Working Paper, Submitted on 1st April 2008(Resubmitted 1st July 2008) to:

The 24th IMP Conference
Studies on Business Interaction – Consequences for Business in Theory and Business in Practices
Uppsala University

Thursday 4th September – Saturday 6th September 2008

Formatted: Left: 1,9 cm, Right: 1,9 cm, Top: 1,9 cm, Bottom: 1,9 cm, Width: 21 cm, Height: 29,7 cm

Network Pictures: Building an Holistic Representation of a Dyadic Business-to-Business Relationship

Sheena Leek and Katy Mason

Abstract

Network pictures are perceived as providing a picture of a company's position within a network and as providing managers with a framework for strategic decision making. This exploratory paper set out to investigate the application of network pictures of individuals from two companies involved in a business relationship. More specifically between companies and between individuals, it examines the boundaries of the network pictures, the lines of communication, the perceived relationship atmosphere and the impact of environmental factors. Within the companies the individuals were found to have different network pictures which reflect their managerial level and function. We suggest that the boundaries of the individuals' network pictures, their frequency of communication and perceptions of the relationship atmosphere systematically vary with their managerial level. Systematic variation occurred between the companies with regard to the perceived lines of communication and the relationship atmosphere.

Key words: Network pictures, inter-firm relationships

Sheena Leek
Birmingham Business School, University of Birmingham,
Edgbaston, Birmingham B15 2TT. UNITED KINGDOM. Tel:+44 (0) 121 414 6226, Fax :+44 (0)121 414 7380, E-mail: S.H.Leek@bham.ac.uk

Katy Mason
Lancaster University Management School,
Lancaster LA1 4YX. UNITED KINGDOM. Tel: + 44 (0) 1524 594840, Fax: + 44 (0) 1524 59 39 28, E-mail: k.j.mason@lancaster.ac.uk

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

Network Pictures:
Building an Holistic Representation of a Dyadic Business-to-Business Relationship

The Problem Companies Face

In order for firms to develop their inter-firm relationships they need to be able to identify key actors in their business networks that can enable them to solve the problems. These problems may vary from working out who has the knowledge to help drive effective changes to problematic inter-firm routines, to identifying individuals with the authority to approve significant changes in make/buy decisions. Identifying actors, who might be individuals or groups of individuals from an intra-firm or inter-firm context, can be challenging. One way that firms might seek to do this is through the use of shared network pictures. The purpose of this research is to compare network pictures of individuals from two companies involved in a business relationship in order to generate insights into how individuals solve problems that span organizational boundaries and if network pictures might be used to develop inter-firm relationships.

Theoretical Background

Ramos et al., (2005) describe network pictures as,

> *"a representational technique that aims to capture or illustrate views that specific actors have of the networked environment within which they operate."*

In this regard, the concept of network pictures shares similarities with the discussions surrounding managerial cognition in the strategy literature (see for example, Osborne et al. 2001; Porac et al. 1989), the organizational behavior literature (see for example, Weick 1979) and the concept of network horizons in the industrial purchasing literature (Gadde et al. 2003; Mattsson 2002). Despite recent developments of the network pictures concept (Ford et al. 2002; Henneberg et al. 2006), there continues to be a degree of ambiguity regarding how and when network pictures might most usefully be applied. One approach to exploring the application of network pictures is through four distinct levels of network management identified by Möller and Halinen (1999). The first level to which network pictures could be applied is the industry level. At this level network pictures have been used to represent the configuration of all actors carrying out value adding activities within a given industry (for example, Ford et al. 2002). At the second level, network pictures have been applied to represent the configuration of a firm's strategic positioning within its focal net (Henneberg et al. 2006; Öberg et al. 2007). At the third level, network pictures could be applied to represent make/buy decisions. This level takes the firm as the nexus of resources and activities and the network picture would therefore be used to represent the configuration of activities carried out internally and externally, identifying the different types of exchange relationships with the core firm. At the fourth level, network pictures could be applied to individual customer-supplier relationships.

While Leek and Mason (forthcoming) have examined the utilization of network pictures as a relationship management tool from the perspective of a core firm, no research to date has explored the differences and similarities of network pictures developed by different actors from both sides of a single inter-firm relationship – the buyer and the supplier. We suggest that the examinations and comparison of network pictures from actors on each side of a single dyadic relationship is likely to generate valuable insights for relationship management theory. Using network pictures at the individual dyadic relationship level seems likely to generate insights into how actors understand and the represent their position in the network. Further, by asking actors to draw and explain their network pictures it is possible to capture the 'stories' that accompany the representations. How each firm's network position evolves through individual, intra and inter-firm episodes that constitute what the relationship actually *is* (Ford and Redwood 2005; Kamp 2005), can then be explored.

Understanding a firm's network position is important as it affects its ability to develop current and new relationships within the network, and in this way, grow. Indeed, as Ritter and Geműnden (2004) explain, the smooth running of a specific relationship will affect its outcome and this in turn will affect other network relationships. For example, a problematic relationship with one supplier may lead to a company giving more of its business to another supplier.

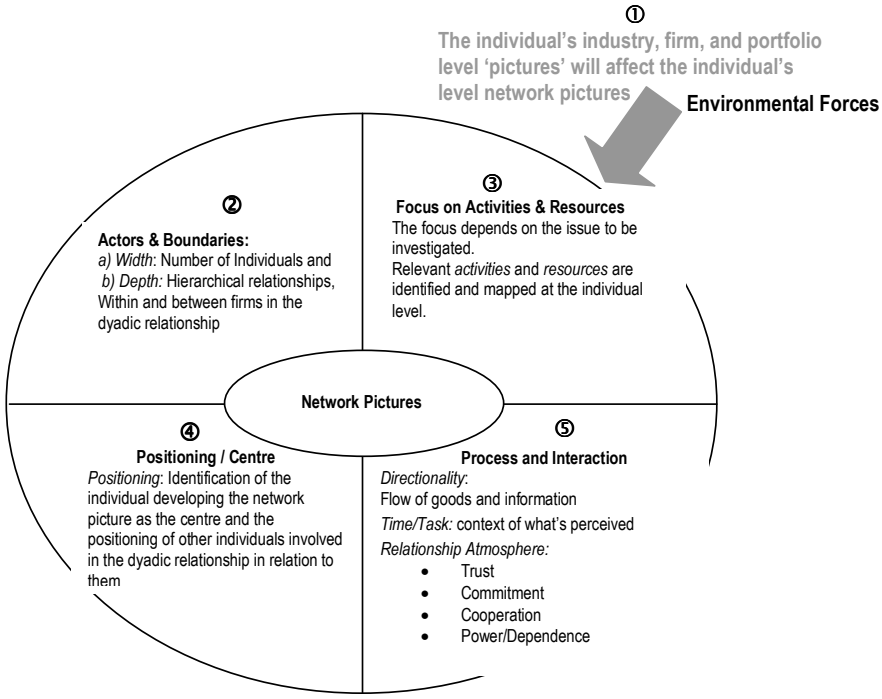
Comparing the network pictures from a number of individuals within both firms involved in a single relationship should help us develop a richer and more comprehensive picture of the relationship. Håkansson and Ford (2002) suggest that multiple network pictures are necessary in order to enable managers to cope with multilayered, multifaceted demands of the workforce and the business network. The call for the use of

multiple network pictures is perhaps not surprising when we consider inter-firm relationship dynamics comprise multiple individuals that operate and interact at different organizational levels and on an intra and inter-firm basis. Further, the activities of individuals within the firm are bound by both the functional divisions within which they operate and by the specific roles associated with each worker. The multiplicity of these boundaries suggests that no one could have a complete picture of what is happening in a specific inter-firm relationship. In this regard, we suggest that organizational structures set boundaries around the amount and type of information that any one actor might have about a specific relationship. Hence, multiple network pictures seem likely to provide a more complete view of a relationship both within and between the firms.

Dimensions of Network Pictures

Using network pictures to identify and configure a firm's network position within its focal network, Henneberg et al (2006) identify eight dimensions of network pictures. Leek and Mason (forthcoming) interpret these dimensions at the individual, dyadic relationship level (c.f. Möller and Halinen 1999) modeling five dimensions (with sub-dimensions). For the purpose of this paper, the five dimensions are identified; Environmental Forces, Actors and Boundaries, Focus on Activities and Resources, Positioning, and Process and Interaction (see Figure 4. below):

Figure 4, Dimensions of Network pictures at the Dyadic Relationship Level
Source: Adapted from Leek and Mason (forthcoming)



Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

1) Environmental Forces

The external environment includes aspects that are outside the visibility of the network picture, outside the boundary but whose influence may effect how the network picture evolves (Anderson et al 1994, Holmen and Pedersen 2003, Henneberg et al 2006). Because of the interactive nature of the Möller and Holinen's (1999) levels of management, it seems likely that the network pictures that managers hold at the industry, firm and portfolio levels are likely to impact upon and inform their network pictures at the dyadic relationship level.

2) Actors and Boundaries

Henneberg et al.'s (2006) identify two sub-dimensions of actors and boundaries; depth and width. *Depth* is understood as the number of relationships a focal company has involving the direct supply of goods and services. *Width* is understood as the nature of relationships that a focal company has with other companies outside the formal product/service delivery system (Henneberg et al 2006). For our purposes, at the relationship level *depth* is to be interpreted as the number of hierarchical levels within the dyadic relationship, at which the focal individual has a relationship. That is, the relationships between the individuals at different hierarchical levels within the core firm and their relationships with individuals at different hierarchical levels within the buyer/supplier firm. The *width* of a relationship is be interpreted as the number of relationships the individual has i.e. the number of individuals and groups the focal individual interacts with, both within their own company and the supplier/buyer company. This explains the association between actors and boundaries of the perceived relationship.

Actors may be depicted as individuals or groups of individuals and may sometimes be described as specific functions e.g. the design team. Essentially the boundaries at this level encompass a specific relationship but it is acknowledged that relationships outside that boundary will have an impact as boundaries are artificial (Holmen and Pedersen 2003).

3) Focus on Activities and Resources

A network picture will include different types of activities and resources (Håkansson and Johansson 1992; Håkansson and Snehota 1995). Resource ties such as the integration of information systems should also be considered (Holland and Lockett 1997). Within a relationship the actors' network pictures will encompass the activities and resources and this can be used to clarify the structure and workings of the relationship, i.e. which group or individual is responsible for which task. Most individuals in a relationship will probably be aware of these points but in a new situation, for example, a new design task or work stream, these aspects may not be clearly understood by either customer and/or supplier. This could create problems which a network picture could possibly help identify and clarify.

The focus of the network picture will vary according to what is being investigated for example if there is a problem with payment then the financial aspect becomes the focus.

4) Positioning/Centre

This is the perspective the individual will be using to base their decisions and actions on. The individual may be at the centre of the relationship in that they are responsible for its smooth running on a day-to-day basis and whether the relationship should continue.

5) Process and Interaction

Here three sub-dimensions are identified: 1) the direction of interaction, 2) time and task and 3) relationship atmosphere. First, *Directionality of Interactions* at the relationship level encompasses the flow of goods and information and the processes that enable this to happen. For example, respondents might well identify who is communicating with whom, how often, about what and how important is that communication?

The second sub-dimension of process and interaction is *Time/Task.* Ganesan (1994) suggests that a network picture can provide information on the duration of the relationship. It is stated that certain activities performed by a company may be accepted if the relationship is short term but would be deemed unacceptable should the relationship be long term (Weick 1995). However it is unclear how this information would actually be depicted on a network picture. Thus, it seems likely that information on the expected duration of the relationship would be required to provide contextual information for the interpretation of the network picture.

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

The third sub-dimension of process and interaction is *Relationship Atmosphere.* Henneberg et al., (2006) state that the degree of power between the companies in a network is important as it indicates the extent to which they are dependent or independent on others in the network. This dimension also encompassed whether the ties between the companies were strong or weak (Granovetter 1973) and consequently whether there was a strong or weak degree of commitment. These perceptions of power between companies are developed from individual episodes. As the companies interact, the nature of the interactions and the outcome of the interactions will lead to the development of the perception of power each company has and also whether the individuals involved will use it (Gaski 1986).

The five dimensions of individual network pictures offer a useful framework on two levels. First, it seems feasible that these dimensions might prove useful to practitioners trying to understand and develop an inter-firm relationship. In this sense, the dimensions might provide a framework for enquiry to drive information gathering and sense making.

Second, the dimensions of individual network pictures offer an analytical framework for academics to examine and compare multiple network pictures. In this regard, the network picture dimensions might be used as a lens through which to scrutinize not only the pictures themselves, but also the stories surrounding the drawings gathered from multiple respondents, in multiple organizations, involved in a single business network. This study adopts such an approach by applying the network picture dimensions as an analytical framework to five network pictures gather from a dyadic inter-firm relationship.

Method

A multi method exploratory approach was taken in order to examine network pictures at the inter-firm relationship level. The research focuses on the relationship between two engineering companies, Company A and Company B. Company A is outsourcing work to Company B. This is a new situation for Company A who has not previously outsourced any of the work relating to this particular activity.

There are five main individuals involved at the interface between Company A and Company B relationship; three from Company A and two from Company B. One of the individuals from Company B is in situ at Company A. The five individuals were asked to produce a network picture that depicted their perceptions of the key people in the relationship, their role, influence, and bearing on the business network being investigated. Each respondent was accompanied by a research as they drew their network picture. The researcher recorded the narrative which explained and interpreted the network picture. The researcher asked questions where necessary for clarification or to gain further insight into the relationships. The names of all the individuals concerned have been disguised to protect their identities (Table 1).

Table 1. Details of Respondents

Respondent's name	Job Title (and managerial level)	Company
Gary	Director of Business Development	A
Chris	Senior Purchaser	A
John	Outsourcing Manager Engineer	A
Tony	Work Stream Manager	B
Mike	Director of Business Development	B

Past studies of network pictures (Henneberg et al. 2006; Öberg et al. 2007) have used a number of constructs (actors, activities, resources, network boundaries, network power and network centre/periphery). These constructs have similarly been adopted by in this study. A series of individual in-depth interviews have taken

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

place at three months intervals over the course of the relationship (eighteen months). Each interview which lasted one hour on average was audio-recorded and later transcribed. All interviews were recorded and analyzed using the individual network picture framework (Eisenhardt 1991; Turner 1981). Analysis was carried out simultaneously with data collection creating an iterative process between interviews, literature reviews and analysis.

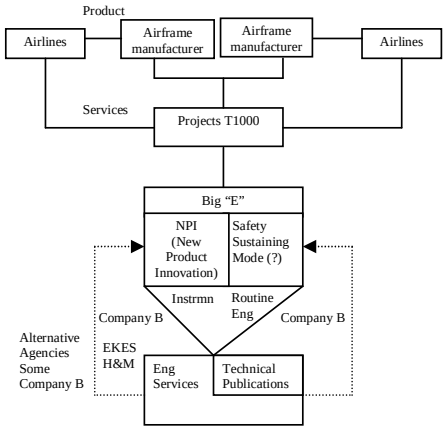
Each month throughout the course of the relationship the respondents have completed a questionnaire investigating various facets of the relationship atmosphere; trust, commitment, cooperation and dependence. The questions examined these elements of the relationship atmosphere and power with regard to the relationship with the supplier/buyer company.

Findings

In total five network pictures were collected; three from Company A (the customer) and two from Company B (the supplier). All network pictures were hand drawn by respondents. We have redrawn them in 'MSWord' leaving out some details to protect the identities of the companies and the individuals. Figures 2 to 6 present the network pictures of respondents. This section explores the characteristics of the different network pictures and examines the similarities and differences of the pictures that represent different perspectives of the same inter-firm relationship. Gary, John, Chris, Tony, and Mike have not seen each others network pictures.

Figure 2. Gary's network pictures

2a) First picture



2b) Second picture

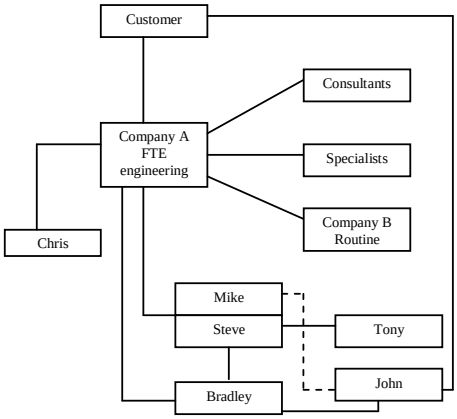


Figure 2. shows Gary's network pictures – Gary drew two separate pictures, one depicting the relationship between companies and functions in the network (Figure 2a) and the other providing a micro analysis, including key individuals involved in the relationship. One of Gary's pictures (Figure 2a) includes customers, projects and functions and in this way, includes some of the environmental forces that he feels impact on the relationship. The other network picture (Figure 2b) includes the key individuals from Company A (Chris and John) and shows their key lines of communication with individuals from Company B (Mike and Steve). Gary does not put himself in the picture. Neither does Gary emphasise the direction of communications (the *process and interaction* dimension) but in both pictures actors and their boundaries are clearly identified.

Figure 3. shows Chris' network picture. Chris, like Gary works for Company A but his position is a functionally based (in purchasing). Chris' picture focuses on the individuals he has frequent communications with. Chris also includes one person he does not have direct communications with but who can affect the person he does have communications with being able to complete a task that he is in turn reliant upon in order to complete some of his activities. Chris includes a much larger number of individuals in his picture than Gary. Chris positions himself at the centre of the picture and names all the respondents included in the research (Gary, John, Tony and Mike). Chris' picture emphasises the flow of information.

Figure 3. Chris' network picture

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

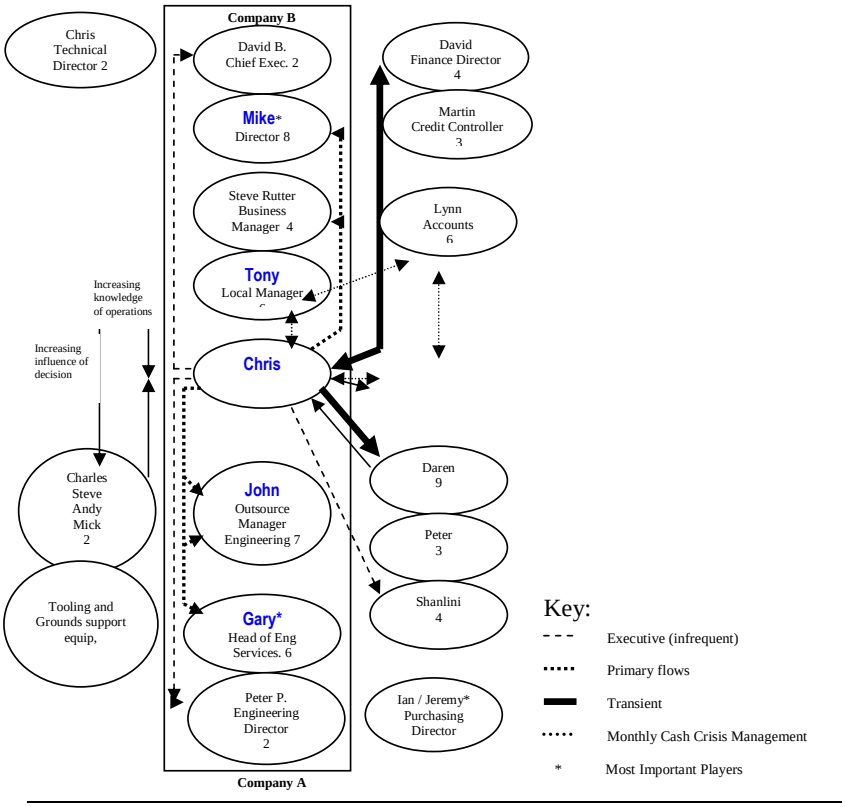
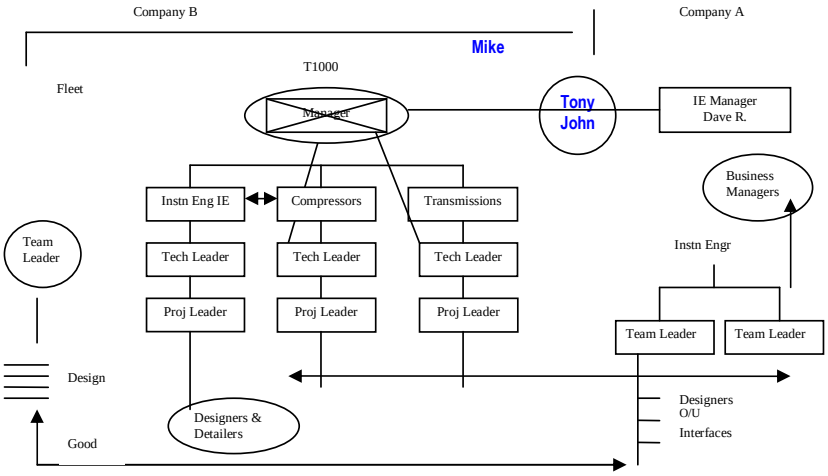


Figure 4. John's network picture



John's network picture (Figure 4) includes three respondents (himself, Tony and Mike). John is the Company A's relationship manager for this specific relationship. This perhaps explains his preoccupation with the functional basis of the groups or work streams identified for his own company (A) but the naming of

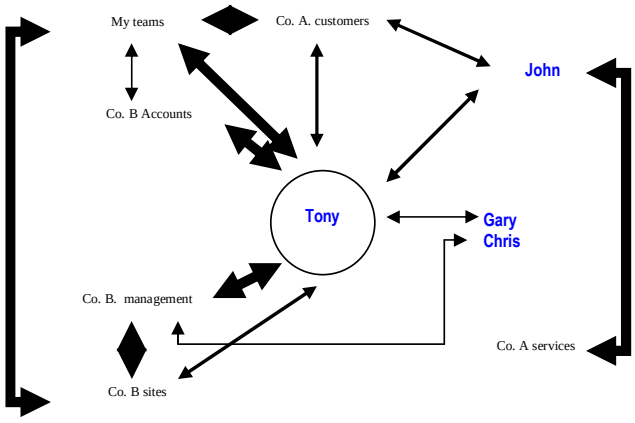
Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

individuals from Company B (Mike and Tony). While John labels indicated approximately which part of the picture related to Company A and, which to Company B, he did not draw hard boundaries. The boundaries appeared between the different functions or groups – each of which were put in boxes. In practice, John (Company A) and Tony (Company B) sat opposite each other in an open plan office. Tony was part of the 'embedded solution' in this inter-firm relationship.

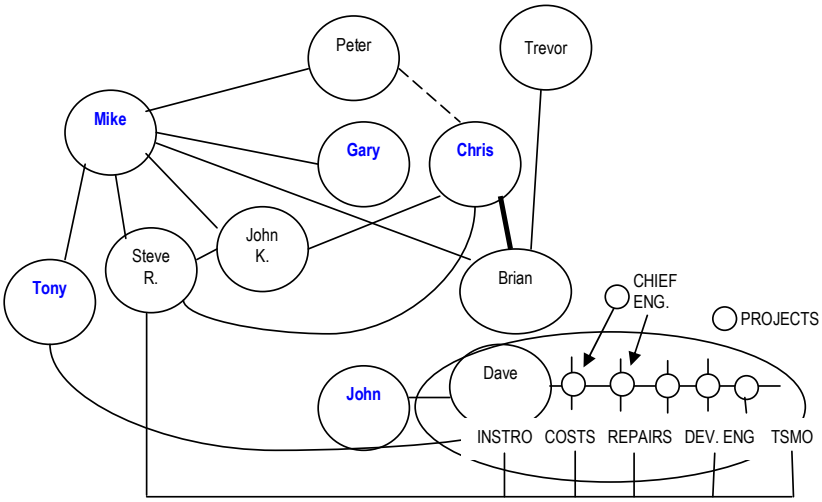
Tony's network picture (Figure 5) does not name his boss, Mike, (though his does show a heavy line to Co. B management and he did confirm that this is Mike and the other directors at Company B). Tony, like Chris, positions himself at the centre of the picture and, like Chris, is primarily concerned with the flows of information and goods.

Figure 5. Tony's network picture



Mike's network picture (Figure 5) is similar to John's in that it reads horizontally (Gary's and Chris' are vertical, while Tony's is a circle). Mike has positioned himself top left, but draws two of Company A's individuals at a higher level than himself (even though their job titles might suggest they were of an equivalent hierarchical position to himself. Mike's network picture not only does he include the people he's communicating with but also includes the people who they are communicating with.

Figure 6. Mike's network picture



Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

The time/task sub-dimension (of *process and interaction*) has particular significance for Mike's picture. Mike's picture includes Gary even though it was drawn after Gary had 'left' the business relationship. Gary was promoted within Company A and moved to another division at a geographically distant location. Despite this, Gary was still included on Mike's network picture. Although Mike did not communicate very regularly with Gary he did feel that Gary was a key line of communication. If Mike had a problem with any of the work streams he could go to Gary who would advise Mike on who to talk to, either escalating the problem up the hierarchy or sometimes lower down the hierarchy to a particular front-line worker who had the skills or knowledge to sort out that particular problem. However without Gary, Mike experienced problems in identifying appropriate the individuals for specific problems solving tasks. Steve has been brought in by Mike to manage operations. Gary has not yet been replaced.

Although Mike is operating in a senior management role (like Gary), Mike's picture is not presented at a strategic level network picture; Gary's is. Mike's picture concentrates exclusively on the Company A – Company B relationship. Unlike Gary's picture, Mike seems to give equal weight to interactions and processes of both the operational side (delivering of 'goods') and the financial side (getting paid for it). This business relationship is of strategic importance to Company B in that it makes up 25% of Company B's turnover. In his supporting narrative, Mike acknowledged that he was uncomfortable with one company being responsible for more than 20% of their turnover.

Table 2. presents a comparison of the five network pictures across the five dimensions of individual network pictures. While the network pictures visually look very different from each other, there are clear areas of overlap. Three dimensions seem to be of particular interest; *Actors and Boundaries*, *Process and Interaction* and *Focus on Activities and Resources.*

Table 2. A Comparison of the Five Network Pictures across Five Dimensions

Individual Network Picture Dimensions			Respondents				
			Gary	**John**	**Chris**	**Tony**	**Mike**
1	**Environmental Forces**	Industry	yes	no	no	Customers only	no
		Firm	yes	yes	no		Not explicitly
		Projects	yes	yes	yes	yes	yes
2	**Actors & Boundaries**	Width: (no. of individuals)	6	3	20	3	6
		Depth: (levels hierarchical relationships)	6	2	4	2	2
3	**Activities & Resources**	What activities and resources are emphasised in the pictures	Accounts Projects Relationship management	Projects Relationship management	Accounts Projects Relationship management	Accounts Projects Relationship management	Projects
4	**Positioning**	of network picture owner	Not at all	Top right	Centre Puts himself as the link between the 2 firms	Centre	Top left
5	**Process & Interaction**	Directionality: (flow of goods and information)	2-way	2-way (explicit)	Uses arrows 1-way comms.	2-way (emphasised)	2-way (implied)
		Time/Task	Got promoted – largely on the back of his handling of this relationship	Continuous and steady relationship with Tony	Chris has had less contact with Mike as time goes by	Continuous steady relationship with John. Less with Mike over time	Gary included in the picture after he'd left
		Relationship Atmosphere	Recorded in the narratives that surrounding the process of drawing the network pictures. Trust, commitment, cooperation and dependence were measured at 3 monthly intervals throughout the 18 months period of study (see Table 5)				

Actors and Boundaries across the Five Pictures

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

The respondents selected to draw the network pictures nearly all include each other in their network pictures. The respondents at Company A (the larger company) seem more concerned with hierarchy and reporting levels than individuals at Company B. However, Mike (Company B) repeatedly cited the problems he had with identifying 'problem solvers' within Company A when he was drawing his picture. He explained,

> *"even if you can find someone who recognizes the problem and even, ….[pause].. even agrees on your proposed solution, getting the authority – which usually means identifying and contacting yet another person – is near impossible….[pause].. and incredibly time consuming."*

Another interesting feature of the network pictures is the number of individuals each picture identifies (Table 3). For example, Gary and Mike can be considered to hold the equivalent level of seniority and both identity six individuals, while John and Tony (John reports to Gary and Tony to Mike), each identify three. This suggests that the more senior the manager, the broader their view of the network (Möller and Halinen 1999; Möller et al. 2005). This is perhaps not surprising and suggests that managers might generate valuable insights from viewing each others pictures, particularly at a senior level (Leek and Mason forthcoming). As a managerial tool, the sharing of network pictures might help work towards solving Mike's problem of identifying people with the authority to approve proposed solutions to process and interaction problems that the relationship is experiencing.

Table 3: The number of named individuals who the respondent communicates with in their network pictures

Respondent	Number of Named Individuals in Network Picture	Number of individuals unique to their network picture
Gary	6	0
Chris	20	14
John	3	0
Tony	3	0
Mike	6	2

The issue, raised by Mike's narrative, in having problems identifying individuals to solve specific problems, might be indicative of the use of groups in the network pictures. Four out of the five respondents included groups in their network pictures (Table 4). Respondents tended to name groups when they had had repeated contact with a group, but not with the same individual. Or when, in the case of Mike, he was aware of Tony having direct contact with the group but he had not experienced this himself. In this regard, groups can provide a useful starting point to generate discussion and drill down in to greater detail when individuals compare network pictures.

Table 4: The Number of Groups in the Individuals Network Pictures.

Respondent	Number of Groups in Network Picture	Number of Company A Groups in Network Picture	Number of Company B Groups in Network Picture	Number of Other Groups in Network Picture
Gary	9	3	2	4
Chris	1	1		
John	7	3	4	
Tony	6	2	2	1 mixed group Co. A and Co. B
Mike	7 named	0	7	

Process and Interaction across the Five Pictures

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

The narratives surrounding the collection of the network pictures identified three key areas that individuals were experiencing process and interaction problems, specifically; *who* to communicate with; *how* best to communicate with them and; how to manage effective *information flows.*

Who individuals needed to communicate with in the 'other firm' was often cited as an issue for the respondents from Company B. These difficulties were associated with identifying who had responsibility and authority for what. Mike and Tony both cited repeated problems they had experienced in raising purchase orders for different work streams, from different sections within Company A. Tony showed his frustration,

"Sometimes you wonder if the left foot knows what the right's doing…"

Similarly, *how* communications were best carried out was also an issue of some considerable concern for respondents. Respondents told us stories about the inaccessibility of key communications technologies due to complicated security procedures being in place. This created significant problems in information and consequently work flows. Respondents cited examples of not receiving communications about important meetings and the lack of trust and anger that built up between individuals because of these missed communications.

We tried monitoring the relationship atmosphere by measuring each respondent's perceptions of the levels of trust, commitment, cooperation and dependence between the two companies over the first eighteen months of the relationship. The average scores for each respondent are detailed in table 5. Interestingly, the highest levels of trust commitment and cooperation are recorded equally between respondents at Company A and B holding the least senior positions. At the senior level it is Company B's respondent that show's the highest levels of perceived dependence and commitment. Gary, is Company A's most senior respondent but records the lowest levels of commitment, cooperation and dependence. Gary 'left' the relationship because he was promoted.

Table 5: The Average Level of Trust, Commitment, Cooperation and Dependence amongst the Respondents.

Respondent	Ave Trust (10-70)	Ave Commitment (11-77)	Ave Cooperation (5-35)	Ave Dependence (11-77)
John	50.923 sd5.937	47.231 sd5.150	25.615 sd3.686	49.385 sd5.952
Tony	46.000 sd4.000	57.778 sd2.819	23.778 sd3.42	64.556 sd3.712
Chris	51.778 sd5.239	46.667 sd5.831	25.778 sd2.635	53.444 sd6.821
Gary	39.222 sd15.031	34.333 sd5.339	19.111 sd6.809	41.000 sd9.206
Mike	39	62	26.00	61

A further problem was the late communication of information pertaining work requirements from Company A to Company B. The problem of *information flow* resulted in the late arrival of information from Company A and prevented the commencement of work at Company B. This put Company A's project behind schedule and risked A incurring significant financial penalties from their customer, due to late delivery.

Focus on Activities and Resources across the Five Pictures

The communications problems had implications for the activities and resources that were utilized by the companies. There were problems with connectivity of the IT systems between Company A and Company B. Company B had limited access to the Company A system. Company B had only about four computer terminals available to them which had access to the Company A communications system. Company B employed thirty individuals and was looking to grow this dedicated team to fifty. The restricted access made it extremely difficult for the Company B employees to remain up-to-date with what is going on. These issues were not brought into the network pictures visually, but formed part of the accompanying narratives of three of the respondents (Mike, Tony and John). The focus of the network pictures reflected the activities and resources associated with work flows, information flows, and cash flows - getting paid for work done.

Conclusions and Implications

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

Network pictures are perceived as providing a picture of a company's position within a network and as providing managers with a framework for strategic decision making and problem solving. This exploratory paper set out to investigate the application of network pictures of individuals from two companies involved in a business relationship. Applying network pictures to both sides of a dyadic relationship generates valuable preliminary findings that warrant further investigation.

First, our findings suggest the importance of hierarchy in the way inter-firm relationships are perceived and understood. The respondents in our research are operating at different managerial levels, within different functional areas. This is reflected in the depth and width of their network pictures. Further, our findings suggest that senior managers may be more inclined to have a greater depth to their network pictures in that to obtain an overall picture of the relationship they need to talk to managers at a variety of levels. This means they may perceive relationships in terms of groups of people or functions rather than individuals. Due to this strategic perspective it is possible that the senior manager's network picture may broadly encompass the network picture of a manager at a less senior level, for example, as with Gary (Figure 2) and John (Figures 4). It is also possible that the senior managers' network pictures may only minimally overlap, for example, as with Gary (Figures 2) and Chris (Figures 3). Managers at less senior levels dealing with a specific function tend to have network pictures which have less depth but greater width. They tend to be less concerned with the overall view of how the relationship fits in with the company strategy and are more concerned with the smooth running of their function so they are relating to a number of individuals and some groups and fewer levels of management. There may be some degree of overlap between the network pictures of managers in different functions. From an academic perspective, this leads to a number of questions relating to the degree of overlap; how much overlap in terms of depth and width, is necessary between individuals at different managerial levels in different organizations, for the relationship they are dealing with to run smoothly. What functions need to overlap and what degree of overlap between them is necessary for the relationship they are dealing with to be successful? From a practitioner perspective, posing such questions might lead managers to identify and solve inter-firm relationship problems.

Second, our findings suggest that overlap between individual network pictures, both within the firm and between firms is relevant for different reasons. Overlap may be indicative of mutual awareness of various aspects of the relationship. Overlap may be indicative of the existence of communication channels between the individuals' network pictures. Although there is overlap and a potential channel of communication it does not always mean it will be used, for example Gary's network picture encompasses Tony but Gary does not actually communicate with Tony at all. There may be a substantial degree of overlap and therefore a number of communication channels which exist but the individuals may not need to actually utilize them. Individuals then have to consider which communication channels to use, how often should they use them and what kind of information should they convey?

Third, our findings suggest that network pictures act as a valuable tool for identifying not only where interaction points are, but where they are not – and by implication, where they are needed. The network pictures of the less senior managers' functions are quite detailed which may be indicative of the depth of knowledge they have in that area. When utilizing the communication channels how much of this information is transferred across functions and across management levels, what information is selected and what information is deselected? How many communication channels are transferring information into the decision makers? The information transferred will be used to make various decisions so it is vital the decision maker has sufficient, appropriate information. There may be instances where there is a lack of overlap and a lack of potential communication channel where there should be one ideally. Network pictures may be useful in identifying where there should be communication channels. It is assumed that information is flowing up the managerial hierarchy from the lower managers to the seniors to assist them in relationship management decisions. The flow of information down the managerial hierarchy also needs to occur to enable the contract to be implemented.

In examining the network pictures from individuals at each company, we compare individuals linking the two companies looking at who was communicating with whom, from what department and at what level. We were also able to identify who these individuals were communicating with in their own company (a crucial source of information). Chris (Company A) communicates with the key individuals in the principle areas: Mike (Company B) and John (Company A). Chris gathers substantial amounts of information which provides him with a holistic picture of the relationship which he can feedback up his organizational hierarchy to Gary.

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

Fourth our findings, that different individuals perceive the relationship atmosphere differently, opens to debate as to whether it is desirable for individuals involved in the relationship to share the same perceptions. Perhaps such divergence is the sign of a healthy, dynamic and developing relationship. Regularity of communication, managerial level and degree of day-to-day involvement seem to be influencing the individuals' perception of the relationship atmosphere. It appears that the managers, for example, Chris, John and Tony, who work on a relationship daily and communicate regularly, have similar perceptions of the relationship. Their close involvement with day-to-day interactions provides a balanced perspective of what is working well, what needs improving and what has gone wrong in the relationship. However, the senior managers, Gary and Mike, have a slightly different perspective. This may be due to less day-to-day involvement in the relationship and less regular communication about the relationship. Our findings suggest that they are more involved in interactions between the organizations when something is going wrong with the relationship. This is likely to lead to a more negatively biased view of the relationship. There may also be a lack of acknowledgement from Tony, Chris and John to Gary and Mike when the relationship is going well.

Diverging perceptions of the relationship atmosphere might suggest that senior manager needs to be less involved in the relationship in order for them to make objective decisions in their company's interest. Further research might examine the degree of disparity in perceptions of the relationship atmosphere, investigating how disparity in individuals' perceptions of the relationship atmosphere can be influenced, possibly through increased frequency of communication internally, between managers and their seniors.

This research has examined the network pictures of the individuals at Companies A and B. Further research is needed to determine whether the findings are applicable to the individuals in the wider business network (Easton and Araujo 1994). Research then needs to investigate how the dynamics within companies A and B affect their interactions with each other. This would entail comparing the dimensions of the individuals' network pictures from several companies identifying the similarities and differences and trying to use these pictures to identify and solve network problems. .

Network pictures whilst not a theoretical concept in itself does provide a very useful tool for visually expressing other academic concepts. The network pictures provide only a very limited amount of information and therefore need to be complimented by the use of additional research tools including, in-depth interviews, in order to obtain a comprehensive understanding of the individuals' network pictures and it's context. There is no standardized way of using or presenting network pictures. It is open to debate as to whether consistency of presentation of network pictures is necessary. While standardization would allow academics to readily understand any research using network pictures, it would also impose a framework on the individuals using network pictures. This might restrict their level of creativity and prevent the discovery of some interesting findings.

Managerial Implications

While this paper has concentrated on network pictures from an academic perspective there are clear managerial implications. Firstly, the methodological issues regarding the use of network pictures would require some clarification before being recommended to managers as a tool. Network pictures could potentially be very useful to managers for identifying and explaining a variety of problems. They could be used as an aid to making decisions and problem solving. They do not however, represent a prescriptive toolkit. Network pictures could be utilized in one organization or more depending on the problem. Whatever the situation it would be useful for individuals involved to draw their network pictures and then meet to discuss the dimensions of their own and each others network pictures, including asking them what relationships they were aware of, what relationships they were unaware of and where additional links both within companies and between companies might be useful. The exact information collected and the methods utilised would be dependent on the objectives of the exercise. The knowledge obtained from the network pictures would provide a basis for devising actions to implement in the relationship and subsequently the individuals could assess the effectiveness of the actions. It would be necessary to monitor the network pictures over time and determine whether and how they can be changed as required. In this way, the need for in-depth, longitudinal research to explore the application of network pictures seems valuable.

References

Formatted: Tabs: 17,2 cm, Right + Not at 7,32 cm + 14,65 cm

Formatted: Font: (Default) Arial, 8 pt

Easton, Geoff and Luis Araujo (1994), "Market Exchange, Social Structures and Time," European Journal of Marketing, 28 (3), 3-84.
Eisenhardt, Kathleen M. (1991), "Better Stories and Better Constructs: The Case for Rigor and Comparative Logic," Academy of Management Review, 16 (3), 620.
Ford, D., L.E. Gadde, H. Håkansson, and I. Snehota (2002), "Managing Networks," IMP Group in Asia, 11th - 13th December.
Ford, David and Michael Redwood (2005), "Making sense of network dynamics through network pictures: A longitudinal case study " Industrial Marketing Management, 34 (7), 648-57
Gadde, L.-E., L. Huemer, and H. Håkansson (2003), "Strategizing in Industrial Networks," Industrial Marketing Management, 32, 357-54.
Ganesan, Shankar (1994), "Determinants of long-term orientation in buyer-seller relationships," Journal of Marketing, 58 (2), 1.
Gaski, John F. (1986), "Interrelations Among a Channel Entity's Power Sources: Impact of the Exercise of Reward and Coercion on Expert, Referent, and Legitimate Power Sources.," JMR, Journal of Marketing Research, 23 (1), 62.
Granovetter, M. (1973), "The Strength of Weak Ties," American Journal of Sociology, 78, 1360-80.
Håkansson, H. and J. Johansson (1992), A Model of Industrial Networks. London: Routledge.
Håkansson, H. and I. Snehota (1995), Analysing Business Relationships. London: Routledge.
Henneberg, S. C., S. Mouzas, and P. Naude (2006), "Network Pictures - Concepts and Representations," European Journal of Marketing, 40 (3/4).
Holland, C. P. and A. G. Lockett (1997), "Mixed Mode Network Theory: The Strategic Use of Electronic Communication by Organisations," Organization Science, 8 (4), 475-88.
Holmen, E. and A.-C Pedersen (2003), "Strategizing Through Analyzing and Influencing the Network Horizon," Industrial Marketing Management, 32, 409-18.
Kamp, Bart (2005), "Formation and evolution of buyer-supplier relationships: Conceiving dynamism in actor composition of business networks," Industrial Marketing Management, 34 (7), 658-68.
Leek, Sheena and Katy Mason (forthcoming), "The Utilisation of Network Pictures to Examine A Company's Employees' Perceptions of a Supplier Relationship," Industrial Marketing Management.
Mattsson, L-G (2002), "Understanding market Dynamics - Potential Contributions of Marketing Studies from Actor-Network-Theory," in 18th IMP Conference. Perth, Australia: Keynote paper.
Möller, K. and A. Halinen (1999), "Business Relationships and Networks: Managerial Challenge of Network Era," Industrial Marketing Management, 28, 413-27.
Möller, Kristian, Arto Rajala, and Senja Svahn (2005), "Strategic business nets - their type and management," Journal of Business Research, 58, 1274-84.
Öberg, Christina, Stephan C. Henneberg, and Stefanos Mouzas (2007), "Changing network pictures: Evidence from mergers and acquisitions," Industrial Marketing Management, 36 (7), 926-40.
Osborne, J. D., C. I. Stubbart, and A. Ramaprasad (2001), "Strategic Groups and Competitive Enactment: A Study of Dynamic Relationships Between Mental Models and Performance," Strategic Management Journal, 22, 435-54.
Porac, J. F., H. Thomas, and C. Baden-Fuller (1989), "Competitive Groups a Cognitive Communities: The Case of Scottish Knitwear Manufacturers," Journal of Management Studies, 26 (4), 397-416.
Ramos, C., D. Ford, and P. Naude (2005), " Developing Network Pictures as a Conceptual Device," First Annual IMP Journal Seminar.
Ritter, Thomas and Hans Georg Gemünden (2004), "The impact of a company's business strategy on its technological competence, network competence and innovation success," Journal of Business Research, 57 (5), 548-56.
Turner, Barry (1981), "Some Practical Aspects of Qualitative Data Analysis," Quality& Quantity, 15, 225-47.
Weick, K. E. (1995), Sensemaking in Organizations: Sage, Thousand Oaks.
---- (1979), The Social Psychology of Organizing. Reading: Addison-Wesley.