# SME's as systems integrator in the Dutch construction industry by 2020

I.J.E. Ploegmakers*
*University of Twente – Drienerlolaan 5 7522 NB Enschede*
**i.j.e.ploegmakers@student.utwente.nl*

ABSTRACT: Projects in the Dutch construction industry become more complex and dynamic. The different aspects of the building process have to be integrated. The most important role of the systems integrator within this construction network is to organize the activities within the infrastructural network in such a way that they match the constantly changing demands of the client in the innovation superstructure. For these activities a network has to be set up and maintained. Setting up and maintaining a network consists of several steps. The required steps have been defined by the output of literature study, a case study consisting a market-, organization- and network exploration. Through a selection of respondents and organizations/institutions a cross-case method is used to analyze the results of this research. On the basis of these outcomes the recommendations for small-, and medium-sized enterprises (SMEs) turning from jobber into systems integrator are formulated.

Key words: systems integrator, innovation superstructure, innovation infrastructure, strategic networks, business plan, UAV-GC, Dutch construction industry, SMEs, expert.

## 1 INTRODUCTION

Over the last years the Dutch construction industry turned from a traditional construct-only contract to a professional UAV-GC contract which sets functional specifications on building projects. An UAV-GC contract is a standard form of contract of the Netherlands that contains the general terms and conditions for integrated contracts, such as Design and Build or Design, Build and Maintain. Due to these circumstances and changes in the market the bidders have to adapt its organisation to this type of contract, and thereby make strategic choices to fulfil the needs of the contract. Their task is to integrate the different aspect of building; design and construction. The organisations need to respond to these complex projects as an integrator of the different systems and phases and leave the jobber way of bidding (low selectiveness by bidding on projects and activities). In the Dutch construction industry a lot of SME's are specialized in some aspects of building. Therefore, an SME on its own is not able to fulfil the complete demands of an integrated contract for a complex project. For this reason, these SME enterprises form strategic alliances to fulfil the requirements of the potential client. The initiation and coordination of these kind of networks ask for a well-organized plan and structure whereby the SME stays a competitive player in the Dutch Construction industry. Therefore, the steps an SME company has to take to turn from a jobber into a systems integrator of the different phases and disciplines need to be analysed. In this paper, a case study is done within the organization of a Dutch SME named Ploegam. Ploegam is an SME with 160 employees and a yearly turnover of about €50.000.000,- and focuses on dike reconstruction projects within the Netherlands. By considering the market, the organisation and the current network the client becomes aware of the steps to take in the process of turning from a jobber into a systems integrator. In order to develop the steps that the SME has to take, all aspects and actions to form a strategic network are identified by means of literature review.

## 2 INTEGRATED CONTRACTS: AN EVOLVING BUSINESS MODEL

As the Dutch construction industry turned from a traditional construct-only contract to a professional UAV-GC contract over the last years. The jobbers need to evolve their business model to become the professional within the market. First, the Dutch construction industry is discussed, focusing on the issues of integrating complex contracts and the role of organizations responsible for the coordination and integration of complex projects to develop a framework for the expected model to turn from jobber into systems integrator.

### *2.1 Dutch construction industry*

The Dutch building industry is characterized as a Loosely Coupled Network (LCN) in which complex products (CoPS) are made (Dubois & Gadde, 2002) (Winch, 2006). The LCN is a network in which projects are seen as a specific timely network within a more permanent network (Dubois & Gadde, 2002). Within this LCN there is not one single institution or organisation which has the overview of all modules and there mutual links (Hofman, 2009). In

the LCN/Building Industry specific products from one supplier influence the demand of products of the other supplier. Therefore, this process asks for coordination by one party (Dubois & Gadde, 2002). When more solid relationships are present in the network, the project performance will be higher, due to efficient and effective integration of the different phases of the building process (Dubois & Gadde, 2002).

*2.2. System Integration*

Whereas the projects become larger and more comprehensive, due to political and social objectives. The number of stakeholders, the complicity and participation of stakeholder increases. Where the jobbers hob from project to project without selecting or focusing on the integration of different aspects, this integrated process of coordination needs to be done by one responsible party (Dubois & Gadde, 2002). To integrate the different aspects of complex projects the whole system needs systems integration. Systems integration does not only refer to the integration of physical components like the resources named in the previous paragraph, but also to the knowledge and resource integration among the system, or even sequential inter-project couplings, needs to be integrated to optimize or innovate the system. If the intra- and interproject couplings are not accompanied and integrated over time (learning and strategizing process of organizations), the organization may not be on a sufficient level for technological innovation to occur, which will lead to an underdeveloped system (Dorée and Holmen, 2004).

The philosophy behind this new management techniques of systems integration have come from the defense-industry to coordinate and manage complex project from designing to delivery by only one party (Prencipe, 2003). In the 70's the system integration is implemented for the first time in the building project of petrochemical and oil-installations in the Mid-East (Gann, 2000). By this way the integration of the different systems has become a new specialism within the organizations of the building process (Davies, 2004). Summarized, contractors, project management enterprises and design and engineering agencies have a new challenge: the development of capabilities to be able to bid on integral and integrated solutions which fulfills the wished and requirements of the client (Davies, 2004).

This phenomena is presented within the Dutch construction industry; clients are increasingly asking for integrated solutions. The increase of UAV-GC contracts on the market is the result. Also other aspects like finance, own, operate and maintenance become part of the new contracts. All these aspects are hard to cover by a jobber which simply delivers capacity and has low selectiveness on the work acquired, and mostly only reacts on requests.

*2.4. The systems integrator*

As the jobber does not show the required activities within the current network, who does? It's the systems integrator. In other words, the coordination, integration and overview of the so called bottlenecks, components, products and phases (design and construction) (within the UAV-GC contracts) is the main task and function of the systems integrator. The definition of the systems integrator originates from the CoPS (complex products) industry. *A systems integrator is a main contractor organization responsible for designing and integrating product and service components supplied by a variety of external suppliers into a functioning system for an individual customer* (Davies, Brady, Hobday, 2007). An organisation is a systems integrator as the following criteria are met: (1) the organisation has the full contractual responsibility for the design and production of a functional system; (2) the components with which the organisation the system composes are delivered by different external parties. This could be both physical product components and services; (3) the organisation develops a system for an individual and unique client. The position of the systems integrator is located between the innovation superstructure and the innovation infrastructure (Miller, Hobday, Leroux-Demers, Olleros, 1995). The innovation superstructure consists of clients, knowledge institutions and regulatory bodies, whereas the innovation infrastructure consists out of advisors, suppliers and subcontractors.

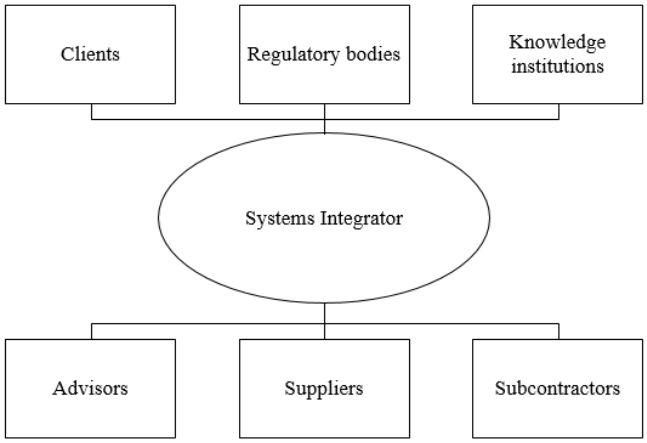


*Figure 1 Position systems integrator (Miller et al., 1995)*

*2.5 Role of the systems integrator*

As discussed in the previous paragraph the position of the systems integrator is situated between the innovation infrastructure and the innovation superstructure. The most important task of the organization that takes on the role of the systems integrator is to organize the activities within the infrastructural network in such a way that they match the constantly changing demands of the client in the innovation superstructure (Brusoni, Prencipe, Pavit, 2001) (Prencipe, 2003). Where the role as a systems integrator knowns a twofold: being the integrator of

several disciplines within one construction project or being the expert company (SI business model) who is able to integrate the whole system. Mainly the last version is focussed on due to the strategic business model for the MKB organisation.

As shown in figure 1 the SI-network consists out of two parts. The innovation superstructure (clients and regulatory bodies) and the innovation infrastructure (suppliers, advisors and subcontractors). Both parts of the network have a different network mechanism. Where the client/principal is always the leading party in procuring a project and is also the party that sets requirements on the works to be done, communication and collaboration. In other words, it's a one way means of networking. The organization of the potential contractor can only obey, but is not able and allowed to work together or influence the principal. However, the systems integrator can position itself in such a way that he becomes the expert of a unique solution, so that he positions, due to analysis of the client/market, the organization as the market leader and other (colleges and clients) will be triggered by the expertise and therefore follow the organization of the systems integrator. Becoming such an expert with superior solutions asks at least for innovation, coordination, diagnosing and entrepreneurship (Foote et al., 2001)(Davies, et. al., 2007).

On the other hand, the disciplines (suppliers, advisors and subcontractors) of the infrastructure are parties that an organization intensively has to work with and are all part of a free-market-economy with just a few restrictions. This part of the network knows an integral network mechanism, where parties are free in the choice to work together and in which way.

Long-term collaborations between parties within the supply chain are common in the trend to a better controllability of the project (Davies, 2007).

### *2.6. Networking and partnerships in the construction industry*

Where the jobber just searches for continuity in turnover and capacity, a systems integrator needs to arrange continuity within the whole network in order to stay a competitive player and actively positions itself in the market. As a systems integrator within a specific niche market it is important to build a strategic network around you and be able to coordinate the parties in the network with whom a complex project can be realised. Besides the steps to take in order to have a stable network, the capabilities of the organisation turning from a jobber into a systems integrator have to be on a sufficient level to maintain the strategic partnerships and choices. On the other hand, due to the focus on contractual and financial aspects within projects there is less room for technique related cases and specialisms. The content has to come first (Davies, 2007).

### *2.7. The SME company*

The jobber, within this research, which wants to transform into the systems integrator is an SME organization. During the execution phase the SMEs play an important role. However, the SMEs have difficulties in investing for new developments, knowledge and capacity (Rijkswaterstaat, 2017). More interest in professionalizing and the use of simplified integrated contracts is necessary. Within this research a framework is set for SME organizations. Small and medium-sized enterprises (SMEs) are non-subsidiary, independent firms which employ fewer than a given number of employees. This number varies across countries. The most frequent upper limit designating an SME is 250 employees, as in the European Union.

## 3 ORGANIZING AN SI BUSINESS

Now it is made clear that a jobber has to firstly define the market and core competence, followed by analysing the client/market. It is important to discuss what the jobber needs to organize within his organization to turn into a systems integrator. Organizing the systems integrator network knows different aspects and disciplines. On the one hand the systems integrator has to deal with the expectations of the infrastructure (1) and superstructure (2) and on the other hand the systems integrator has to coordinate or influence the superstructure (or even the whole network) with their (innovative) system or solution (3).

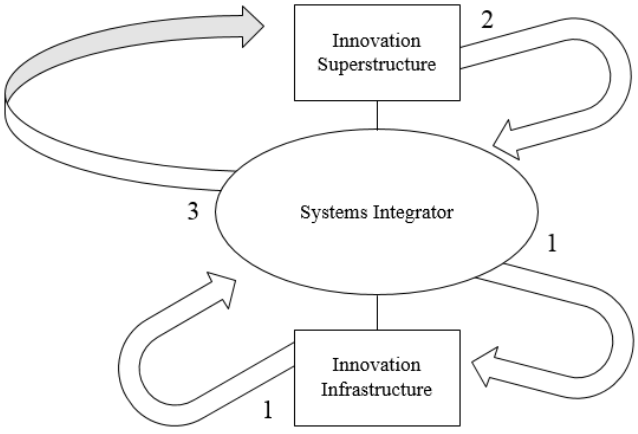


*Figure 2 Illustration of steps for analysing*

First, the coordination of the resources within the innovation infrastructure and superstructure are discussed, followed by the discussion of the influence on the network by being the expert as an SI organization.

*3.1. Capabilities*

As a systems integrator the main task of the organization is to set up and maintain strategic networks within a specific market. Strategic networks are mostly long-term and sustainable relationships, which are formed by trust, openness, transparency and sharing information, in which all parties have the same long-term objectives (Brady, 2005) According to Brady et al. 2005 a SME must at least have the following capabilities available, to develop sustainable long-term relationships: account management, risk management, financial management, information management, legal knowledge, innovation management and finally portfolio management. Remarkable is that mostly the traditional builder is the one that shifts, or is able to shift to the role of systems integrator. Whereby these organisations hire design capacity or buy new in-house knowledge (Rutten, 2009).

*3.2 Network Structure and Coordination Factors*

Besides the capabilities a jobber needs to develop in order to turn from jobber into systems integrator more aspects are of importance to set up a strategic network. Therefore network structure factors give a guidance in selecting your partners and making the right choices in that phase of networking. The jobber is most of the time already active in the market they want to succeed as a systems integrator. Therefore, they already have links within the market with other firms. Most of the time these relationships are loose and sometimes not on purpose. Therefore, it is important that the jobber now sets up a stable network conscious. Firstly, it is important that organisation selects parties which are complementary (Richardson, 1972) (Rutten, 2009), strategically bilateral dependent (Rutten, 2009)(Aiken & Hage, 1968), known and trusted (Gulati, 1998) (Granovetter, 1985) and have social embedding (Gulati, 1998).

After selecting the parties for the network, by the guidance of the network structure factors, the following step is to coordinate the set up strategic network. In literature the foundation of a well-coordinated network is discussed, and literature states that the following factors are decisive; trust (Gulati, 1998)(Shapiro, 1992), administrative control (Gulati, 1995), opportunistic behaviour (Zaheer, 1997), regulative information exchange (Helper, 1991) (Heide, 1992), knowledge mobility (Doz, 1991)(Gulati, 1999)(Hansen, 1999), innovation agility (Sakakibara, 2002) (Teece, 2000) (Dhanaraj, 2004), stable network (Stuart, 2000) (Dhanaraj, 2006).

*3.3. Network management*

As discussed before, a jobber does already have some (loose) relationships within the market, because otherwise the organizations could not be able to realize projects nowadays. Because there is always a component, product or service which is not part of the organizational inventory. However, jobbers can have taken the capabilities, network structure and coordination steps and still have an unstable network. The trick of networking does not only depend on the discussed capabilities, network structure factors and coordination factors, but depends mostly on the network management. The network management is defined as the purposeful contribution of the organization on the quality of networking for gaining organizational objectives.

Ritter (2002) states: '*Firms are not able to decide whether to have relationships or not or whether to care about them; the only choice is whether to cope effectively and efficiently or not.'*

Nahapiet & Goshal (1988) describe four conditions that are needed to actually encourage an organization to network. These conditions are: opportunity, anticipation (or: prospect of value creation) of valuableness (prospect of value creation), motivation and capacity. They form together the input for networking, namely: social capital.

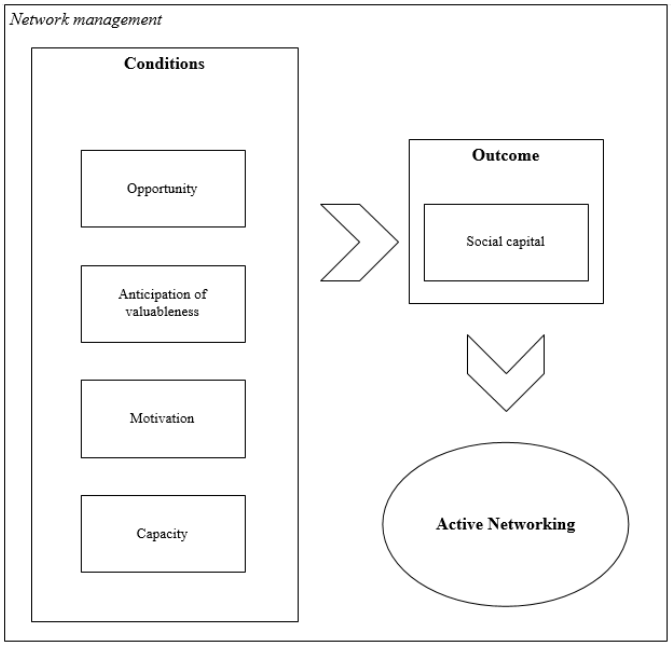


*Figure 3 Network management (Nahapiet & Goshal, 1988)*

Opportunity is determined by the accessibility to the network. Whereas anticipation of valuableness is about being aware of the potential value which can be created by active networking. Motivation is about the feeling that networking is worth it. Finally, capacity deals with the availability of information and time to actually network. These factors together with the personal network style encourage people and organization to network. The organization should be aware of the extent to these aspects, before active networking can be spread over the unit (Nahapiet & Goshal, 1988).

### *3.4. Being the expert*

The last aspect concern the willingness of being the expert for your client. Where the jobber reacts passively to requests of the client and says yes to every work which could realize a higher turnover, the systems integrator is actively involved in the procurement process. Therefore, being a systems integrator does not only concern a company which owns long-term relationships with its client and network. It does also concern the issues of being the expert / market leader. An organization who integrates the active involvement in regulatory, knowledge institutions and has a consulting role for the client. With the strategic consulting role is meant that the organization:

- Provides an in-depth analysis of a customer's business
- Identifies and diagnoses problems in a customer's organization (often before the customer is aware of it)
- Offer solutions based on its experience of working with a number of customers facing similar situations
- Coordinates the integration of components into a solution. (Davies et al. 2007)

Systems integrator organizations, which want to stay or be the expert are searching for a standard solution, which can be easily adjusted on different aspects to be able to become the solution for the unique problem owned the client. The efficiency gains can be achieved by spreading the costs of providing solution over many project with different customers. Recent literature on these integrated solutions also emphasized the importance of developing standardized 'solutions-ready' components, that can be combined and recombined at much lower cost than solutions comprised of entirely customized components (Davies & Brady, 2000)(Foote et al., 2001). Moreover, a phenomena with the implementation and need for 'new' or innovative solution shows that less experienced customers often require solution comprised entirely of standardized offerings, originating from traditional building processes.

Customer demand for more complex solutions based on components supplied by a variety of firms is an important driver behind the emergence of systems integrators offering multi-discipline solution. This involves a willingness to specify, integrate and service a competitor's technology, products and installed base, should the customer demand it or should it provide a superior solution to customer's needs (Foote et al., 2001).

In conclusion, a systems integrator focuses on the component integration task, while coordinating the activities of many external suppliers. This external network expands the capabilities and range of components and knowledge that can be combined to create value for its customers (Galbraith, 2002). Organizing an systems integrator business is all about the willingness to be the expert within your discipline, so that you can strategically consult the client and make use of the resources (knowledge institutions, suppliers, advisors and subcontractors) gained due to a well-organized network and thereby trigger the regulatory as well (Davies et al. 2007).

## 4 JOBBER VS SYSTEMS INTEGRATOR

Within the previous paragraphs the overall construction industry is analysed and the requirements for a systems integrator are defined. The jobber and systems integrator can both be characterized and steps, on the basis of the literature, can be defined to turn from a jobber into the systems integrator. This characteristics and steps will be discussed below and shown in figure 3, which shows an expectation model based on the literature study.

### *4.1. The jobber*

The jobber can be characterized as an organization focussing on making money with the capacity they have in-house. They are low selective on where they want to invest their capacity in. In other words: jobbers are not busy with actively analysing the client and market and developing new solutions which will positively benefit both the client as the own organization. They passively react on request from clients. However, jobbers can still come with new innovative ideas, but these ideas will most of the time only benefit their own organization (Rutten, 2009), to make money more easily and be cheaper than the concurrent in order to acquire work and boost the turnover.

### *4.2. The systems integrator*

The characteristics of the systems integrator are; that the systems integrator is a main contractor organization responsible for designing and integrating product and service components supplied by a variety of external suppliers into a functioning system for an individual customer (Davies, Brady, Hobday, 2007). And is actively involved in the process to match the constantly changing demand of the client (Brusoni, Prencipe, Pavit, 2001)(Prencipe, 2003). The final characteristic is that the systems integrator positions itself and the (innovative) systems within the network in such a way that they can consult the client with focus on innovation, coordination, diagnosing and entrepreneurship (Foote et al., 2001)(Davies, et al., 2007)

### *4.3. 0-model*

On the basis of the characteristics and requirements of both organization types, jobber vs. systems integrator, the proposed steps (intervention strategy of the gap) can be defined to climb the stairs to transform into the systems

integrator. In the figure and table below the proposed steps are illustrated.

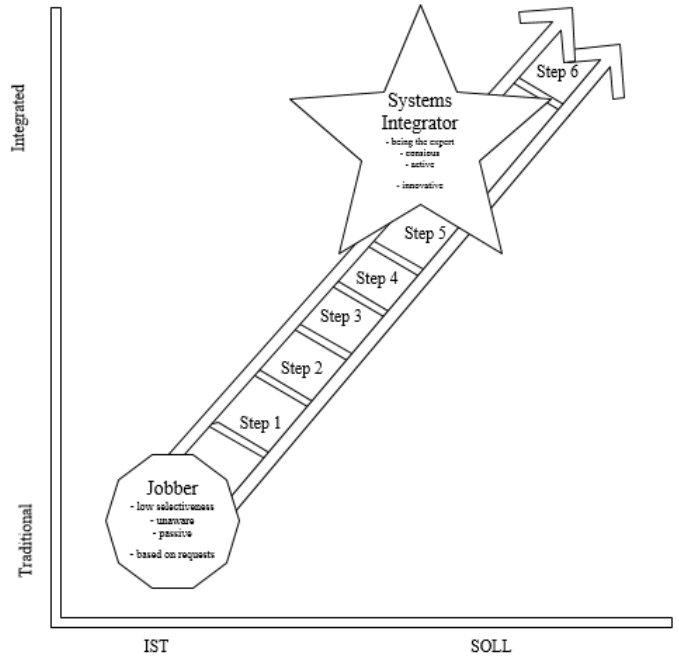


*Figure 4 Interpretation of IST - SOLL situation*

| Step | Activity | Reference |
|---|---|---|
| 1 | Define core competence & market | Davies, 2004; Davies, Brady, Hobday, 2007; |
| 2 | Analyse market | Brusoni, Prencipe, Pavit, 2001; Prencipe, 2003. |
| 3 | Sort out capabilities | Brady, 2005; Rutten, 2009 |
| 4 | Select & built network | Rutten, 2009; Granovetter, 1985; Brady, 2005. |
| 5 | Coordinate & maintain network | Rutten, 2009; Nahapiet & Goshal, 1988; Teece, 2000. |
| 6 | Consult client | Foote et al., 2001; Davies, 2007. |

*Table 1 Explanation proposed steps incl. resources*

*Explanation of proposed steps:*

Step 1: as a criteria of a systems integrator is to develop a system for an individual and unique client (Davies, Brady, Hobday, 2007) it is important to define the core competence of the organization in order to start developing a system. Together with defining the core competence is the defining of the market as a framework for the system (Davies, 2004).

Step 2: where the most important task of the systems integrator is to organize activities in such a way that they match the constantly changing demands of the client (Brusoni, Prencipe, Pavit, 2001)(Prencipe, 2003) it is necessary to analyse the market / client, so that the demands of the client can be made clear.

Step 3: as soon as it is clear what the market expects, the capabilities can be sort out. As the activities need to be organized within a network with long-term relationships an organization does at least have to sort out the same capabilities in order to develop a sustainable network (Brady, 2005). Whereby organizations could hire or buy new in-house capabilities (Rutten, 2009)

Step 4: as soon as the capabilities are sorted out the development of the network can start. In the early process of selecting and building the network it is important to use the network structure factors as a guidance in selecting your partners and making the right choices in this early phase of networking (Rutten, 2009)(Granovetter, 1985)(Brady, 2005).

Step 5: coordinating and maintaining the network is the next step. In order to integrate activities, or the system, within the whole network as a systems integrator it is necessary to have a stable network. A stable network can be achieved by coordination and maintenance of the network, by keeping the network management up-to-date and use the coordination factors as a guidance (Rutten, 2009)(Nahapiet & Goshal, 1988) (Teece, 2000).

Step 6: as steps 1 to 5 are integrated in the business model of the jobber, the jobber could now slightly transform into a systems integrator. However, part of the systems integrator philosophy is to actively participate within the network, especially within the innovation superstructure. Therefore, consulting the client is the final expert step to position the organization within the competitive market to further develop the system (Foote et al., 2001)(Davies, 2007).

These 6 steps can be seen as sequential and logic to follow up each other. However, there is no evidence that these steps are sequential and follow up each other, after one step has been finished. Expected is that the process is an iterative process in which steps are made several times and over again.

## 5 RESEARCH METHOD

Literature review shows that there are several capabilities, network structure factors and coordination factors in successfully building up and coordinating the strategic network to transform from jobber into systems integrator. To develop the business plan these capabilities and factors and the market in which the organization is active are examined during a case study. For this examination a market exploration, organisation exploration and network exploration are analysed. 16 organizations are involved. Where the focus is on the niche market of dike projects and partners available in the current network. The data from the exploration is collected by analysing the market vision of the (potential) clients, and interviews. For each discipline within the innovation superstructure and innovation infrastructure different parties are interviewed, representing the client, the advisor, the supplier and the subcontractor. The data are collected using a semi-structured approach. The case studies are cross-case analysed using the theoretical aspects as mentioned above. By means of this analysis, the steps to take in developing

and coordinating a successful systems integrator network are identified. These considerations have led to the development of a business plan for building and coordinating the SI-network, which is validated by several advisors (Board of Directors, Management Team, Organisation Advisors, Head of Acquisition) within the organisation of Ploegam. The objective of the final business plan is to guide the organisation in building and coordinating the SI-network, so that the organisation has some grips and structure to become and stay the systems integrator of a successful, valuable and sustainable network.

## 6 CASE STUDY

In this study the two different structures (super and infra) of the SI-network are examined with regards to what is expected from a systems integrator within the network and the organisation exploration. For the innovation superstructure the expectations of the client from a systems integrator are examined. Whereas the expectations, wishes and requirements of building and coordinating the SI-network are examined by different parties in the current innovation infrastructure (advisors, suppliers and subcontractors).

Within each structure of the SI-network the role of the organisation is different. Where the role of the systems integrator in the innovation superstructure is to meet the clients requirements and expectations, it is hard to have a partnership, because in most traditional settings it is mostly a one-way networking, due to the integrity of the clients (for instance the Waterboards) set by the procurement procedures and regulations, which does not allow the client to *partner* with only one contractor for a certain project. The role of the systems integrator in the innovation infrastructure is building, maintaining and coordinating the network of parties with which the organisation works together to fulfil the needs of the client. In the figure below an illustration of the case study is presented.

Besides the networking role, there is also a challenge for the systems integrator to become the expert who is able to integrate the components, products and services into one unique solution. Within the first steps of the research the networking with resources is made clear, but the challenge of being a systems integrator is to find an innovative and effective way of coordination, influencing and make use of the network to become the leading party, *the star,* within the organizations specific niche market, as shown in figure 3.

### *6.1. Organization exploration*

Ploegam is an SME building company in the Netherlands, employs 160 employees and has a yearly turnover of approximately €50.000.000,-. The company is specialized in earthworks, especially the redeveloping, reconstruction, improvement and building of dikes in the Netherlands. As the contracts and projects are becoming more complex and integrated every day, the organisation wants to prepare the unit of earthworks applied in dike projects to be the systems integrator in 2020.

At this moment Ploegam has already taken some initiative steps on the stairs to transform to systems integrator. However, still a gross of the turnover is generated through so called jobber-activities to stimulate the continuity during the transformation from jobber into systems integrator. According to the literature jobbers should take five preparing steps in order to generate the sixth positioning step as the systems integrator. In the following paragraphs the intervention strategy (0-model) is set out against the organization of Ploegam.

#### *6.1.1. Define core competence and market*

As Ploegam is a jobber from origin, they did not have the focus on one special type of work and wanted to be the party who delivers all; capacity, knowledge and services. Therefore, to stay competitive they formulated their core competence and market for the next 10-15 years, namely: earthworks within dike reconstruction projects. This core competence, or even called focus or starting point is according to Ploegam the foundation for the steps following in the process to transform from a jobber into a systems integrator.

Noticeable is that Ploegam on the one hand had some difficulties in defining their core competence. The way they entrepreneur is that they want to do everything which comes on their path. However on the other, when they asked themselves the question: What can we do best? The answer was the same by all respondents.

#### *6.1.2. Analyse market*

According to the literature the next step is to analyse the market, in order to get to know what the client demands. Ploegam analysed the market as well, they analysed the perspectives of the market in parallel with the concolleagues (other parties in the network capable doing the same activities). The way they analysed the market was by conversations with the client of current projects, by following the market vision and searching for a trend in demands of clients (*Dutch: aanbestedingsuitvragen*) .

#### *6.1.3. Sort out capabilities*

As soon as Ploegam analysed the market and diagnosed the issues within the market they reflected their organization to the possible solutions. The literature states that capabilities like account management, risk management, financial management, information management, legal knowledge, innovation management and finally portfolio management are capabilities to maintain sustainable long-term relationships. In the period when Ploegam defined their core competence and market,

and thereby analysed their clients they invested on the one hand in content capabilities and on the other hand in organizational capabilities.

Examples of content capabilities are that due to the integration of the different aspects, a new aspect for the organization was born. Before the integrated contracts became part of the market it was enough to have a standard organization with some people 'just knowing' the price of producing an object as prescribed by the principal. Now, part of the integrated contracts is still the aspect of pricing. However, the integration of design and construct became a new part of the organization. Therefore, Ploegam invested in capabilities who were able to integrate functional requirements into a design which could then be priced. The investments where mostly based on acquiring new in-house knowledge from people. For example, since the last few years a contract manager, design manager and environmental manager became part of the employees.

Besides these content related capabilities, Ploegam also invested in the capabilities they possibly already have in house, but they tried to unroll these. For example, Ploegam did already have the capability of account management within the organization. However, by defining the core competence and developing this content further they recognized that infiltrating in the market asked for more and different account management.

Ploegam did also recognize that the shift in contracts forces the organization to be prepared for more than one type of procurement procedure or contract. Therefore, as already discussed, they had already legal knowledge in house, but had to unroll this aspect even further, to be prepared for the future.

One remarkable fact is that since Ploegam joined more integrated contracts and held a workshop for partners they are more invited for works by clients and even colleagues (or even competitors). In other words, more cooperation is spontaneously triggered since Ploegam started to focus on integrated projects.

*6.1.4. Select & build network*

As soon as Ploegam started to sort out the capabilities, it also started to find partners to cooperate together with. Ploegam knew that it was not immediately able to realize integrated contracts. Therefore, it searched for a partner with whom it could together realize a project. The fundament of the search for this partner was based on trust, experiences, openness, but also on the contribution of each activities on the others. Ploegam especially searched for a partner which had the process capabilities already unrolled, so that they could learn and invest in these underdeveloped capabilities.

Besides the partner (*Dutch: combinant*) Ploegam did not directly pay attention to the other parties within an integrated network. They just made use of the parties they already cooperated with in the 'jobber-period'.

*6.1.5. Coordinate & maintain network*

Ploegam states that coordinating and maintaining a network is more different than building up a network. During projects, but also in general, it experienced difficulties in the way the network wanted to be involved when choices had to be made and problems were encountered. But it did also recognize that the relationship changed between parties as they worked together more closely. This soft-aspect asked for knowledge and information sharing, even as opportunistic behaviour and continuity. Being capable to deal with this soft-aspect Ploegam optimized their network management, by paying more attention to the soft side of building project and relationships, and investing in aspects which benefits the stable network (meetings, arrangements, information sharing).

One key issue for Ploegam in this process of coordination was and is the issue of knowledge sharing within the organization and projects, so a system could be further developed and revised. The other issue is the way in which they need to coordinate or push through, together with their partners, the network around the innovative system. Here, culture and decision hierarchy play an important role.

*6.1.6. Consult the client*

Ploegam consulted their client as well. At first, it did not have the intention to consult or confront the client with a diagnosis of its problem and the possible solution (Ploegam core competence). However, during the developing of this system it experienced the need of involvement from the client. This involvement could not be received by only bidding on projects and talking with the client during the realization of other projects, due to the fact that the focus of these meetings was always on the current issues during the projects construction phase. Therefore, Ploegam invested in the named capability on account management, so that Ploegam was able to bring over its story to the client. Nowadays, the one-way communication (top down from client to contractor) is changing in a twofold communication where the contractor (Ploegam) consults the client. With the result that the client reacts with reasonable demands to the market where Ploegam can implement the system again.

*6.2. The Innovation Superstructure*

Within this paragraph the 0-model will be reflected within the innovation superstructure to transform from jobber into a systems integrator. As the organization is yet climbing the stairs, it would be interesting to reflect this

0-model within the market, so that it can be fine-tuned for the organisation. The respondents of the innovations superstructure all play a significant role within the future market of Ploegam.

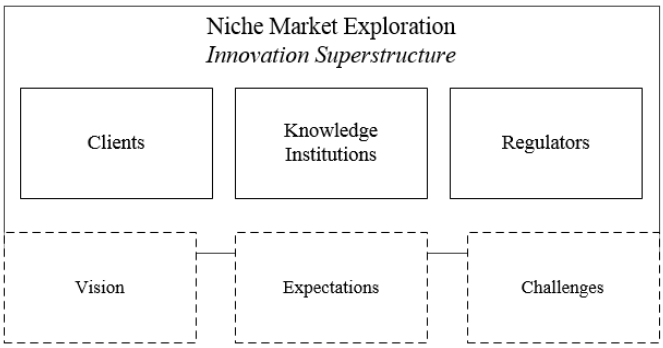


*Figure 5 Focus within case study - innovation superstructure*

### *6.2.1. Defining core competence & market*

In general, the clients state that it is important to a principal to know where a company is good in and what they can expect from that company. During the last years, when the crisis came across the market, a lot of companies started hobbing from one discipline to another in other to gain money. For the future the clients think it is important to define the core competence in order to specialize within the dynamic market to transform from the jobber (even due to crisis) into a system integrator.

In the opinion of the respondents Ploegam has a clear core competence and market, namely: earthworks within dike reconstruction projects.

### *6.2.2. Analysing the market*

Whereas the market is defined it is the next step to analyse the market. Clients state that it is important to analyse the market, not only for single project, but as well for overall and future choices. They even state that by analysing the market, you also have to analyse every single client separate. Due to the unique location of each client, every client knows their own issues and bottlenecks. Even the market analysis could not only consists of issues and bottlenecks, but also of wishes for instance if desired situations are good to have spoken about in order to have a complete analysis of the market.

### *6.2.3. Sort out capabilities*

The sorting out of capabilities is an interesting domain for the innovation superstructure. They also determined and considered the differences between jobbers and systems integrator within their market. However, they state that there are some future capabilities which at least have to be present within a professional building organization who wants to deliver integrated solutions.

The first capability is contract management, because due to the shift from traditional to integrated contracts new project teams are involved within the procurement processes. Most of these project teams have experiences with different contracts out of the infrastructural market. However, due to the lack of knowledge on how contracts will be received within the dike reconstruction market, they distribute a spectrum of contracts among the market in order to gain experiences for future projects. Therefore, they state that it is important that organizations do not only have contract management on the basis of legal knowledge, but as well contract management focusing on procurement strategies and possible future contracts.

Secondly, the risk management capability is one which needs to be unrolled or even changed. Within the traditional contracts it was most of the time a discussion to whom belongs the risk, even during the construct phase. Nowadays, due to fixed budgets clients are no longer searching for a partner who can divide the risks the best, but the client is searching for a partner with whom he can eliminate risks. Therefore, the client states that the risk management capability has to be developed further in relation to the standard risk management capability.

Finally, the clients state that within the next few years a standard project team model is used to find balance between principal and contractor (for this case the IPM-model of Rijkswaterstaat). They state that an organization needs to be able, or capable, to fulfil the roles and work according to this specific model (routine).

### *6.2.4. Steps 4 and 5*

Step 4 (selecting and building the network) and 5 (coordinate and maintain network) have not been reflected within the clients domain.

However, these steps are discussed with the knowledge institutions within the innovation superstructure. The institutions state that it is important to select partners with whom you share (partly) the same knowledge in order to cooperate and integrate the different aspects. The most important part of the selection is according to the knowledge institutions the involvement of parties within the innovation superstructure, especially the regulatory bodies. It has been confirmed that organizations come further within the process of innovating, developing and introducing systems when the ideas and activities are made clear within the innovation superstructure. As soon as the activities of an organization are lifted up to the innovation superstructure, the process of getting the system implemented by client and regulatory is easier. In conclusion, it is therefore important to select parties to join the organizations network, who are able to implement and introduce systems within the innovation superstructure.

6.2.5. Consult the client

The sixth step (consulting the client) is an interesting step for the clients. They state in line with the underpinning of the literature that it is important to be with your client in warm and cold time to talk about experiences, expectations and issues. Warm times refer to periods you work intensively together with your client in projects. Cold times are the periods in which you do not work together so close with the client. Consulting the client in these cold periods gives room for diagnosing and analysing future issues of the client, which can be investigated and on forehand be solved before they become a real issue.

As selling / introducing the innovative system of the organization is part of the consulting step it is good to explore that clients react differently to innovations and the implementation of innovative solutions. One client only sees risks and puts up an obstacle for the implementation, others are intrinsically open for new things, and other clients are only judging the implementation with respect to their own money-based objectives and therefore lose the attention for the attached risks and chances (short-term view).

Moreover, within this- for the clients interesting- step the clients mainly state that two capabilities have to be sorted out in special, namely; account management and network management. These two capabilities are of importance, because consulting the client has on one hand to do with strategically addressing the client. And on the other hand the capability to translate technical knowledge and ideas into a solution oriented approach for the client is important to match supply and demand.

*6.3. The Innovation Infrastructure*

Where the innovation infrastructure has aims to have no influence or role in the first steps of the proposed steps of the 0-model, these steps will not be reflected. Therefore, we shift immediately to the reflection of step 4 en 5 (selecting and building the network) which show interfaces with the innovation infrastructure . Per discipline (advisors, suppliers and subcontractors) the main statements reflecting the 0-model are considered.

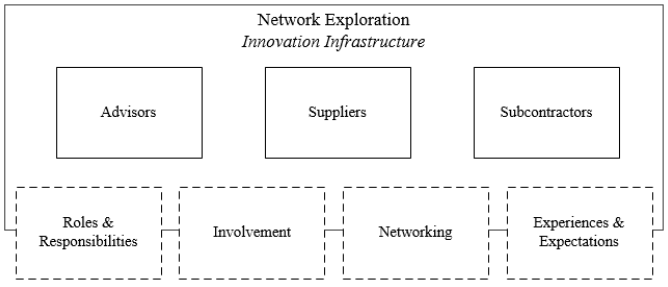


*Figure 6 Focus within case study - innovation infrastructure*

*6.3.1. Advisors*

Within the shift from traditional to integrated contracts advisors are searching for the right role within the network. Where they are mostly during projects present within the infrastructure, they could also be the knowledge institution of the innovation superstructure during the position phases of the systems integrator which is already shortly discussed in paragraph 6.2.4. The advisors state that it is unclear what their role or influence is on for example biddings, advices to clients and integrated proposals.

Advisors do also strive for continuity and coordination of the whole. Therefore, they experience problems when advisors are not informed adequate about the process or role they join. In other words: advisors state that organizations shifting from jobber to systems integrator need to be capable to distinguish the role of advisors in and over projects and also have to boost information sharing (capability) among the network in order to keep the system up-to-date and even to develop it further.

*6.3.2. Suppliers*

Suppliers state that within step 4 and 5 the SI organisation can make steps by involving the suppliers within their network. Most of the times products are chosen to be part of a new unique situation, without involving the supplier of the good. This introduces new integration and coordination problems. Therefore, coordination of information and knowledge is very important. Otherwise, new risks will be introduced and the chance of having a system which stays behind is greater. This refers to the literature on the LCN networks, which knows loose links, but also strong which are necessary balance demand and supply. Therefore, to set up a strategic and valuable network with your suppliers it is important that information sharing capabilities are up-to-date.

*6.3.3. Subcontractors*

The reflection of step 3 (sorting out capabilities) shows an interface with the subcontractors. They state that within projects some capabilities do not have to be in-house of the systems integrator. This can for example be specific and detailed knowledge on the application of a component or method. They subcontractors state that it could be useful to sort out capabilities externally as well.

The subcontractors state as well that the level of involvement within networks mostly is unclear. For some projects they have almost just the role as supplier, whereas in other projects they fulfil the role of member of the project team. This shift between level of involvement and decision-making forms an obstacle for the coordination (step 5).

Moreover, the subcontractor add to the step of coordination (step 5) that it is important besides the defining of the involvement, to network in the way which

is in line with the culture of both parties (optimized networkmanagement). Subcontractors do also strive for continuity and try to be flexible to 'hob' with the client to stay attractive to work with. In return for that they expect to be treated in the same way as the systems integrator wanted to be treated. Not only money –driven, but also having focus on the capabilities and qualities of the subcontractor. They state that when the systems integrator shows openness to its subcontractors about capabilities, qualities, expectation, information and knowledge the coordination will positively be benefited.

*6.3.3. General addition to 0-model*

Besides the individual additions of the advisors, suppliers and subcontractors, they all give one main and significant addition to the 0-model as proposed in paragraph 4. Namely, the challenging of the network. Advisors, suppliers and subcontractors state that it is important to reflect the cooperation periodically and underpin the experiences and expectations. Like you challenge the system with your client to stay up-to-date, the same has to be done within the network in order to search for the optimal composition of the network.

## 7 ANALYSIS OF CASE STUDY

Within this paragraph the 0-model to transform from jobber into systems integrator is analysed according to the results of the case study. The analysis is done to define contributions, gaps or conformations to the literature proposed 0-model.

In practice all five steps are confirmed by the case study. Which means that organizations that want to transform from jobber to systems integrator at least have to undertake these five steps. However, the case study showed some gaps and contributions to this model.

Firstly, step 2 suggests that the organization needs to select and built a network. However, due to the fact that organizations who want to transform already have partners in their loose network which they can use to involve deeper in the network of the systems integrator. This means that the selection of partners in the innovation infrastructure is mostly already done. Only partners have to be selected for new disciplines when bidding on integrated contracts as a systems integrator.

Secondly, the coordination is one step given in the proposed model. However, during the case study it became clear that coordination and maintenance of the network consists out of several disciplines/aspects. All are of importance to make coordination possible. These aspects focus on the network management of the organization and the level of involvement of the parties within the network during (decision) processes and information sharing. The steps in the proposed model are likely to be of equal size and importance, but the main challenge is in the coordination of the network.

Moreover, the 0-model suggests that step 5 (coordination of network) is part of shifting from jobber to systems integrator. However, coordination is not only part of transforming, but it also remains part of the systems integrator tasks when the organization is already transformed.

Finally, being a systems integrator the organization wants to be the expert within a certain market with their own system. Therefore, the organization indeed consults the client, challenges the systems, where required revises the system and optimizes the process. However, it is also important that the partners you work with (innovation infrastructure) are also challenged towards the value adding of the cooperation in order to make the best out of your system and remain the expert.

In conclusion, the complete selection of new partners can be nuanced. Moreover, based on the 0-model more semi-steps should be added to the coordination phase, even as an iterative process on the basis of coordination and finally, challenging the network has to become part of the steps to remain the systems integrator.

## 8 THE BUSINESS PLAN

In this paragraph the practical steps in the process of preparing the specific organisation of Ploegam to turn from jobber into a systems integrator in 2020 will be highlighted, based on the proposed 0-mode and analysis (paragraph 7). In the next paragraph (paragraph 9) a generalized model is given for SME's transforming from jobber into a systems integrator.

As the requirement of the organisation is to use the current network to professionalize, the starting point of actually having a first meeting with a new partner is skipped as also nuanced in the analysis. Therefore, 10 recommendations are made to come from an organisation that has a traditional network to an organization with a systems integrator network, specified for the SMEs. The steps are not sequential, but are ordered on the most preferred and feasible steps.

*8.1 Invest in the IPM-roles*

Principals expect organizations to copy and flip the standard IPM-model (Rijkswaterstaat). Especially SME's have to develop their personnel spectrum to fulfil all roles within the IPM-team. Therefore, line up the organization in such a way that the project management philosophy is clear and that employees are going to be able to be responsible for the roles within the IPM-team. To line up, investments have to be done in employees and within the organisation or network.

A possible investment is defining employees tasks and roles, together with the IPMA course focussing on project management (also introduced by the principals).

The second opportunity is to find your IPM-roles within your network. The technical manager can for example be a person from your own organisation, where the stakeholder manager is an employee of your subcontractor or partner. However, it is therefore important that all disciplines of the IPM-model are already filled in the tender phase by potential candidates. By starting with defining the roles in the tender phase the right person will be already around the table with the client during the clarification sessions.

*8.2 Optimize the Network management*

The points of interest for networking are given in this article. However, before the organisation can implement these points , the network management should be set up in order to allow networking can actually be undertaken. To optimize the network management, the SME organisation should create surface among the 'to-be-networking'-unit. The opportunity, anticipation, motivation and capacity has to be stimulated even as the linking of the network management with the available capabilities. Therefore, ensure that the main player within your organisation have the motivation and capacity to network. Train them on the soft aspects of cooperation (Human Resource Management), like this is for instance done during tender phases of alliances. Besides, the motivation and capacity of the person ensure that there is time reserved for the employees to spend on just sitting around the table with the network and actually start networking. In conclusion, stimulate the whole unit to network and don't just keep it by the current one and only contact person.

*8.3 Know your client*

As stated before in the construction industry you have to deal with two types of clients: your project client and your potential client.

On the one hand, you have to know your client with whom you're accomplishing a project. Trust, openness and information sharing are according to the principals the most important aspects to get to know each other. The principals attach importance to seeing and speaking each other. Therefore, implement together with your client a weekly or two-weekly meeting in which information is openly shared and trust is gained.

On the other hand, you have to know your client for whom you are going to write a bidding document. Due to the short times between the announcement of a project to be procured and the appliance date you have to know on beforehand for whom you are writing the proposal. Therefore, take time to go and visit your potential clients on a frequent basis and just listen to their story. Moreover, you also have to react very quickly to the announcements and appliance guidance and gain information, so that the information meetings of the potential client can be valuable. Before you actually start your proposal you have to know what the client wants and when the client is satisfied. Finally, be in the surrounding of your (potential) clients in warm and cold times.

*8.4 Be ready for new contracts*

As the procurement procedures become more complex by the time, the principals are testing what the right procedure is. However, to get to know what is the best they have to try different forms of contracting. Therefore, in the first period of the HWBP-program a lot of different contract will be brought on the market originating from Rijkswaterstaat. To act properly, effectively and efficient the knowledge on the divers contract forms have to be in house. Therefore, give notice on the market meetings of your client, invest in experiences on earlier contracts of Rijkswaterstaat. Especially, the 'dry' –unit of the market goes in front of the 'wet'-unit of the market, so contracts in the 'wet'-unit will be based on the 'dry'-unit contracts of Rijkswaterstaat. Collecting experiences on these contracts helps dealing with the great spectrum of contracts.

*8.5 Involve the network*

During the bidding phase of the project it is important to involve the network in order to integrate the different disciplines. Define in front which parties are needed for knowledge or capacity. Do not take this step on 5 to 12, but make an analysis in the early beginning. An example of a way to analyse is to implement a consistent tender management plan. In which the expectations of the bidding are described and how you will fill in the different roles and disciplines. Even consider their influence on the final bidding, does their advice count or is it overruled by the main contractor?

*8.6 Treat others like you want to be treated / Make arrangements*

As projects become more complex the price is not always decisive. The ratio between price and quality has become more important. Contractors within the construction industry are nowadays more selected by this ratio, and subcontractors expect to be selected on the same basis. The other issue is continuity, whereas the main contractor wants to have the activities distributed steadily over the year, the subcontractor desires the same situation. Therefore, keep in mind that sending away a subcontractor due to the fact his price is just one euro per hour more expensive, without taking into account the ratio (price/quality), it will damage the continuity and relationships. A tool for continuity between organizations are arrangements. Making arrangements will speed up the

process during the early bidding phase, due to a decrease in discussions.

*8.7 Bring routine in the organization*

Where openness and trust are important aspects of a sustainable relationships, the client prefers to work together with common teams they already know. Therefore, try to find a suitable team for each client during the tender and realisation phase. Routine boost the level of trust, by which the focus shifts to the content instead to the discussions on the soft side.

*8.8 Change teams*

Where routine is wished by the client, the shifting of team member is important for the organization. Every project team can be seen as an organisation in itself. However, every team is part of a greater organization which wants to learn and share knowledge within the organizations and network. By changing members of teams knowledge will be naturally shared. Keep the routine, which means that just some members are shifted within the teams. By changing just a few members within teams the client still experiences the routine of the SME companies. An example is the direct step from the i-Lent team to Ooijen-Wanssum; excellent for the team performance, but the organization has not learned anything.

*8.9 Challenge your network*

As projects sometime lasts for a few years, working together with an organization in your network becomes normal and the standard. However, it stays important to challenge your network and evaluate what the added value of working together is. Is this organization the most suitable for the future, how is the quality of contact, experiences and the work delivered? What could we do better? What have we done excellent? What are the strengths of the cooperation? What are the weaknesses of the organization? Are there organizations which fulfill our needs better? These are all questions to challenge the organization in the network to stay striving for the optimum and keep your network active.

*8.10 Keep focus on core competence*

Keep doing what you can do best! Don't try to be the specialist for every single detail.

## 9 DISCUSSION

In the previous paragraph the specific steps to be taken by Ploegam, based on the case study, to turn form a jobber into a systems integrator are discussed. However, the aim of this specific paragraph is to discuss the 0-model including the additions based on the analysis done in paragraph 7. Therefore this paragraph shows the general steps for organizations to take when transforming from jobber into a systems integrator. The steps are numbered to give the origin. However, when an organisation rolls out the business model it may take some steps over and over again in order to stay up-to-date as an SI organisation in a dynamic and changing market.

*Step 1: Defining the market and core competence*

The main starting point of a jobber organization is to define the specific market where it is in and to formulate the core activity. What is it excellent in? Issues by jobbers is that they passively react on the market and 'just' deliver capacity (Davies, 2004), there is mostly no focus on a specific market, which makes it difficult to formulate the core activity. Therefore in order to transform into a systems integrator the core competence of the organization needs to be made clear.

*Step 2: Get to know the client*

Secondly, as soon as the market and core activity are formulated it is important to know what the client expects from an organization being a systems integrator within the market (Anderson, 1998). The current trends within the construction industry is that they are searching for an organization that can eliminate risks, move from contract to contact, bid on a great spectrum of contracts and can deal with the shifting of project teams within the clients organizations.

*Step 3: Unroll and develop capabilities*

Every 'standard' organization already consists of for example the capability of risk management, account management, contract management, legal knowledge. During the shift from jobber to systems integrator these capabilities have to be further unrolled. On the one hand the content (techniques, regulatory) capabilities need to be present, but on the other hand also the overall capabilities need to be unrolled in the direction which matches the market. For example, risk management is no longer the capability of dividing risks, but eliminating risks. Therefore, to become a systems integrator you need to unroll the capabilities, but also be capable to unroll and find out which capabilities need extra attention within specific markets.

*Step 4: Selecting the network*

As the market, core activity and client wishes are formulated the SME has to discover which organizations suits the involvement within the systems integrator network the best (Granovetter, 1985). Due to the fact that all SME's turning from jobber into systems integrator already have done projects in the same market they don't have to set up a completely new network, but they can make use of the current network of the organization. Therefore, SMEs have to analyse their current network in order to select the organization to work with in order to come to a more solid relationship (Dubois & Gadde, 2002).

*Step 5: Optimizing the network management*

The following step is to analyse the network management within the organization of the SME. Due to the fact that an SME organization is mostly not complex to management communication with partners is mostly done by just a few and the same people. In order to come to a solid network which suits the whole unit it is necessary to create surface among the unit of the systems integrator. When creating surface and network management is not stimulated most employees within both organization (SME and network) will only contact each other, instead of networking. By analysing the network management and optimizing it the SME organization will be ready to network for long-term relationships.

*Step 6: Define the level of network involvement*

As soon as the organization has optimized the network management the following issue is to define the involvement of the systems integrator network. Is a partner always involved in the early stages of the bidding process, what is the influence of the advices given by the advisors, do suppliers have a say in the integration of different components? All organizations are arguing on these questions, rational of course, due to the fact that within the building industry a specific product from one supplier is of influence on the demand of products or services of the other supplier (Dubois, 2002) (Gadde, 2000). Therefore, it is an important step to consider the involvement of the parties within the network. The defining of the level of involvement can be done for every single project or for the whole system. Most parties prefer to define the level of involvement for the whole system, together with restrictions and arrangements.

*Step 7: Continue networking*

The network is set up, partners are chosen and the first projects have been designed and estimated. Now it is important to keep working together on the arranged levels. Networking needs investment in times, trusts and openness. Therefore, it is important that network management is spread around the whole unit, so that the single links of the contact persons disappear. Another important action in keeping the continuity within the network in the learning process. The learning process is boosted by information sharing among all parties (Brusoni, 2001). As an SME it is important that the organization brings the other partners and information together, to learn and stay a strategic systems integrator within the network and the market (Teece, 2000). Moreover, the sharing of information within teams and within the network benefits the process of risk elimination. The larger organisations have more disciplines within their own organization where the sharing of information has a more organizational sharing motive. The sharing of information can as well be boosted by routines, as by circulating main team members over different teams (Dhanaraj, 2004).

*Step 8: Challenge the network*

Complex projects mostly last for a few years. The cooperation within the project and the relationships formed become a normal standard (Doz, 1991). For new projects and strategic choices it is always important to challenge the current network. Is the current partner the most suitable partner for the future, in terms of activities, culture, experiences and expectations? What is the added value of each organization to a strategic cooperation? These questions consequently have to be challenged in order to keep the network awake. Projects and client demands are changing (Gann, 2000), to compete it is important that it is worth to work as a network and stay competitive (Winch, 1998).

*Step 9: Core competences consulting the client*

This final step could also be the first step. During the whole process of setting up, maintaining, coordinating and challenging the network *focus on core competence* is the most important. By focussing the innovation superstructure and innovation infrastructure know the value of the SME and therefore the value of the strategic partnerships (BigIdeasProject).

Only when the focus is clear the client can be consulted in order to position the organization on the right place in the market. Where consulting consists out of providing an in-depth analysis, identification and diagnosis of client organization, offer solutions and coordinating the integration of components into a solution (Davies et al. 2007). These aspects needs to be stimulate by the willingness to be the best or to serve the client the best and sufficient attention, the right capabilities and an up-to-date network management.

Finally and from significant importance; consulting the client is the most effective in the period before the client realizes the impact of the problem they are confronting.

## 10 CONCLUSION

In general, the analysis of the case study has shown that the shifting from jobber to a systems integrator is possible but asks for several steps to be taken by the organization. The steps to be taken are related to the level of dynamics in the innovation infrastructure as well as in the innovation superstructure.

Furthermore, the analysis of the case study shows that the proposed steps are in line with the practice. However, some extra semi-steps should be added in the intervention model to cover all the important aspects within the transformation process to become the systems integrator.

The general outcomes are equal. In general, clients and network partners all expect the same from a systems integrator on the basis of information sharing, involvement, focus, cooperation and risk sharing, which is discussed in the business model.

Based on the considerations, expectations and aspects, the steps to be taken by the jobber are defined in paragraph 9. The defined steps will guide the organization of the jobber to consider the implementation aspects of setting up and coordinating a systems integrator network within the construction industry. When applied, the steps are the guidance for a well-organized and structured approach, to match the defined capabilities and network- and coordination factors in the most suitable way for each specific organization. The specific business plan (paragraph 8) of the case study shows more detail for the specific niche market, network and organization explored.

Finally, to make the guiding steps to transform from jobber into a systems integrator, defined in paragraph 8, more organization specific, especially the steps 1, 3, 4 and 5 make the intervention model more organization specific. These steps focus on the strategic choices on the selection of the niche market, the selection of potential network partners and finally the optimization of the network management suitable for the organization culture.

## 11 REFERENCES


Anderson, J. e. (1998). Business marketing: understand what customers value. *Harvard Business Review*, November-December, 53-65.

Barney, J. e. (1994). Trustworthiness as a source of competitive advantage. *Strategic Management Journal*, Winter Special Issue, 15, pp. 175-190.

Bayer, S. & Gann, D. (2007). Innovation and the dynamics of capability accumulation in project-based organisations. *Management, Policy & Practice*, 9 (3-4), 217-234.

Brady T, D. A. (2005). Can integrated solutions business model work in construction? *Building Research & Information*, 33 (6), 571-579.

Brady T, D. A. (2005). Creating value by delivering integrated solutions. *International Journal of Projectmanagement* 2, 360-365.

Brusoni, S., Prencipe, A. and Pavitt, K. . (2001). Knowledge specialization, organizational coupling, and the boundaries of the firm: Why do firms know more than they make? *Administrative Science Quarterly*, Vol. 46, No 4, 597-621.

Chao-Duivis, M. &. (2001). Veranderende rollen: Een inleiding in nieuwe contractvormen in het bouwrecht. Den Haag: *Stichting Instituut voor Bouwrecht*.

Davies A, H. M. (2005). The business of projects: managing innovation in complex products and systems. Cambridge: *Cambridge University Press*.

Davies, A. (2004). Moving base into high-value integrated solutions: a value stream approach. *Industrial and Corporate Change,* 13 (5), 727-756.

Davies, A., Brady, T., Hobday, M. (2007). Organizing for solutions: Systems seller vs. Systems integrator. *Industrial Marketing Management*, 36 (2), 183.

Dhanaraj, C. L. (2004). Managing tacit and explicit knowledge transfer in IJVs: The rol of relational embeedness and the impact on performance. *Journal of International Business Studies,* 35, 428-443.

Dorée, A.G., & Holmen (2004). Achieving the unlikely: innovating in the loosely coupled construction system. C*onstruction Management and Economics* (October 2004) **22**, 827–838

Dorée, A., & Veen, B. v. (1999). Strategische allianties in de bouw: Van hooggespannen verwachtingen naar concrete actie?! Enschede: p3bi, *Universiteit Twente*.

Doz, Y. (1991). The evolution of cooperation in strategic alliances: Initial conditions or learning processes? *Strategic Management Journal*, Summer, 145-164.

Dubois, A. G. (2002). The construction industry as a loosely coupled system: Implications for productivity and innovation. *Construction Management and Economics*, 20 (7), 621-631.

Foote, N.W., Galbraith, J.R., Hope, Q., & Miller, D. (2001). Making solutions the answer. *The McKinsey Quarterly,* 3, 84-93.

Gadde, L. S. (2000). Making the most of supplier relationships. *Industrial Marketing Management*, 29 (4), 305-316.

Gann, D. (2000). Building innovation: Complex constructs in a changing world. London: *Thomas Telford Publishing*.

Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 481-510.

Gulati. (1998). Alliances and Networks. *Strategic Management Journal,* 293-317.

Gulati, R. (1993). The dynamics of alliance formation. *Harvard University*.

Heide, J. e. (1992). The shadow of the future: Effects of anticipated interaction and frequency of contact on buyer-seller cooperation. *Academy of Management Journal*, 35, 265-291.

Helper, S. (1991). How much has really changed between U.S. automakers and their suppliers? *Sloan Management Review (Summer)* 32, 15-28.

Hofman, E. (2009). De economische kracht van de bouw: noodzaak van een culturele trendbreuk. Den Haag: *TNO, Beleidsstudies: Stichting Maatschappij en Onderneming*.

Koolwijk, J. &. (2006). Projectalliantie; Procesinnovatie bij complexe bouwprojecten. Delft: *VSSD*.

Miles, L. (1961). Techniques of Value Analysis and Engineering. New York: *McGraw-Hill.*

Miller, R., Hobday, M., Leroux-Demers, T. and Olleros, X. . (1995). Innovation in complex systems industries: the case of flight simulation. *Industrial and Corporate Change* Vol. 4, No 2, pp. 363-400.

Orton, J., & Weick, K. (1990). Loosely copled systems: A reconceptualizaton. *The Academy of Management Review*, 15, 259-270.

Prencipe, A. D. (2003). The business of systems integration. Oxford: *Oxford University Press*.

Reichstein, T., Salter, A., & Gann, D. (2008). Break on through: Sources and determinants of product and process innovation among UK construction firms. *Industry and Innovation*, 15 (6), 601-625.

Richardson, G. B. (1972). 'The organization of industry'. *Economic Journal*, 883-896.

Rijkswaterstaat. (2016). Projecten '17, De Nieuwe Norm. *Rijkswaterstaat*.

Roger, S. (2009). Wegwijs in het aanbodparadijs; Proceskosten in de bouw. Berkel-Enschot: *Publicatie van de Regieraad Bouw.*

Rutten, M. D. (2009). Innovation and interorganizational cooperation: a synthesis of literature. *Construction Innovation.*

Sakakibara, M. (2002). Formation of R&D consortia: Industry and company effects. *Strategic Management Journal,* 23, 1033-1050.

Shapiro, D. S. (1992). Business on a handshake. *Negotiation Journal*, Vol. 8, 365-377.

Teece, D. (2000). managing intellectual capital: Organizational, strategic, and policy dimensions. Londen: *Oxford University Press*.

Winch, G. (1998). Zephyrs of creative destruction: Understanding the management of innovation in Construction. *Building Research & Information*, 26 (4), 268-279.

WInch, G. (2006). Towards a theory of construction as production by projects. *Building Research & Information*, 34 (2), 164-174.

Winch, G. (2006). Towards a theory of construction as production by projects. . *Building Research & Information,* 34 (2), 164-174.

Zaheer, A. M. (1997). Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance. *Organizational Science*