

## **Project networks - a short term and a long term view**

**Tuomas J. Ahola**

Helsinki University of Technology  
BIT Research Centre  
Otaniementie 17, P.O. Box 5500  
Finland  
tuomas.ahola@hut.fi

### **Abstract**

Project networks are temporary inter-organizational networks that exist only for the duration of the project at hand. Despite this clear short term orientation, project networks tend to be partially reconstructed from one project to the next implying that there is a need for a long term view, as generally applied to other types of inter-organizational networks (alliances, joint ventures, delivery chains, etc.). This work-in-progress paper discusses project networks by complementing the short term view dominant in project management literature with a long term view, utilizing a theoretical background consisting mainly of the IMP group's network approach. A brief empirical illustration is provided in the context of the Finnish construction industry. Based on the theoretical discussion and empirical illustration, propositions regarding project networks are formulated. Based on theory and empirical data, it appears that project networks suffer from short term optimization and excessive focus on the executing and controlling processes of the project, leading to problems in the preceding project initiation process and problems in developing long term inter-organizational relationships between project network actors.

**Keywords:** Project networks, inter-organizational networks, construction industry

## Introduction

Projects contribute significantly towards the wealth and well-being of nations. Various construction projects, roads, bridges, power plants, hospitals, etc. maintain and improve the infrastructure of a nation. Major development projects such as the Space Race or Concorde project have significantly contributed to the technological capabilities of nations, even though their full economic benefits have sometimes taken decades to realize. Major projects are almost never conducted by one individual organization and to ensure that the project is successful it needs to meet its integrated scope, cost, time, and quality requirements (PMBOK 1996). To achieve these goals the collaboration and complementary resources and capabilities of several organizations, i.e. a *project network*, is usually required.

It can be argued that project networks can be characterized by a short term focus. Project management literature emphasizes the importance of *executing and planning processes* to ensure that the goals (scope, cost, time, and quality requirements) set for the project are met (Hellgren and Stjernberg 1995). However, project management literature contains only a limited amount of discussion concerning how the *initiation process* should be managed, i.e. how the goals of the project should be set in a context involving several organizations. Further, project management literature seems not to consider how organizations should develop their inter-organizational relationships with other organizations, i.e. project management offers very limited support towards a relational view of conducting business.

This paper attempts to clarify the concept of project network by complementing the short term focus dominant in the project management literature with a long term focus derived primarily from the research conducted by the IMP group, particularly the network approach (Håkansson 1987; Håkansson and Johansson 1992; Håkansson and Snehota 1995). Three broad research questions guiding the research, from which intermediate results are presented in this paper, are as follows:

- ❖ What are the salient features of project networks?
- ❖ What are the key problems that hinder the effectiveness of project networks?
- ❖ How should organizations operating in project networks manage their long term inter-organizational relationships?

## Theoretical background

In the following, relevant inter-organizational network research is introduced. Since inter-organizational networks have been studied from very differing theoretical perspectives, this discussion does not attempt to summarize all network research schools or paradigms (for a rather extensive review, see Oliver and Ebers 1998), but focuses primarily on the network approach presented by Håkansson (1987) and later amended by Håkansson and Johansson (1992) and Håkansson and Snehota (1995). Some theories that the network approach partly builds on such as Coase's (1937) distinction between markets and hierarchies, transaction cost economics (Williamson 1975, 1985), resource dependence (Pfeffer and Salancik 1978), Granovetter's (1985) work on the embeddedness of economic action in social structures, and Powell's (1990) work on networks are also briefly introduced. After the brief discussion on the key theories, the salient features of project networks and their relationship to these theories are discussed.

A stream of research complementing project management with a relational viewpoint that clearly needs to be noted here is *project marketing*, building on strategy and marketing research (see e.g. Cova et al. 2002; Cova and Salle 2004). As project marketing discusses projects from a rather different viewpoint than the one taken in this paper, it is not discussed here further.

Ronald Coase was first to question the traditional "black box" production function view of the firm. In his seminal article Coase (1937) distinguished between markets and hierarchies as two alternative ways of organizing similar transactions. In the markets outside the firm, price movements direct production, but within firms, this market structure is substituted by the entrepreneur who is coordinating production (which can be accomplished in a number of ways). According to Coase (1937), organizing production by the use of the price mechanism includes a cost, and the most obvious cost is that of

discovering the relevant prices. This cost can be reduced, but not eliminated, by using specialists that sell this information. In addition, the costs of negotiations that need to be carried out must be taken into account. When forming an organization, the entrepreneur attempts to make profit by avoiding some of these costs. Market transactions and transactions internal to an organization are also treated differently by governments or regulatory powers (Coase 1937). For example, value added tax is generally applied only to exchanges that take place in markets, but not to transactions conducted within firms. These differences between exchange transactions that take place in markets and transactions that are internal to an organization actually form the reason of existence of the firm (Coase 1937). Arguably, when the costs of conducting certain transactions within the firm are lower than the costs of conducting these transactions in the market, it is optimal to conduct them within the firm. As increasing the amount of internal transactions naturally also increases the size of the firm, it can also be assumed that as the firm gets larger, the costs of organizing production within the firm increase and the returns to the entrepreneur diminish. At some point the costs of internalizing transactions becomes higher than the costs of market transactions, and this fact limits firms from growing indefinitely. Clearly, both market transactions and transactions internal to organizations need to exist. (Coase 1937)

### **Transaction costs**

Transaction cost economics (TCE) examines “*the comparative costs of planning, adapting, and monitoring task completion under alternative governance structures*” Williamson (1985: 2). It should be noted that by definition, TCE is not concerned with discovering *the absolute costs* of transactions, but with comparing the costs resulting from different governance structures. Williamson (1985: 17) argued that “*the economic institutions of capitalism have the main purpose and effect of economizing on transaction costs.*” This should not be misinterpreted as the *sole* purpose of the organization.

According to Williamson (1975, 1985), transactions are affected by *asset specificity*, *bounded rationalism* and *opportunism*. Asset specificity refers to investments that are tied into transactions creating “lock-in” effects. In some cases, assets that are intended for certain transactions are difficult or impossible to be allocated to other uses. This can, for example, increase the costs for a customer to switch suppliers. High asset specificity can lead to opportunism, since switching organizations involved in the transactions can be very costly. Transactions with low asset-specificity are more likely to take place on across a market interface, whereas transactions with high asset-specificity are more likely to be internalized by the organization (Williamson 1985).

### **Resource dependence**

Pfeffer and Salancik (1978) presented the argument that the external environment of a firm greatly affects the strategic behavior of the firm and that no organization alone possesses all the resources that are needed for successful operation or even survival. To acquire the required resources a firm has to interact with their environments, and is therefore dependent on these environments. The task of interacting with the external environments is laborious and often problematic. The environments also constrain the possible actions of the firm, since in order to survive, the firm also needs to fulfill the requirements of the environments it operates in. Organizations have to cope with an environment where interacting organizations are increasingly mutually dependent and the management of these interconnections is a central task for management. Scarce and critical resources form a source of power, and organizations that control these resources seek to benefit from this situation. At the same time, organizations try to avoid being overly dependent on other organizations, by attempting to ensure their supply of critical resources. This situation is likely to result to the utilization of different strategies and tactics by organizations to improve their positions within the environment - one sort of a game. The resource dependence view is arguably rooted deeply in open systems theory, in which it is assumed that the structure or behavior of an organization cannot be understood without understanding the context or environment where it operates in.

## **Markets, hierarchies, and the importance of social context for economic exchange**

Some academics (e.g. Williamson 1985; Thorelli 1986) stress that different forms of organizing production form a continuum with perfect markets on the one end and total hierarchies (vertical integration) on the other end and all other forms, such as a network, are hybrid forms of these two extremes. During the recent two decades, new forms of inter-organizational collaboration (such as joint ventures, strategic alliances, and inter-firm networks) between firms have started to emerge. Several academics (e.g. Powell, 1990) have claimed that these new forms cannot be placed in a continuum between markets and hierarchies, but should be treated individually with their distinctive salient features. Social structures related to exchange also seem to matter, since Granovetter (1985) argued that markets cannot be separated from social structures, since social access can result to information benefits for some parties, while leaving other parties disadvantaged. If these aspects are disregarded and these forms of organizing production are “forcefully” allocated into the market-hierarchy continuum, the essence of these forms is easily lost. Granovetter (1985) coined the term embeddedness to stress the importance of social relations, trust and the avoidance of malfeasance between organizations. People do prefer to transact with individuals they know or who possess a good reputation. Contrary to Williamson’s (1975) claim that efficiency is the prime mechanism for the selection of organizational form, Granovetter (1985) argued that interpersonal relations and networks of relations among organizations are the key determinants of organizational form.

Uzzi (1997) further developed the connection between social embeddedness and inter-organizational networks by discussing the effects of *arm’s length* (market) relationships and *embedded* (close) relationships in organizational networks and argued that the formation of embedded relationships may create competitive advantages for firms and trust present in embedded relationships may facilitate fine-grained information transfer and promote joint problem solving arrangements. Uzzi (ibid.) further categorized networks as *underembedded arm’s length networks*, consisting only arm’s length ties, *integrated networks*, consisting of both arm’s length and embedded ties, and *overembedded networks* consisting of only embedded ties and hypothesized that the integrated network would be an optimal structure. Uzzi (ibid.) also criticized Williamson’s (1985) categorization of an actor’s motivation into selfish or cooperative and rationality into pure or bounded, by stating that these are emergent properties of the social structure (network) which the actors are embedded. In other words, the actions taken by individual actors participating in networks are more dependent on the social relationships between the actors than on the network structure. Uzzi (1997) also discovered that actors are conscious of the differences between arm’s length ties and embedded ties and purposefully utilize both types of relationships.

### **Alliances and strategic networks**

US researchers studying inter-organizational relations often refer to alliances or strategic networks while their European colleagues often use the terms networks and partnerships. In addition to somewhat different terminology, the research methods utilized by US researchers are more often quantitative than methods used by European researchers (e.g. the later described IMP research has been dominantly qualitative in nature). These two factors have contributed to a lack of cross-continental referencing in inter-organizational network research.

Nooteboom (1999) identifies the need to concentrate on core competencies, outsource activities, access to complementary knowledge and competencies, spreading fixed costs, circumvent entry barriers, increase speed to market-entry, adapt products to markets, acquire sources of materials, components, labor, technology, or learning, set market standards, and pre-empt attack or attack competition as common reasons for forming alliances or strategic networks. Strategic networks can be characterized as purposeful long term inter-organizational networks, which have a clear leader actor, a ‘hub firm’ (Jarillo 1988). Alliances can be characterized as inherently dyadic exchanges, even though they may in some cases involve several organizations and take many forms from alliances with no shared equity to joint ventures with a significant amount of shared equity (Gulati 1998). Alliance formation research has also been criticized for considering that firms exist in an atomistic system, in which social embeddedness plays no significant role and information is equally and freely available to all firms (Granovetter 1985; Gulati 1998).

## **European Industrial Marketing and Purchasing (IMP) Group research**

The following reviews the research conducted by the European Industrial Marketing and Purchasing (IMP) Group. IMP Group has actively studied inter-organizational relationships and networks since it was founded in the middle 1970's. In the following discussion, the only most crucial developments of IMP Group research are discussed and the purpose of the following is not to provide a complete summary of all IMP Group research.

IMP research began with the analysis of dyadic buyer/seller pairs. Drawing primarily from inter-organizational theory (e.g. Van de Ven et al. 1975) and new institutional theory (e.g. Williamson 1975), the *interaction model*, a tool for analyzing dyadic inter-organizational relationships was created (Håkansson, 1982, p. 1-8). The interaction model contains four basic elements: the *two parties* involved in the transaction process, the *interaction process*, the *atmosphere* affecting and affected by the interaction, and the *environment* within the interaction takes place. The interaction model views the interaction between two organizations as a continuous process, contrary to most previous studies that had focused on analyzing discrete transactions between organizations that were assumed to be making autonomous decisions. In addition, most previous studies focusing on buying and selling had analyzed only a single organization. Since the introduction of the interaction model, dyadic relationships between organizations have been studied rather extensively (see e.g. Backhaus and BÜschken 1997).

In most cases, individual relationships between organizations cannot be managed in isolation. Organizations often have interdependent relationships with several other organizations and therefore an individual relationship should only be analyzed in the context of the other relationships. A very central construct of social exchange theory is connection (Cook and Emerson 1984). 'Two exchange relationships are connected to the extent that exchange in one relationship is contingent, positively or negatively, upon the exchange in the other relationship.' Connectedness is also a central concept of systems theory. Granovetter (1992) warns researchers focusing on inter-organizational relations of the risk of "dyadic atomization", referring to the analysis of pairs abstracted out of their embedded context. In addition, all organizations possess a limited amount of resources and therefore there is a constant need to balance how these resources divided between the various relationships the organization has (Axelsson and Easton, 1992).

To move the scope of analysis from understanding how dyadic pairs of organizations interact to understanding how entire networks function, researchers from IMP Group (Håkansson 1987; Håkansson and Johansson 1992; Håkansson and Snehota 1995) presented the *network approach* (also referred as *network model* or *ARA model*). The network approach identifies three basic classes of variables related to the *actors*, *activities*, and the *resources*, aiming to provide researchers and managers with central constructs that are required to be able to make sense out of complex and interconnected inter-organizational networks.

- ❖ Actors control the activities and resources of the network. They determine, alone or jointly, which activities to perform and how various resources of the network are used. Actors may control resources directly (ownership) or indirectly (through relationships with other actors). Actors have interests and goals that sometimes conflict.
- ❖ Activities occur when actors utilize, develop, combine, exchange or create resources. Activities can be divided into transformation and transfer activities. Single activities are linked to other activities in various ways.
- ❖ Resources are heterogeneous and can be used in an unlimited number of ways. Performing transformation activities requires transformation resources and performing transfer activities requires transfer resources. Knowledge and experience of resources are important.

## **Project networks**

According to Thorelli (1986), "a network can be viewed as consisting of "nodes" or *positions* (occupied by firms, households, strategic business units inside a diversified concern, trade associations and other types of organization) and *links* manifested by interactions between the positions or members". The number of nodes and links varies among networks, as does the intensity of interaction between nodes (or organizations). In this paper, the nodes are organizations and the links are inter-organizational relationships.

In extant literature, the term “project network” is often used to refer to a network of activities required to complete a project and are subject to a set of precedence relations (see e.g. Demeulemeester 1995). In this paper, a completely different view to project networks is taken as they are considered as networks of organizations with complementary resources and capabilities that participate or influence a given project.

Hellgren and Stjernberg (1995, p. 379) present a working definition that rather elegantly describes the essence of project networks:

“... a project network is defined as (1) a set of relations, where no single actor may act as a legitimate authority for the network as a whole, (2) where the network is open in the sense that there are no definite criteria by which the boundary of the network may be identified and controlled, (3) where the network is temporally limited, dynamically changing and (partially) reconstructed from one project to the next.”

In his study of the construction industry, Eccles (1981) discovered that despite of strong price competition, organizations operating in the industry formed “quasifirms” where many of the actors participating a given project participated also to the ensuing project. The motivation to favor organizations that had participated to previous projects when selecting participants for new projects, and not to enforce a price-only-based tendering mechanism, stemmed from attempts to reduce project total costs, by for example, learning to efficiently work together with organizations that were delivering quality work, and by reducing the need for allocating resources for supervising the work of these organizations. Working with the same organizations from one project to the other as a mechanism was also considered as a mechanism for reducing demand volatility (Eccles 1981) that arguably characterizes the construction industry. The tendency of using the same suppliers from one project to another has been confirmed by Håkansson et al. (1999). However, even though there clearly is an inherent element of stability in project networks, they are in most cases far more dynamic than other inter-organizational networks (e.g. supply networks or alliances) scrutinized in most inter-organizational studies (Hellgren and Stjernberg 1995).

Considering project networks from a transaction cost perspective provides some implications towards the need for long term relational development. Projects are inherently complex and typically involve both sequential and reciprocal interdependencies<sup>1</sup>. Subcontracting work via the tendering mechanism often involves high transaction costs, since creating an invitation to tender, and evaluating several bids containing complex technical information are laborious and time consuming tasks. Reducing the number of organizations that are considered as potential subcontractors and creating more flexible contracts can be used to reduce tendering costs. Building long term inter-organizational relationships or partnering with certain key suppliers are ways to accomplish this. Flexible subcontracting practices do decrease tendering costs, and often also to costs of coordinating work, but simultaneously increase the possibilities of opportunistic behavior by both the contractor and the subcontractor. Trust is arguably a key requirement for not using traditional tendering practices, since it acts as a complementary governance mechanism to formal contracts. The concept of trust is clearly related to Granovetter’s (1985) embeddedness argument that states that interpersonal relationships significantly affect economic exchange. It is also possible that information benefits (1985) or fine grained information transfer promoted by trust (Uzzi 1997) increases the probability of inclusion to forthcoming projects, since early information regarding forthcoming projects has been identified as critically important for the successful marketing of new projects (Cova et al. 2002).

Project networks can often be characterized by a rather low degree of asset specificity. This is rational, since there is no guarantee for any of the organizations participating a given project to be included in forthcoming projects. This limits the motivation for example, to invest in shared IT systems or jointly develop working practices. Low asset specificity is an important (and possibly in some cases harmful) characteristic of project networks, since it act as an inducement to focus effort on short term optimization.

When considering project networks from a resource dependence perspective, an individual organization’s environment could be viewed as the set of potential organizations to work with. In industries,

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<sup>1</sup> Following the categorization by Thompson (1967)

where project networks are common (e.g. construction and shipbuilding), the capabilities and resources of organizations differ highly and no organization is able to deliver projects without working with other organizations. Therefore, to prosper or even to survive in an industry environment where project networks are common, any organization must somehow ensure that there is at least a reasonable probability that it will be included in forthcoming project networks. To ensure this, firms must manage the complex task of interacting with the environment that Pfeffer and Salancik (1978) referred to and to ensure that they possess resources that make them attractive network partners. In addition to self-evident technological capabilities and resources, relational aspects such as trust and reputation can be highly relevant here.

Despite the arguable importance of project networks, there are surprisingly few studies that address them. Hellgren and Stjernberg (1995) discussed project networks and presented several shortcomings related to their management. Their main critique was addressed towards viewing project networks as suitable to be managed “as machines” via formal planning techniques adopted from traditional project management discourse. Tikkanen (1997) discussed project deliveries as business processes and characterized individual project deliveries as more or less unique, but the business processes involving ongoing exchange as general and “ahistorical” in nature. He further argued that an understanding of how projects occur within the network of organizations that jointly produce it is an important vehicle for organizational learning. The following table (table 1) summarizes some key characteristics of project management, project networks and inter-organizational networks research.

**Table 1 – key characteristics of project management, project networks, and inter-organizational networks research**

	Project management	Project networks	Inter-organizational networks (according to IMP Group)
Typical focus of research	► How to efficiently deliver a project with a given scope, cost, time, and quality requirements	► <i>Not established as a research field</i> ► How to complement short term (project management) objectives with long term inter-organizational relationships	► How to manage in inter-organizational networks ► How to actively develop inter-organizational relationships
Typical unit of analysis	Organizations participating a given project	A population (possibly geographically limited) of organizations operating within an industry sector delivering projects (e.g. construction, shipbuilding)	Network of organizations (e.g. supply chain, research consortia)
Planning horizon / optimizing horizon	Short/medium term	Short/medium/long term	Medium/long term
Dynamism of network	Normally not an issue	Moderate / high	Low / moderate
Primary practical contribution of research	Improved cost-efficiency and quality of delivered projects	A long term relational focus to complement the short term objectives dominant in project management	Guidelines for creating, dissolving, and leveraging inter-organizational relationships. Guidelines for achieving innovation and improving technological development.

### Empirical illustration

Empirical evidence supporting this paper was gathered during a research project supported by the Finnish Technology Agency (TEKES) and the participating organizations. The research project studies the construction industry in Finland with the general aims of discovering the problems that reduce the effectiveness of project networks and providing tools and guidelines that help to reduce these prob-

lems. The research project provided access to a network of six organizations (actors) operating in the construction industry with the following characteristics:

- ❖ The organizations included in the network have participated in several construction projects
- ❖ The organizations wish to cooperate and develop the inter-organizational network as-a-whole with a long term focus.
- ❖ The organizations (i.e. their activities and resources) are complementary. No two organizations clearly focus on performing exactly the same activity in the network and thus, no two actors are direct competitors in any situation.

In addition to the current six organizations, the author will later study another project network, likely in another business area than construction, to strengthen the empirical data and to refine the propositions presented later in this paper.

### ***Data collection and analysis***

The primary method for gathering data was the semi-structured (thematic) interview. The author has interviewed the managing directors of each organization, as well as persons responsible for managing inter-organizational projects and inter-organizational relationships. To gain a holistic understanding of the organizations in their networked context, the author has interviewed each person 1-3 times. Between the interviews, case reports were written and the consecutive interviews aimed to deepen the insight gained in previous interviews. The amount of interviews conducted is 19, each lasting from about one to three hours. All interviews were recorded and later reviewed to improve the reliability of analysis. To ensure that the interviews would not remain mere discussions and that the data gathered would prove useful, the author conducted the interviews with the following set of a “mindset” of apriori constructs and issues:

- ❖ The actors, resources, activities (ARA) model by IMP group (Håkansson 1987). The author needed to understand the key actors involved in the network, what resources each actor brings to “play” and how these resources are combined and used. Activities performed by either solely or jointly by actors were also crucial, since they provide an understanding to how the network creates value for its customers.
- ❖ Needs, goals, and networking plans (strategies) of each organization, what are they, and how is this information shared among the actors (organizations)
- ❖ What are the most relevant problems hindering the effective delivery of projects as perceived by different network actors.

The data analysis was interpretative with the aim to generate a holistic understanding, i.e. make sense of the strategies and practices of the studied organizations and their complex, networked context. No formal data analysis such as the use of structured data reduction and analysis techniques was employed (Miles and Huberman 1994). Case descriptions were written based on the author’s interpretation of the interview results. To ensure the validity of these descriptions, they were discussed and augmented with the interviewees to confirm that the interpretations of the author did not conflict the views of the interviewees.

### ***Preliminary results in brief***

The interviews clearly indicated that networking and building relationships with other organizations were considered important, but that so far, the relationships with other organizations had mostly been built “ad-hoc” during completed projects. The interviews clearly indicated that despite the competitive tendering practices common in the industry, case organizations generally preferred to deal only with a few “proven” organizations. Outside suppliers were contacted occasionally just to make sure that the current suppliers do not take too much advantage of their situation.

Further issues that were discovered during the interviews:

- ❖ The primary focus of improvement activities was on the executing and controlling processes (project delivery), not on the project initiation process.

- ❖ When making decisions, the network-as-whole or its effectiveness was typically not considered by the individual network actors.
- ❖ Actors possessed very limited knowledge about how their actions affect other network actors.
- ❖ Actors had significantly differing network pictures<sup>2</sup> (different actors described the structure and the boundaries of the project network differently, implicating a lack of shared vision or goals among the network members)
- ❖ No organization had a defined networking strategy (i.e. how to systematically build and maintain relationships with other organizations)
- ❖ The importance of trust and past experiences was considered pivotal in the selection of organizations for a forthcoming project.
- ❖ No organization could act as legitimate authority for the entire network, but some actors clearly possessed more authority than others.

It is important to note that despite inter-organizational relationships and networking have received limited attention from the case organizations, it can not be claimed that this has negatively affected their profitability. All of the case organizations were established actors in the construction industry, and this alone proves that their non-explicit/reactive networking practices, at least so far, have been adequate. A remark from an interviewed manager illustrates the importance of maintaining trusting relationships rather clearly:

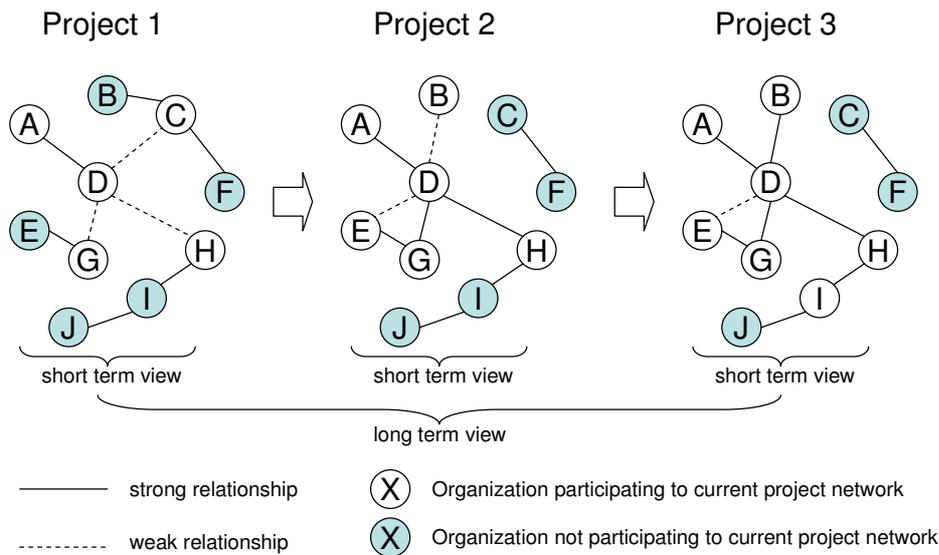
*“Trust is everything in this business and everybody knows everybody. You do what you promise. If you betray your partner just once, he will never deal with you again and will tell his friends about your action.”*

### **Implications / initial propositions**

The following exemplary figure (figure 1) derived from previous theory and the analysis of empirical data illustrates how short term project networks are embedded in a long term inter-organizational context. Interaction and experiences during projects can create, strengthen, maintain, weaken, or destroy long term relational ties between organizations. For example, in project 1, it may be that for some reason organization D or C (or both) was not satisfied with D-C collaboration during the project (there may be several other reasons also, e.g. B and C have possess similar resources and B has made a more competitive offer in project 2). The weak tie between the organizations was destroyed and this resulted in the exclusion of C from ensuing project 2. However, B and E were included in project two. It may be that they possessed similar resources and capabilities as C, or perhaps the scope of the project 2 differed from project 1 in the extent that their collaboration was required. The figure illustrates the third point of the earlier mentioned definition of Hellgren and Stjernberg (1995), since project networks are constantly changing and partially reconstructed. For illustrative purposes, and perhaps contradictory to Hellgren and Stjernberg's second point in their definition, the figure contains only the most relevant (i.e. control a very significant amount of resources and capabilities that can affect the project delivery) actors in the inter-organizational network. The figure illustrates that from the perspective of one individual organization, focusing only on a short term view (ongoing project) and ignoring the long term view (ensuing projects) may result in exclusion from ensuing projects. As implicated by the empirical part and supported by studies by Eccles (1981), Granovetter (1985), and Uzzi (1997), strong relational ties between network actors appear to be crucially important, since they appear to improve the probability of inclusion in forthcoming projects.

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<sup>2</sup> As discussed in Ford et al. 2002



**Figure 1 – Example of how sequential projects can partially re-create the project network and affect inter-organizational relationships between organizations**

**Formulating propositions**

Based on the theoretical discussion and empirical evidence, propositions regarding project networks are now presented. The author realizes the fact that the empirical testing of these propositions poses a significant challenge, since gaining access to a large sample of project networks and collecting the relevant data are both difficult and time consuming tasks.

**Proposition 1:** *“The management within project networks focuses primarily on the executing and controlling processes as emphasized by PMBOK (1996), while at least partially neglecting the preceding project initiation process.”*

Based on the assumption that strong relational ties to other organizations improve the probability of inclusion to forthcoming project networks:

**Proposition 2:** *“Organizations operating in project networks that are actively developing their long term business relationships are financially more successful than organizations that do not actively develop long term business relationships.”*

As discovered during the interviews, and supported by the findings of Eccles (1981):

**Proposition 3a:** *“Positive past experiences with other organizations is the prime determinant for the selection of organizations for a project network.”*

And,

**Proposition 3b:** *“Interpersonal trust between key actors of different organizations correlates positively with positive past experiences with other organizations.”*

It can be assumed that a different set of skills and capabilities are required in initiation than executing and controlling processes. Since, PMBOK (1996) emphasizes planning and control, it may be that:

**Proposition 4:** *“Organizations operating in project networks aim to develop their skills, resources and capabilities required primarily in the executing and controlling processes, at least party neglecting the development of skills, resources and capabilities required in the initiation process.”*

Due to the competitive tendering system that is common in project networks, it is likely that:

**Proposition 5:** *“Organizations operating in project networks focus their goal setting efforts primarily on their own goals and the setting of joint goals for the entire project network tends to be either non-existent, or superficial.”*

The assumed importance of inter-personal ties and past experiences with other organizations leads to the following propositions related to the dynamism of project networks:

**Proposition 6a:** *“Project networks with a high degree of positive past experiences with other organizations are less dynamic (i.e. many of the actors included in the current project contribute also the next project) than project networks with a low degree of positive past experiences with other organizations”.*

And,

**Proposition 6b:** *“Project networks with a high degree of interpersonal trust between actors are less dynamic (i.e. many of the actors included in the current project contribute also the next project) than project networks with a low degree of interpersonal trust between actors.”*

During the research project, it became evident that many organizations that by definition operate within project networks, do not consider the management of inter-organizational networking in their strategic decision making processes. Based on the findings of the research project:

**Proposition 7:** *“Organizations operating in project networks do often not consider to be operating in a “network context” and are to a great extent unaware of published inter-organizational networking studies and results of such studies.”*

## Conclusion

This paper discussed the concept of project network from both a short term and a long term view and presented testable propositions. These propositions have yet to be empirically tested in further research, which poses a significant challenge because of the difficulties related to gaining access to a large sample of project networks and gathering relevant data from them. The propositions were derived from the analysis of extant theory and one single industry (construction). The analysis of further project networks, perhaps with larger organizations than those studied by the author, and project networks operating in other industries are also likely to provide important insights and contribute towards more refined propositions.

From a managerial perspective, it appears (although not proven) that contrary to the Williamsonian TCE, understanding and leveraging the social-relational context of project networks is more vital for organizations operating in them (at least, for smaller organizations) than seeking to minimize the costs of inter-organizational transactions or honing technological capabilities and skills. It would appear that interpersonal trust and experiences are the prime determinants for inclusion in a project network, and thus the prime determinants for organizational survival in project network context. Further research is needed to confirm how interpersonal relationships affect project networks and what implications this may have for organizations participating in project networks. Ad-hoc networking practices that seem to be common within project networks could possibly be improved by conceptual models and tools provided by research projects.

Further, the author is curious if a “common set” of problems hindering the effectiveness of many of today’s project networks could be derived to direct improvement initiatives within the industry. Focusing too much on the executing and controlling processes of the project and too little on the preceding initiation process, lack of a shared holistic and relational view of the project network, and focusing too much on the short term gains on the cost of long term opportunities could prove to be elements of this hypothetical common set. Are there any others?

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