Broker Positions in Task-Specific Knowledge Networks: Effects on Perceived Performance and Role Stressors in an Account Management System

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Abstract

In this paper we empirically investigate various benefits and costs associated with broker characteristics of individuals who operate in the account management system of financial service providers. We narrow our focus to broker positions in two specific task-specific knowledge networks that facilitate account management. We study the effect of broker positions on the contribution of individuals to organizational performance. We measure such a contribution by measuring the perceptions of others concerning a particular individual. We also explore how certain personal costs are associated with these task-specific broker positions. More specifically, we explore how these positions affect role ambiguity and role conflict, as self-perceived by that particular individual. To test the hypothesized effects we collect data for a network consisting of 55 individuals. We conclude with stating that service specification broker positions benefit organizations, but service delivery broker positions are detrimental to an organization and that they also invoke personal costs.

Keywords: Social Networks, Task-Specific Broker Positions, Role Stress, Account Management.

1. Introduction

In this paper we empirically investigate various benefits and costs associated with broker characteristics of individuals who operate in the account management system of financial service providers. We narrow our focus to broker positions in two specific task-specific knowledge networks that facilitate account management. We study the effect of broker positions on the contribution of individuals to organizational performance. We measure such a contribution by measuring the perceptions of others concerning a particular individual. We also explore how certain personal costs are associated with these task-specific broker positions. More specifically, we explore how these positions affect role ambiguity and role conflict, as self-perceived by that particular individual. To test the hypothesized effects we collect data for a network consisting of 55 individuals. Before we turn to detailed discussions of the topics mentioned above, in the remainder of this section we proceed with defining the research area and reviewing the relevant literature.

Account management is defined as the set of customer-oriented processes involving activities that develop and maintain beneficial relationships with important customers. Account management allows organizations to offer competitive tailor-made products and services. These offerings aim to deal with the unique and changing needs of customers, and often they therefore require cooperation between various individuals (Cespedes, 1991, 1992, 1996; Shapiro & Moriarty, 1984).

For example, an account manager and a risk manager may collaborate on putting together a loan proposal for a customer who wants to buy a new car. Once the customer has agreed with the terms of the proposal, the two managers cooperate again by issuing the loan. Continuing the example, suppose that a few months later the same customer wants a new roof on the house. The account manager now starts cooperating with a mortgage specialist. It may now be that the level of cooperation with the risk manager can decrease, but on the other

hand it may also happen that the account manager initiates a link between the mortgage specialist and the risk manager. Additionally, the three managers may also collaborate in other workgroups that address the needs of other customers or other needs of the same customer. As such, different cooperative structures might arise and each cooperative structure could have a specific influence on how the cash-flow structures of the car and the roof get established.

The above example suggests that the nature of the cooperation between individual employees in an account management system can imply a certain level of service quality (Shapiro & Moriarty, 1984; Zeithaml, Berry & Parasuraman, 1988). In fact it is well understood that in financial service firms, cross-functional cooperation allows the integration of various knowledge bases in order to generate competitive offerings (Cespedes, 1991; Galbraith, 1994; Grant 1996; Shapiro & Moriarty, 1984). In our example, the account manager presumably has detailed knowledge about the needs of a specific customer. The risk manager likely knows more about the risk associated with these needs, as well as about the risk the organization is willing to take. The combination of these two knowledge bases now facilitates an adequate effort to serve the needs of the account.

An important consequence of customer orientation in account management systems is that changes in customer-specific needs require changes in the knowledge composition of cross-functional workgroups (Homans, 1950). As it is likely that these changes occur continuously, the changes in the knowledge composition of workgroups result in the emergence of knowledge exchange networks (Feld, 1981; Ibarra, 1992). These networks could be thought of as being an imprint of cooperative activities within an organizational context. In our running example, we observe that a knowledge exchange relationship between the account manager and the risk manager emerges while they consider the loan for the car. Furthermore, the new roof initiates a knowledge exchange relationship between the account

manager and the mortgage specialist. These two relationships can be summarized into a network containing knowledge exchange.

A basic premise in social network theory is that networks define the opportunities and limitations that actors face concerning subsequent actions (Wasserman & Faust, [1994] 1997; Galaskiewicz, 1996; Uzzi, 1997). Network positions not only indicate the distribution of knowledge (Rulke & Galaskiewicz, 2000), but also indicate opportunities to integrate knowledge. When it comes to knowledge exchange, broker positions encompass characteristics that are relevant for knowledge integration (Burt, 1992, 1997a, 2000a; Hansen, 1999).

These advantages of broker positions can have substantial impact on account management systems. Burt's (1992, 1997a) theory on structural holes indicates that such advantages particularly concern opportunities to create added value by connecting otherwise unconnected individuals. As such, brokers have access to and have control over different knowledge bases. These advantages allow brokers to strive for efficiency when integrating various knowledge bases. In our example the account manager could opt for not initiating a relationship between the risk manager and the mortgage specialist, thereby perhaps simply saving time and reducing effort.

Despite the advantages, the integration of knowledge by brokers not necessarily leads to the attainment of *organizational goals*. For example, Burt (2000a) considers broker positions within and between workgroups, and his study suggests that broker advantages may not be congruent with workgroup goals in the first situation. This is because broker positions within groups may lead to inefficiency in the interpretation of tasks, because such positions indicate at least some absent relationships within the workgroup. These absent relationships may indicate a sub-optimal degree of focussed communication, which in turn may contribute to interpretive barriers (Feld, 1981; Dougerthy, 1992; Pelled, Eisenhardt & Xin, 1999). In our

running example, the risk manager and the mortgage specialist might use different phrases for similar matters (see Ancona and Caldwell, 1992). This may confuse the account manager and hence he/she may loose time and slow down the service process.

In contrast to 'within group broker positions', Burt (2000a) suggests that broker positions between workgroups *do* have a favorable impact on the workgroup goals. Between group brokers contribute positively to the performance of the group, because they add to the informational diversity of the group (Ancona & Caldwell, 1992; Jehn, Northcraft & Neale, 1997; Zenger & Lawrence, 1989). In our example, the risk manager and another colleague risk manager can have different ideas about the cash-flow structures required to finance additional mortgage payments. The absence of a relationship between these two risk managers would keep their ideas unknown to each other. The account manager may now combine the best of both ideas when he/she has a relationship with the two risk managers and might improve the cooperation upon meeting the needs of the customer.

The concept of informational diversity, which is relevant for our paper, refers to the differences in knowledge bases and perspectives that members bring to the group (Jehn, Northcraft & Neale, 1999). Informational diversity may lead to improved group performance, although improvements are typically found to be task-specific (Jehn, 1995, 1997; Jehn et al., 1999; Williams & O'Reilly, 1998). Interestingly enough, in network studies which focus on knowledge exchange networks and broker positions usually no distinction between various tasks is made (see Burt, 2000a; Hansen, 1999; Hinds, Carley, Krackhardt and Wholey, 2000; Ibarra & Andrews, 1993; Rulke & Galaskiewicz, 2000). Therefore, in our paper we explicitly aim to do so. We empirically test some hypotheses on the link between characteristics of *task-specific* broker positions and their contribution to organizational performance.

Finally, broker positions can inflict personal costs due to increased stress (see Burt, 1997a). Role theory suggests that brokers are more susceptible to increases in role stressors

(Merton, 1968; Kahn, Wolfe, Quin & Snoek, 1964). Although role stress does not necessarily influences a job outcomes negatively, it is a personal cost as it absorbs coping resources (Kahn et al., 1964; Singh, Goolsby & Rhoads, 1994). Two important role stressors are role ambiguity and role conflict (Walker, Churchill & Ford, 1977; Brown & Peterson, 1993). As brokers have contacts with otherwise unconnected others, it is likely that they have to deal with more unclear or conflicting expectations. In this paper we therefore include a focus on the effects of tasks on such expectations. To that end, we formulate and empirically test hypotheses concerning the possibility that the link between broker positions and different role stressors is task-specific.

To summarize, this paper aims to contribute to the relevant literature in the following three ways. First, we examine the link between task-specific broker positions and organizational performance. In particular, we consider the perceived contribution to organizational performance of individuals across workgroups. Second, we examine the personal costs for brokers within an account management system. We consider these in terms of role ambiguity and of role conflict while allowing for variation across tasks. Finally, and in contrast to most other literature we focus on a service organization.

This paper is built up as follows. In section 2, we identify two essential account management tasks in services industries. In section 3, we present the theoretical background of broker positions and of informational diversity in workgroups. In section 4, we formulate hypotheses on the links between perceived performance, role stressors and task-specific broker positions. In section 5, we discuss the collected method that we use in this study. In section 6, we present the results of our analysis of empirical network data. In section 7, we discuss these results, and we pay attention to the limitations of this study and the topics for further research. Finally, in section 8 we draw some conclusions.

2. Tasks in Account Management

In knowledge intensive service firms, like for example, IT consultancy, banks, and, insurance companies, account management systems are set up to stimulate cross-functional cooperative activities (see Galbraith, 1994; Weitz & Bradford, 1999). Cross-functional workgroups facilitate knowledge integration for individuals with specialized knowledge (see Ancona & Caldwell, 1992; Dougherty, 1992; Grant, 1996; Hackman, 1987). These groups are supposed to develop competitive tailor-made products and services (Grant, 1996; Kogut & Zander, 1992). In this paper we focus on two tasks in account management that depend on knowledge integration.

Two tasks in (financial) service industries are particularly dependent on knowledge integration. Zeithaml, Berry & Parasuraman (1988) indictae that performance in service industries depends on the attainment of *service specification* and *service delivery* tasks. To accomplish each task, specific knowledge is required (see Nelson & Winter, 1982; Ruekert & Walker 1987; Russell, [1948] 1961; Simon, [1957] 1997). Accomplishment of the *service specification* task depends on knowledge about *which* service specifications will serve accounts in a satisfactory way. More specifically, the execution of the service specification task, which usually involves decisions on which bundles of services should be offered, results in a tailor-made service specification like the architectural innovations discussed in Henderson & Clark (1990). The second task, that is *service delivery*, requires knowledge on *how* and *when* to implement a service specification. Once a customer has accepted a service specification, the implementation of the specification should lead to the realization of services and hence to the accomplishment of the service delivery task.

In our example, the account manager and risk manager may discuss which financial constructions would secure the payments for the car loan. Such constructions could for example aim to minimize the risk for the parties involved or aim to maximize the amount of

money involved. Once the account agrees with a certain proposal, it has to be implemented. This requires knowledge of the routines and procedures within the organization that allow the delivery of the service. Different kinds of check-ups then need to be done. For example, money will get transferred to the car dealer in time, but not before collateral check-ups have been performed and different departments within the bank have approved the loan.

Naturally, the exchange of knowledge within cross-functional teams depends on the exchange of information. We will indicate the information that carries knowledge relevant for service specification tasks as service specification information. Similarly, there is service delivery information.

To summarize this section, the service specification and service delivery tasks in account management require the integration of different types of knowledge bases. From these knowledge bases different types of knowledge need to be integrated for each specific task. The integration of knowledge occurs through the transfer of information.

In the following sections we will conjecture that continuous information exchange establish a network of relationships. These information exchange networks have a substantial impact on the opportunity for individuals to integrate knowledge. Below we consider concepts like network positions of individuals and various aspects of broker positions that supposedly are relevant for knowledge integration.

3. Broker Positions

In account management the attainment of tasks depends on knowledge integration (see Shapiro & Moriarty, 1984). The total of the information exchange between individuals, which enables knowledge integration for a specific task, defines a task-specific network. In this paper we consider a service specification network and a service delivery networks. In this section we focus on broker positions within these networks.

A network consists of individuals and of the relationships between these individuals (Wasserman & Faust, [1994] 1997). These relationships are channels through which (knowledge) resources flow (Podolny & Baron, 1997; Burt, 1997b). The specific configuration of all relationships is called the network structure. The network structure defines the network positions of each individual within the network, where a network position of an individual refers to the structural characteristics of the organizational context.

3.1 Aspects of Broker Positions

The structural characteristic of a broker position is that this position links two or more otherwise unconnected other individuals in a network (see Adams, 1976; Burt, 1992, 1997a, 2000a; Fernandez & Gould, 1994; Friedman & Podolny, 1992; Granovetter, 1973; Marsden, 1982; Simmel, 1964). Previous research has identified some relevant consequences of this structural aspect for knowledge integration in account management processes (see Simmel, 1964; Granovetter, 1973; Burt, 1992, 1997a, 2000a; Krackhardt, 1995; Hansen, 1999). First, a broker has a better access to a broad scope of relevant and valuable knowledge than others have. Second, a broker is quicker informed about new developments. Third, a broker is more often referred to and consulted, and this provides easier access to different knowledge bases. Finally, a broker is able to filter, choose and mediate knowledge between unconnected actors.

3.2 Informational Diversity and Broker Positions

The above four characteristics of broker positions imply that the contribution of individuals in broker positions to workgroup performance is related to informational diversity, where such diversity refers to the differences in knowledge bases and perspectives that members bring to the group (Jehn, Northcraft & Neale, 1999). Academic studies on the effects of informational diversity usually focus on informational diversity *within* groups. In these studies, informational diversity is usually measured by assessing variables like educational level, functional background and formal position in the organization (see Jehn, et al., 1999;

Pelled, Eisenhardt & Xin, 1999; Williams & O'Reilly, 1998). The common assumption is then that similarity across variables reduces diversity.

Besides individual specific variables, it may well be that the workgroup themselves have an effect on individuals. In fact, Hackman (1990, p.225) emphasizes the importance of these on the knowledge and skills of individuals. Similarly, we would argue that somehow being involved in to different workgroups, temporal as well as intertemporal, has an effect on the opportunities of individuals to contribute to and to have control over informational diversity within these workgroups. This means that individuals in broker positions may contribute to informational diversity because they have access to a broad scope of knowledge bases. This allows brokers to accumulate heterogeneous knowledge more than individuals in non-broker positions. An individual in a broker position thus adds to the informational diversity of the workgroup to which he/she belongs. Individuals in broker positions can also control their contribution to informational diversity. A broker has more opportunities to filter, choose and mediate knowledge flows and thus can control the informational diversity within the group better than non-brokers can.

It should be noted that both the accumulation of heterogeneous knowledge and the control over informational diversity are broker aspects that assume the independence of knowledge between different individuals. One important assumption in social network theory is that a direct link between individuals makes their knowledge more similar (Granovetter, 1973). Hence, the knowledge of an individual depends on the knowledge of those who are directly linked to that individual. When two individuals are only indirectly linked, we say that their knowledge is less dependent. Two actors who are not linked at all are said to have independent knowledge.

Contributing to informational diversity occurs through combining and recombining different knowledge sources. Individuals who have many opportunities to accumulate

heterogeneous knowledge unlikely exchange overlapping knowledge. The exchange of overlapping knowledge is inefficient because it wastes time and effort. It is the efficiency of the set of relationships of an individual that allows for accumulating heterogeneous knowledge (Burt, 1992). In our example, when the account manager, the mortgage specialist and the risk manager exchange knowledge it is almost inevitable that redundant knowledge exchanges will occur.

The control over informational diversity within a workgroup depends on the relative scarcity of knowledge within a knowledge base. Less knowledge implies less opportunity to choose how to contribute to informational diversity, that is to control over the informational diversity within a workgroup.

Note that efficiency does not take into account the scarcity of knowledge (Burt, 1997a). When an individual has access to a specific knowledge base, he/she controls the informational diversity that this knowledge base adds to the workgroups of which he/she is a member. The strength of this control depends on the opportunity to complement or replace a contact in a specific knowledge base with another contact that provides independent knowledge from the same knowledge base. Hence, controlling informational diversity does not depend on the lack of relationships between individuals who share a specific knowledge base.

To fix concepts, it now seems useful to consider an exemplary service specification task for illustrative purposes. In our example, once the car loan is given and the mortgage is raised to finance the roof, the account manager encounters a mortgage need with another account. The concept proposal for a new mortgage construction that the account manager and mortgage specialist have made turns out to be very competitive. However, it also bears high risk. To deal with this risk in a responsible way, while at the same time not giving up the competitive aspects of their concept, they agree that the account manager will discuss matters

with with risk management. Suppose that the risk managers do not often exchange much information about concept proposals, and suppose that the account manager presents the proposal to two risk managers independently. Weighting the independent knowledge of both risk managers about high-risk deals now enables the account manager to exercise control over informational diversity within the workgroup with the mortgage specialist. This control can be higher than it would have been in the situation where both risk managers do exchange information about proposals.

In the measurement section below, we formally define both efficiency and the degree to which actors are constraint in controlling informational diversity. However, we already mention here that efficiency is a positive measure of the accumulation of heterogeneous knowledge, while constraint is a negative measure of controlling informational diversity. In the next section we therefore formulate hypotheses in terms of "accumulation of heterogeneous knowledge" and "*lack of* control over informational diversity" in workgroups.

4. Hypotheses

In this section we first formulate hypotheses about the relations between broker positions and organizational performance. Informational diversity has been suggested to enhance problem solving ability and creativity of a workgroup (Williams & O'Reilly, 1998). However, this may be important for some tasks, it may be unimportant or detrimental for other tasks. This implies that broker positions in some cases can be less beneficial from an organizational perspective. Next, in this section we formulate hypotheses about the relation between broker positions and the personal costs that may come with these positions. We expect broker positions to positively influence role stress. However we also expect that different types of information have a different effect on role stressors.

4.1 Task-Specific Broker Positions and Performance

Workgroup performance depends on the extent to which social processes maintain or enhance the capability of group members to cooperate on subsequent tasks (Hackman, 1987). Account management encompasses social processes that correspond with the attainment of different tasks. More precise, task-related knowledge exchange networks mirror how these tasks are executed. Network positions define the organizational context of actors, and these give meaning to the knowledge they possess and these allow utilization of that knowledge (Granovetter, 1985; Nelson & Winter, 1982, p.105). More specifically, network positions reflect how workgroup members contribute to the transformation of workgroup inputs into workgroup outputs (see Hackman, 1987; Ibarra & Andrews, 1993).

Broker positions in information exchange networks reflect how actors contribute to informational diversity, based on their current and previous cooperative activities. A broker position may be beneficial to a workgroup outcome when the broker characteristics contribute to the attainment of some group or organizational goal (Williams & O'Reilly, 1998). A workgroup that has to make decisions concerning a service specification benefits from knowledge of a broad scope of specification opportunities that the organization offers. Therefore, accumulation of heterogeneous knowledge on these specification opportunities may improve the ability of individuals to contribute to the task of service specification. Also, the ability to control informational diversity will positively influence the perceived contribution to organizational performance. Indeed, control over informational diversity allows for better decision making because various alternatives have been considered and may have been offered to the workgroup.

In our example, to attain the task of service specification, an account manager might be sufficiently able to combine the mortgage knowledge as well as the risk management knowledge. This implies that in the workgroup a combination of independent ideas gets

presented. This increases informational diversity in the workgroup and may enhance creativity and as such the competitiveness of the mortgage specification. The broker position of the account manager implies that the mortgage specialist and the risk manager both save time, while revenues may increase. We therefore expect that both will perceive the contribution of the account manager to organizational performance to be positive. To summarize, we put forward the following hypotheses:

Hypothesis 1a: The amount of heterogeneous knowledge, that an individual can accumulate due to his or her position in a service specification network, positively effects his or her contribution to organizational performance.

Hypothesis 1b: In a service specification network, a lack of control over informational diversity in workgroups negatively effects the contribution of an individual to organizational performance.

It should be mentioned that the scope of knowledge that individuals possess might imply a lack of ability to provide in-dept knowledge. Indeed, brokers may frustrate the attainment of tasks in processes where depth of knowledge is valued over the scope of knowledge. For example, a knowledge specialist in a broker position may be aware of many constructions to attain an optimal cash flow across various situations. However, in processes related to the service delivery task, detailed knowledge of implementing constructions is needed. A specialist with broad knowledge may have insufficient knowledge to adequately contribute to the delivery of the appropriate services. Also, the unique bundles of services offered in account management usually require a non-standard fine-tuning of different service components. A homogeneous interpretation of information is then required. It turns out that

coordination by mutual adjustment has been found to be effective in these situations (Thompson, 1967).

Individuals in broker positions however face an organizational context that does not allow for coordination by mutual adjustment. Broker control mimics the control that a hierarchical structure offers to increase informational diversity. Such control could be detrimental to the processes when coordination by mutual adjustment is needed (Thompson, 1967). Although a broker can have an opportunity to shape the processes (and their outcomes) to his/her own ideas, this can result in inefficiently and slowly accomplished outcomes.

In our example, when the account manager chooses not to bring together two specialists representing distinct knowledge bases, he/she frustrates the possibility for mutual adjustment. The lack of relationships within an department, but outside the workgroup, might frustrate cooperation within the workgroup. Consider the example in which the account manager approaches two risk managers with independent knowledge. Combining the knowledge on what to offer may lead to a creative competitive solution. However, combining the knowledge on how to implement this offer may lead to inconsistent and changing implementation procedures. A mortgage specialist confronted with continuously changing procedures could become less satisfied with the implementation process.

We summarize the above conjectures in the the following two hypotheses.

Hypothesis 2a: The amount of heterogeneous knowledge, that an individual can accumulate due to his or her position in a service delivery network, negatively effects his or her contribution to organizational performance.

Hypothesis 2b: In a service delivery network, a lack of control over informational diversity in workgroups positively effects the contribution of an individual to organizational performance.

4.2 Task-Specific Broker Positions and Role Stress

It has been suggested that broker positions come with personal costs such as uncertainty, stress and conflict (Burt, 1997a; Friedman & Podolny, 1992). From a role set perspective it may be argued that actors in broker positions are more often confronted with strain. Role set theory defines that a role set constitutes an array of associated roles of an actor in a certain status or position (see Merton, 1968, p.423). These roles materialize in the relationships of the focal actor (Burt, 1982). Through these relationships, others communicate their expectations with the focal actor with more or less pressure. Role ambiguity represents the uncertainty felt by a focal actor due to a the lack of (explicit) information on these expectations. Role conflict occurs when a focal actor faces conflicting expectations.

However, in their study of the effect of broker positions on role conflict Friedman & Podolny (1992) suggest that "…the existence of conflicting signals does not necessarily mean that the same individual needs to be the object of these signals. It is possible for individuals to specialize in terms of enacting different *dimensions* of … role expectations" [emphasis added]. As the identification of task-specific broker positions isolates a specific dimension of role expectations, a natural question that arises concerns whether different dimensions of role expectations defined by different tasks equally influence different role stressors?

4.2.1 Role Ambiguity

Individuals that seek knowledge on unfamiliar services have to deal with some intrinsic uncertainty about this knowledge. In our example, the account manager may have doubts on whether the skills of a specialist suffice to deliver the service aspect that best fit the needs of a customer. Because, skills are complex and come forward from knowledge that is tacit to

some degree, there is inevitably some ambiguity regarding the scope of a skill (Nelson & Winter 1982, p.88). This uncertainty may inflict role ambiguity on a focal actor that receives this information (Hartline & Ferrel, 1996; Spreitzer, 1996). Uncertainty about whether the skills of others are relevant creates ambiguity about the job that has to get done. For example, when an account manager faces a plethora of uncertain possibilities to match a need of a customer, this may generate confusion on what he/she thinks is expected of him/her. This effect seems immediate in service specification, but less so in service delivery. In the latter task, the availability of the specification about what is expected reduces uncertainty. Indeed, the execution of service delivery tasks may only start once a service specification has been established and accepted by a customer. Knowledge exchanges in service delivery processes explicate when and how things have to be done. We summarize the above in the following hypothesis.

Hypothesis 3a: A broker position in a service specification network will correspond more role ambiguity than a broker position in a service delivery network.

4.2.2 Role Conflict

The explicit expectations on when and how things have to be done in service delivery are more likely to increase role conflict. Indeed, role conflict is about known but conflicting expectations. The explicit knowledge in service production networks is more likely to cause role conflict than the more tacit knowledge in service specification. For example, the knowledge of a specialist about which distinctive services two different accounts need, is unlikely to generate role conflict. However, knowing that both services need to be delivered at the same time may inflict role conflict.

Hypothesis 3b: A broker position in a service delivery network will correspond with more role conflict than a broker position in a service specification network.

In the next section we elaborate on the empirical method we use in order to examine the validity of the above hypotheses.

5. Method

In this section we discuss our sample, the questionnaire and the relevant measures. We also discuss the method used to test the hypotheses.

5.1 Sample

The data have been collected within a branch of an international financial service provider in a Dutch metropolitan area. This organization utilizes an account management system in which specialists support account managers. However, the latter managers have no hierarchical authority over the former. The network includes 57 employees who work within 5 different departments; 4 specialist departments and 1 account managers department. The account managers department operates in 6 teams, where each account manager has the direct support of one or two internal account managers that support in advice and clerical duties. Each account team serves over a large number of customers (100 to 150) in the "Private Banking"-market segment. This segment consists of well-off individuals, mostly successful entrepreneurs, who need financial services for them and/or for their businesses.

Certain technical characteristics, such as complexities in tax regulations, sizable risk and the intertwining of personal and business finance, make it necessary for the account managers to bring in support from one or more different specialists. Specialists also have to deal with the requests of account managers operating in other market segments, and some of then specialists have to deal with external intermediaries or with clients directly.

The network boundary has been set after consultation with the local management team. We decided to consider those specialist departments that directly contribute to service specification and service delivery in the "Private-Banking"-segment.

5.2 Measurement

A questionnaire has been developed that measures (among other things) the role stress variables, performance and the knowledge exchange networks. Also, we measure some control variables, which are known to effect workgroup outcome.

With the departmental approach we could explicitly define the network boundary (Marsden, 1990). This allows for the identification of the individuals who are relevant for the account management processes in the "Private Banking"-segment. The names of these individuals have been subsequently attached to each question.

The performance and the knowledge exchange networks have been measured with questions in roster format (Wasserman & Faust, [1994] 1997). The roster questions correspond with the service specification and service delivery networks that are under study here. This way of collecting data makes data less biased as opposed to ego centered data collection (Wasserman & Faust, [1994] 1997). From the answers we construct socio-matrices to represent the networks.

The final response to the questionnaire has been 96% (55 respondents). This response rate was achieved by directly contacting non-respondents (telephonically). We asked if there were any reasons why they did not reply. The usual primary answer was that respondents lacked time. Another reason for the initial non-response was a concern about confidentiality. However, we could sufficiently neutralize most concerns by assuring that nobody besides the researchers would see results at the individual level. The main argument we used was that it would be extremely detrimental to the researchers to violate this confidentiality. We were then able to ask for a commitment to respond after stressing the importance of 100% response

rate for this type of research. The maximum number of these personal reminders was 5. Data collection effectively took 7 weeks.

To calculate the performance and broker measures we use the socio-matrices. The role stress variables have been measured using standard psychometric scales. In the subsequent part of this section we discuss these measures in more detail. Also, we discuss the control variables.

5.2.1 Performance

To measure performance, we ask respondents to consider the question: *"Please consider those of the people listed below with whom you have cooperated to serve a customer in the last six months. How successful was this cooperation for the organization?"* In the introduction to this question we explicitly defined organizational success as: *"Organizational success is success for [company name] such as profits, customer retention or increasing customer satisfaction as a result of cooperation."* Respondents could rate the level of success on a 5-point scale (1 = very negative, 2 = negative, 3 = no attribution to success, 4 = positive and 5 = very positive).

We calculate the perceived contribution to organizational performance of individual j (OP_j) by the following equation,

$$OP_j = \frac{\sum_i OP_{ij}}{n_j}, \qquad (1)$$

where i is an individual who cooperates with focal individual j and n_j is the total number of individuals that cooperate with individual j. The variable OP_j is the average perception by actors i of the performance of the focal individual j. Note that OP_j gives a score that does not depend on the self-perception of the focal individual.

To examine to what extent this single item unambiguously measures the contribution to organizational performance, we check its concurrent validity. For this purpose we use a

database on the sales of four services by account managers. This database contains information on about 1000 actual sales of the 6 account managers in the six months preceding the distribution of the questionnaire. To get comparable performance measures across the different products, we normalize (mean), aggregate and average the sales figures into 24 comparable performance measures. For 23 of these measures we are able to derive clusters of specialists that cooperated with the account manager in establishing these sales. We calculate the average perceived performance that these clusters indicate concerning the performance of the account managers. These perceived performance measures can be compared with the 23 actual performance indicators.

To check for concurrent validity we calculate the Kendall's tau-b correlation between the actual and perceived performance measures. Kendall's tau-b correlation is a rank order correlation that compares all possible pairs for both variables. This implies that n(n-1)/2 pairs are to be compared, where n is the number of performance measures (here, n=23). A concordant pair is a pair of observations, which has the same sign for the difference between both variables. For example, $X_1 - X_2$ and $Y_1 - Y_2$ are either both positive or negative. A discordant pair corresponds with opposite signs. For example, $X_1 - X_2$ is positive (negative) while $Y_1 - Y_2$ is negative (positive). The odds ratio between concordant and discordant pairs determines the value of Kendall tau-b correlation coefficient.

For our performance measures we obtain a Kendall tau-b correlation of 0.31, which corresponds with a one-sided *p*-value of 0.02. We use a one-sided test because we expect a positive relation. This result supports concurrent validity. To calculate the odds ratio, we ignore pairs that have zero difference on one or both variables. The odds ratio between concordant and discordant pairs is about 2, and this implies that 2 out of 3 pairs have the same sign. We continue our analysis while using the perceived contribution to organizational performance measure in *(1)*.

5.2.2 Role Stressors

We measure role ambiguity and role conflict by adapting the 5-point scales items from Rizzo, House & Lirtzman (1970) (see table 1). To check for uni-dimensionality and for internal consistency of the measures we proceed as follows. First, initial confirmatory factor analyses are used to assess the contribution of the items to the scale. Second, uni-dimensional scales are derived. Finally, we examine these scales on internal consistency.

*** Insert table 1 about here ***

Initial confirmatory factor analysis of the role ambiguity scale reveals low contributions of item 1 and 4 (see table 1). These items are subsequently deleted resulting in a 5-item scale ($?^2$=4.61, df=5, p=0.46, RMSEA=0.00, AGFI=0.90; a=0.91). The fit statistics and a-value indicate one dimensionality and sufficient reliability of this scale.

The initial confirmatory factor analysis on the 9 item role conflict measure caused some doubt about the uni-dimensionality of this construct ($?^2$=42.32, df=27, p=0.03, RMSEA=0.10, AGFI=0.75). An explorative factor analysis reveals two distinct factors. A confirmatory factor analysis on the 6 items contributing most to the first factor results in a better fitting model ($?^2$=8.14, df=9, p=0.52, RMSEA=0.00, AGFI=0.89). The Cronbach-*a* of this construct is 0.85 indicating sufficient reliability. Notice that the items for role conflict have in common that they emphasize the effect of lack of resources on role conflict, and this should be taken into account when interpreting the results below.

5.2.3 Broker Position Measures

Our measures of broker positions should have two properties. First, a task feature should represent the specific network for which we measure the broker position. Second, the measures should reflect the extent to which individuals have broker characteristics. We aim to capture the task feature by identifying two different types of knowledge exchange networks. For each network we separately calculate to what extent individuals have the two

broker characteristics. The first characteristic, that is, the accumulation of heterogeneous knowledge, is measured by the efficiency of a network position. The second characteristic, that is the control over workgroup informational diversity, is measured by the constraint of a network position. Both measures are derived from Burt (1992). We will now first discuss the measurement of the networks and after that we discuss measuring the broker characteristics.

Knowledge exchange networks concern in information exchanges between pairs of individuals. We measure these information exchanges using two roster questions. Prior to the questions which should provide a map of the networks, we explicitly define the two types of information of our interest. First, "…*service specification information is information related to the integration of service bundles to be advised, proposed and/or offered to a customer"*. Secondly, *"…service delivery information is defined as information related to the 'production' of accepted advice, proposals and/or offerings."*

We formulate two roster questions to measure the information exchange. In the questions we ask, *"How frequently do you exchange each type of information with those listed when they cooperated with you in servicing a customer?"* In order to reduce potential irritation and boredom with the respondent, we introduce a different scale than in the previous questions. Respondents can indicate frequency of information exchange on continuous scales. These scales range from *"hardly ever"* to *"very often"*. We transform the data from these continuous scales to 7-point scales to make data entry more convenient.

The resulting socio-matrices are used to calculate two distinct broker measures for the two relevant characteristics of broker positions. The first measure concerns the extent to which the network structure allows an individual to accumulate heterogeneous knowledge. The second measure concerns the extent to which the network structure constrains an individual to control informational diversity in workgroups. The measures are based on the efficiency

and constraint measures respectively, which Burt (1992) proposes to use as indicators of broker advantages.

To determine the amount of superfluous or redundant knowledge that an actor *i* exchanges with an actor *j*, Burt (1992) combines two variables. First, p_{iq} is the proportion of information exchanged with actor *q*, relative to the total amount of knowledge exchanges in which *i* is involved, that is,

$$p_{iq} = \frac{(z_{iq} + z_{qi})}{[\sum_{j} (z_{ij} + z_{ji})]} \qquad i \neq j, \tag{2}$$

and z_{ij} is a socio-matrix that indicates the valued information exchange relationships between *i* and *j*.

The second variable m_{jq} represents the marginal amount of knowledge exchanged between *j* and *q*, defined by the relative importance of exchanges between *j* and *q* as compared to the largest exchange *j* makes, that is,

$$m_{jq} = \frac{(z_{jq} + z_{qj})}{\max(z_{jk} + z_{kj})} \qquad j \neq k \tag{3}$$

This variable allows for an inter-subjective comparison of the importance of the relation between *j* and *q*. When multiplying the two variables in *(2)* and *(3)*, we weight the proportion of information exchanged with *q* with the relative importance of the information exchanged between *j* and *q* (from *j*'s viewpoint).

The product $p_{iq}q_{jq}$ defines the amount of redundant knowledge exchanged between *i* and *j*, due to their mutual link with *q*. Summing over *q* defines the total amount of redundant knowledge that is exchanged between *i* and *j*, that is,

$$\sum_{q} p_{iq} m_{jq} \qquad q \neq i, j \tag{4}$$

Naturally, one minus the amount of redundant knowledge is the amount of non-redundant knowledge exchanged. Summing this over *j* gives the amount of non-redundant information

that *i* could accumulate. To normalize the scores this expression has to be divided by the number of individuals in the network (*N*). Taking this together we define individual *i*'s network efficiency, which is a relative measure of the heterogeneity in knowledge that an individual may accumulate due to his/her network position, by

$$\frac{\sum_j (1 - \sum_q p_{iq} m_{jq})}{N} \quad q \neq i, j \qquad (5)$$

The constraint measure proposed in Burt (1992) concerns the lack of control on the informational diversity within a workgroup. It is formally defined as the adjusted sum of the amount of information that a focal individual exchanges directly and indirectly with others. The adjustment reflects the degree to which there is a lack of relationships between individuals who offer knowledge from the same knowledge base. As such, constraint measures the control aspect of brokerage.

The constraint measure consists of three elements. The first is the information that *i* directly and indirectly exchanges with *j*. The second is the degree to which *i* can broker this information (that is, the number of individuals with whom *i* has and *j* has no relationship). The third element concerns the degree to which *j* has relationships with an individual *t* within the same knowledge base as *j*. The first and second elements are measured by

$$p_{ij} + \sum_q p_{iq} p_{qj} \quad q \neq i, j \qquad (6)$$

Burt (1992) suggests to take the squares of this expression, that is,

$$(p_{ij} + \sum_q p_{iq} p_{qj})^2 \quad q \neq i, j \qquad (7)$$

As regards to the third element, our collected sample data allow us to use the most rigorous option which is suggested in Burt (1992). This option amounts to calculating a centrality measure based on the cluster of which *j* is a member. The departments to which the actors belong determine the clusters. These departments are the knowledge bases, which

allow the actors to contribute to the attainment of tasks in account management. Missing relationships around *j* within his/her department increase control for *i*. In sum, constraint is measured by

$$(p_{ij} + \sum_{q} p_{iq} p_{qj})^2 O_{Aj} \qquad q \neq i, j, \tag{8}$$

where O_{Aj} is defined as:

$$O_{Aj} = \frac{\sum_{t} b_{Ajt}}{T_A - 1} \qquad T_A > 1, \tag{9}$$

where $b_{Ajt} = 1$ whenever *j* indicates to have an information exchange relation with colleague *t* who is a member of the same department *A* as *j* is, and $b_{Ajt} = 0$ otherwise. T_A is the total number of colleagues in department *A*. Hence, O_{Aj} is the proportion of the members of department *A* with whom *j* has a relationship. This measure of O_{Aj} incorporates the scarcity of the knowledge of *j* in the organization. When T_A gets smaller, knowledge get scarcer and each relationship that *j* has within his/her department will attribute more to *i*'s constraint. When summing *(8)* over *j* we get the constraint for individual *i*.

5.3 Control Variables

Recall that informational diversity refers to differences in knowledge bases and perspectives that members bring to a workgroup. In workgroup diversity research, measures of informational diversity usually concern heterogeneity of education, functional area in the firm and position in the firm (see McGrath, Arrow & Berdahl, 2000; Jehn, Chadwick & Thatcher. 1997; Jehn, et al., 1999).

Informational diversity is a characteristic of workgroups and therefore a contextual characteristic for individuals. We assume the following. If the set of individuals with whom a particular individual collaborates displays high informational diversity, the average

informational diversity in the different workgroups to which this particular individual belongs active in will also be high. The individual measure reflects the group measure.

Commonly applied measures for informational diversity such as for example, education, functional area, and position, are nominal variables. To express informational diversity using nominal variables often an index is used that was introduced by Teachman (1980). We adapt this index to measure the informational diversity across the direct contacts of the actors in the networks of our interest.

First, we establish the set of direct cooperative contacts of each actor. We do this by summing the socio-matrices that represent the specification and delivery tasks networks, that is,

$$x_{ij} = \sum_{s=1}^{2} z_{ij}^{s} \qquad (10)$$

The x_{ij} represents the frequency of information exchange and the superscript s denotesare the two networks (s=1,2). For our purposes, we dichotomize x_{ij}, which results in

$$y_{ij} = \begin{cases} 1 & \text{if } x_{ij} > 0 \quad \forall i \neq j \\ 0 & \text{if } x_{ij} = 0 \quad \forall i \neq j \end{cases} \qquad (11)$$

Here y_{ij} represents the set of direct relationships of each individual i. Furthermore, we establish in which outcome category each individual j belongs, using the nominal variable c_{kj} defined by

$$c_{kj} = \begin{cases} 1 & \text{if } j \in K \\ 0 & \text{if } j \notin K \end{cases} \qquad (12)$$

The Teachman-measure involves the proportion of individuals in each category. The proportion of direct contacts of an individual i who belongs to category k is defined by

$$P_{ki} = \frac{\sum_j y_{ij} \times c_{kj}}{\sum_j y_{ij}} \qquad (13)$$

This proportion is used to construct,

$$H_i = -\sum_{k=1}^{m} P_{ki} \times \ln(P_{ki}) \qquad (14)$$

where *m* is the number of categories in a measure and where P_{ki} is defined in *(13)*. When a category has proportion zero it is not used in the calculations (Ancona & Caldwell, 1992).

Based on three observed nominal variables (education, functional area and position) we calculate three proxies of informational diversity of the workgroup context as noted by the individuals. The informational diversity based on department membership and position turn out to be highly correlated (*?* = 0.78). To avoid multi-collinearity problems we combine both proxies by taking the average of the two for each individual.

Finally, two other control variables we use are education and function tenure. These variables indicate individual knowledge and experience levels, and they both could have a positive influence on the contributions to performance. Furthermore we expect that experience is negatively related with role stressors.

5.4 Tests

To test our hypotheses we use two statistical techniques. First, we consider OLS regression models. The estimated coefficients indicate the effects of broker variables on the three dependent variables (contribution to performance, role ambiguity and role conflict). We also test whether the addition of the set of broker variables significantly increases the explained variance.

Second, we extend our analysis with Wald-tests. These tests allow us to exmine whether two coefficients differ significantly in size. This test is especially employed to test

hypotheses 3a and 3b. A shortcoming of Wald tests is that it is a pure significance test of the null hypothesis that certain coefficients are equal (Greene, 2000). This may limit the power of this test, at least for one specific purpose. To assess the empirical probability of rejecting the null hypothesis when it is false, that is, rejecting the hypothesis that the coefficients are equal when they differ, we run a Monte Carlo experiment using 10.000 simulations. In each simulation run we first generate *Role Ambiguity* and *Role Conflict* scores per individual using the estimated model and normally distributed errors. These error terms have mean zero and variance equal to the estimated residual variance. Next, we re-estimate the models and calculate Wald test statistics. The fraction of simulation runs where the Wald test rejects the null hypothesis determines the probability of rejection when coefficients do differ. The empirical power of the test thus indicates to what extent the test correctly indicates differences between coefficients.

6. Results

Table 2 shows the means, standard deviations and Pearson correlation coefficients for all dependent, broker and control measures. The correlation properties of the data reveal that the highest correlation is 0.70 (for specification efficiency with delivery efficiency). A general rule of thumb is that levels of correlation exceeding 0.75 may lead to multicollinearity problems (Tsui, Ashford, St. Clair & Xin, 1995). Although 0.70 is less than this benchmark, it is close, and therefore we examine the variance inflation factors (VIFs) of the independent variables. This statistic measures the extent to which the variance of a specific independent variable can be explained by the other independent variables. The highest VIF value we obtain is for specification efficiency (3.08), which means that about 67% of its variance can be explained by the other independent variables. Based on these results we confidently decide to maintain all variables for further analysis.

Insert table 2 about here

The inspection of the correlation coefficients in table 2 furthermore reveals that role ambiguity is significantly (at the 5% level) and positively related to our performance measure. Although this issue is not key to our study, this result confirms earlier findings that role ambiguity is not necessarily detrimental to performance (see Singh et al., 1994).

Furthermore, we find a positive correlation between the efficiency and constraint measures. As the latter is a negative measure and the former a positive measure of broker positions, a negative relationship between the two measures may have been anticipated. However, a positive correlation is not inconsistent. It rather seems to imply that the opportunity to accumulate heterogeneous knowledge and the lack of control on informational diversity are two distinct characteristics of broker positions. Furthermore, the positive correlation implies a specific network structure, which is characterized by low density within departments and higher density between departments. The positive correlation between constraint and efficiency occurs because both are low. First, efficiency is low because in cross-functional workgroups similar individuals have contacts. Second, constraint is low because within knowledge bases, like departments, less knowledge exchange occurs.

As mentioned earlier, we use regression analysis to estimate the parameters. The estimated equations are represented in table 3. Model 1 is used to test the hypotheses 1a to 2b. The results show that adding the broker measures improve the fit of the model (F-value ? R^2 = 4.09, p<0.01). The coefficient estimates are seen to give support for H1b, H2a and H2b. The coefficients of specification constraint, delivery efficiency and delivery constraint are significant and have the anticipated signs. With regard to H1b we find no significant effect, as the parameter for the specification efficiency variable is not significant. The informational diversity measure based on departmental and positional differences of

collaborators has a significant positive effect. The other control variables however have no traceable effects on perceived performance.

Insert table 3 about here

The results of Model 2 are consistent with H3a. The effects of both measures of broker aspects (efficiency and constraint) indicate that brokers in specification networks have to deal with increasing role ambiguity. Furthermore, table 4 shows that in all tests these effects are significantly larger than the effects of broker positions in delivery networks. A counter-intuitive finding is that delivery efficiency negatively influences role ambiguity (ß=-6.50, *p*=.05). We anticipated a smaller effect in service delivery, but not a negative effect of broker positions on role ambiguity.

Insert table 4 about here

Finally, Model 3 does not support hypothesis 3b. Although we find that delivery constraint has a significant negative effect on role conflict, we do not obtain that this effect is larger than that of specification constraint. The power analysis indicates that the data provide not enough information to reject the claim that the coefficients are equal. The differences between the parameters are not large enough to be significantly different, although the directions of the signs of the differences are consistent with the hypothesized ones.

7. Discussion

The continuously changing configuration of workgroups create networks of relationships. Complementary to informational diversity based on background, a network perspective allows researchers to explicitly specify an important part of the organizational knowledge context. Several authors have emphasized that this context is of importance to workgroup studies (Alderfer, 1987; Homans, 1950). Furthermore focusing on networks that are support

the to accomplishment of different tasks provides extra insight in workgroup input-output transformation processes (Feld, 1981; Hackman, 1987).

In this paper we study a few effects of broker-induced informational diversity in workgroups attaining the specification and delivery of services. Within these workgroups, knowledge of different knowledge bases gets integrated. Informational diversity refers to the degree of heterogeneous information. Brokers, since they have diverse contacts, may contribute to and control informational diversity in workgroups.

We consider two tasks in account management that require specific types of knowledge. In the first task, that is the service specification task, relevant knowledge answers *what* and *which* questions. The second task, the service delivery task, requires knowledge that can produce answers to *how* and *when* questions. We find that broker induced informational diversity is not beneficial to every task.

To summarize our results, we find that adding information about broker characteristics substantially increases the amount of explained variance in our models. Informational diversity from background variables also has a significant influence. This suggests that both sets of measures are complementary instead of substitutes. More specific, support is found for the hypothesized effects between task-specific broker positions and performance (hypotheses 1b, 2a and 2b). Hypothesis 3a, regarding the differential effect of task-specific broker positions on role ambiguity, is supported too. We also obtain significant differences between the same broker characteristics (efficiency and constraint) in different task networks. Furthermore, a power analysis shows sufficient power for the Wald test we use to test the significance of the differences between task-specific broker effects.

The empirical findings in this paper should be viewed as explorative results, but most results presented here are strong results. Further research may be very useful. This study thus may be regarded as contributing to the insight in knowledge integration processes in service

firms that utilize account management systems. In the remainder of this section we discuss some revealing effects of broker positions and non-hypothesized findings.

7.1 Effects of Broker Positions

The results we found in our empirical setting present support most of our hypotheses concerning the contribution of individuals to organizational performance. The notion that the individual contribution to organizational performance depends on the broker positions in different task networks gets empirical supported. This implies that cooperation in workgroups influence potential contributions to other workgroups.

The informational diversity control aspects of broker positions in the two task networks influence contributions to organizational performance. However, as we hypothesized, in service specification tasks this control is beneficial to organizational performance, while it is detrimental in service delivery tasks. As control is based on the lack of relationships within knowledge bases we may consider the following consequences. First, the results seem to indicate that it may be harmful to have an organizational context where individuals in a similar knowledge base have independent knowledge about *how* and *when* services are to be delivered. An explanation of this finding could include the mutual adjustment argument. In account management, combinations of service bundles are tailor-made. Integration of knowledge about the implementation of these service bundles might need coordination by mutual adjustment (Thompson, 1967). This implies that it is necessary to exchange information during the implementation process. Furthermore, the individuals involved adjust their activities based on the information they receive. Increasing informational diversity about implementation routines and procedures might frustrate the process of mutual adjustment. When individuals in a workgroup have to adjust their activities too much, this might invoke rigidity to further changes, and this in turn may diminish

performance. Hence, increasing informational diversity might backfire on a broker in a service delivery network.

This explanation is consistent with the significant effect we found of service delivery broker positions on role conflict. Recall that our role conflict measure primarily indicates a perceived lack of resources to accomplish tasks as expected. Individuals may perceive excessive demand for their resources, when they individually have to coordinate tasks that are more efficiently coordinated through mutual adjustment. Furthermore, when coordination is inefficient, and takes too much time, this might invoke a greater need for resources to be able to accomplish tasks in the expected time spans.

Another explanation could be that those more embedded in a network are valued more because they are better understood. Informational diversity has been found to create task conflict (see Jehn et al., 1999; Pelled et al., 1999). Task conflict might increase performance because it enhances creativity. However, it may also slow down task accomplishments (see Dougherty, 1992). In service delivery tasks, where time is an important service aspect, low informational diversity might be more beneficial.

Further, the results suggest that the effects of service specification broker characteristics on role ambiguity are larger than the effects of broker aspects in service delivery networks. Heterogeneous knowledge about *what* should be done increases role ambiguity more than heterogeneous knowledge about *how* and *when* things should be done.

7.2 Non-Hypothesized Results

Surprisingly, service specification efficiency has no influence on organizational performance, while service specification constraint does. The difference between the two broker aspects might shed some light on this finding. Efficiency is based on the direct relationships of a focal individual. It measures the heterogeneity of knowledge across and within knowledge bases. Constraint measures the aggregate of the lack of heterogeneity within knowledge

bases. Less heterogeneity within knowledge bases reduces the control of the focal actor over informational diversity within the workgroups in which he/she is involved. This difference between the two measures indicates that it is not so much the heterogeneity of different knowledge bases, but rather the heterogeneity within knowledge bases, which contributes to organizational performance. In account management in service industries it may seem quite obvious that a certain type of service should be offered, but it is the specification of the right service attributes of that service that creates value. More heterogeneous knowledge about the specifics of a certain service seems more valuable than heterogeneous knowledge about different services.

Another non-hypothesized finding is that the degree of efficiency of an individual in service delivery networks decreases his/her level of role ambiguity. This seems to indicate that heterogeneous knowledge on different services decreases the uncertainty of what is expected of a focal individual. We suspect that this knowledge that is explicit in how and when things should be done creates a benchmark for individuals, which provides more certainty about expectations.

Finally, the differences between effects of broker characteristics in different networks on role conflict appeared not significant. The differences were consistent with our hypotheses but they were too small to be detected with the Wald test. A larger number of observations and repeated measurement perhaps could bring more clarity on this hypothesis.

7.3 Implications for Account Management

A direct implication we see concerns the staffing of account focused workgroups. Weilbaker & Weeks (1997), for example, emphasize the importance of further research on personnel aspects in account management. Ancona & Caldwell (1992) ask the fundamental questions on how innovative teams should be staffed. The tasks in account management should lead to customized outcomes, which are often similar to architectural innovations (Henderson &

Clark, 1990). As such the findings in the “innovation teams”-literature might be applicable to account management workgroups.

However, a common property of account management systems is that the knowledge compositions of workgroups experience frequent changes. Our results suggest that it is necessary to consider network positions in the staffing of account focussed workgroups. This may of course come naturally when individuals are left free to choose partners for collaboration. Colarelli & Boos (1992), for example, find in a classroom situation that this method leads to better results then when groups are composed centrally. However, Hinds, et al. (2000) find that free choice leads to homogeneous groups, which reduces informational diversity. Within organizations, the free choice method may be managerial dissatisfying since insufficient informational diversity is created.

Knowledge management instruments are developed in order to allow individuals to reach the knowledge they need to perform their tasks. Two types of knowledge management systems have been identified, that is, a personified and a codified system (Hansen, Tierney & Nohria, 1999). The personified system may particularly serve the purpose of determining network positions and identifying potential individuals who may generate the preferred knowledge composition of workgroups.

7.4 Further Research

There is large scope for further research in the area of task-specific broker positions. The limitations of our study indicate that further research is necessary to establish the effects of task-specific knowledge networks. Furthermore, a range of other effects on other dependent variables needs to be studied (for example, learning, employee satisfaction, and organizational growth). Also, more fundamental research has to be done on how broker positions are formed (see Burt, 2000b; Hinds, et al., 2000).

8. Conclusions

This study explored the effects of task-specific broker positions on performance and role stressors in an account management system. The results suggested that different characteristics of broker positions have distinct effects on perceived performance, role ambiguity and role conflict. Furthermore, these effects were found to be dependent on the specific knowledge exchange network of the broker position under consideration. In certain task-specific knowledge networks, characteristics of broker positions have a positive effect on the perceived contributions to organizational performance. However, other tasks-dependent broker positions were detrimental to organizational performance. Furthermore, broker positions often invoked personal costs to those holding them in terms of increased levels of stress.

We conclude with stating that service specification broker positions benefit organizations, but service delivery broker positions are detrimental to an organization and that they also invoke personal costs.

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Tabel 1: Measuring role ambiguity and role conflict

Items •	Role Ambiguity *	Role Conflict
1. I feel certain about how my performances will be evaluated	—	
2. Explanations are clear about what has to be done	0.84	
3. I feel certain about how much authority I have	0.84	
4. I know that I have divided my time properly	—	
5. I know what my responsibilities are	0.89	
6. For my job there exist clear planned goals and objectives	0.75	
7. I know exactly what is expected of me	0.89	
8. I have to do things that should be done differently		0,64
9. I do things that are apt to be accepted by one person and not accepted by others		—
10. I work with two or more groups who operate quite differently		—
11. I work on unnecessary things		0,77
12. I receive incompatible requests from two or more people		—
13. I receive an assignment without the adequate resources and materials to execute it		0,88
14. I work under incompatible policies and guide lines		0,67
15. I have to buck a rule or policy in order to carry out an assignment		—
16. I receive an assignment without the manpower to complete it		0,66
	α=0.91	α=0.85

•Items with no score were deleted from the scale. * Items 1 to 7 are scored in a reversed way.

Table 2: Means, Standard Deviations and Bivariate Correlations (N=55)

	Mean	S.d.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Perceived Performance	3.72	0.27										
(2) Role Ambiguity	0.00	0.96	0.33									
(3) Role Conflict	0.00	0.94	0.21	0.06								
(4) Education (1=High)	0.75	0.44	0.02	-0.04	0.08							
(5) Function Tenure	1.42	1.67	-0.23	0.19	0.27	0.01						
(6) ID Education	0.88	0.35	-0.01	0.13	0.15	0.12	0.15					
(7) ID Department & Position	0.90	0.44	0.24	0.34	0.27	0.31	0.11	0.57				
(8) Specification Efficiency	0.10	0.06	-0.13	0.27	0.02	0.15	0.17	0.42	0.60			
(9) Specification Constraint	0.03	0.02	-0.34	-0.15	-0.25	0.11	-0.07	0.12	0.16	0.55		
(10) Delivery Efficiency	0.10	0.07	-0.13	0.00	-0.04	0.20	0.08	0.36	0.55	0.70	0.42	
(11) Delivery Constraint	0.05	0.04	0.19	0.02	-0.40	0.01	-0.24	0.04	0.10	0.26	0.31	0.43

Role Ambiguity and Role Conflict are regression factor scores with mean zero. ID = Informational Diversity. All correlations above (below) (-) 0.26 are significant at p <0.05 (two-tailed test). All correlations above (below) (-) 0.34 are significant at p <0.01 (two-tailed test). All correlations above (below) (-) 0.42 are significant at p <0.001 (two-tailed test).

Table3: OLS Regression Results (N=55). Individual Level Measures Predicting: Perceived Contribution to Organizational Performance (1), Role Ambiguity (2) and Role Conflict (3)

	Model		
Independent Variables	**1**	**2**	**3**
Controls			
Education (1=High)	-0.00 (-0.02)	-0.19 (-0.69)	-0.04 (-0.15)
Function Tenure	-0.03 (-1.35)	0.09 (1.26)	0.07 (0.99)
Informational Diversity Education	-0.11 (-1.05)	-0.40 (-1.00)	-0.06 (-0.15)
Informational Diversity Departments & Positions	0.32** (3.12)	0.81* (2.07)	0.80 (1.99)
Task-Specific Broker Measures			
Specification Efficiency	0.21 (0.25)	9.62** (3.00)	-0.88 (-0.27)
Specification Constraint	-4.61** (-2.89)	-15.18* (-2.51)	-6.17 (-1.00)
Delivery Efficiency	-1.34* (-2.07)	-6.50** (-2.65)	-0.07 (-0.03)
Delivery Constraint	2.37** (2.83)	4.53 (1.42)	-7.45* (-2.29)
Intercept	3.70*** (36.26)	-0.48 (-1.24)	-0.10 (-0.25)
Statistics			
Adj.-R^2	0.32	0.27	0.19
F-value	5.51**	3.47**	2.52*
? R^2 (adding Broker Measures)	0.28	0.20	0.18
F-value ?R^2 of Broker Measures	4.09**	3.63*	2.99*

**p<0.05; **p<0.01; ***p<0.001 t-values in parentheses*

Table 4: Wald Type Tests for the Equality of Coefficients

	Role Ambiguity (Model 2 in table 3)	**Role Conflict (Model 3 in table 3)**
I. (a) Specification Efficiency with (b) Delivery Efficiency	H_0: (a)=(b), H_1:(a)> (b) Coefficients (a,b): (9.62,-6.50) F = 11.47** Power = 0.62	H_0: (a)=(b), H_1:(a)< (b) Coefficients (a,b): (-0.88,-0.07) F = 0.02 Power = 0.00
II. (c) Specification Constraint with (d) Delivery Constraint	H_0: (c)=(d), H_1:(c)< (d) Coefficients (c,d): (-15.18, 4.53) F = 7.50** Power = 0.92	H_0: (c)=(d), H_1:(c)> (d) Coefficients (c,d): (-6.17, -7.45) F = 0.03 Power = 0.20
III. I and II Simultaneously	H_0: (a)=(b) and (c)=(d) H_1: (a)>(b) and (c)<(d) F = 7.04** Power = 0.97	H_0: (a)=(b) and (c)=(d) H_1: (a)<(b) and (c)>(d) F = 0.03 Power = 0.30

$^{*}p<.05$; $^{**}p<.01$

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