediating tool within holonic manufacturing systems or, at the ultimate, result in the establishment of relationship holons that could establish and maintain standardized co-operative patterns of behaviour between interacting partners, or holons, in the supply chain.

**Keywords:** transactional analysis, supply chain networks, organization boundaries, virtual partnerships, mediating tool, holonic manufacturing systems

## 1 INTRODUCTION

Within any supply chain network, individual interactions often suffer from the problem of 'local optimization' at the expense of overall system optimization. Within holonic manufacturing systems where supportive collaboration between interacting holons is a fundamental requirement, such 'local optimization' is clearly counterproductive. The research presented in this paper focuses on interactions at the individual level in order to determine the nature of the relationships between collaborating individuals who co-operate across company boundaries within networks of companies. It was hypothesized that the quality of the relationships between these individuals has a fundamental effect upon business success. This is based on the recognition that in these relationships there is a great potential for psychological behaviour to occur that can result in one business partner winning in a sensitive problem situation while another loses. The initial work concentrated on assessing whether this form of win-lose behaviour does

occur, under what particular circumstances, what influences it and whether the approach based on transactional analysis (TA) can be used as an effective tool for modelling and explaining the behaviour. The aim is to raise understanding of relationship issues in order, firstly, to aid management in managing relationships to achieve mutual benefit and, secondly, to suggest a route to the establishment of relationship holons whose function would be to establish and monitor behavioural patterns for business relationships [1, 2].

## 2 RESEARCH CONTEXT

All businesses have complex internal networks of relationships between individuals and groups and at different levels in the organization. They also have partnerships and relationships that extend beyond the boundaries of the company with regulatory agencies, employment agencies, customers, suppliers and partners. With many of the regulatory agencies the business has relatively little power and it has to abide by the rules that are defined. However, with other collaborators and sometimes with customers the business exercises power by defining the rules of partnership in its favour

*The MS was received on 19 June 2003 and was accepted after revision for publication on 18 February 2004.*

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and sometimes by controlling the purchasing behaviour of customers by, for example, a 'lock-in' strategy. The ultimate aim of the business is always to maximize power within the supply network.

## 2.1 Power in the supply network

The issue of power in supply networks has been explored by Cox [3], Cox *et al.* [4], Jablin *et al.* [5], Conrad [6] and Pfeffer [7], among many others. Dahl's [8] definition of power is the capacity of actor A to get actor B to do something that actor B would probably not do—if not influenced to do so. According to Cox, the buyer is dominant when the utility and scarcity of the buyer's resources relevant to the supplier are high. When this situation is reversed and the utility and scarcity of the supplier's resources relevant to the buyer are low, then the supplier takes a dominant role. In Cox's view, wielding power is not a negative process but an essential element of strategy and planning. All firms attempt to frame their relationships with outside bodies to their own advantage. This advantage is designed to maximize their own revenue and to keep competitors out. According to Teece [9], who describes the resource based view of business, power can be established if the business has some advantage that is difficult for others to imitate but is much in need. This could be access to a key resource or a competence in some technology [10]. Having and wielding power do not necessarily have negative connotations for others in the relationship. It is really about how the business uses its power. All companies exist in a variety of relationships some where they do have dominant power and many where they do not.

The issue of power is usually accepted as a natural element of collaboration and many companies accept reasonable rules and conditions applied by their more larger and powerful collaborator. However, the situation becomes difficult if power is applied in an inappropriate manner. In such circumstances, less dominant partners stand to lose a considerable amount if they cannot influence the situation. An example for the potential inappropriate application of power would be where a consignment of goods has been received but is now no longer required by the receiving company. If the receiving company is dominant in this relationship then it may be tempted to maximize its own position by transferring responsibility for over-supply to the supplier. Alternatively, it could blame the supplier for a quality or delivery fault. Thus, while power has value in that it enables a business to optimize strategically its relationship in favour of its preferred strategy, it can also be used inappropriately in a manner that causes damage to a relationship. It is obvious to any outside observer that the inappropriate application of power in such circumstances would result in long-term disadvantage to both parties. However, to the individuals concerned

in the transactions, the distracted long-term view may be difficult to maintain. Shorter-term considerations can become dominant, in which case inappropriate gamesmanship occurs based primarily on the balance of power in the supply network.

## 2.2 Opportunistic behaviour

In contrast to power relationships there also exists opportunistic behaviour within supply networks. This typically involves one partner having access to knowledge that the other partner does not have and then taking advantage of the knowledge asymmetry to gain a business advantage. Jap [11] has explored opportunistic behaviour. Her determinants of this behaviour are suspicion of opportunistic behaviour, asymmetrical knowledge (one party knowing more than the other) and poor distributive justice in the past. A variety of behaviours can occur between partners involving opportunistic jostling in order to change the power balance in the supply network or to achieve a one-off advantage. Similar to the inappropriate application of power discussed in the previous section, an injudicious approach to opportunistic jostling is likely to risk the demise of the long-term relationship [12].

Jap explored the mechanisms of governance that control opportunistic behaviour. According to Jap, the factors that tend to limit opportunistic behaviour between parties are trust, bilateral investments and shared goals. If the parties involved have established a trust relationship over a prolonged period of time, then this tends to limit opportunistic behaviour and to encourage more open communication. If they have bilateral and shared investments in the collaboration with shared goals, then this also limits opportunistic behaviour.

## 2.3 Exit or voice relationship

Whether dominant or less powerful, all parties in a supply network may be suspicious of both the inappropriate use of power and opportunistic behaviour. If either occurs and is identified, they are unlikely to accept this situation willingly. How they choose to respond depends upon a number of factors. It depends upon the nature of the relationship. If, as Hirschman [13] and Helper [14] say, the relationship is exit in type, i.e. the two companies in the relationship are not fundamentally dependent upon each other, then typically they will end the relationship—probably relatively quickly and easily. However, if there is a voice relationship, i.e. the companies are interdependent, then there is a strong incentive of self-interest to stay in the relationship and to attempt to resolve any problem issues. The exit relationship leads to rapid termination of the relationship but the voice relationship is likely to lead to interaction, the pattern of which will depend upon the characteristics of the relationship.

## 2.4 Behaviours in relationships and situational strengths

A network of interactions involves many relationships, some transitory and some more permanent, both inside the company and external to it. Many regular transactions take place at a factual and non-psychological level involving simple day-to-day transactions. However, others occur at a deeper level during negotiation or if there is an issue to be resolved. In such situations there is a strong potential for inappropriate use of power or opportunistic behaviour to emerge depending on how both parties in the relationship choose to behave. (In this sense, behaviour is defined as a sequence of actions that an individual within a company carries out in response to a situational stimulus.) The personal disposition of the individual and the constraints of the work situation combine to become fundamental to determining the behaviour in the relationship. The person will exhibit preferred personal ways of behaving which may be more evident in stressful situations involving problems or delicate negotiations. It is this factor that is fundamental in creating gamesmanship situations which, while appearing sensible to the individual concerned, are detrimental to long-term business-to-business relationships.

In addition, no matter what the individual predispositions are to behave in certain ways, the environment in which a person works will effect their response to a greater or lesser extent. The work situation is very different from, for example, the family relationship. At work, people are within a hierarchy of power relationships, people progress in the organization by meeting appraisal targets, the organization they work for is efficiency oriented and the individuals work to targets. They lack fundamental freedoms to determine their own actions.

To explain this restriction to freedom of action for the individual the concept of situational strength has value [15, 16]. In the strong situation the decision latitude available to the individual is small and behaviour is largely prescribed by organization policy or some rule set. This situation can be conceptualized as red traffic lights where everybody (most at least) knows the rules of the lights and obeys them—with sanctions if they do not (if they are caught). The ambiguity in decisions to be made is low and the rule set defining behaviour is high. Under these circumstances, people, no matter what their predisposition, tend to behave in a similar manner under the same stimulus. The opposite to the strong situation is the weak situation when there is high degree of latitude in decision making and the actual decisions that emerge depend more upon individuals' preferred ways of behaving.

However, it would be wrong to assume that the individual has no influence on the situation strength. There is a mutual interaction between situation strength and the individual disposition to behave in certain ways. One strategy for a manager may be to engineer the situation so that they personally have considerable

freedom in their decision making while they ensure that the situation is strong for their own subordinates.

A further issue is that of discretion which has been explored by Hambrick and Finkelstein [17]. The perception of the strength of a situation is related to the personality of the individuals and it is likely that certain people who prefer stronger situations will deliberately select positions where the discretion in decision making is largely controlled by company policies. In contrast, others may prefer weaker situations and they either engineer or choose the situation to suit their personality. Hambrick and Finkelstein identified that strong situations often correlate with older chief executive officers promoted from within, low executive remuneration, little use of incentive schemes, stable strategy and large firms. The person will follow prescribed behaviours when the situation dictates and these behaviours will have been learnt over a significant time period. They will involve an alignment of individual behaviours and the organization's proceduralized and preferred ways of behaving.

In the research described in this paper the commonly held view was accepted that, in a weak situation, individuals involved in transactions adopt patterns based upon their own predispositions, maximizing their own power, access to information or political influence and that, in a strong situation, the organization or group provide strong guidelines and will sanction people if they depart from the guidelines. In the strong situation the organization ensures that a certain behaviour results when a stimulus occurs. The organization may do this because it needs controlled and predictable responses for safety reasons, to minimize damage resulting from an adverse situation, or to guarantee particular performance levels.

In both strong and weak situations the interaction between an individual's predisposition for behaviour and the prescribed behaviours preferred by the organization is complex. People with certain trait patterns will seek to maximize their own situation regardless of the strength of the overall situation; others will prefer to work in environments having particular situation strengths and they will seek employment in companies offering these conditions. A model of these interactions between individuals in collaborating organizations is shown in Fig. 1. The figure depicts the process of two organizations transacting in a supply network relationship. The relative power between the two organizations and the effect of situation strength will influence the choice of game played and whether persons representing the organizations play their own game or play the organization's game.

## 2.5 Games

The behaviour between individuals in the organization, or when they are acting as proxy for the organization,



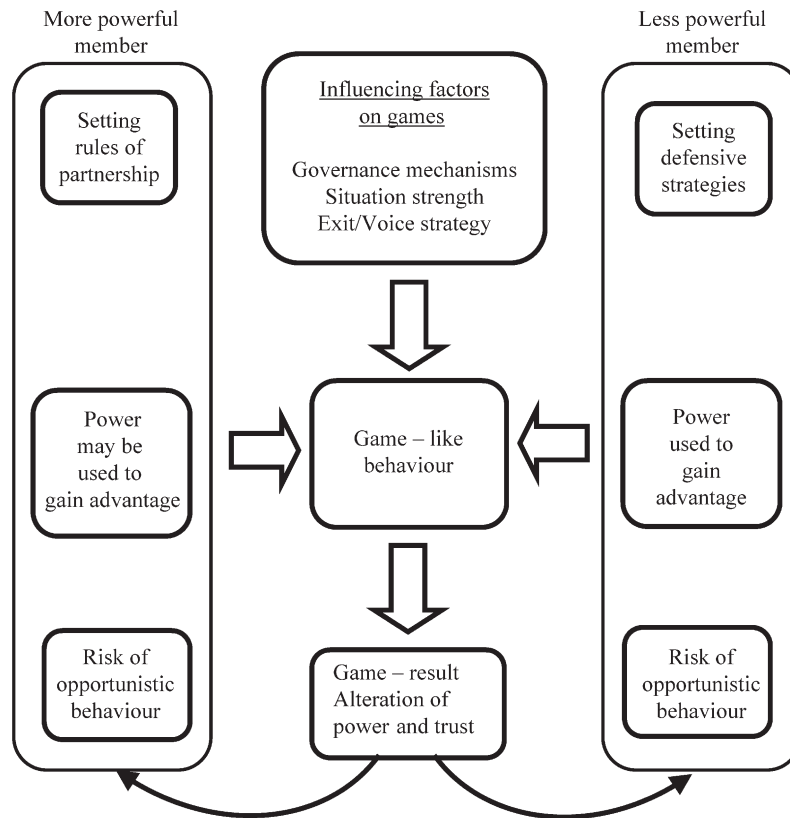


Fig. 1 Two organizations in a supply network relationship

involves transactions of primarily verbal and electronic communication. However, behind this communication there is a significant element of psychological message, e.g. when the communication becomes abusive and loaded with feeling. According to Jablin *et al.* [5], language games are used by organizational actors to disguise their political intentions, to mobilize support and to provide opposition. Various games were identified by Burawoy [18], such as ‘making out’ games to compensate for loss of control over the labour process. Such behaviour may appear to the detached observer as not being predetermined nor having objectives but it is rational to the actors with respect to the decisions that they make. For example, an individual may enter an organization with every intention of being productive but may be pressurized to behave in certain ways and to limit their work output. They may have to choose between a strategy of being productive and to risk group sanction or to join in the group game. These organizational games exist within all companies, between individuals and between groups. They also occur between collaborating organizations. Inherently, the complex issue of power is involved—power that may shift and move as the game is played so that an individual that started as the dominant partner may not be the dominant partner at the end of the game.

In the organization, a person exists in a complex network of games; sometimes they are the victim of the

game and sometimes they strategically manipulate the game to their own advantage. In many respects, how they progress within the organization and gain power depends upon their skill to manipulate strategically the games to their own advantage. Games can exist as surface phenomena, such as political games defining the frame of reference for the individual in the organization, e.g. networking to achieve empire building [19]. The games can be intra-organizational, between groups or between individuals and the dominant coalition, e.g. ‘them-and-us’ games, or the games can be deeply embedded inside the organization representing the social reality of the organization and not always within the conscious knowledge of the participants. They are designed to maintain power balances. A further discussion of these levels of games has been provided by Frost [20].

## 2.6 Transactional analysis

The belief in this research was that the techniques of TA could be used to model the interactions between communicating individuals. TA as originally developed by Berne [21, 22] applied to weak situations involving script messages coming from the *parent*, *adult* or *child* states of the individual. The parent applies injunctions and judgements. The adult is factual with absence of

feeling. The child is emotional and feeling. According to Berne, people can speak from a number of identifiable script positions related to where they perceive themselves to be in the parent, adult or child spectrum. In weak situations it is individual preferences about behaviour (and how others see them) that have the most significance and determine the response patterns.

In the strong situation, Berne recognized that the organization pathology will be dominant. The *etiquette*, i.e. organization procedures and rules, define the stages and verbal patterns of any transaction. The etiquette is the parent or traditional aspect of group culture; it enforces the social contract and provides form to the group process. Berne therefore extended TA theory to the organization and in the process defined the etiquette (corresponding to the parent), the *technical culture* (corresponding to the adult) and the *character* (corresponding to the child). The technical culture is the rational aspect and consists of whatever scientific/technical knowledge and skill is required to carry out the group activity. Character, the emotional part of the culture, consists of those behaviours permitted by the etiquette.

Fischer [23] described the job of the organizational etiquette to be that of setting policies and behavioural rules. It takes information from its external environment and internal systems and transforms it into policies and behavioural rules for the technical culture and character. This theory was also put forth by Blakeney [24] who proposed that organizations are open and social systems. They interact with the external environment, they take in energy inputs (stimuli, in TA terms) and use internal processes and structures (ego states) to transform them and to make energy outputs (responses). He also proposes that every system consists of subsystems each having ego states.

Most communications between buyers and sellers in networks will involve some directives from the company about how to behave, combined with response patterns determined and controlled by the transacting individuals. The organizational script and the individual script will interact depending upon respective powers and dispositions. No individual is going to accept completely the company injunction about behaviour, and in most cases the company would not want this. However, in some situations, and particularly in those of high risk, then the behaviour patterns in response to situational stimuli are strictly controlled by the organization and frequently rehearsed to ensure that they are correctly carried out. In these situations, ambiguity is removed as far as possible.

TA is a powerful tool for displaying and analysing transaction patterns. As its origins arose from the therapeutic counselling of couples, it has been shown to be highly effective in conflict resolution. At issue is how much modification of the TA theory is needed to

make it applicable and useful within the organizational context.

## 2.7 Organization games

There are many ways in which the individual interacts with his/her work organization and both attempt to manipulate each other to obtain what each desires. Early examination of these relationships has confirmed that opportunistic behaviour does take place particularly in situations where one party needs to win; this causes some form of game to take place. Rather than looking at these games from a mathematical sense as in game theory, the major interest is with the psychological transactions and whether the technique of TA can be used as a reasonable modelling tool to represent the pattern of transactions. In TA terms a game has a definite sequence of activity typically involving a pattern of transactions, a switch, for example, where the victim becomes the persecutor and a negative pay-off for one of the parties. In this sense a game may not involve all stages but may involve a regular pattern of interactions, some corresponding to the Berne games, some being collusive in nature and some simply being a regular repeating pattern of transactions that this person or organization frequently exhibits under the same stimulus.

## 2.8 The games

Games taking place in the organization as a consequence of either individual or organizational characteristics may gain short-term benefit for the more powerful partner but in the long term may lead to loss of trust and higher risk of relationship failure. Since honest collaboration is more desirable in maximizing long-term mutual performance, then the game-like behaviour has to be recognized and attempts made to change the unhelpful aspects of this behaviour. Returning to the concept of holons at this stage may prove useful. A fundamental aspect of a holonic system is that all the holons must operate in a co-operative environment in order to achieve whole system optimization. Unfortunately, for the theorists, this takes no account of the individuality of human nature. Individuals within holons, transacting across holonic boundaries, may develop personal games strategies which do not support, and may indeed damage, whole system optimization. Thus, at one level, managers need to be able to predict and identify non-beneficial games in order to 'defuse' them; at a second level the concept may lead to the potential development of a relationship holon which establishes and monitors mutually beneficial behavioural standards, or codes of conduct, during negotiations or problem resolution. Such systems can never remove the human element in the relationship but at least they

could define a standard approach in the business to conduct relationship behaviours.

### 3 CASE STUDIES

There are a number of questions that arise from the research that attempts are made to answer:

1. Are transactions between individuals strongly influenced by the situational context and the power relations in the organizations?
2. Where the manipulation of power in the organization is realized as games, is TA a valid representation of these games?
3. If the games arise from the individual or the organization, is this contingent upon the strength of the situation?

To gather data to answer these questions a qualitative study was carried out involving both semistructured and structured interviews with people involved in network relationships. The initial purpose was to determine whether the model proposed and shown in Fig. 1 was a reasonably accurate representation of transactions. If verified, it was then intended to identify whether specific company policies and communication patterns lead to repetitive patterns of behaviour among supply chain entities. Finally it was intended to provide managers with the resulting insight into games being played in order that they could better understand and thus manage the situation. Studies have taken place in organizations involved in:

- (a) electronic reverse auctions between buyers and suppliers,
- (b) supply chain interactions between food product suppliers and buyers and
- (c) supply chain interactions between automotive suppliers and buyers.

#### 3.1 Case study 1: electronic auctions

The electronic auction is an important new means of trading that has been made possible by the internet. It resembles a reverse bidding process where potential suppliers of goods or services compete with one another to offer the lowest price. A deadline on the bidding is imposed on suppliers all of whom can see each other's bids on the internet. In many respects, electronic auctions change the rules of engagement in supplier to buyer relationships. The auction process apparently gives greater power to the purchaser, particularly enabling them to force down prices. However, in reality, suppliers develop new rules of engagement in order to find ways of exerting and developing their own power.

Discussions were held with a number of buyers who do business by means of reverse auctions and they were

asked to describe qualitatively how suppliers and purchasers behave during the auction. Most of the auctions were conducted in a reasonable manner although they did not always realize the savings planned and they seemed to do little for longer-term trading partnerships. However, it does appear that suppliers do attempt to maximize their power in the relationship with the purchaser in order to maximize their own advantage. The situational strength in a reverse auction would appear to be strong in that the rules of engagement are defined and controlled by the purchaser and there is not much opportunity for supplier discretion other than deciding whether or not to bid and what price to bid.

In discussions with a major producer of motor vehicles the following procedure was identified at the company:

1. The invitation to bid was issued and a pre-qualification process took place.
2. Only those capable of satisfying the quality and delivery requirements were invited to bid against a specification issued by the buyer.
3. The auction was limited in terms of time; generally the bidding was slow in the first half-hour but then speeded up as the time passed and the participants of the auction gained knowledge of the bid levels from the other participants.
4. As the deadline approached, the bidding accelerated, culminating in a frantic final 5 min as suppliers decide whether they are willing to reduce their price finally to win the contract.

The strategies adopted by the suppliers can be surprising and at first sight counter-intuitive. They are aimed at increasing their own power in relation to the other suppliers and/or the purchaser.

A variety of games have been observed:

1. *Collaboration*. Suppliers form a group that bids as one unit and then, when the work is awarded, they divide it up between themselves. By being a more unified entity the bargaining power of the suppliers is increased.
2. *Collusion*. The buyer implies to a favoured supplier that an aggressive approach to price reduction which forces other suppliers to reduce their bids could win future favour.
3. *Loss leader*. The supplier bids very low in the knowledge that, if it wins the order, the purchaser will be locked in and it will have to purchase spares and maintenance from the supplier. The supplier is making a strategic judgement about the value of the work based upon power acquired when the buyer's switching costs are high.
4. *Jostling for advantage*. An incumbent long-term supplier may be under pressure to bid in an auction to retain its position as supplier. This is clearly a mechanism for the purchaser to exert power on the supplier. The supplier makes a calculated decision



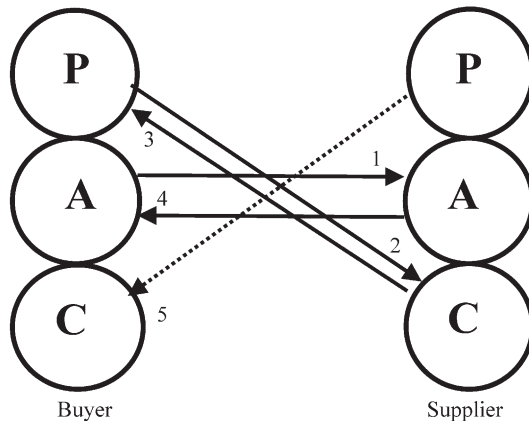


Fig. 2 TA for the electronic-auction loss leader

about the buyer's cost of switching and sometimes backs out of the auction just before it takes place. This can place significant pressure on the buyer since they may not, in reality, wish to switch supplier. Both parties participate in a complex jostling activity to gain advantage.

A typical case that was modelled using TA for the loss leader is shown in Fig. 2. In this case the flow of information took place as follows:

1. The buyer opens the game by providing the opportunity for the supplier to bid for the work. Generally this was carried out as an adult-to-adult transaction, although in some instances, when the buyer exerted power, it was more parent to child. This is shown as transaction 1 in Fig. 2.
2. The buyer, which in this case had more power, specified the terms and conditions of the auction to gain maximum advantage. In that the buyer is setting the rules, this is shown as the parent-to-child transaction 2.
3. The supplier bids low primarily to win the order but with an ulterior motive of gaining control at a later stage when the buyer is locked into the supplier. At the social level the supplier responds from the less dominant position of child to parent, shown as transaction 3. However, there is an unspoken strategy in the supplier to gain some power at a future date.
4. If the game is played over a time period, then eventually the supplier will have some dominance due to the lock-in situation. If the supplier's strategy works, then it will at some future time gain power, enabling it to continue social communication as the adult-to-adult transaction 4 while the ulterior unspoken message is parent-to-child transaction 5.

These behavioural strategies are an attempt by the supplier and the buyer to maximize their benefit. However, it carries a risk for the supplier of miscalculation that could lead to a future loss of business and for the buyer the risk of increasing costs. Some form of strategic

gamesmanship is inevitable in these situations and a code of conduct is needed to define what is an acceptable game and what is not. Such a code of conduct could be written into the 'rules' of the auction or indeed in holonic terms. In the case of the latter a standard relationship holon for the auction environment would be defined which would set the minimum standard for behaviour patterns and outcomes. The purpose of the holon would be to limit opportunistic behaviour and to build up trust. To be successful its benefits to all parties would have to be clearly recognizable.

### 3.2 Case study 2: searching for a quality problem

This scenario was described by the buyer in the transaction. One company supplied raw ingredients to a manufacturer of food products. To ensure that the buyer received a consistent and regular supply of the material a call-off arrangement had been negotiated. The supplier produces and sends an ingredient to the buyer working to an agreed forecast of requirement plus or minus an amount depending upon the agreed tolerance.

Most of the transactions between buyer and supplier were factual and in TA terms adult to adult within a well-defined etiquette. Game-like behaviour to gain advantage was only evident in those relatively rare problem situations that arose between the buyer and the supplier. One particular problem that did occur was a case where the buyer received more product from the supplier than was actually needed in the period even though the amount supplied was still within the pre-agreed call-off tolerance. In terms of situation strength the buying company operated perfectly within the defined terms of contract and therefore at first sight seemed to demonstrate a strong situational strength. However, individual buyers did have some latitude to interpret the framework, leading to some ambiguity in decision making and thus in reality operating to a weak situational strength.

Because of the contractual agreement they could reject any consignment supplied if they found a quality problem. The buyer used this clause to increase its power by searching very hard to find a quality problem of any sort to enable them to reject the consignment. Nearly every time they did find some quality issue on which to base a decision to reject the goods. The supplier did not readily accept the situation but, since the buyer was more powerful in the supply chain, they generally accepted the consignment back. In this situation the etiquette no longer applies and the transaction switches to a parent-to-child situation with the supplier playing a calculated game.

Although the transactions have to be estimated it is possible to plot out the interaction between supplier and buyer (from the buyer's perspective) using the TA terminology:

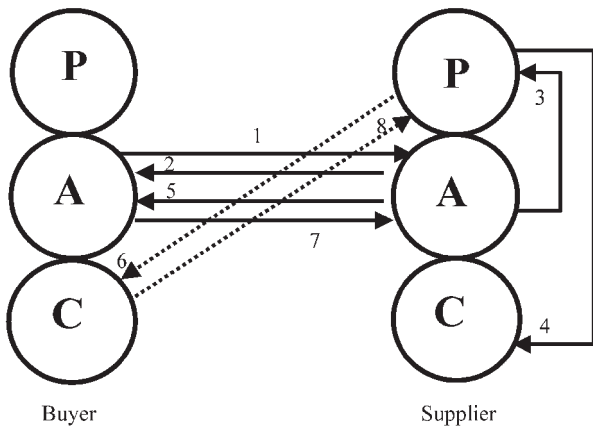


Fig. 3 Searching for a quality problem

1. The initial transaction is as follows: a call-off instruction indicating the quantity required as per pre-arranged forecast was sent by the buyer to the supplier. This is modelled as the adult-to-adult transaction 1 in Fig. 3.
2. The supplier responded by supplying the called-off quantity of goods. This is again modelled as an adult-to-adult response to the buyer as transaction 2.
3. The buyer had miscalculated the amount needed and there was a considerable over-supply. There was a significant number of transactions that took place inside the buyer organization between purchasing and senior management about what to do about the over-supply. This is shown as transactions 3 and 4. In transaction 3 there was an adult-to-parent message from the purchasing department to the dominant coalition in the business. The dominant coalition took a critical parental stance instigating the parent-to-child transaction 4 to the purchasing department. The message from the dominant coalition was to find a means of rejecting the delivery. A search for a mechanism to reject the delivery was instigated and a convenient reason found.
4. A message was then sent to the supplier, indicating with reasons why the batch was being rejected. On the surface this was an adult-to-adult transaction, shown as transaction 5, but at the psychological level this was a powerful parental injunction and the underlying message that this was the supplier fault and problem, shown as transaction 6.
5. The supplier, in a less powerful position, indicated that they would take back the consignment. Although they did not think it was justifiable, they took it back primarily to maintain the relationship. This is shown as transaction 7 while the underlying ulterior message is 8.

In this situation the buyer had the power and the supplier did not want to damage the business relationship. The problem with the behaviour was that it lowered long-term trust and encouraged both parties to continue to seek

opportunistic behaviour in the future. The framework and culture at the buyer company were encouraging the buyers in the purchasing department to adopt strategies to gain short-term advantage at the expense of longer-term benefit.

3.3 Case study 3: you may be powerful, but ...

While negotiating for the business, the supplier agreed to most of the terms and conditions set by the buyer and entered into a long-term partnership at agreed and negotiated prices. Some time after the business relationship had been established, a lock-in situation had developed which tended to give the supplier more power. The supplier used objective reasoning backed by tools such as activity-based costing to justify a pricing increase. In this situation the buyer agreed when presented with the facts.

The transactions took place over a significant time interval. The approximate sequence of transactions was as follows:

1. Initially power seemed to reside with the buyer and the supplier agreed to all the requirements of the business at a reduced price in order to win the contract. A series of transactions occurred, associated with the negotiation and establishment of the contract. These were conducted on primarily an adult-to-adult basis, shown as transaction 1 in Fig. 4.
2. After some time the supplier had become closely integrated into the buyer's product lines. The supplier considered that it was strong enough to ask for a price rise but it had to be based on some objective data. This is shown as the surface adult-to-adult transaction 2 with an ulterior message of 'now that we (the supplier) have more power, you have to pay more' shown as transaction 3.
3. A negotiation process took place and the buyer agreed to most of the price increase. On the surface this is the adult-to-adult transaction 4. However, at a later time it invited the supplier to take part in an

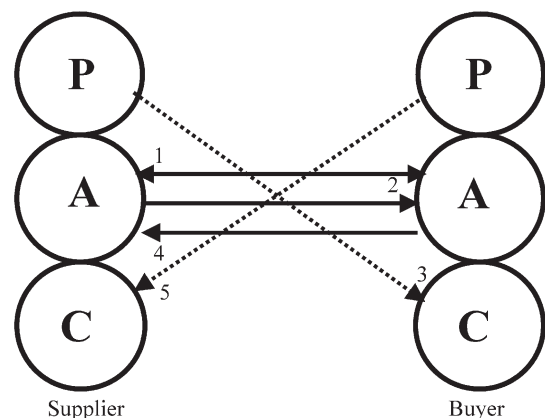


Fig. 4 You may be powerful, but ...

internet auction for the supply of the parts, but the ulterior message was 'we will get you later' and this is represented as transaction 5.

The example demonstrates that the two companies use their perceived power to gain advantage. The game playing that was taking place was overall damaging to long-term relationships but maximized the benefit in the short term. The only solution seemed to expose the games and to encourage the two parties to act in a more interdependent style.

#### 4 DISCUSSION

TA provides a very valuable tool for displaying the information transfer between partners in the supply chain. It can represent the ulterior messages at the same time as the psychological message and hence provide a much richer picture about the transactions than conventional information modelling tools. In this research the concept of games has been used. The games, as developed in TA, are repeating patterns of transactions that occur between supply chain partners. TA was applied to organizations by Berne himself with the concepts of character, etiquette and technical culture matching to the child, parent and adult states. However, games in TA are generally carried out at an unconscious level and relate to learnt patterns of behaviour and to re-enforce beliefs about the self. Between organizations the games are often more conscious and planned actions corresponding to unspoken transaction strategies. Rather than call these games it may be better to call these deliberate strategic manoeuvres.

The information modelling capability of TA provides a much 'richer' picture about what is being verbally and non-verbally communicated than many other information modelling tools. It is also possible to identify transactions inside the organization that match the parental judgements, the logical adult and the emotional child. One difficulty in using TA is the interpretation of which part of the ego state the messages are coming from. To a considerable extent the theoretical base of TA does provide guidance about recognizing whether it is a parent-to-adult transaction or an adult-to-adult transaction, etc., and it was judged that, as organizational practitioners gained more experience, it would become easier to identify clearly the patterns of transaction. From the field work in organizations it does seem likely that there are only a limited number of games that occur in supply-chain interactions. There would be considerable value if this could be verified and to determine what these patterns are. It would also be worthwhile to determine whether these organization games match the Berne games. An assumption of this research is that organizations can be modelled in a rather similar way to the individual in that there are parental, child-like and adult transactions. Whether you

identify the organization in the same way as the individual or not it was clearly observed in this research that there were parental-type transactions, child-like transactions and adult-like transactions regularly taking place within any one organization.

An important question is, once game-like behaviour is identified, what can be done about these rather negative game-like patterns. It is not even obvious that any company would actually choose to be up front and to eliminate these games particularly if it is gaining some strategic advantage and power from them. All the parties in the transactions have to see these games as being negative before any concerted action can take place to eliminate the game-like behaviour; then the therapeutic methods of TA would be appropriate. Being aware of the game and having a deliberate strategy to interrupt the pattern of transactions once identified would end the games. Also using governance mechanisms similar to those defined by Sandy Jap to control the incidence of opportunistic behaviour could significantly reduce the likelihood of games. Finally, the research has shown the importance of power in that the more powerful member generally sets the rules and controls the game-like behaviour. To eliminate games the use of power must be used wisely not to overwhelm the other in the transactions. Much of the transaction patterns appear to be a means of acquiring power in the transaction process, primarily to leverage the maximum value for the organization. Although by far the majority of the transactions observed were adult to adult, the incidence of game-like behaviour increased in problem situations. Where one party wanted to ensure that it did not suffer loss or alternatively wanted to gain advantage, gaming became obvious.

Now the three questions raised in section 3 are considered.

*Are transactions between individuals strongly influenced by the situational context and the power relations in the organizations?*

From the case studies the answer would appear to be 'yes'. Where a strong situational strength has been identified, then the transactions have primarily been at the adult-to-adult level. However, where the situational strength is weak, then gaming becomes more available with the dominant partner instigating parent-to-child-type transactions. Interestingly, the longer-term 'ulterior' transactions were primarily instigated by the weaker partner to gain longer-term advantage.

*Where the manipulation of power in the organization is realized as games, is TA a valid representation of these games?*

Certainly, in the case studies investigated, it provides a very useful short-hand demonstration of the transactions taking place. It adds a new dimension to the understanding of transactions between organizations since it



considers more that just information flows. It shows the relative strengths and weaknesses of the partners within a set of transactions, enabling partners to identify problem issues which would not be so apparent without the TA methodology.

*If the games arise from the individual or the organization, is this contingent upon the strength of the situation?*

From the case studies investigated, so far very little evidence was found that individuals instigated games on their own personal account. It is true that games were initiated by individuals but in all cases this was done to the supposed benefit of the employing company. Significant loyalty to the company was seen in many cases. However, where games were played, it was aimed primarily at short-term benefit for the individuals' company and not for long-term benefit of the partnership.

## 5 CONCLUSION

In conclusion, the present authors are of the opinion that significant insight and benefit can be developed by modelling supply chain interactions using TA and have been impressed by the diagnostic capabilities of TA and its capability as an information modelling tool. As supply chains become increasingly lean and agile, their overall performance becomes increasingly dependent on maintaining mutual beneficial power relationships. The holonic concept of supply chains can only be established through co-operation, and co-operation is only ensured by understanding power relationships. TA provides a means for this understanding and hence relationship management.

## ACKNOWLEDGEMENT

The authors would like gratefully to acknowledge the support that the Engineering and Physical Sciences Research Council, UK, has extended towards them for this work.

## REFERENCES

- 1 Koestler, A. *Janus, A Summing Up*, 1979 (Hutchinson, London).
- 2 Lyall, I. and Zakeri, A. Holons in knowledge-based manufacturing. *Mfg Engr*, August 2002, **81**(4), 159–161.
- 3 Cox, A. Power, value and supply chain management. *Supply Chain Mgt*, 1999, **4**(4), 167–175.
- 4 Cox, A., Sanderson, J. and Watson, G. Power regimes: a new perspective on managing in supply chains and networks. In Proceedings of the 10th International Annual IPSE Conference, Jonkoping University, Sweden, 8–11 April 2001, pp. 215–228.
- 5 Jablin, F. M., Putnam, L. L., Roberts, K. H. and Lyman, W. P. *Handbook of Organizational Communication*, 1987 (Sage, Newbury Park, California).
- 6 Conrad, C. Organizational power: faces and symbolic form. In *Communication and Organization: An Interpretative Approach* (Ed. L. Putnam), 1983, pp. 171–194 (Sage, Newbury Park, California).
- 7 Pfeffer, J. *Power in Organizations*, 1981 (Pitman, Boston, Massachusetts).
- 8 Dahl, R. The concept of power. *Behavioural Sci.*, 1957, **2**, 201–215.
- 9 Teece, D. J. Economies of scope and the scope of the enterprise. *J. Econ. Behaviour Org.*, **1**, 223–247.
- 10 Prahalad, C. K. and Hamel, G. The core competence of the corporation. *Harvard Business Rev.*, 1990, **68**(3), 79–91.
- 11 Jap, S. D. Pie-expansion effects: collaboration pressure in buyer–supplier relationships. *J. Marketing Res.*, 1993, **36**(4), 461–475.
- 12 Lorange, P. and Nelson, R. T. Uncertain imitability: an analysis of interfirm differences in efficiency under competition. *Bell J. Economics*, 1987, **13**, 418–438.
- 13 Hirschman, A. *Exit, Voice and Loyalty Response to Decline in Firms, Organizations and States*, 1970 (Harvard Paperback, Cambridge, Massachusetts).
- 14 Helper, S. An exit–voice analysis of supplier relations. In *The Embedded Firm* (Ed. G. Grabher), 3rd reprint, 1995 (Routledge, London).
- 15 Mischel, W. The interaction of person and situation. In *Personality at the Crossroads: Current Issues in Interactional Psychology* (Eds D. Magnusson and N. Endler), 1977, Ch. 25 (Lawrence Erlbaum Associates, Hove, Sussex).
- 16 Mullins, J. W. and Cummings, L. L. Situational strength: a framework for understanding the role of individuals in initiating proactive strategic change. *J. Organizational Change Managmt*, 1999, **12**(6), 462–479.
- 17 Hambrick, D. C. and Finkelstein, S. *Strategic Leadership*, 1996 (West Publishing Company, New York).
- 18 Burawoy, M. *Manufacturing Consent: Changes in the Labor Processes under Monopoly Capitalism*, 1979 (University of Chicago Press, Chicago, Illinois).
- 19 Culbert, S. A. and McDonough, J. J. *The Invisible Way: Pursuing Self Interest and Work*, 1980 (John Wiley, New York).
- 20 Frost, P. J. Power politics and influence. In *Handbook of Organizational Commitment* (Eds F. M. Jablin, L. L. Putnam, K. H. Roberts and W. P. Lyman), 1987, paper 15, pp. 503–547 (Sage, Newbury Park, California).
- 21 Berne, E. *Structure and Dynamics of Organizations and Groups*, 1963 (Grove Press, New York).
- 22 Berne, E. *Games People Play: Psychology of Human Relationships*, 1964 (Grove Press, New York).
- 23 Fischer, G. P. The changing organizational parent. *Transactional Analysis J.*, 1993, **23**(2), 71–76.
- 24 Blakeney, R. The organizational, group and individual levels of analysis in organizational behaviour. *Transactional Analysis J.*, January 1983, **13**(1), 58–64.