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MASTERTHESIS:

THE ASSESSMENT OF
ORGANIZATIONS' WILLINGNESS
TO COOPERATE IN OPEN SUPPLY
NETWORKS

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Executive summary

This study investigates how organizations assess potential partners for cooperation and the consequent effect on their willingness to cooperate in open supply networks. Six explorative case studies were conducted in the Brainport open supply network consisting of six distinct high-tech organizations. The cases each explored an organization's considerations on R&D cooperation towards products and/or services. Results suggest that willingness to cooperate is present if essential conditions are met. These conditions suggest an open supply network model towards cooperation that fits organizations that operate open supply network routines in development. According to this model, these organizations should construct for *confidence against opportunistic behavior* through trust and control mechanisms, and extract an *supportive fit towards innovation* through assessing an organization's project –and partner fit. This may create for confidence in partner cooperation and stimulate the willingness to cooperate with a specific partner. The model also includes network mechanisms of prior experience and a third contact in the network that diminish the need for extensive partner assessment.

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PROBLEM STATEMENT

1.1. INTRODUCTION

The closed innovation paradigm is increasingly being undermined in innovation processes. The increased mobility of skilled workers, the expansion of venture capital, external options for unused technologies and the increase in availability of highly capable partners imply a fundamental change of processes towards more ‘open innovations’ for numerous firms and industries. A new paradigm of innovation is introduced, open innovation, defined as: *"firms commercialize external (as well as internal) ideas by deploying outside (as well as in-house) pathways to the market."*

(Chesbrough, 2003, p. 36,37). Open innovations require early supplier integration (Schiele, 2010). Such cooperations between suppliers and clients have a positive influence on product innovation (Annique Un, Cuervo-Cazurra, Asakawa, 2010).

Supply chains are currently making a transition that responds to the changed innovation perspective. Traditional supply chains are not capable to integrate open innovation. A distinction has been made between traditional supply chains and supply networks (Braziotis, Bourlakis, Rogers and Tannock., 2013). It is argued that open innovation benefits from supplier networks as such networks allow for early supplier integration. In this research the term ‘open supply networks’ is used as an appellative for those supply networks that integrate early supplier involvement, flexibility and open innovation characteristics in cooperation. The open supply network term more accurately addresses supply networks that operate towards open innovations. Industries that made the transition to the inclusion of open innovation require open supply network routines such as early supplier integration and flexibility in business with suppliers. Supplier relations are managed in a network perspective that distantiates from traditional dyadic relations. Successful creation of open supply networks has the potential to acquire joint innovative capacities that exceed the innovative capabilities of individual organizations.

1.2. PROBLEM FORMULATION

Managers do not know what effectively creates open supply networks and what the implications are on new types of cooperations within these networks. This research aims to contribute in this field by investigating the mechanics of alliance forming in open supply networks. Authors have yet contributed by forming theories regarding supplier networks and supplier integration on the organizational level. Klibi, Martel and Guitouni (2010) actually provided recommendations on how to design supply chain networks. Their research mainly focused on production-distribution issues, but did not explicitly address supplier integration as intended in this research’ view of open supply networks. Petersen et al. (2005) developed managerial practices in situations where suppliers are integrated early and found that such integration leads to improvements in both financial result and product development. In addition, van Echtelt (2008) dedicated his research on how to manage such supplier involvement. More has been written about the complexity of supplier networks (Choi, Hong,

2002)(Choi, Dooley, Rungtusanatham, 2001) but the literature fails to elaborate on the antecedents of supplier network creation that allows for open innovation. In this research's view, cooperations between organizations is what essentially creates networks.. Through cooperations, organizations form a network of organizations that they are 'connected' to. The forming of successful cooperations may increase the innovative capacity of such networks. For some open supply networks, especially those that emerge regionally, a network's innovative capacity is often an objective at the time of its creation.

In the open supply network context of this research it is expected that the 'willingness to cooperate' and 'perceived partner fit' of organizations determine whether cooperations are formed. The willingness to cooperate concept originally derives from transaction cost literature, concerning opportunistic behavior and corresponding trust and control issues (Das & Teng, 1998). The perceived partner fit concept is constructed from resource-based view perspectives and trends (Eisenhardt, Schoonhoven, 1996)(Dyer, Singh, 1998), concerning potential competitive advantage through cooperation. Furthermore, it is expected that organizational similarities may increase a willingness to cooperate and a perceived partner fit of an organization. This is deducted from economic geography literature. According to Boschma (2005), such similarities increase the innovative outcome of cooperations. Consequently, it is expected that organizations are more willing to cooperate and perceive a partner as a better fit with comparable organizations. Organizations are comparable on five similarities, or proximities: social, cultural, cognitive, organizational and geographical (Boschma, 2005). By linking such proximities to alliance formation in an open supply network context, this research addresses how cooperations emerge in open supply networks. In conclusion, the problem that is addressed in this research is: *How does proximity affect the willingness to cooperate and perceived partner fit in the context of an open supply network?*

The objective of this research is to assess whether the willingness to cooperate and perceived partner fit of organizations determine whether organizations cooperate in open supply networks. To reach this objective it must be determined what is included in the willingness to cooperate and perceived partner fit of organizations, and how organizational proximities affect the two.

1.3. ACADEMIC AND PRACTICAL RELEVANCE

1.3.1 ACADEMIC RELEVANCE

This research aims to contribute to the conceptualizing of open supply networks. It does so by assessing the influence of proximity on alliance forming in the context of an open supply network. The concept of open supply networks is novel and rather unexplored in business literature. It is a concept that combines two recent trends in the literature that are interdependent: an transition from traditional supply chains into supply chain networks (Braziotis, Bourlakis, Rogers and Tannock., 2013), and the transition from a closed innovation perspective to an open innovation perspective (Chesbrough, 2003). This research combines these two trends in an attempt to identify organizations that operate in an open

supply network. Furthermore, to assess cooperation in open supply networks, literature from various perspectives is combined into new theory. Strategic alliance literature on trust and control (Das & Teng, 1998), the resource based view on strategic alliances (Eisenhardt, Schoonhoven, 1996) and the relational view (Dyer, Singh, 1998) are altered by proximity dimensions (Boschma, 2005) in the context of open supply networks. More traditional literature is thus depicted in a new framework in which alterations of these traditional concepts are expected due to the effect of organizational proximities and the context of an open supply network .

1.3.2 MANAGERIAL RELEVANCE

Managers that are either willing or forced to bring open innovation into practice face organizational challenges such as the necessity of dealing with a broad diversity of external contacts towards the development of a product (van de Vrande, de Jonh, Vanhaverbeke, Rochemont, 2009). This research may simplify this challenge by providing other organizations' considerations whether to cooperate with certain organizations or not in the context of open innovation. This may provide tools and/or best practices that managers can use in their assessment of the broad diversity of external contacts with whom they could potentially engage into open innovation. One such tool could be the partner fit that managers can assess per potential partner, based on certain characteristics that emerge from this research.

1.3.3 RELEVANCE FOR BRAINPORT INDUSTRIES

The Brainport industry campus (BIC) is in its development phase. The Brainport industries campus is designed to bring 1st, 2nd and 3rd degree high-tech suppliers in the Netherlands together to serve a common goal: increase the international competitive power of the Noord-Brabant region. Consequently, this campus is considered as an future regional open supply network. The BIC thrives by this research' findings as this research's cases derive from the Brainport open supply network. The cases include organizations that will settle on the BIC, and organizations that choose not to settle on the BIC. This is likely to result in valuable insights concerning cooperation for both the Brainport open supply network and the future BIC. Successful cooperation formation results in robust cooperations that obviously add more value to the Brainport and BIC open supply network than cooperations that fail. Through the combination of theory and data in this research, Brainport Industries can be advised on cooperation favorability in an open supply network context based on certain organizations' similarities, resource criteria and inter-organizational confidence. Furthermore, a debatable downside of open supply networks is assessed to which the BIC may also be subject in the future; the danger of organizations' lock-in behavior.

1.4. SCOPE

This research is conducted in the context of the high-tech Brainport open supply network. Organizations that are included in the Brainport open supply network can potentially settle on the BIC.

To be able to make recommendations towards the BIC, the Brainport open supply network is assessed. It is intended to generate conclusions that are applicable for the BIC, and are generalizable to the open supply network concept. To do so, this research includes organizations that could potentially cooperate with each other on the BIC. These organizations' considerations towards current or past cooperations with specific partners are included into this research's scope to assess what motivates organizations in open supply networks to cooperate.

This research excludes the outcome that cooperations in open supply networks actually generate. The scope concerns the perceived partner fit and the willingness to form cooperations, rather than actual alliance forming and outcomes.

For Brainport industries, the possibility of lock-in behavior within the BIC is a concern. On such a campus, the firms should still consider input and opportunities outside of the regional open supply network. Open supply networks in general may be subject to such behavior. Therefore, lock-in behavior is included in the scope of this research by assessing whether the organizations in the Brainport open supply network are open to organizations outside of the network.

LITERATURE REVIEW

This research literature review starts by providing handles on which organizations that are involved in open supply networks can possibly be identified in data analysis. Organizations that are involved in an open supply network are the organizations that are expected to have explaining power in this research. The handles are provided through a discussion of the two trends that have already been mentioned in the problem statement; supply networks and open innovations. Subsequently, three theoretical perspectives are discussed on their specific concepts that organizations may use to assess a potential partner for cooperation.

2.1. OPEN INNOVATION

Organizations applying the closed innovation paradigm maintain internal control over the process by subtracting all knowledge and required resources for the innovation from within the boundaries of the organization. Innovation from the closed innovation perspective is initiated through investments in the organizations' R&D department. By doing so organizations aim to develop fundamental technology breakthroughs, resulting in new products and features to increase sales. It is argued that the closed innovation paradigm is being undermined as a new innovation type is signaled more frequently (Chesbrough, 2003). An organization generating innovations from an open innovation ideology utilizes both internal and external human resources and R&D. It considers acquiring and selling intellectual property (IP) and does not have the urgency to bring the specific innovation to the market first, but rather prioritizes on building a strong business model around it initially. Chesbrough (2003) his distinction of closed innovation principles and open innovation principles is illustrated in table 1.

Cheng, Huizingh and Ekre (2014) assess the effect of open innovation on four dimensions of innovation performance: new product/service innovativeness, new product/service success, customer performance and financial performance. They find that open innovation positively affects all four innovation dimensions, indicating the competitive potential for firms successfully implementing a business model around open innovations. Furthermore, Cheng et al. (2014) conclude that firms with a more explicit strategic orientation enhance the positive performance effects of open innovations significantly.

TABLE 1: CLOSED VS OPEN INNOVATION, ADOPTED FROM CHESBROUGH (2003)

Closed Innovation Principles	Open Innovation Principles
The smart people in the field work for us.	Not all the smart people work for us, so we must find and tap into the knowledge and expertise of bright individuals outside our organization.
To profit from R&D, we must discover it, develop it, and ship it ourselves.	External R&D can create significant value: internal R&D is needed to claim some portion of that value.

If we discover it ourselves, we will get it to the market first.	We don't have to originate the research to profit from it.
The organization that gets an innovation to the market first will win.	Building a better business model is better than getting to the market first.
If we create the most and the best ideas in the industry, we will win.	If we make the best use of internal and external ideas, we will win.
We should control our intellectual property (IP) so that our competitors don't profit from our ideas	We should profit from others' use of our IP, and we should buy others' IP whenever it advances our business model.

In knowledge-intensive industries the open innovation ideology is an instrument to manage innovation. A organization aiming to develop high-tech technologies should be concerned with core processes of open innovation, as only few firms are capable of developing such complex products, services or technologies on their own. In this research, the 'outside-in process' and the 'inside out' are expected to be encountered. *"The outside-in process is the process enriching the organization's own knowledge base through the integration of suppliers, customers, and external knowledge sourcing. This process can increase a organization's innovativeness"* (Laursen and Salter, 2006; Lettl et al., 2006; Piller and Walcher, 2006., taken from Enkel, Gassmann, Chesbrough, 2009, p. 312) whereas the *"inside-out process refers to earning profits by bringing ideas to market, selling IP, and multiplying technology by transferring ideas to the outside environment"* (Enkel, Gassmann, Chesbrough, 2009, p. 312). Towards open supply network cooperation in a high-tech context, it is expected that the outside-in principle will be of importance more substantially as organizations cooperate to innovate, rather than to sell IP. The inside-out process also seems to comply to the open innovation principles more significantly than the inside-out process.

2.2. TRADITIONAL SUPPLY CHAINS VS. OPEN SUPPLY NETWORKS

It has been mentioned that traditional supply chains are not capable of integrating open innovation, whereas supply networks are expected to be able to integrate such innovations. Braziotis, Bourlakis, Rogers and Tannock (2013) dissociate between 'typical' traditional supply chains and supply networks. Their distinctive overview is presented in table 2. Traditional supply chains focus on products, their linear and ongoing design and configuration, low complexity, predictable and stable operations and structured integration. Traditional supply chains enhance competitiveness by cooperation and collaboration among present supply chain members. In contrast, supply networks focus on relationships, have nonlinear and dynamic structure forms of design and configuration, can handle high complexity during unpredictable operations and are ad-hoc integrated. Such a network requires for flexibility of organizations.

TABLE 2: SUPPLY CHAINS VS SUPPLY NETWORKS, ADOPTED FROM BRAZIOTIS ET. AL (2013)

Dimensions	Supply chain	Supply network
Focal concept	Products (and services)	Relationships
Design and configuration	Linear and ongoing, relatively stable structures (due to established power attributes)	Non-linear and dynamic structures (non-established power attributes)
Complexity	Low	High
Operations	Predictable and stable	Unpredictable/un-solidified
Coordination	Management focuses on the coordination of flow (information, products and finance) and on integration	Management focused on the coordination of the web of inter-firm relationships
Integration	Structured	<i>Ad hoc</i> /unplanned
Means to enhance competitiveness	Cooperation, collaboration, and coordination among SC members involving competition between these members in some occasions	Cooperation, collaboration, and coordination among members of a web of SCs. At the same time, it involves conflict and competition too

Other authors assessed supply network's positive effects on organizations and innovation. In supply networks, supplier involvement positively affects project team effectiveness due to which financial performance and design performance are influenced positively (Petersen, Handfield, Ragatz, 2005). Johnson (2009) confirms the positive effect of supplier involvement through his conclusion that early supplier involvement in new process development (NPD) improves the efficiency and effectiveness of the NPD process. In addition, Zimmermann and Kortmann (2013) investigated the effects of supplier involvement regarding the 'time to market' of innovations and concluded that supplier involvement decreases the average time to market of a product. This confirmed the earlier findings of Tyndall (2000) regarding market responsiveness and decreased product time to market ratios in supply chains with intensive supplier integration. Finally, Van Echtelt et al. (2008) stress that the NPD process is boosted on quality in its outcome. Through the inclusion of suppliers in early stages more state of the art technologies and knowledge towards innovation are incorporated in the NPD process. This results in a boost of the NPD process.

2.3. WILLINGNESS TO COOPERATE

Willingness to cooperate is used as a concept that addresses actors' intrinsic intentions to invest time and resources in alliance forming with a specific partner. The term is disconnected from other motivations that might awaken intentions to cooperate such as strategic outcomes of the alliance but rather focuses on the relationship between potential cooperation partners. Authors differ in interpretations of the concept. A brief literature overview is therefore provided.

2.3.1 LITERATURE OVERVIEW

Brown, Poole and Rodgers (2004) incorporated trust as main driver for the willingness to cooperate in virtual cooperation. Their research focused on the individual level using an in depth personality type model that links interpersonally types to their expected interpersonal behaviors. In this research, the weight of trust in willingness to cooperate is not conducted on the individual, but organizational level. Organizations are perceived as entities that can trust or distrust other organizations. Other

authors that addressed willingness to cooperate in their study did not incorporate trust in interpretations of willingness to cooperate. Fawcett et al. (2008) regard willingness to cooperate as a dimension of yet another variable that addresses the individual level of cooperation. They argue that people are the bridge to successful cooperative innovation in supply chains, but are intractable at the same time. Due to the intractability of people, the managing of people is inevitably occupied with 'people issues'. Willingness to cooperate is considered as one of its dimensions among others such as culture, trust and aversion to change. The specific definition and indicators of willingness to cooperate in this research remain rather unclear and are therefore neglected in the construction of a definition in this research.

Selnis and Sallis (2003) regard willingness to cooperate as a concept that determines the relational learning capabilities of parties in joint learning activities. In contrast to other authors, they assess the negative consequences of trust in relationships. In the context of relationship learning they conclude that high levels of trust reduce the effect of positive learning rather than positively moderate it. Even though trust facilitates information sharing, joint sense making and shared cognitive processes, it is argued that these positive effects are outweighed by the hidden costs of trust. The first type of hidden cost includes the neglecting of negative information. Negative information may affect the existent relationship, and thus organizations avoid the topic to preserve the organizations' 'friendship'. This causes a negative impact on relationship performance due to ignorance towards sensitive but important aspects of the alliance. Secondly, the authors argue that control mechanisms against opportunistic behavior are only loosely applied when trust is high, but more actively applied when trust is low or moderate. It is therefore argued that moderate trust is most favorable for relationship learning since organizations still benefit from the positive effects of trust, but also counter opportunistic behavior through control mechanisms.

In strategic alliance theory, trust and control are measures that can tackle partners' opportunistic behavior in alliances. Rooting in transaction cost economics (Williamson, 1981), strategic alliances are potential platforms for opportunistic behavior to occur for one or multiple actors in the alliance (Das, 2006). Opportunistic behavior incorporates risk and autonomous decisions from actors, decisions that other actors feel should be cooperative decisions. Park and Ungson (2001) underscore the failure rate of strategic alliances. They state that many alliances fail because of partners' opportunistic hazards; acting in their self-interests and neglecting the common purpose of the alliance. At the same time, agency costs such as the alignment of alliance operations to the long-term goals of the organization endanger the success of the alliance. Trust and commitment function as factors that minimize such conflicts, and decrease the failure rate of strategic alliances. In a competitive environment however, it has proven to be difficult to develop and maintain such trust based on mutual goodwill. When GE and Rolls Royce cooperated in a strategic alliance to manufacture jet engines for

commercial airliners, trust was the restrictive factor. The alliance seemed to be a perfect opportunity for both parties to strengthen their positions in promising markets. However, the lack of mutual trust in a competitive environment between rivals caused both organizations to depart from the alliance and rather not lose any form of individual resources than to collaboratively gain them (Wall Street Journal, 1986). This signifies that in many cases, especially in cases where rivals are ought to cooperate, merely the perception or expectation of opportunistic behavior is enough to sabotage alliances. In the Brainport open supply network, intellectual property is exchanged extensively. It is expected that expectations of opportunistic behavior will drastically decrease the willingness to cooperate. Organizations are unlikely to invest time and resources towards cooperation the other organization is expected to behave opportunistically. Some confirmation that such behavior is not likely to occur is needed. Das and Teng (1998) their framework provides such confirmation through ‘confidence’ against opportunistic behavior, which is constructed by trust and control mechanisms. This framework is adopted and modified towards this research’ willingness to cooperate variable. The framework and the modifications are described in the next paragraph.

2.3.4 ALLIANCE PARTNER COOPERATION

Partner cooperation in alliances is defined as: “*the willingness of a partner organization to pursue mutually compatible interests in the alliance rather than act opportunistically*” (Das & Teng, 1998. P. 492). This definition complies to the willingness to cooperate variable in this research as it defines partner cooperation from the intentions of partner firms to contribute in the favor of the cooperation. It addresses opportunistic behavior which indicates that the definition concerns relationships that determine whether a partner is willing to cooperate or not. This definition complies to the intended willingness to cooperate concept in this research. It clearly distinguishes from other intentions to cooperate such as resource based intentions and is therefore adopted.

2.3.4.1 CONFIDENCE IN PARTNER COOPERATION

Confidence in partner cooperation is stated as an important driver of the willingness to cooperate in this research. Confidence is ‘*a organization’s perceived certainty about satisfactory partner cooperation*’ (Das & Teng, 1998. P. 492). The concept deals with uncertainty in partner cooperation. Opportunistic behaviors such as misleading partners, distorting information and appropriating partners’ critical resources are common in many strategic alliances. Therefore, some authors have argued that strategic alliances are inherent to fail and damage organizations (Das & Teng, 1997; Inkpen & Beamish, 1997; Kogut, 1989; Williamson, 1985). Here it is argued that confidence in alliances may absorb concerns for opportunistic behaviour in alliances since confidence reduces uncertainty in partner cooperation. When confidence is present in partner cooperation neither of the partners behaves opportunistically as neither partner expects the other to act opportunistically. In the context of open supply networks where high-tech innovative organizations are operative confidence is expected to be of even more importance. In such supply networks one of the main drivers to form

alliances is that of knowledge transfer. In this context, knowledge is a sensitive, vulnerable resource for an organization's competitive position and is therefore only to be shared with partners that are not expected to behave opportunistically.

Confidence is obtained from two perspectives: (1) the control perspective and (2) the trust perspective (Das and Teng, 1998). Control is used to influence a partners' behaviour, and therefore increases the predictability that organizations perceive over other organizations' behaviour. Control is organized for through control mechanisms, and the result is a certain level of control that is perceived.

A less extrinsic based source of confidence is trust. Trust is of importance in uncertain and risky contexts (Deutsch, 1962; Kee & Knox, 1970) and basically entails the act of leaving oneself vulnerable to others based on the expectation that the others' motives are positive (Boon & Holmes, 1991, Hosmer, 1995). This expectation of goodwill directly implies the connection of the trust perspective with the concept definition of confidence. The concepts are still distinct however, since trust deals with expectations of positive motives whereas confidence deals with (un)certainty about partners' behaviour. It should be noted that confidence can still be high were the degree of trust to be low since the perspectives are different kinds of approaches. The control perspective can compensate for the trust perspective, as can the trust perspective for the control perspective. Control measures are needed when adequate degrees of trust are not present. On the other hand, there is no need for control measures when trust in partners' positive intentions is high and rightfully placed. However, even when



FIGURE 2 THE EFFECT OF TRUST AND CONTROL ON CONFIDENCE, ADOPTED FROM DAS & TANG (1998)

trust is high, firms that wish to obtain a higher confidence can still apply control mechanisms as the two perspectives simultaneously and jointly have their effect on confidence (Das & Teng, 1998).

Figure 2 depicts Das and Teng (1998) their framework. The factors that influence the level of trust and the level of control have not been discussed as of yet. With regard to trust building, Das and Tang (1998) build upon the notion of Creed and Miles (1996) that the level of trust in a strategic alliance is

not static, but that it develops. Other authors have later referred to this phenomenon under the concept of 'relational trust' (Selnes, 2003) (Scarborough et al. 2013). In this research, we also speak of relational trust. More specifically, the willingness to develop relational trust through cooperating. Therefore, the trust building measures as depicted in figure 2 are modified to the willingness to take risk, the willingness to preserve equity, the willingness to communicate effectively and the willingness to adopt to the other organization.

Willingness to take risk signals trustworthiness to other actors in the alliance and by doing so it increases the level of relational trust. An organization that is willing to take risk signals that it is operating in the favor of the alliance. Examples of risk taking are sharing knowledge, investing in new assets etc. In contrast, an organization committing to the alliance and its objectives verbally but not explicitly by taking risk will decrease in trustworthiness.

Willingness to preserve equity is a more extrinsic type commitment to the alliance. Investing resources in equity creates a notion of sunk costs would the investing party not stick to the alliance objectives and contribute to make the alliance successful. At the same time, for the party investing most resources it would only be fair to harvest equal proportions from alliance outcomes. Relational trust can be built on the thought that both organizations are 'tied' to the alliance since they both invested monetary resources in equity.

Willingness to contribute to effective communication is an essential factor for relational trust building in a cooperation. Communication behavior and quality is one of the primary characteristics for partnership success (Mohr, Spekman, 1994) and is an indispensable characteristic of trusting relationships (Kanter, 1994) (Larson, 1992). Conflicts can be avoided by providing transparency of interests through effective communication. Also, communication guides goal setting and structural specifications of the alliance which serve as control mechanisms but also provide clarity in trust building. Communication in an early stage also smoothenes the process of due diligence prior the formation of strategic alliances. In this stage the credibility and trustworthiness of organizations can be signaled through the transparent communications of evidence and goodwill. .

Willingness to adopt to the other organization builds relational trust by signaling trustworthiness through adjustment of behavioral and/or structural patterns to the partners' environment. The adoptions of other organizations routines signals that the organization is willing to put in effort in favor of the alliance. Such adoptions may require employees to alter habits and operational routines that they would have on a day at work at the original organization. On a higher organizational level it may require a organization to go along with the way the cooperative organization distributes power for decision making.

Control mechanisms have an effect on both the level of trust and the level of control in strategic alliances. Formal control mechanisms undermine the level of trust, whereas social control mechanisms enhance the level of trust between partners. Furthermore, control mechanisms have a higher level of control in high trust alliances than in low trust alliances. Three control mechanisms are discussed: goal setting, structural specifications and cultural blending.

Goal setting is a social control mechanism. Goal setting prior the alliance allows for congruence on goals between partners. This type of control can be used for the justification of feedback and evaluation towards partners on whether they are complying to prior set goals or not. All parties should make sure their interests are represented in the formulation of goals.

Structural specifications are formal control mechanisms. Structural specifications include rules, regulations and consequences of behavior. Even though formal control may undermine trust, formal control in alliances provides confidence through the feeling of having control over uncertainty and possible opportunism in the alliance.

Cultural blending is a social control mechanism. People are unconsciously guided by their shared values and norms in organizations. One of the infamous challenges in strategic alliances is that two cultures come together, and are forced to blend. The blending of two cultures into one culture offers possibilities for social control. A shared culture indicates predictability of behavior of actors (Trice & Beyer, 1993). At the same time, a feeling of unification through culture also has a positive influence on trust in the alliance.

2.4. PERCEIVED PARTNER FIT

In open supply networks organizations cooperate towards clear objectives that may include, but often exceed reducing transaction costs. Confidence in partner cooperation as described in the previous paragraph may therefore not suffice for partner assessment. Gulati (1998) mentioned that organizations base alliances on strategic complementarities that can be offered exchangeably. In other words, organizations ally with partners with whom they expect to acquire competitive advantages. This research assumes that such expectations lead to perceptions of organizations' fitness for cooperation. In this paragraph, the resource based view of the firm and a relational view that emerged from this perceptive are discussed. This discussion is used to construct a definition of organizations' perceived partner fit in open supply networks.

2.4.1 RESOURCE BASED VIEW OF THE FIRM

The resource based view of the firm is a perspective that more explicitly addresses organizations' strategic needs. The resource based view of the firm is a perspective that considers the organization from its resource needs, rather than from the outcome-product side (Wernefelt, 1984). According to the resource based theory of the organization, an organization should assess its resource position and

base its strategic choices upon its needs. According to traditional resource-based theory, possible strategic options are the exploitation of existing resources, the development of new ones or the purchase of resources through acquisitions (Wernefelt, 1984). Regarding the latter, Dyer, Kale and Singh (2004) demonstrate that mergers and acquisitions are not best practices for resource acquisition in every context. To ally, in form of different type of alliances, proves to be more effective and risk averse in contexts where resources must be combined, where reciprocal synergies are of importance and where your rivals may be your potential partners. Such contingencies require for appropriate assessment of suitable partners.

The resource based view on strategic alliances is an extension of the resource based view of the firm that assesses organizations as pools of resources. It aimed to incorporate both strategic and social factors (Eisenhardt, 1996). By doing so the perspective argues that firms that are in vulnerable strategic positions and strong social positions tend to form alliances most frequent and effectively. The perspective also underscores organization's characteristics and every organization's specific needs and opportunities. The remark that strategic needs indicate types of resources that organizations wish to acquire through alliance forming suits the intended perceived partner fit concept in this research. Whereas the willingness to cooperate discusses transaction cost economic of cooperation and the proximity dimensions are to cover impact of characteristics of the organization, perceived partner fit assesses the strategic needs of organizations. This research however aims to go beyond the strategic needs of organizations. Namely, the generation of cooperative outcomes that specific organizations could only jointly achieve through synergetic outflow. A trend emerged from the resource based view that addressed such relational synergies between organizations. This trend is discussed in the following paragraph.

2.4.2 THE RELATIONAL VIEW: GENERATING RELATIONAL RENT

Whereas the resource-based-view on strategic alliances argues that alliance formation is a result of strategic needs and social opportunities (Eisenhardt, 1996), the relational view argues that cooperative strategy can be a source for inter-organizational competitive advantage. In the resource-based view alliances are a way to acquire resources that are not owned by the organization originally. The relational view holds on to a network perspective of organizations that is able to acquire interfirm competitive advantage collectively (Dyer, Singh, 1998).

This research is conducted in a network environment where firms aim to develop innovations that they could not develop on their own. The relational view is thus regarded as more suitable when assessing the partner fit in alliance formation than the resource-based-view on strategic alliances. Competitive advantage can be acquired through the generation of relational rent (Dyer and Singh, 1998). Relational rent is profit generated from alliances where the partners 'fit' is based on the perception of four interfirm characteristics: (1) relation-specific assets, (2) knowledge-sharing routines, (3)

complementary resources/capabilities and (4) effective governance (Dyer and Singh, 1998). It is the profit jointly generated from an exchange relationship that could not have been generated by either organization in isolation. It could only be generated from mutual idiosyncratic contributions from both organizations. The profit is measured in currencies of knowledge, frequency and quality of innovations, patents etc. rather than in monetary entities (Dyer and Singh, 1998). The definition of relational rent complies to the objectives of the BIC in the Noord-Brabant region, to acquire innovations that neither organization could have developed on their own. Therefore, this definition is adopted for the perceived partner fit definition: a organization's expectation to be able to generate relational rent with another organization in alliance activities.

Before discussing the interfirm characteristics that generate relational rent it must be noted that effective governance is not included as intended by Dyer and Singh (1998). The concept has yet been incorporated in the willingness to cooperate variable. The control perspective (Das & Teng, 1998) illustrates similar measures of governance as the concept of effective governance (Dyer and Singh, 1998), namely that of formal and informal (or social) control mechanisms. Two other concepts are modified to the contents of this research. This research deals with perceptions of perceived partner fit rather than actual outcomes. Consequently, perceptions of relational rent generators are discussed. The concepts that generate perceived relational rent are perceived interfirm relational-specific assets, perceived interfirm knowledge-sharing routines and perceived complementary resources and/or capabilities.

Perceived interfirm relation-specific assets are assets that are specialized in favor of the alliance and specifically adjusted towards the cooperating partner. To generate competitive advantage, organizations that collaborate must do something specialized. Organizations can attain specialized assets by creating assets that adopt to the alliance partner its strategic assets (Klein, Crawford, & Alchion, 1987; Teece, 1987). Such adoptions require investments in site specific assets such as factories and distribution centres, physical specific assets such as customized machinery and human specific assets such as engineers who adopt to the partners' routines (Williamson, 1985). Such investments not only reduce inventory and transaction cost but also increase coordination activities, allow for product differentiation and an increased product fit between partners, and increase product quality and speed to market through effective communication. Furthermore, the greater the intensity of contact and transactions in the alliance, the more likely it is that alliances can create in-depth specialized relational assets.

Perceived interfirm knowledge-sharing routines allow alliances to transfer, recombine or create specialized knowledge and by doing so generate rents (Dyer and Singh, 1998). In order to do so, firms should be able to identify which other organizations' knowledge resources could possibly lead to rents in their specific commercial situation and how to utilize them. Absorptive capacity deals with an

organization's capability to do so. Specifically, in this research the partner-specific absorptive capacity is assessed. This implies that the capacity to absorb one's knowledge is alliance orientated rather than that the capability to learn from all other organizations is intended. Absorptive capacity needs overlapping knowledge bases in order to exist and develop (Dyer and Singh, 1998; Mowery, Oxley, & Silverman, 1996). Comparable knowledge bases assist receivers of knowledge in the unraveling, prioritization, translation and context specific application of knowledge. The second requisite for absorptive capacity are interaction routines. Actors should know where knowledge is distributed in the organization with which specific individuals. Such routines are created as a result of frequent interactions where knowledge transfer naturally occurs and is discussed explicitly (Dyer and Singh, 1998). This indicates that absorptive capacity develops over time as partners and individuals in the organization get to know each other. Alliances that actively organize for such interactions create an environment for knowledge sharing.

Perceived complementary resources and/or capabilities in the context of strategic alliances are resources that neither organization is able to acquire in any secondary market (Dyer, Singh, 1998). If available in secondary markets, the alliance has no grounds of existence since any organization could simply make a similar purchase. The aim is to realize a synergistic effect by combining the resources of the partner with the distinctive resources of the partnering organization. It is argued that this will create more valuable, rare and difficult to imitate resources. Consequently, this has the potential to generate relational rent and result in improved competitive positions. Therefore, ideally all the resources of an alliance partner have potential synergetic effects towards possessed resources and capabilities. Practically, it is impossible to form an alliance in which all resources have synergistic effects once combined. Therefore, partners should look for as many synergistic resources as possible in alliances. An example of organizations combining synergetic resources for the generation of relational rent is that of Uber and Spotify. Uber allows customers to play their favorite playlist. In order to do so, customers need a premium Spotify account. This partnership offers a new sort of exclusivity to Uber taxis, and incentives to upgrade to a premium Spotify account (Forbes, 2014). Such mutual advantage could only be acquired by the cooperation of these specific organizations and is not easily available through other channels. In this example the mutual perception of potential relational rent is quite obvious. However, for many strategic alliances the potential advantages are not that clear. The ability to identify potential partners with synergistic resources depends on (1) prior experience in alliance forming, (2) evaluation capabilities and (3) ability to acquire information about potential partners (Dyer and Singh, 1998). In the context of this research this indicates that the perceived partner fit not only depends on the potential alliance partner's characteristics, but also on the capabilities of organizations to assess potential partners. These concepts are expected to create for most of the perception of partner fit.

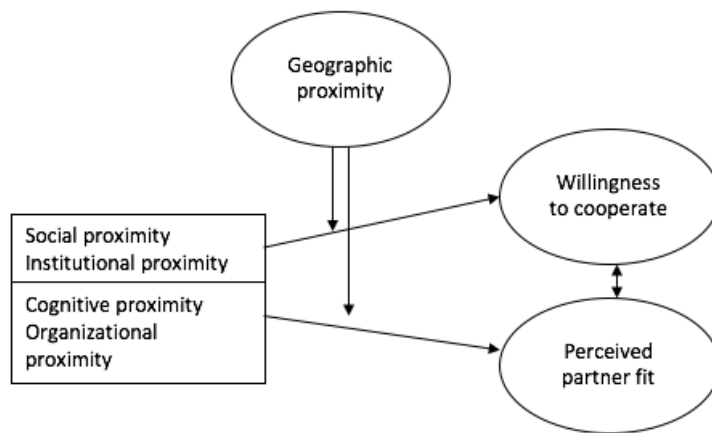


FIGURE 2: CONCEPTUAL MODEL

2.5. PROXIMITY

In this research, organizational similarities or differences are depicted as proximities of organizations. Proximities are used to characterize organizations and assess potential effects of organizations' characteristics on the willingness to cooperate and perceived partner fit.

The term proximity is typified broadly in organization literature. A 2006 literature review by Knoben and Oerlemans concluded that the literature had made a notion of seven dimensions of proximity. By far, geographical proximity is the most frequently noted dimension of proximity, followed by organizational proximity. The other dimensions that are mentioned are cultural, technological, cognitive, institutional and social proximity. Geographical proximity is a dimension that relatively requires little discussion regarding its definition as it simply contains the physical distance between organizations. Its effect on organizations has been discussed extensively in the literature. Specific mechanisms cause organizations that are locally clustered to experience an extensive degree of knowledge exchange. As such clusters often settle in regions that are typified by a specific knowledge pool, organizations profit from the local labor market turnover. Furthermore, geographic proximity has been linked to likely success of early stage technology development through intense social and professional contacts, informal communication and face to face interaction (Gittelman, 2007). From the regional studies literature, the concept of 'small worlds' describes organizations that experience high degrees of geographic proximity. In line with previous remarks regarding geographic proximity, small worlds with strategic technology alliance networks gain favorable implications from intensive face to face contact towards knowledge transfer (Verspagen, Duysters, 2004). Other authors more specifically focus on the way knowledge is transferred. Geographic proximity implies 'closeness' which allows for more frequent and intensive interaction. Due to such interactions, the converging of tacit knowledge into explicit knowledge and the creation of new knowledge through interactions are boosted (Morgan, 2004) (Gertler, 1995).

Boschma (2005) identifies four dimensions of proximity besides geographical proximity: (1) cognitive, (2) organizational, (3) social and (4) institutional proximity. This typification is more simplistic and applicable to organizations than typifications that use Knoben and Oerlemans' (2006) extensive framework of proximities. As this research rather concerns culture on individual level than the proximity of institutions, institutional proximity is adopted as 'cultural proximity'.

Another reason why Boschma's (2005) typification is used is due to its findings regarding geographic proximity. This research expects that geographical proximity moderates the effects of other proximities on the dependent variables. Likewise, Boschma (2005) states that geographical proximity facilitates knowledge sharing and interactive learning by strengthening the other dimensions of proximity. It must be noted that the boundaries of this research exclude analysis of cooperations' outcomes such as knowledge sharing and interactive learning. Therefore, this research does not fully adapt the typifications proximity effects that Boschma (2005) describes. The purpose of his research was to describe relationships between organizations' proximities and innovative performance, whereas this research aims to describe the relationships between organizations' similarities and the influence these have on how cooperations emerge in open supply networks. Therefore, some modifications are made and implications are altered to the context of this research. The interpretations of the proximities are described below.

2.5.1 COGNITIVE PROXIMITY

Cognitive proximity concerns the proximity of knowledge bases of organizations in Boschma (2005) his framework. For every knowledge gap there is a required minimal amount of knowledge for each actor in order to be able to overcome the gap. If the knowledge bases of actors are below this level, the cognitive proximity is insufficient causing effective communication to be problematic. A high degree of cognitive proximity indicates that knowledge bases are the same, and the knowledge gap is small. A low degree of cognitive proximity indicates that knowledge bases do not overlap strongly and that the knowledge gap is more significant. Some cognitive distance is necessary in order for parties to be able to learn from each other and stimulate novelty and creativity in innovation. Thus, whilst interactive learning requires common resources and capabilities it also requires incentives that ignite the need to cooperate.

The interpretation of cognitive proximity differs in this research. This research assesses the knowledge bases of individuals, rather than that of organizations. It is expected that similar knowledge bases will create for a certain 'cognitive fit' between individuals, which may increase the perception of partner fit.. Individuals that communicate through a certain jargon, are expected to form certain cognitive understandings that bond them. This is expected to apply to both individuals that cooperate in the specific project, as to higher-layered personnel that creates the cooperation. Through this interpretation the individual level is included in the partner fit variable

Proposition 4a: Individuals with little cognitive distance are likely to perceive a higher partner fit than individuals with larger degrees of cognitive distance.

2.5.2 ORGANIZATIONAL PROXIMITY

Organizational proximity concerns the proximities of organizations' governance structures. It refers to the rate of autonomy and degree of control in and between organizations. Organizations with high organizational proximity are typically resistant, bureaucratic organizations whereas organizations with low organizational proximity are typically autonomously organized, on-the-spot market organizations. It is expected that organizations that have similar governance structures expect the same from cooperations regarding decision making and power distribution. In contrast, difference on organizational proximity is expected to cause for conflict and inefficiency in cooperation. For example, in a context where an autonomous, horizontal department of an organization is cooperating with a department of a bureaucratic organization, problems will likely arise on the timely manner in which decisions are made. The autonomous department is decentralized in such a way that it can make decisions on the spot, whereas the bureaucratic department has to coordinate back through hierarchical layers to confirm decisions. In project meetings, the autonomous organization typically expects to form agreements whereas the bureaucratic department can solely develop propositions that are reversed to higher organizational layers. Therefore, it is expected that organizations will perceive a partner as more fit if it has a similar organizational structure.

Proposition 4c: Comparable degrees of organizational proximity positively affect the perceived partner fit.

This proposition differs from Boschma's (2005) framework. In this study, high degrees of proximity indicate stubborn bureaucracy structures whereas low proximity indicates autonomous structures where opportunistic behavior is more common. Moderate proximity is characterized by loosely coupled network organizations. A clear desirability for moderate proximity is therefore indicated. In contrast, this research assesses the preference for comparable proximities. This diminishes the assessment whether such proximity is low, moderate or high as long as they are comparable. This research does not deny that loosely coupled networks have highest potential for innovative performance, but it is expected that partner fit perceptions rise when organizational structures are similar.

2.5.3 SOCIAL PROXIMITY

Social proximity concerns embeddedness in relationships (Boschma, 2005). A network configuration should be balanced by embedded relations and market relations in order to achieve innovative performance. In this research, this framework is not argued against nor is it fully utilized or adopted. It is not intended to provide best practices regarding what a network configuration should include. Instead, an alternative interpretation of social proximity is used. Namely, the proximity of

organizations within networks. Gulati (1995) described this as the ‘social structure’ of networks as the term intends to address the social position of an organization in a network with potential partners. The social position of organizations’ is affected by two network mechanisms. Firstly, organizations that have prior experience in cooperation are likely to engage in other cooperations. In other words, they are likely to be willing to cooperate since their proximity in the network is high. This does not include firms that experienced opportunistic behaviors of some sort of the allying partner during their cooperation. Secondly, firms that are able to consult trusted organizations regarding a potential partner are located moderately proximal to one another in the network. Such indirect ties indicate acknowledgement of and interest in one another’s services. According to this argumentation, a more general approach can be distinguished. Namely, the shorter the path of direct/indirect ties in the network, the more proximal organizations are located to each other. The expected implications of this proximity are discussed below.

Organizations that are close in the social network are likely to be willing to take risk, invest in equity, contribute to communication and adopt to the other organization for the sake of cooperation. Such signals of good intentions in alliance forming are expected to lower expectations of opportunistic behavior in partner cooperation.

Proposition 4d: High degrees of social proximity in organizations positively affects the willingness to cooperate.

2.5.4 CULTURAL PROXIMITY

Cultural proximity refers to resemblance of cultural attributes between actors of organizations. It is the second proximity dimension in this research that assesses the individual level rather than organizational. A high degree of cultural proximity implies shared believes, norms and values between individuals of organizations whereas a low degree implies polarization between organizations’ personnel on such aspects.

Organizations’ cooperations concern individuals of organizations physically cooperating in a certain frequency. Cultural proximity affects the willingness to cooperate as it is likely that individuals prefer to cooperate with other individuals with whom they can get along on a cultural basis. A common ground in relationships based on culture is expected to result in a cultural fit between individuals that allows for bonding. Shared norms, values and believes are cultural pillars based on which individuals may be more willing to cooperate than individuals who do not possess such shared traits.

Proposition 4e: High degrees of cultural proximity in organizations positively affects the willingness to cooperate.

This implies that higher layered personnel should consider the cultural fit of low layered personnel that are supposed to cooperate. Also, higher-layered personnel may be directly included in the cooperation and therefore assess cultural fit themselves.

2.5.5 GEOGRAPHIC PROXIMITY AS MODERATOR

According to Boschma (2005) geographic proximity strengthens the earlier discussed dimensions towards innovative performance of organizations. In this research, geographic proximity is expected to strengthen the effect of the proximities towards either the willingness to cooperate, or the perceived partner fit. The general implication of geographic proximity is that organizations, or individuals of organizations, have the possibility of more frequent face to face contact. Towards the cultural and social proximities that proposedly affect the willingness to cooperate, this may implicate that individuals more easily create shared cultures and networks. Towards the cognitive and organizational proximities that proposedly affect the perceived partner fit, this may implicate that cognitive understandings between individuals are be formed more easily and that cooperative decisions are made more swiftly.

Proposition 4f: Geographic proximity moderates the effect of social and cultural proximity on the willingness to cooperate.

Proposition 4g: Geographic proximity moderates the effect of cognitive and organizational proximity on the willingness to cooperate and perceived partner fit.

Geographic proximity is not expected to have an strengthening impact in every context. For instance, social proximity concerns networks. Networks are not necessarily depended of spatial distance. They form due to former working experience and social connectedness and can be disconnected from spatial distance. The same applies for organizational proximity. Organizations that decentralize and standardize routines into simple tasks do not directly benefit from geographical distance. In these contexts, the strengthening effect of geographic proximity is inapplicable.

METHOD

3.1. INTRODUCTION

In this research a qualitative research approach of data gathering and analysis is applied rather than a quantitative approach. The exploratory character of this research requires in depth analysis of variables and relationships. In qualitative research the procedures for textual interpretation allow for a deeper understanding than interpretations from quantitative analysis (Malterud, 2001). In this research, a moderate exploratory approach is conducted using qualitative research methods. A theoretical frame has been formed through studies of various research fields such as strategic management, supply chain management, economic geography and innovation management. The clustering of specific concepts out of these fields in combination with explorative primary data is expected to allow for theory development. Such an explorative approach that utilizes both existing theory and primary data exhibits resemblance with the grounded theory approach (Glaser & Strauss, 1967).

Throughout our research, research ethics were respected at all times. The researcher has adjusted to the partition requirements of the participants and has informed the participants of the research purpose and connectedness with Brainport Industries. Anonymity of participants and organizations is ensured in the public version of this research. Names of organizations as participants have been altered into fictive appellations. Participants will receive the public version after grading. The only purpose of the confidential version of this research is grading. All participants have been requested to allow for audio recording, which has been granted in every case. Such recordings have solely been used for analysis objectives.

3.2. RESEARCH METHOD

3.2.1 CASE STUDY

A case study method was used to gather the required data for theory development. The conceptual model that has been described in this research includes concepts for which a case study is a better research method than others. The qualitative case study allows for in-depth analysis of concepts and relations allowing for theory building (Eisenhardt, 1989). Other research methods such as surveys may not capture the complexity of real-life situations (Zainal, 2007).

Expectations of relationships between concepts have been described in the literature review. Cases have been selected to gather information that may confirm or contradict these relationships in practice. Due to the heterogeneity of organizations in the high-tech Brainport open supply network and the boundaries of this research, a ‘mini-case’ approach was executed. Using few respondents per case, the aim was to generate similarities and differences between multiple distinct cases. More respondents in fewer cases would likely result in more reliable data, but would decrease the generalizability towards

open supply networks. Generalizability has been prioritized as the objective of this research is to conceptualize cooperation in heterogenic open supply networks.

3.2.2 OPERATIONALIZATION

Variable	Dimensions	Indicators	Source
Willingness to Cooperate	Perceived trust	<ul style="list-style-type: none"> - Willingness to take risks - Willingness to invest in equity - Willingness to actively contribute to effective communication - Willingness to adopt to the other o 	Adapted and modified from Das and Teng (1998)
	Perceived control	<ul style="list-style-type: none"> - Goal setting - Structural specifications - Blending cultures 	Adapted from Das and Teng (1998)
Perceived partner fit	Perceived relational specific assets	<ul style="list-style-type: none"> - Site specific assets - Physical specific assets - Human specific assets 	Adopted and modified from Dyer and Singh (1998)
	Perceived interfirm knowledge-sharing routines	<ul style="list-style-type: none"> - Frequency of interactions - Absorbed knowledge from partner 	Adopted and modified from Dyer and Singh (1998)
	Perceived complementarity of resources/capabilities	<ul style="list-style-type: none"> - Experience in alliance forming - Evaluation capabilities - Ability to acquire partner information 	Adopted and modified from Dyer and Singh (1998)
Proximity	Cognitive proximity	<ul style="list-style-type: none"> - Communication through jargon - Mutual learning -(mis)understanding 	Adopted from Boschma (2005)
	Organizational proximity	Decision making: Hierarchical, (de)centralized, autonomous Cooperation structure: <ul style="list-style-type: none"> - Hierarchical - Joint venture - Equity venture - Loosely coupled 	Adopted from Boschma (2005)
	Social proximity	<ul style="list-style-type: none"> - Past shared experiences - Shared contacts in network 	Adopted and modified from Gulati (1995)
	Cultural proximity	<ul style="list-style-type: none"> - Shared values - Shared norms - Shared believes 	Adopted from Boschma (2005)
	Geographic proximity	<ul style="list-style-type: none"> - On-campus - Off-campus 	Adopted from Boschma (2005)

Cognitive proximity assesses whether individuals are able to form cognitive understandings. It is measured in terms of proximity. Little proximity is indicated by misunderstandings whereas high proximity is indicated by understandings through specific jargon.. When cognitive proximity is high, communication runs smoothly since both parties are capable of using the required jargon. Individuals have the feeling that they understand each other and are likely to feel connected to the other individual. For situations of low cognitive proximity, indications are that communications regarding the specialized topics are problematic and individuals misunderstand each other.

Organizational proximity concerns the distribution of power. It is assessed per organization. The way individuals are controlled depict the organizational proximity (e.g. hierarchical structures, (de)centralized power distributions, (non) autonomous entities). Too little organizational proximity is

indicated by acts of opportunism in cooperations whereas too much proximity is indicated by bureaucracy in cooperations. More specifically, organizations that are characterized by low organizational proximity are typically found at on-the-spot markets where actors are greatly independent. Moderate organizational proximity is indicated by loose contacts, cooperation forms (e.g. joint venture, equity venture) and organizations with high organizational proximity are typified by strict, bureaucratic, hierarchal organized organizations. Organizations that experience high organizational proximity are inflexible, whereas organizations that experience low organizational proximity are flexible.

Social proximity is assessed on micro-level. In this research, social proximity intends the position of organizations in a social network of organizations. A high degree of social proximity is indicated by two organizations that engaged in alliances before. Low social proximity is indicated by two organizations that do not directly know each other. Moderate social proximity occurs when organizations do not directly know each other personally but are able to retrieve information due to common partners in the network

Cultural proximity is indicated by shared norms, values and artefacts. Organizations that think the same about e.g. attitude towards society, the environment, employees' rights are likely to have common institutional grounds for trust. Too little proximity in this dimension is indicated by opportunism in the cooperation whereas too much proximity is indicated by lock-in behavior and inertia. The concept is assessed at macro level of organizations and includes cultural aspects. Indicators for high cultural proximity are a common language, shared norms and values, shared habits, shared routines between institutions. Low cultural proximity implies differences on such aspects.

Geographical proximity concerns spatial distance. In the context of the case in this study, the degree of geographical proximity is defined accordingly the context of the case. A high level of geographical proximity is indicated by organizations operating in the same working space. In this case this indicates organizations that settle on-campus. Organizations that are not going to settle on campus do not benefit from geographical proximity in this sense and are therefore labeled with low levels of geographic proximity.

Willingness to cooperate is indicated by the willingness to take risks, willingness to invest in equity, willingness to actively contribute to effective communication and willingness to adopt to the other organization. In alliances where a lot of trust is built, the willingness to cooperate remains high. Alliances that do not build trust perceive a low willingness to cooperate. Alliances that have control measures in place aim to control for a lack of trust. Therefore, control measures can also be used as indicators of the willingness to cooperate. Setting goals and allowing for social control by blending cultures implies trust, whereas setting structural specifications indicates a lack of trust. Again, trust indicates higher degrees of the willingness to cooperate.

Perceived partner fit concerns a firms' perceived advantages from cooperations. Relational rent is the sum of rent generated from relational-specific assets, interfirm knowledge routines and complementary resources/capabilities. It is not measured in monetary currencies but in benchmarks such as innovative performance, effectivity and efficiency of operational processes, patents etc. Relational specific assets can only be observed from the context of the organization. Does a organization possess assets that are specifically relevant towards the other firms' assets? Interfirm knowledge routines are characterized by effective communication in the workforce. A organization that is complementary in its resources implies that it is a organization that differs in resources from the other organization. In some way, the resources complement each other. These are contingencies that are greatly context and environment dependent.

3.2.3 SELECTING CASES

The proposed cases in this research are organizations' considerations towards cooperation in the context of an open supply network. To gather data on such considerations, cases are selected from an open supply network. In this research, organizations that are formally connected to Brainport Industries through a partnership, are regarded as actors in the Brainport open supply network. These cases are potential settlers on the new BIC simultaneously. In cooperation with Loris van Beek and Rik de Boer, respectively director and innovation and business development manager of Brainport industries, an argumentation towards a set of cases had been developed. The main criteria was to include distinct cases that will settle on-campus, and distinct cases that were invited to settle on-campus but rather would not. In later analysis it will be validated whether these cases are indeed organizations that practice open supply network aspects. The cases are described below.

Case 1: One organization that will settle on the BIC and that operates in open supply network contexts. This organization will be located next to the organization of case 2 on-campus.

BDSU is an all-round processor of metal for Aerospace and developer of High-tech equipment systems. As of yet the allocation of organizations on-campus is largely unknown, but in the process of this research it was discovered that these organizations will be located next to each other. This potentially allows for cooperations and/or spill-overs.

Case 2: One organization that will settle on the BIC and that operates in open supply network contexts. This organizations will be located next to the organization of case 1 on-campus.

Opticon is a developer of optical solutions. BDSU (case 1) and Opticon (case 2) are distinct organizations with cooperative possibilities. Both BDSU and Opticon use precise measurement equipment around which cooperation might emerge.

Case 3: *One organization that will settle on the BIC and operates in open supply network contexts.*

PCBprintx is an organization in a highly complex high-tech segment, the printed circuit board segment. In this case, highly innovative development projects are expected.

Case 4: *One organizations that potentially could settle on the BIC, but is unwilling to do so, and operates in open supply network projects.*

Plasticproces is an organization that would be welcomed by the BIC, but is unwilling to do so. This case is weighted against organizations that are settling on the BIC.

Case 5: *One organizations that potentially could settle on the BIC, but is unwilling to do so, and operates in open supply network projects.*

ElectronicPCBs is an organization that would be welcomed by the BIC, but is unwilling to do so. This case is weighted against organizations that are settling on the BIC.

Case 6: *One organization that is located in the Brainport region, but is not involved in open supply network projects.*

This case serves as a control case. It controls for the differences between open supply networks and more traditional supply chains. EveryTechnics is an organization that has grown to one of the largest high tech organizations in the Brainport region. They did so by integrating vertical integration, rather than horizontally cooperating with other organizations.

TABLE 3: ADDITIONAL CASE CRITERION

Criteria	Case 1: BDSU	Case 2: Opticon	Case 3: PCBprintx	Case 4: Plasticproces precision	Case 5: ElectronicPCB	Case 6: EveryTechnics
Size (FTE)	550 (Large)	78 (medium)	110 (medium)	50 (medium)	30 (medium)	1100 (large)
Age (founding)	1995	2006	1976	1982	2010	1993
Sector	Aerospace, Semiconductor, Medical, Industrial automation	Optical precision elements	Printed circuit board chain	High performance plastic processing	Printed circuit board chain	Electronic, mechatronic products and systems
NACE Rev. 2 (Source: Orbis)	5223, 7112	2670	2611	2229	2611, 2612	2790, 7112
Cooperation type	Horizontal, multilateral	Vertical bilateral	Horizontal multilateral	Horizontal bilateral	Horizontal multilateral	Vertical, outsourcing
Future campus situation	On-campus, next to Opticon	On-campus, next to BDSU	On-campus	Off-campus	Off-campus	Off-campus
Market Scope	National & International	National & international	National & International	National & international	National & international	National & international

Table continues on next page

Production	High mix, low volume, high complexity	High mix, low volume, high complexity	High mix, high volume, high complexity	High mix, low volume, high complexity	High mix, low volume, high complexity	High mix, high volume, high complexity
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It was expected that organizations in various segments in the high-tech industry have distinct motivations to cooperate. The aim was to find both distinctions and consensus on the willingness to cooperate and perceived partner fit concepts.

3.2.4 DATA COLLECTION

Primary data was gathered using an interview method. A questionnaire (Appendix A, p. 74) has been developed based on indicators that were operationalized in paragraph 3.2.2. The questionnaire was used as structural element in semi-structured interviews. Semi-structured interviews allowed for in-depth exploration of concepts through the use of the questionnaire and exploration of divergent responses. Divergent responses were followed by successive questions that allowed for explorative findings.

Additional secondary data, apart from publications described in the literature review, was gathered from Brainport Industries. This data provided more insight regarding the Brainport open supply network (Appendix C, p. 81).

3.2.6 INFORMANTS

Per case, preferably two informants were included. As the interviews discussed alliance forming in detail, the informants should have been actively involved in the forming of at least one alliance for the organization, preferably a recent one. The informants were required to have an overview of how decision making is structured in their organization, and preferably also of the partnering organization. The questionnaire required the informants to be capable of noticing resemblances and differences between two organizations on cognitive, structural/organizational and institutional/cultural level. The informants had an overview of what the organization tried to achieve strategically with the cooperation and what the organization invested in specific resources in favor of the cooperation. In practice, it was found that CEO's, CTO's and directors were able to provide such desired information. One exception was made, the custom project manager of PCBprintx was able to use his extensive former experience to form response to the questionnaire.

Pragmatically, the informant requirements caused that not all cases could be researched using more than one informant. The availability of directors, CEO's and CTO's was limited in the context of the cases. For case 1, 2 and 6 only one informant could be included. The fact that the respondents were either directors or an CEO, provides confidence that the informants could provide a holistic and reliable image of the organizations cooperative intentions. Nonetheless, extra respondents per case would have increased the reliability of the data as it would have allowed for the validation of

respondents' results. The overview of informants is provided in Appendix B, p. 77. Their transcripts are included in the additional document to this thesis.

3.2.7 CODING AND ANALYSIS

The interviews were documented in transcriptions. The transcriptions have been analyzed using qualitative content analysis processes, using qualitative analysis software. Three phases were determined: the preparation phase, the organizing phase and the reporting of the analyzing process and the results (Elo, Kyngäs, 2007). In the preparation phase, the transcripts were coded. Codes were formed along a grounded theory approach where coding occurs openly, axially and selectively (Glaser & Strauss, 1967). Through open coding various codes could be deducted from the data that largely complied to the operationalization categories in this research. During axial coding, these codes were assigned to their respective categories. Some codes emerged exploratively. For these codes, new categories had to be created inductively. At last, through selective coding the categories could be assigned to the core variables in this research. Using qualitative software, an overview emerged of possible relationships between codes and variables. Due to the inclusion of codes that were not specified in the operationalization, new relationships emerged. Through interpretative, deductive and inductive reasoning a results model emerged that differed from the conceptual model. This model is discussed in the results chapter.

RESULTS

The results have been structured along major findings in the data analysis. Primarily, one paragraph is devoted to willingness to cooperate assessment per case. Subsequently, the willingness to cooperate of this research's organizations is suggested to be subject to three conditions. Results concerning each of these conditions are discussed in separate paragraphs: 1) Firstly, explorative results suggest that the presence of Brainport regional routines in development determine whether cases are willing to cooperate. 2) Secondly, results suggest that confidence that a partner will not act opportunistically is a condition for cases to be willing to cooperate. 3) At last, results suggest that the perception that a partner is supportive towards innovation is a third condition for cases to be willing to cooperate.

In the final paragraph results are discussed that suggest a potential lock-in behavior within the researched open supply network.

4.1 WILLINGNESS TO COOPERATE

In this paragraph the cases are assessed on the degree of willingness to cooperate that could be deducted from either past and current cooperations, or considerations towards cooperations. An overview of cases' relevant cooperation characteristics per case is provided in table 4.

Initially, the willingness to cooperate had been defined and interpreted towards broad cooperation, in which the type and objective of cooperation was not addressed specifically. The pursuit for compatible interests in general was concerned. The inclusion of an open supply network context in the questionnaire altered the focus of the research. A wide spectrum of cooperation possibilities got specified towards cooperative innovation. Consequently, the data that emerged in this research concerned projects in which organizations cooperate with the objective of innovation.

4.1.1 PER CASE ANALYSIS

The willingness to cooperate degree towards innovations varied among the cases. The role that the cases had in cooperation, or wanted to have, determined what the willingness to cooperate contained. Some cases were restrained to the extent of their cooperative possibilities, whereas others could coordinate whole projects. BDSU is an organization that is assessed with a high degree of willingness to cooperate. In their case, a specific project was discussed where BDSU operated as initiator. Their cooperative intentions were expressed clearly through the approaches they made to other organizations, selecting and including them in cooperation towards a new service. The BDSU case is used to illustrate the willingness to cooperate degree in the development of a new service:

#R1, Director, BDSU, Appendix B, p. : *“L: Can we discuss an cooperation which BDSU is currently involved in?”*

J: Regarding the Brainport thought?

L: Yes, it would be ideal if we could discuss an innovative cooperation. Ja als het een innovatief karakter heeft zou dat ideaal zijn.

J: The Brainport campus includes an innovation program. Smart Logistics, and flexible manufacturing on which not much is known as of yet. But smart logistics, we are making progress on that. BDSU cooperates with LogisticTechX, and we are assessing whether we can include SoftwareTechx Technology. They joined to see if they can fulfill a part. When regarding what we are actually doing at the moment, the pragmatic side, that is just for now. We are looking into the future, the theoretical side. The most important thing is how are we going to coordinate the logistics between organizations XYZ. We have to create a model that includes an interface to communicate. SoftwareTechx technology will thus probably be assigned with the highest role, and LogisticTechX will also do its part. Eventually the interface should be developed. TNO is currently creating fieldlabs and smartconnect services to communicate to various EHP systems. But at the moment, the systems are not in existence yet. So we have to develop all of that. Ultimately we will have to develop a lot cooperatively in the coming years."

In this project, BDSU uses internal and external knowledge, by including suppliers and other institutions to cooperatively develop. The organizations cooperate horizontally, without the presence or security of a specific customer. ElectronicPCBs coordinated a project of similar complexity, where a new product was developed by 12 organizations. In their case, the original initiator was a large retailer which was approached as a customer. Like BDSU, ElectronicPCBs included various organizations from various segments, since ElectronicPCBs lacked specialisms to develop the product themselves. Thus, both BDSU and ElectronicPCBs are willing to cooperate to a high degree and express it in the coordination of a development project. However, BDSU was willing to cooperate based on a vision on development whereas ElectronicPCBs was motivated by a customer:

#R7, Director, ElectronicPCBs: *"L: That can also be considered as a type of cooperation. Do you also cooperate with other suppliers, for a common customer?"*

A: Of course. We just developed a product, coordinated it fully, for the large retailer. The product will be in store 1 october. It is a digital sent machine. In the whole coordination of the project we gathered 10/12 organizations around us to include all specializations. The design, molding, casing, everything.

L: And eventually the product is developed cooperatively?"

A: Yes. We are responsible for the end product. We are coordinating all subparts.

Possibly, as a larger organization, BDSU has more capacity to initiate a service themselves than ElectronicPCBs, and consequently does not require the safeguard of a direct customer for the project. A sidenote to the BDSU and ElectronicPCBs cases must be made. The projects that are discussed may be subject to selection bias. In other projects BDSU and ElectronicPCBs likely operate in other roles than initiator. It cannot be concluded that BDSU and ElectronicPCBs structurally coordinate product development, but their willingness to cooperate degrees in these projects provide valuable insights for this research.

In the PCBprintx and Plasticproces cases, specific projects that they initiated and coordinated were not discussed. From past and current cooperations it could be assessed that their willingness to cooperate degree ranged from medium to high. The informants indicated that their organizations function as co-developers. Both cases' willingness to cooperate is expressed through the desire to be included early in development projects. They influence the course of an innovation through an advisory role in early phases of development where they exchange their knowledge regarding productivity and testing, which are their future activities in the cooperation. Like ElectronicPCBs, PCBprintx may initiate co-

development with PCB suppliers once they are approached by a customer. How PCBprintx is willing to cooperate towards co-development is illustrated in the following citation:

#R3, Director, PCBprintx: *“So that cooperation is mainly with knowledge institutions. Regarding private organizations, do you co-develop and produce with other private organizations?”*

T: Yes, in co-development we are responsible for production. We apply early supplier involvement a lot. In early supplier involvement, we assess producibility, testability, whether we will reach the yield, component choice, obsolescent working, life cycle management. We apply such practices with Demcon for example. These are projects that run for 4 to 5 years, and only then it could be that something comes out of it.”

PCBprintx starts as an advisory partner through early supplier involvement, and evolves in a producer and tester of PCB's during the project. Through their early involvement PCBprintx makes sure that the PCB is producible. Plasticproces's role in cooperation, and types of cooperation, are similar to that of PCBprintx. Plasticproces operates in a segment which some of their customers regard as rather basic. They disagree that plastic processing is basic, and regard co-development as a requisite for producibility likewise. An illustration is provided concerning their willingness to co-develop with customers:

#R6, Director, Plasticproces: *“L: So what is important towards cooperation, what makes you think up front: this could be a good cooperation?”*

..... M: We have two directions. There are organizations that come in with a design and just simply let us produce it as, and we have organizations that involve us in the development, whom want to co-develop with us. In such cooperations it is important to be open to one another. Those are the cooperations we want. The other organization should also acknowledge us for our quality, our capabilities. Such acknowledgement allows for open discussion, openness and the willingness to solve problems together, for which an understanding of the segment is needed that we can provide.

A distinction between the co-development activities of PCBprintx and Plasticproces is that PCBprintx mostly cooperates with other suppliers whereas Plasticproces cooperates with customers. A comparison can be made that their willingness to cooperate is expressed through the inclusion of co-development in their development strategy. Both organizations want to contribute to the development of certain products by applying their knowledge so that producibility increases.

Opticon's willingness to cooperate degree is assessed to range from low to medium. Opticon occasionally co-develops with customers, whilst co-development with suppliers is more uncommon. Relationships with customers developed into trust relationships. Opticon requires similar degrees of trust with suppliers in order to co-develop. This is illustrated below:

#R2, CTO, Opticon: *“Does Opticon develop with clients, or also with suppliers, that something is developed cooperatively for a client?”*

E: In most cases we develop internally, or include a customer. We develop components: lenses or lensassemblies or subassemblies that we develop ourselves. Of course we discuss with suppliers, and in this sense something is developed cooperatively. However, this is always in a client-supplier relationship where we serve as the client.....

.....L: Returning to cooperation with suppliers, what attracts Opticon to cooperate with suppliers?

E: Trustworthiness. We have a client base which is very stable, most of our clients have been our clients for more than 5 years, and often 10/15 years. We built a trust relationship with these clients, they know what we can

do. We require the same of our suppliers. So that means that we will need a similar relationship, so that we can accomplish what we want to accomplish on the longer term.”

Opticon mostly develops internally. Its development strategy partly resembles the vertical integration principles that EveryTechnics is assessed with. Even though cooperation towards innovation is less obviously present for Opticon, co-development is also part of their development strategy through customer involvement and limited supplier involvement.

The embeddedness of a willingness to cooperate in development strategy is not self-evident. In the EveryTechnics case, a willingness to cooperate towards innovations is only expressed through outsourcing activities. The EveryTechnics case is assessed with the lowest willing to cooperate degree. Rather, EveryTechnics applies vertical integration principles to develop internally, and outsources activities when capacities are reached. To demonstrate, EveryTechnics would rather recruit personnel than co-develop with suppliers when expertise lacks:

#R9, CEO, EveryTechnics: *“In a situation where you don’t possess the expertise, and you are looking for individuals whom do, do you approach organizations that you know or are these located outside of your network?”*

H: We have 400 engineers, so we have all the knowledge. We have all types of engineers, all the knowledge. We outsource from time to time because we reach our capacity, because we are sold out. At the moment our biggest concern is to acquire more knowledge, we are looking for hundreds of new engineers.

L: So instead of cooperating, you would rather recruit for expertise? Even though a organization located next to you already possesses such knowledge and could immediately apply it? Wouldn’t you cooperate with such a organization?

H: No. Then we would attempt to recruit their personnel.”

The cases that include cooperation in their development strategy clearly differ from EveryTechnics. EveryTechnics does not deem cooperation as a strength, but rather as a weakness. As EveryTechnics is the single control case in this research, this cannot be generalized to organizations that are not embedded in open supply networks. Rather, the purpose is to distinguish between EveryTechnics and other cases.

TABLE 4: WILLINGNESS TO COOPERATE CHARACTERIZED

Case	1: BDSU	2: Opticon	3: PCBprintx	4: Plasticproces	5: ElectronicPCBs	6: EveryTechnics
Type of cooperation	Willing to coordinate co-development of products/services with suppliers	Willing to co-develop with customers and trusted suppliers	Willing to be involved early in co-development with suppliers	Willing to coordinate co-development of products/services with suppliers	Willing to cooperatively develop and realize products with suppliers	Willing to outsource when capacity is reached
Direction WTC degree	Horizontally High	Vertically Low/medium	Horizontally Medium/High	Vertically Medium	Horizontally High	Vertically Low
Cooperation objective	New automatic, smart logistic service	Optical developments for own portfolio	The development of PCB’s for machining industry	Processing of engineering plastic	New product for a large retailer which requires an PCB	Full development of electronic, mechatronic products

Role in cooperation	Supplier Coordinating, development	Supplier Development	Supplier Advisor, producing, testing	Supplier Advisor, producing	Supplier Coordinator, development, producing, testing	Client Outsourcer
Early cooperation with	Suppliers	Client, Suppliers	Suppliers	Client	Suppliers	Suppliers
Initiator of project	Independent, client	Client	Client	Client	Client	Independent, client

4.1.2 WILLINGNESS TO COOPERATE IN DEVELOPMENT STRATEGY

The willingness to cooperate in the table above is deducted from the project examples that cases gave, and considerations that were discussed towards cooperation. As demonstrated in the argumentation and table above, the cases' degree of willingness to cooperate appear to be limited by the organizations' strategies regarding development. To some degree, the cases all incorporated the willingness to cooperate in development strategy. Such a strategy illustrated to be partly dependent on how the organizations create value. For example, BDSU is an organization that creates value through the coordination of a project towards a new service. This both allowed and required BDSU to apply a strategy where the willingness to cooperate is of a high degree. An organization such as Plasticproces is not likely to coordinate such a project, as processing engineering plastic is typically a late development stage activity. Still, Plasticproces does utilize co-development in development strategy when possible. In contrast, Opticon and especially EveryTechnics more actively focus on a vertical integration strategy towards development. Such a strategy seems to diminish the cases' degree of willingness to cooperate towards innovations as a result of internal development. Thus, most cases seem to incorporate willingness to cooperate in development strategy. At the same time, some cases choose to vertically integrate development activities.

Whether the cases maintained a strategy including co-development or internal development could not be explained through organizations' characteristics using this research's data. Rationally, it was expected that the smaller organizations in this research would have high degrees of willingness to cooperate due to a lack of broad expertise. Larger organizations would indicate lower degrees as internal development is also a possibility. Surprisingly, the second largest organization in this research was assessed with the highest degree of willingness to cooperate whereas a medium sized organization practiced internal development towards innovation. Other characteristics such as the specific segment or production complexity neither formed an explanatory pattern. Instead, one case claimed that it is due to the specificity of the region that many organizations cooperatively develop towards innovations. Organizations in the region supposedly apply certain routines that stimulate cooperation towards innovation. This claim is discussed in the next paragraph.

4.2 THE BRAINPORT THOUGHT

The data that that indicates the presence of certain regional routines to co-develop rather than outsource or develop internally is discussed in this paragraph. The appellative for such regional

routines is 'The Brainport thought'. Primarily, the content of the appellative is presented through the case that introduced the term, and through secondary data. Secondly, it is assessed whether the Brainport thought resembles open supply network routines. The final assessment of cases' Brainport thought is conducted in a concluding paragraph.

4.2.1 CONTENT

'The Brainport Thought' is a term that was explicitly introduced in the BDSU case when the respondent was asked about the flexibility towards cooperation of his organization. The respondent mentioned that flexibility is one of the requirements of the Brainport thought; to collectively cooperate and innovate towards open innovation:

#R1, Operative Director, BDSU: *L: Is BDSU an organization that is willing to adopt towards cooperation?*

J: We adopt a lot. Towards our clients, because we have to deliver to them. But also to our suppliers, so that we can cooperate to our best with them. We are very flexibly. If we perceive it best to adopt per organization, then we will. If you remain a little bit stubborn you can still trust each other, but if you are really stubborn than you will be done swiftly. An open mind is needed that includes adoptive behavior. The Brainport thought is based on collective cooperation, innovation, open innovation. That is how to achieve something. If such core values lack, it won't happen.

The possible importance of this statement had only been noted until the analysis of data, which is why the topic was not discussed more profoundly and literally in the BDSU case and other cases.

Secondary data strongly confirms BDSU's claim. The Brainport Eindhoven organization claims that cooperation, knowledge exchange and open innovation is embedded in the DNA of the Brainport region. It claims that the strength of the region is that synergies and growth are created through extensive cooperation towards innovations:

Appendix C, Brainport Eindhoven: *"In Brainport, high-tech and design go hand in hand with high-quality manufacturing and entrepreneurship. Collaboration and knowledge-sharing are part of our DNA, forming the basis for the characteristic open innovation that makes Brainport smart and strong. This 'Brabantse' approach is what allows us to be an accelerator of innovation; both on economic as social and individual level. What drives us forward is growth in prosperity and wellbeing. To achieve this growth we're constantly making new connections. Synergy comes from collaboration. Together we're smarter, stronger and better able to react to change than on our own. This makes Brainport a very attractive environment which energizes both people and the economy. Together we achieve growth."*

This secondary data may be subject to a certain bias, as the Brainport region is promoted to an external environment. Still, the above could explain the possible findings presented in paragraph 4.1, that the majority of cases are subject to certain routines that drive them to cooperate. In the EveryTechnics case, the director denied the effectiveness of the Brainport thought, but did not deny the existence of it. Even though the director defies the idea of horizontal cooperation, and claims that it does not lead to success, he does not deny the existence of the cooperation routines in the region. A claim that the Brainport approach to cooperation does not lead to such success within organization that is obtained by organizations such as Apple, Samsung, PCBMACHINEINT., Phillips, does not deny the presence of the approach:

#R9, CEO, EveryTechnics: *“L: De Brainport region is characterized by the idea that organizations cooperating achieve benefits that they would not achieve normally. What is your perspective on this?
H: I can't think of any examples where cooperation has gotten to such success as organizations that vertically integrate. I do know the success of PCBMACHINEINT., who develop whole machines. They are vertically integrated. Phillips, apply, vertical integration. That doesn't mean that outsourcing is an option. Samsung, also vertical integration. Such cooperative successes, I can't think of any. People cooperating creates for jealousy, who's making the most profit etc. Cooperating is very difficult. Most organizations can not cooperate because multiple CEO's collide.*

The CEO promotes vertical integration over horizontal integration. Most organizations in the Brainport region do not have the capacity to vertically integrate various specialism of product development. The Brainport thought may therefore be an instrument to accomplish such developments horizontally instead of vertically.

The assumption that the Brainport thought is a unique strength that can be dedicated to the region is denied in the ElectronicPCBs case. A ElectronicPCBs director argues that the willingness to cooperate as is in the Brainport region, is just as much present in another region in the Netherlands. This argument originated in the context of a cultural related question:

#R9, Director, ElectronicPCBs: *“H: Yes, in the Netherlands cultural differences can also be encountered.
L: Are these differences per region?
H: In the Brainport region the willingness to cooperate is better, for which VDL set a nice example. It is understood that developments cannot be accomplished individually, and that organizations thus need help, that cooperation is crucial for the end-result. But in Twente this understanding is also present, however in Twente they cooperate with someone from Twente. It is hard to infiltrate there.”*

Even though the question originally addressed cultural differences, the response offered an interesting perspective regarding the Brainport region. It is suggested that other regions in the Netherlands, like Twente, may perceive the importance of cooperation equally. The response can be interpreted as such that the Brainport thought is not necessarily existent as a result of unique regional routines, but rather incorporates general open supply network routines. The Brainport thought may thus be an appellative for open supply network routines, rather than regional routines. This argumentation is tested in further analysis where such routines are assessed for all cases.

4.2.2 OPEN SUPPLY NETWORK ROUTINES

The BDSU case is the only case that could directly be assessed with the Brainport thought. The remainder of cases require more indirect assessment using the research's data. In this assessment open supply network routines are used to determine the presence of the Brainport thought per case. For both types of routines, open innovation and flexibility, the BDSU case was assessed highest. This supports that the Brainport thought resembles open supply network routines. Consequently, the BDSU case can be used as reflection case for the remainder of cases in assessment.

4.2.2.1 OPEN INNOVATION

As the Brainport thought allegedly incorporates routines that stimulate open innovation, the cases are assessed on their open innovation characteristics. These could mostly be determined from the data analysis of their willingness to cooperate degree and types that were discussed in paragraph 4.1.

TABLE 5: OPEN INNOVATION CHARACTERISTICS

Cases	BDS U	Opticon	PCBprint x	Plasticproce s	ElectronicPCB s	EveryTechnic s
Characteristics of open innovation cooperation						
Use of both external and internal R&D/Knowledge/Expertise	Yes	Yes, but mostly internal	Yes	No, Plasticprocess provides external	Yes	Yes, but mostly internal
Focus on business model over first to market innovation	Yes	Yes	Yes	Yes	Yes	Yes
Focus on cooperative research rather than who originated it	Yes	No	Yes	inapplicable	Yes	No
Establishment of open innovation activities	Very	Moderate	Very	Moderate	Very	No

Table 5 illustrates that all cases apart from the control case practice routines that allow for open innovation. It must be noted that open innovation establishments that imply the presence of the Brainport thought among these cases are not generalizable towards the whole region due to a lack of external validity.

A remarkable result emerges; the cases that were assessed with highest willingness to cooperate degree (Table 4, paragraph 4.1), are assessed highest on open innovation characteristics in parallel. Lower degrees are assessed with less open innovation characteristics. As data on the willingness to cooperate indicated earlier, the lower intensity on the willingness to cooperate and now on open innovative characteristics is not necessarily impute to an organizations willingness to cooperate. Other conditions such as the cooperation capacity of the organization may limit an organization in their possibilities towards cooperation and open innovation.

4.2.2.2 FLEXIBILITY

Suppliers' and clients' flexibility in cooperation is regarded as a second routine of open supply networks in this research. Typical examples of flexibility in cooperation that were found among the cases regard adoptive behavior towards aspects such as purchasing systems, deadlines and reporting. Another important aspect is the unpredictability of projects for which flexible time management is required.

4.2.2.2.1 Per case analysis

The quote to indicate the flexibility in the BDSU case has already been used to illustrate a possible presence of the Brainport thought in paragraph 4.2. In this quote, BDSU indicates that it is flexible towards other organizations. No follow-up question followed to specify what aspects BDSU is flexible on. Luckily, another quote from the case can be used to illustrate aspects examples on which BDSU is flexible. Both quotes are used to illustrate BDSU's flexibility:

#R1, Operative Director, BDSU:

"L: Is BDSU an organization that is willing to adopt towards cooperation?"

J: We adopt a lot. Towards our clients, because we have to deliver to them. But also to our suppliers, so that we can cooperate to our best with them. We are very flexibly. If we perceive it best to adopt per organization, then we will. If you remain a little bit stubborn you can still trust each other, but if you are really stubborn than you will be done swiftly. An open mind is needed that includes adoptive behavior. The Brainport thought is based on collective cooperation, innovation, open innovation. That is how to achieve something. If such core values lack, it won't happen.L: What is it that you generally expect from other organizations? Do you cooperate for knowledge, materials, something else?"

J: That is diverse. What you just mentioned, it depends on what our client needs and based on that we adjust or knowledge and capabilities. Machinery as well, production technologies, we adopt the long mile. We will just see which materials are needed, which machines, which new production technologies. For example 3D printing, we have our own fabric that we share with MTS and van der Valk to test that new production technology. We have a lot of knowledge and capabilities, and we try to keep this up to date through our environment and through learning."

As the initiator and coordinator of cooperation in the specific project that is discussed in this case, BDSU could easily let smaller suppliers that join the project adopt. Instead, when beneficial, BDSU adopts to the smaller organizations. This may be explained by the capacity of BDSU to invest in multiple technology development, and their willingness to successfully coordinate such projects. The quote also indicates that for other projects than the project originally selected in this research, clients are the initiators. The ElectronicPCBs case, another initiator of development, illustrates their flexibility through a best practice on flexible time management in interdependent cooperation:

#R9, Director, ElectronicPCBs: *"L: We have discussed the willingness to cooperate. Is the way of operating in cooperation different from normal routines internally?"*

A: I find that hard to judge. You mean within the other organization?"

L: No, in your cooperation. How you cooperate."

A: That does not matter too much. Well, actually, I do cooperate with some organizations of whom I like that their mindset is similar as ours in cooperation. Yes, I do like that. Actually it is very simply, we are very adoptive. We are very flexible. We cooperate with an organization that assembles PCB's as well. They deliver something to us, we deliver something to them for development. Sometimes they call, and need the PCB's earlier, and sometimes I call them and tell them that I need my components earlier. In such situations it is essential that both organizations are flexible, if only one is flexible it won't work. It has to be mutual."

L: It requires flexibility from both sides?"

A: Yes, it is give and take. If I have to be flexible 10 times and the other is not, I feel disregarded."

This citation illustrates a typical example of an open relationship between suppliers, where flexibility is of importance. The suppliers do not only cooperate on the same project for a client but also deliver to one another for separate clients. In a network of suppliers, the interdependencies are both direct and

indirect. In a situation where a supplier of ElectronicPCBs does not deliver cables on-time, ElectronicPCBs is not able to deliver its part of a project with other suppliers for a larger client such as the large retailer. In a project where twelve organizations cooperate, such flexibility may be essential for the outcome of the cooperation. This indicates that for both BDSU and ElectronicPCBs, whom coordinate co-development, flexibility in cooperation is an essential characteristic.

From the Plasticproces and PCBprintx case, data regarding flexibility emerged from a manager/adjunct director point of view. It seems that managers take more caution in flexibility towards cooperations in these cases. In both cases, it is feared adoptions potentially lead to bad outcomes. According to the adjunct director of Plasticproces, and Custom project manager of PCBprintx:

#R5, Adjunct Director, Plasticproces: *“L: Is it required to be adoptive as an organization towards cooperation?”*

B: How do you mean?

L: Doesn't that signal willingness as an organization?

B: Hmmm, if it is important.. well, certain adjustments, every client has its demands so in some way we do adjust. However we can also be stubborn enough to say, is it possible? And if so, do we want to adjust? If something is outside of your standard structured than that is annoying. It enlarges the possibility of mistakes. When people are involved for example more mistakes are made than when computers are used. In such situations we engage in discussions first, regarding do we want to do this cooperatively? “

#R4, Custom project manager, PCBprintx: *“.... You have to coordinate the other from your expertise perspective in such a way that you will accomplish a product that is producible and testable.*

L: Does that require adoptions from both sides?

J: Yes from both sides. They determine the costs of the PCB, and how to produce it and test it. Our job is to advise them in co-development, and if they neglect all our advice, then we will perceive problems in development. We want to achieve a certain quality in development, and if clients do not want to comply we cannot co-develop. The PCB segment is a small word and if bad quality is delivered then the word spreads swiftly. We have a very good reputation and we want to keep it that way. So yes, we adopt when possible.”

It appears that some contexts do not allow for flexibility as the preservation of the core capabilities is too much of a risk to alter. Organizations that approach other suppliers, or are larger and more all round, may possess more capabilities that provide room for flexibility and error. For specialized organizations that are included and co-develop on a specific component, flexibility may be more of an issue than for organizations that coordinate projects, as they risk a loss of reputation.

Unfortunately, the attitude towards flexibility in cooperation of Opticon could not be discussed. The focus in this interview and the time limit did not allow for coverage off this aspect. Therefore, no clear assessment whether a Brainport thought is present could be made. In the remainder of the analysis Opticon will be included as its open innovation characteristics indicate that Opticon might be included in open supply network practices. In addition, adoption in cooperation was inapplicable in the EveryTechnics case as EveryTechnics diminishes cooperation towards innovation.

4.2.3 ASSESSMENT

Table 6 illustrates the final assessment of the Brainport thought per case. The early supplier involvement had already been analyzed in paragraph 4.1, and has been added to this table as it is a characteristic of organizations in supplier networks. It must be noted that the assessments may be subject to response biases in the interviews, and interpretative biases from the researcher. The Brainport thought is assessed relative to the Brainport thought that the cases could potentially have through a relative comparison of open supply network routines and the value creation of cases. For instance, how Plasticproces creates value does not allow for too much open supply network routines in cooperation, but still the organization applies such routines when possible. Consequently, it has been assessed that the Brainport thought is present in the Plasticproces case even though the assessments were only moderate.

TABLE 6: BRAINPORT THOUGHT ASSESSMENT PER CASE

Case	1: BDSU	2: Opticon	3: PCBprintx	4: Plasticproces	5: ElectronicPCBs	6: EveryTechnics
Establishment of open innovation activities	Very	Moderate	Very	Moderate	Very	No
Flexibility	Very	N.D.	Moderate, When possible	Moderate, When possible	Very	Not applicable
Early supplier/client involvement	Yes	Yes, client	Yes	Yes, client	Yes	No
Brainport thought: open supply network characteristics relative to business model	Yes	Could not fully be assessed. Two out of three routines imply that the Brainport thought is present to some degree.	Yes	Yes	Yes	No

For the cases in this research, the willingness to cooperate has been assessed on organizations' characteristics based on the type –and objective of cooperation. Specifically, the concept assesses the willingness to cooperate towards innovations with a specific partner. In turn, the Brainport thought concerns whether the cases apply open supply network routines in development strategy. When comparing the table above to willingness to cooperate degrees (table 4, 4.1.1), the concepts appear to be related. Logically, organizations that practice the Brainport thought are also willing to cooperate as open supply network routines imply cooperation. Organizations that do not practice the Brainport thought, are unlikely to cooperate towards innovations.

In the remainder of this data analysis partner assessment is discussed. Whereas the Brainport thought suggests an willingness to cooperate to be included in organizations' routines, further analysis suggests specifications for such willingness to cooperate with a specific partner.

4.3 CONFIDENCE AGAINST OPPORTUNISM

Analysis of the data towards the potential importance of opportunism indicates that the willingness to cooperate may be limited by opportunistic threats. All cases in this research, apart from the control case, perceived some sort of opportunistic risk. Typically, the cases feared that partners would abuse intellectual property and that partners would not comply to structural agreements, endangering the cooperation outcome. Mechanisms to building confidence against opportunism were deducted from the data. These mechanisms presume that organizations engage in projects with relatively unknown partners, with whom no trust relationship is present as of yet. In contrast, the cases indicated that for many cooperations a certain confidence level could already be assessed from the network prior a project. This finding is discussed primarily. Secondly, trust and control mechanisms that construct confidence are analyzed per case.

4.3.1 CONFIDENCE THROUGH THE NETWORK

In a network of organizations, perceptions of confidence or no confidence against opportunistic behavior in cooperation may already be present. Two network mechanisms emerged; prior experience and a third contact in the network.

4.3.1.1 PRIOR EXPERIENCE

Prior experience that creates for confidence against opportunistic behavior is illustrated using the Opticon case since Opticon values the 'known' factor the most. Opticon utilizes a network of suppliers with whom they have had positive cooperative experiences in their cooperative activities. This is illustrated through two quotes, of which one has been depicted earlier to illustrate Opticon's lack of willingness to cooperate with suppliers:

#R2, CTO, Opticon *"L: Returning to cooperation with suppliers, what attracts Opticon to cooperate with suppliers?"*

E: Trustworthiness. We have a client base which is very stable, most of our clients have been our clients for more than 5 years, and often 10/15 years. We built a trust relationship with these clients, they know what we can do. We require the same of our suppliers. So that means that we will need a similar relationship, so that we can accomplish what we want to accomplish on the longer term. "....

"...L: Does this mean that you cooperate with suppliers that you know, that you already have experience with?"

E: Yes. Also for our suppliers, we often have the same suppliers for years. Together we march towards the products of the future. That is a very important requisite. Of course, from time to time some suppliers drop out, it also depends on what you are developing. Screws, nails etc. that is different than the development of development of high-end subassemblies that have to be developed together. In those situations we cooperate with organizations we know.

L: And for a new supplier that has the potential to do so, is this hard to build up?

E: That is very difficult. That cannot be achieved in a short period of time. You have to get to know each other, each other's competences, and built a trust relationship on which can be continued. That is very important.

Opticon indicated that it only considers new suppliers over a period of time where trust is built. Usually, suppliers with whom prior experiences are positive are included in new co-development cooperations. Other cases did not indicate the importance of the network in creating confidence against opportunism as explicitly. This may have been due to non-measurement. The use of prior experience as suggested above is a rational thought.

4.3.1.2 THIRD CONTACT IN THE NETWORK

PCBprintx contemplates a third contact in the network to assess organizations' opportunistic behavior. PCBprintx uses prestigious contacts in the network as a benchmark for suppliers. According to the data, PCBMACHINEINT. is one of the most prestigious high-tech organizations in the region. PCBMACHINEINT. was mentioned 24 times throughout the cases in a positive sense, even though no specific questions that directed towards PCBMACHINEINT.'s were included. In this example, suppliers that deliver to PCBMACHINEINT. are perceived to be trustworthy organizations by PCBprintx. It must be noted that the following question was structured as suggestive, which may have led to a desirability bias of the respondent:

#R3, Director, PCBprintx: T: *"That happens. Sometimes the project fails in the middle, and a new partner has to be found.*
L: Can this be avoided by not engaging in cooperation in the first place?
T: Up front, yes. If there is no trust at the beginning of a project for a positive outcome, a project is not even started with.....""L: *With known organizations, this will probably happen less frequently? Towards those you are up to date of their current situation?*
T: Yes, then we know each other, and we know what their situation is. Or, an organization could be working for an organization such as PCBMACHINEINT.. If the organization works for them, due to which PCBMACHINEINT. knows them, that creates for trust. If the organization would have acted opportunistically, PCBMACHINEINT. would have dropped them earlier. Such aspects can also be discussed with the client. If the client know the potential partner and they do not fully trust them, we can take that in consideration in our assessment."

In the quote above, the remark of PCBprintx's director illustrates that a lack of trust prior the cooperation may affect a lack of confidence that the cooperation will succeed. Secondly, the contemplation of a third contact in a network is introduced. PCBMACHINEINT. is used as a benchmark, and the specific client in the project is specifically consulted on potential supplier partners. In other cases, the direct impact of the network on the avoiding of opportunism through third contacts could not be assessed as directly due to non-measurement, but it can be assumed that this is a natural form of assessment for more cases.

4.3.2 CONFIDENCE THROUGH CONSTRUCTIVE MECHANISMS

Often, the network does not provide full disclosure regarding confidence against opportunism. Two mechanisms, the control and trust mechanism, appear to construct confidence in cooperation when the network lacks. The cases are analyzed along these mechanisms to allocate for contrasts and to analyze if and how confidence against opportunism is existent or created for.

4.3.2.1 THE TRUST MECHANISM

The cases' data allowed for deduction of tools that built trust in early stages of a project, when organizations got to know each other. Consensus was deducted among the cases on one tool; investments. Furthermore, cases build trust through the creation of goodwill. Primarily, two cases are used to present different perspectives on investments.

4.3.2.1.1 Investments

The BDSU case illustrates how investments may signal dedication to an initiator of cooperation. In the project that they initiated towards a new service BDSU included a few other organizations. One of these organizations convinced BDSU through their dedication for the project. Investments largely signaled such dedication. This illustration represents the perspective on investments of organizations that include other organizations in this research:

#R1, Operative Director, BDSU: *“J: We had drawn requirements upfront.*

L: You evaluated potential partners using those requirements?

J: Yes, and during the process these requirements were completed, because we did not know everything up front. We completed the requirements with feedback from the market. Eventually we concluded that what we want to develop, does not exist as of yet. SoftwareTechx Technology delivered that feedback to us. Through a presentation they convinced us that it is nonexistent, but that they can develop what is needed. That is how the process went. We had a clear objective of the cooperation, and various organizations replied to that. SoftwareTechx provided the best response. They made a plan along with a timeline, on which we decided that SoftwareTechx is the best candidate. They were also more willing to invest through human resources, time and money. That was a really important condition. Another party also wanted to join but did not want to invest directly. That is no business case for us. Investments are required, and SoftwareTechx made those investments. That simplified the decision for us.

L: Through investments they signaled that they actually want to contribute?

J: Exactly. That was a positive indication for the future, because it will be a long project.

The remark regarding investments emerged out of the respondents' argumentation, which excludes response out of desirability bias. It is argued that without investments, the cooperation is not tangible, there is no business case. The investments made are the amount of risk that both organizations could lose would they behave opportunistically. The investments created confidence that the supplier is committed to the project. Comparison of cases' perspectives on investments signaled a distinction. For BDSU, a supplier that includes other suppliers, investments indicate dedication to a project. For Plasticproces, a supplier that is more often included by clients, investments are not associated with the creation of trust. Rather, investments are based on trust as opportunistic costs are feared for:

#R5, Adjunct Director, Plasticproces: *“... We are not investing in a machine for a client for a single order. If the client would assure us of a year of production, we could invest in a specialized machine.*

L: Is that the risks you take in cooperation?

B: Risk is always involved. If the client leaves after a year, and we just bought a new machine, we will have trouble to pay for the machine. I'm not saying it is impossible, because there are always other ways to pay for that machine. But certain decisions are made on the trust that is perceived between organizations, that cooperation will flow for a number of years. Sometimes it is possible to cover this using contracts, but other organizations base such contracts on performance. And others can only be trusted by their eyes. That differs. It is about wanting to invest in the relationship in a form of machines, tooling. And if we perceive the project to develop in something big we also start investing in human assets.”

The perspective from a typical smaller supplier is illustrated above. Whereas BDSU considers the dedication that suppliers demonstrate through investments, a smaller supplier such as Plasticproces considers the opportunistic risk and potential loss that an investment bears. Thus, the argument that investments generate trust cannot easily be generalized.

4.3.2.1.2 Goodwill

The data indicated that goodwill may also serve as trust mechanism. Goodwill can be created for through less financial dependent methods than investments. Making an effort to visit a partner in person appears to create for goodwill. Especially in foreign organizational contact, such goodwill may be of importance. The Plasticproces case clearly illustrated how such goodwill develops:

#R5, Adjunct Director, Plasticproces

“L: And what signals trust towards a new client?”

B: We experienced it last week during the holidays. We got into contact with a Swizz client through a fare. We had a visit where we provided a presentation. The client was interested and wanted to visit us here, in Kirkland. So I asked, when? Well it was in my holiday so I couldn't be there, but that was no problem as the director and other colleagues would be there. It was very nice to hear after my holiday that the client heard the same from the director and other colleges, as what I told him. That builds for trust for a client.

L: Did the visit that the client made, and that you made also signal trust?

B: Yes of course. That works both ways. If someone makes an effort to make a visit over such a long distance that creates for trust. That is someone that not only talks, but actually makes an effort.

ElectronicPCBs and Opticon also made notion of this approach towards partners that are separated by extensive geographic distances. A ElectronicPCB respondent mentioned that he travels to Amerika when cooperative problems arise, and the Opticon CTO argued that for a relatively large foreign customer base such visits are essential. It must be noted that the cases in this research have most of their cooperative activities within national boundaries, and that national visits are not that much of an effort. Only international travelling efforts seem to create for goodwill. In the PCBprintx and BDSU cases, such aspects of goodwill have not directly been discussed.

4.3.2.2 THE CONTROL MECHANISM

The control mechanism concerned efforts that organizations make to control other organizations' opportunistic behavior. It was found that cases set structural specifications in the form of NDA's, and that communication can also be an effective mechanism of control.

4.3.2.2.1 Structural specifications

The ElectronicPCBs, Plasticproces and PCBprintx and BDSU cases set control measures against opportunistic behavior. Structural specifications were mentioned most. Structural specifications are contractual agreements that set boundaries to what is allowed, agreed upon and expected in the cooperation. The most frequent used structural specification is the Non-disclosure-agreement (NDA). A NDA specifies that aspects that are shared or developed cannot be shared with other organizations. Both Plasticproces and ElectronicPCBs mentioned the use of NDA's. Plasticproces's illustration is most interesting and is therefore quoted. The adjunct-director mentions that NDA's are in use, but do not substitute for trust:

#R5, Adjunct Director, Plasticproces:

“L: And in general, in cooperation, how do you make sure

that communication is effective?”

B: By making sure that the right people are brought into contact. That means that we develop an NDA first, which preserves both our and their knowledge in the cooperation.

L: NDA, what does that mean?”

B: Non-disclosure agreement. Secrecy is a core value in cooperation, to our customers but also for us. We do not want our knowledge to be shared with competitors. That is not how it functions. We want to invest but we want to get something in return. Eventually we are both cooperating to get paid.

L: Even though you have an NDA, is trust still included?

B: Yes. Trust is always essential. Every agreement without trust is doomed to fail.

L: That was my next question actually. How important is trust for you in cooperation?

B: It is essential. Let me put it this way, when you compare an NDA and trust, I would say that without an NDA but with the presence of trust I would engage in cooperation. However, with an NDA but no trust I would not. A NDA is not the basis for cooperation.

The adjunct director either diverted from the original question, or interprets NDA's as an effective way of communication. Nonetheless, the suggestion is made that NDAs may control for opportunistic behavior, but that the importance of trust remains intact. In the ElectronicPCBs case NDAs also served as an additional control measure rather than a tool to build cooperation on. In addition to the remarks in Plasticproces's illustration, the ElectronicPCBs case added that NDA's indicate that an organization is willing to share sensitive information. Through this argument NDA's also create for trust, as such risk taking is concerned with the trust mechanism.

4.3.2.2.2 Effective communication

In the PCBprintx, ElectronicPCBs and BDSU cases, effective communication is a control measure. To illustrate, the PCBprintx director mentioned that a capable project leader who assures effective communication towards the achievement of milestones controls their projects:

#R3, Director, PCBprintx: *"L: Ok. And how does communication in such a cooperation elapse? Is that structured or loose?"*

T: It should be structured and tight, but through the modern way of communicating this is often not the case. A message is sent easily, through e-mail. Often too soon, due to which messages are sent that shouldn't be sent. A capable project leader is needed that manages such communications tightly.

L: What can you do, to allow for more effective communication between organizations?

T: A capable project leader. A project leader who controls everything, makes sure all deadlines are met. That is most important. The project leader should make clear when what components should be delivered. The prototype has to be done by that date, so we need the materials at that time, so we have to order now if we want to be ready in 3 months. You need a dedicated person for that. Luckily, we have one in our service. That project leader follows the steps, makes a planning, and eventually delivers before the deadline.

Through communication, opportunistic behavior of not complying to agreements is controlled for. For BDSU, a similar approach could be conducted. In this case, one individual made sure that all organizations are present at certain meetings where progress is presented and reflected on in presentation form. In the ElectronicPCBs case, one of the directors controls projects through his own communicative efforts:

#R8, Director, ElectronicPCBs: *"L: Do you have tools to control the other, to control the risk in cooperation?"*

A: Yes. I do so by maintaining short lines. I control every project daily. I try to contact the developers daily in order to monitor whether they are on the right track. Developers are tended to keep focusing on paths that are not obtainable. If I realize that the current path is not the right one, and I manage to force the developer to approach another path, I win. This way I can bring him back to the right path, and the developer can focus on the goal that we agreed to cooperate on.

In this case, the director depicts himself as the one executing effective communication towards control.

In assessment of the control measures that cases use, effective communications seem to control for opportunistic risk of not complying to cooperative agreements. In turn, NDAs seem to control for opportunistic risk of intellectual property abuse.

A remarkable finding regarding the control mechanism emerged in the Opticon case. The Opticon CTO did not make note of an effort to control for opportunistic behavior. For an organization that most explicitly fears opportunistic behavior, it was expected that control mechanisms would be in place. In contrast, Opticon does not seem to perceive control actions as effective towards opportunism:

#R2, CTO, Opticon *L: That an organization would take advantage of what is developed to own interests, act opportunistically, is a risk. Do you have certain control actions to assess such risk?*

E: No, that is very difficult.

L: No actions prior a cooperation?

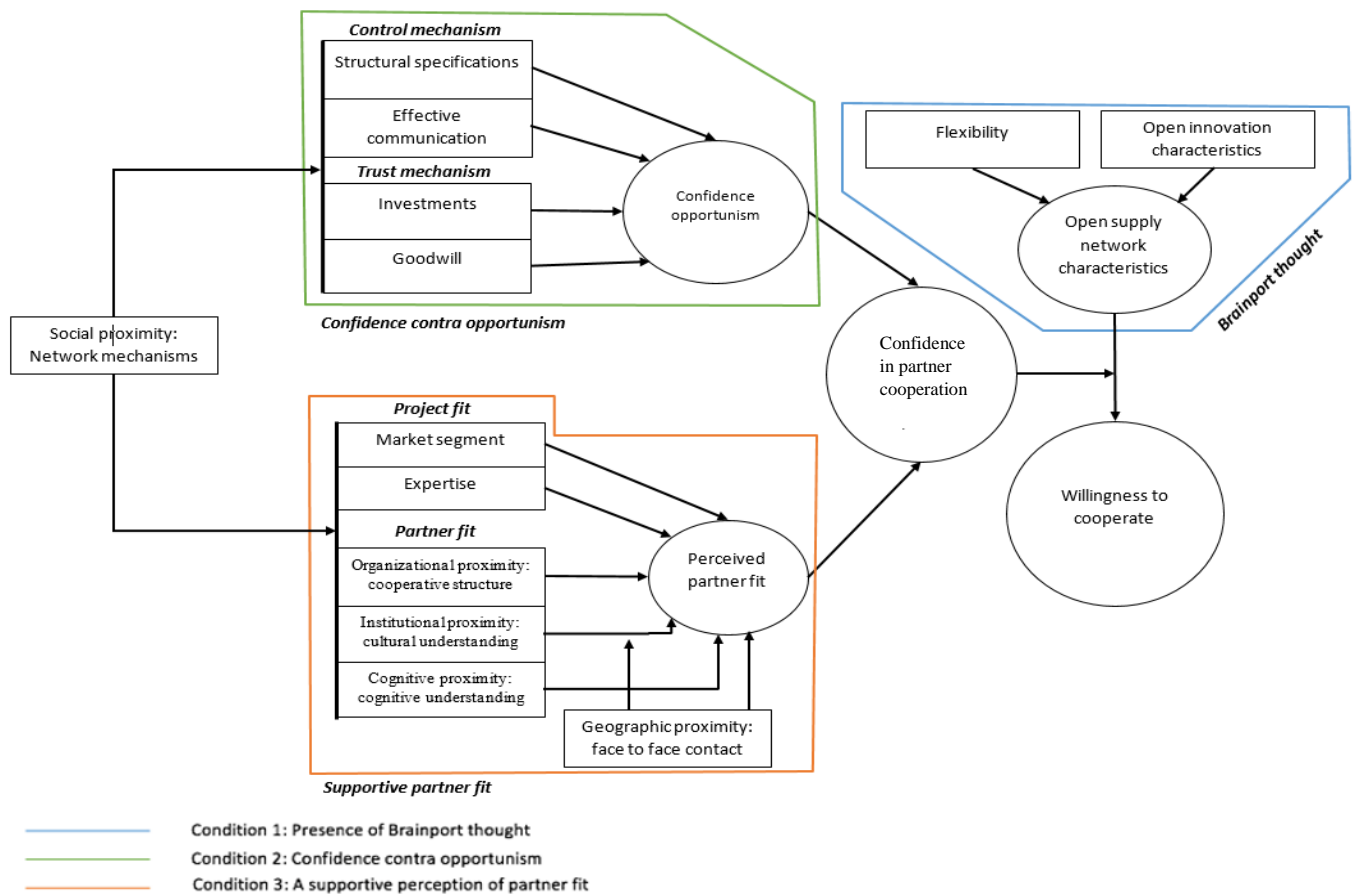
E: Of course, you can make agreements in the sense of, we are neighbors and you are doing something with lasers and I develop lenses, maybe it would be a good idea to see how we could cooperate. But in this context I am potentially claiming their market share, and they potentially claim mine. Instead of competing with each other, it would be better to discuss: does it make sense that we cooperate or should we just remain competitors? I think it is really attractive to evolve to a trust level on which it can openly be assessed whether both organizations can profit from cooperation. How do we bring a better proposition to both our clients? By doing so, a lot of trust barriers are already overcome.

The quote above illustrates that Opticon does try to overcome opportunism. In doing so, Opticon disregards the control mechanism and rather engages in conversation in which it literally discusses the overcoming of opportunism. For Opticon, not cooperating appears to be a measure to avoid potential opportunistic behavior.

The control case has not been discussed as of yet in this paragraph. For EveryTechnics, outsource partners that act opportunistic are cut out of business. Specific control mechanisms were not in place.

Case	1: BDSU	2: Opticon	3: PCBprintx	4: Plasticproces	5: ElectronicPCBs
Trust mechanisms	Yes, Suppliers that invest are perceived as dedicated.	Yes, Cooperating with 'known' suppliers, Goodwill through an effort, Discussing opportunistic behavior literally	Yes Social control through third contact	Yes, Goodwill through an effort Investment in certain client relationships	Yes, Suppliers that invest are perceived as dedicated, Goodwill through travelling
Control mechanisms	Yes, Effective communication	None	Yes, Effective communication	Yes, NDAs, Effective communication	Yes, NDAs, Effective communication

ANALYSIS RESULT: A MODEL TOWARDS WILLINGNESS TO COOPERATE IN OPEN SUPPLY NETWORKS



4.4 A SUPPORTIVE PARTNER FIT

The previous paragraph suggests that expectation of opportunistic behaviour is one aspect on which organizations decide whether to cooperate with a specific organization or not. In another analysis, the importance of a perception of a supportive partner fit in cooperation towards innovation emerged. Data indicated that all cases perceive a fit of a partner towards innovation in some way. The cases differed on the aspects of a partner that they deemed as important. For some cases, a supportive partner fit was mainly perceived as a fit towards a specific project. The fit of an organization's specific market segment and expertise towards a project has been defined as a 'project fit'. Others also included a fit based on partner specific individual and organizational characteristics. Cultural -and cognitive understandings, and an organizational fit form a specific 'partner fit'. For both the project – and partner fit organizations seem to evaluate potential partners. Primarily, the network is discussed as such an evaluation tool.

4.4.1 PARTNER ASSESSMENT THROUGH THE NETWORK

The data indicated that the cases assess both a project and a partner fit through the network. In this data analysis, the effect of the network on some cases their expectation of organizations' opportunistic behavior has already been illustrated in paragraph 4.3.1. The Opticon case made notion of the use of past experiences with organizations whilst the PCBprintx case noted the use of third contacts in the

network to determine potential opportunistic behavior. For these two mechanisms, more support has been found from the cases. The evaluative object that is subject to the network now concerns a potential partner's characteristics.

4.4.1.1 PRIOR EXPERIENCE

Support was found from the Opticon, ElectronicPCBs, PCBprintx, EveryTechnics and Plasticproces cases that a project -and/or partner fit may already have been assessed prior first contact towards new cooperations. As network mechanisms have already been discussed in an earlier paragraph, one case and illustration are used per mechanism to illustrate the applicability in a new context:

#R9, Director, ElectronicPCBs: *"...For us it is important whether another organization has the specific knowledge and expertise that we need towards the project."*

L: How do you assess that?

H: We know the developers in our network. Often we have already collaborated with them in other projects. We know some organizations that are specialized in wifi, power supply etc. We look for a developer that is specialized in a certain segment and include that expertise. That is the construction of the network. You could also cooperate with larger firms that have such expertise, but in such context the larger firms take over coordinative activities.

ElectronicPCBs indicates that their network includes developers with whom they have had experience. Consequently, they easily identify specific expertise of such developing organizations. The case also indicates that new suppliers cannot fulfill such a role in development.

4.4.1.2 THIRD CONTACT IN THE NETWORK

From the PCBprintx case, both the experience and the third contact approach are illustrated:

#R3, Director, PCBprintx: *"L: And how do you determine whether organizations can comply to the expectations, that they can deliver what you need?"*

T: You mean what our client needs. That is a matter of keeping track of organizations that are located inside your network. Knowing what they have done, what we have done together and what they are doing currently. Was it a good or bad experience? That is not something that you develop over a single night. We got a few people here who assess such knowledge, and engage in conversations and go through evaluation phases. That is how we decide who we approach and who we neglect. Subsequently PCBprintx offers the cooperation with a developer to the client, or the developer organization approaches us and introduces us to their client. The whole process goes both ways.

PCBprintx illustrates how organizations actively use the network to find suitable partners for specific projects. Among the cases, consensus is particularly conducted regarding past experiences in the network. Positive experience in cooperation towards innovation logically seem to form a base for the ignition of new projects. Negative experiences demotivate organizations to start a new project with the specific organization. Also, the PCBprintx director indicates that the 'keeping track' of organizations is not just a uniqueness of his organization, but that they are approached in a similar way by other organizations. To illustrate, Plasticproces provides such an example in which they are approached through the network:

#R5, Adjunct Director, Plasticproces: *"L: Does it occur that you obtain information through your network regarding the other organization?"*

B: Yes of course. The network is very important. Often, we are approached through the network. Someone has a problem and does not know how to solve it, through a recommendation they end up at our doorstep. That instantly creates a connection.

L: And subsequently, does a project emerge?

B: No no no. Requirements might be involved that we are not comfortable with. This does not happen often, but sometimes intensive co-development is really needed to come to the desired result. But at least the connection has already been provided through the network."

The remark of the PCBprintx director and the quote above illustrate that proximity in the network may not only help in assessing potential partners, but also in being assessed as a potential partner.

Furthermore, the adjunct director of Plasticproces indicates that a connection through the network not necessarily results in a project, but provides an opportunity at the least.

4.4.2 PARTNER ASSESSMENT THROUGH CONSTRUCTIVE FITS

In contexts where the network cannot fully assess a project –and/or a partner fit the cases construct such fits through characteristics they weigh as important. In the remainder of this paragraph, case analysis assesses what is included in project -and partner fit assessment and what not.

4.4.2.1 PROJECT FIT

Cases indicated that the specificity of high-tech development projects set specific requirements to which a potential partner should comply. This is typified as the project fit. An organization's market segment and expertise emerged as characteristics that are subject to such requirements. The cases' data is used to illustrate that the market segment and expertise of an organization are distinct.

4.4.2.1.1 Market segment

The high-tech industry contains countless specialized segments. For any specific project, the choice for an organization in one segment, rather than in another, may significantly influence the cooperation outcome according to the data. For instance, PCBprintx and ElectronicPCBs are producers and (co) developers of printed circuit boards (PCB's). Logically, they both operate in the PCB segment. However, ElectronicPCBs is a producer for the consumer segment, whereas PCBprintx is specialized in the industrial segment. Even though both organizations possess expertise regarding PCB's, the large retailer should not have approached PCBprintx for the project they approached PCBprintx for. This argument indicates that organizations may possess expertise to produce something, but might not operate in the specific specialized segment. This argument is illustrated from PCBprintx' and ElectronicPCBs' perspective in their assessment of a partner:

#R3, Director, PCBprintx “ *L: Ok. So they need you for production. But why do you chose a specific developer and not another?*

T: You cannot cooperate with the whole world, choices have to be made.. So we chose what fits to our client portfolio, what is the client looking for? If we have a medical organization as client that needs a medical development, we choose an organization that has its disciplines and competences to achieve that. Also medical certifications, the right co-developers. If you approach such an organization in need of a power supplier, that is not a good fit. They are capable to develop it, but they will start from scratch. Another organization would in turn be specialized on this.

In addition:

#R8, Director, ElectronicPCBs “L: Ok. Let’s return to the network, to the organizations that you know. If the experience has been good, is it a benefit to cooperate with such an organization rather than with another?
A: Yes of course. But that must be under the condition that that organization has the expertise I need in the new context. The most important thing is the expertise. I can be very content with an organization that delivered a Wi-Fi solution, but if the next assignment concerns a power supply solution I should not approach them. When I would ask them to deliver a power supply, they would answer: ofcourse we can make that, no problem. But in such a context I would rather switch to an organization that is specialized in power supply. The expertise is most important.

Neither ElectronicPCBs or PCBprintx would ask an organization that is not specialized in power supply to develop a power supplier. Not because they lack the expertise to develop power supply, but rather because they are not segmentally specialized towards it. In the quote above ElectronicPCBs illustrated that organizations that develop Wi-Fi solutions may have the expertise to develop power supply, but lack specialism. An organization that is specialized in power supply is perceived as more fit for the specific project.

A second example to illustrate the difference between market segment and expertise is deducted from the Plasticproces case. The project fit that Plasticproces can offer is dependent of productive requirements. Plasticproces specializes in low batch, high complexity production. An organization demanding mass production of high engineering plastic should not approach Plasticproces as potential partner:

#R5, Adjunct Director, Plasticproces: “L: And how do you determine the presence of a fit? How do you determine whether an organization can deliver?
B: Well, it is concerned whether we can deliver, that depends on factors such as: are we producing similar amounts, is the product challenging or too simple? Both organizations should perceive a challenge, and it should be possible to produce on expected costs. When does the client want to receive to whole produced package? If it has to be produced every one or two weeks, we apologize but that is not how we produce. We are active in the low volume, high complexity. That is the characteristic of organization with whom we cooperate best.

Once again, Plasticproces does possess the required expertise, but the production criteria do not match their segment of specialism. For mass production Plasticproces would therefore not be a reliable partner.

It must be noted that in the Opticon and BDSU cases, a distinction of market segment and expertise was not discussed and could therefore not be used to support or contradict the other cases’ consensus.

4.4.2.1.2 Expertise

Cases differ to the degree that expertise is weighed into a supportive partner fit. Human and physical specific assets appear to form complementary expertise towards projects. The degree to which cases value expertise of importance is assessed per case.

The data indicated that BDSU and ElectronicPCBs most substantially weigh an organizations’ expertise. In their role as coordinator of co-development they are required to include multiple partners with various types of expertise in order to achieve a desired outcome. The importance of expertise in such projects is most clearly described in the ElectronicPCBs case, by one of its directors:

#R8, Director, ElectronicPCBs: *"L: Ok. That is very interesting so let's continue on that. Because, how do you determine which organizations you include in the the large retailer project, what aspects are of importance?"*

A: What is most importance to us is the expertise area on which they are active. In this project, we had the requirement of the client, that the product functions through Wi-Fi and apps. For this project we looked for a developer specialized on Wi-Fi, and an app developer that has an expertise in cloud forming and a connection to the large retailer. We also started a new project for a large bank where we have to take the requirements of the bank into mind. We need a fit with a specific developer that can handle the hardware of the bank. That is a very specific search, using requirements. For design we look for bureaus that best fit such an organization. For the large retailer, high-end products, we need a special type of design. In this case we co-developed with GBO. If the product would be more industrial, we would include another designer. We include different suppliers per project based on their expertise.

The quote above demonstrates the specificity of needed expertise which may differ for each project. The requirements of the client determines what type of expertise is complementary. In an earlier quote it had been illustrated that BDSU coordinated co-development in a project where requirements were not as clear as there was no specific client, and most functionalities of the smart logistics service had not been developed before. In this project, the expertise that was needed only became clear during the tender.

In cases where the willingness to cooperate degree concerned co-development, rather than coordination of co-development (Table 4, paragraph 4.1), other communalities were deducted. For the Plasticproces and PCBprintx case complementary expertise concerns specific knowledge. Both PCBprintx and Plasticproces offer specific knowledge regarding the producibility of relatively PCB's and engineering plastic. In return, PCBprintx and Plasticproces require developers' knowledge regarding the design of the products. In this sense, the co-developers look for a partner with complementary knowledge, since the development process of design and producibility would take either organization too long. The co-development process is more essential for PCBprintx than for Plasticproces. PCBprintx co-develops with suppliers whom cooperatively develop for a client that placed an order. Plasticproces typically co-develops with clients to improve or alter the order that is placed. A quote to illustrate the importance of knowledge as expertise base for these cases is deducted from the PCBprintx case:

#R3, Director, PCBprintx: *"L: Ok. And.. do you cooperate towards knowledge, machines, production, logistics or something else?"*

T: Purely on knowledge. The knowledge exchange, making use of the knowledge we have here. Both ways.

L: Do you consequently achieve outcomes that you could not have achieved yourselves in such a period?"

T: Definitely. That would take too long. If we would develop all of that ourselves we would run behind drastically in terms of years, 5 years at least. Another organization, an developing organization, is specialized on such development and can instantly start developing. And the other organization, in this case ours, is specialized in production and test tooling. A developer would neither develop such expertise themselves. We provide that in our cooperations. Production and production testing is another form of knowledge, which we possess.

L: So your expertise bases differ?"

T: Yes, they are complementary. It's not that we have similar knowledge bases. But of course there are overlaps.

What was described above, is reflected in the quote; PCBprintx needs to co-develop, as the all-inclusive development process of PCB's would take them too long.

Opticon does not regard expertise as a determinant of a supportive partner fit. Rather, Opticon regards trustability as more superior, as had already been conducted in paragraph 4.3, whereas expertise can be compensated for:

#R2, CTO, Opticon:

"L: Returning to cooperation with suppliers, what attracts Opticon to cooperate with suppliers?"

E: Trustworthiness. We have a client base which is very stable, most of our clients have been our clients for more than 5 years, and often 10/15 years. We built a trust relationship with these clients, they know what we can do. We require the same of our suppliers. So that means that we will need a similar relationship, so that we can accomplish what we want to accomplish on the longer term.

L: And specific competences that organization can offer?"

E: Trust is more important. Competences and quality are welcome, but those can be developed. If there is a single doubt regarding trustworthiness of the organization, cooperation is a no-go.

The Opticon CTO indicates that it would rather cooperate with an organization that is trustworthy and lacks expertise, than an organization that possesses expertise but where uncertainty towards opportunistic behavior is perceived. Unfortunately, no successive questions on the expertise topic followed as the focus remained on the trust perspective.

TABLE 8: PROJECT FIT ASSESSMENT PER CASE

Cases Focus	BDSU	Opticon	PCBprintx	Plasticproces	ElectronicPCB	EveryTechnics
Inclusion of project fit in supportive partner fit?	Yes, Complementary expertise towards project	Yes, Past experiences (4.4.1)	Yes, Complementary knowledge, Third contact in network (4.4.1)	Yes, Complementary knowledge, Approached through third contact in network (4.4.1)	Yes, Complementary expertise, Past experiences (4.4.1)	Yes, But concerns outsourcing, Expertise to produce Past experience (4.4.1)

4.4.2.2 PARTNER FIT

Through the partner fit, cases seem to include the effect of social dynamics in a supportive partner fit. Cognitive and cultural understandings may create for a fit between partners on individual levels. In contexts where organizations cooperate intensively, individual fits may influence the outcome of development positively as such fits smoothen the cooperation. Whether cases valued proximity on culture as important was expressed through the concern of how people get along based on personality. For proximity on cognitive levels it was expressed through a concern of how people get along based on specific understandings or misunderstandings. Some cases more actively incorporated such individual fits towards a supportive partner fit than others.

Furthermore, valuation of an organizational fit was expressed through preferences for certain organizational structures. Cases varied in argumentations to cooperate with an organization with a certain organizational structure.

4.4.2.2.1 Cultural fit

The cases do not indisputably include a cultural fit, or cultural proximity, in a perception of partner fit. Two argumentations emerged that contradict one another. Most cases comply to an argumentation that; cultural fits improve social dynamics and create desirable atmosphere which may improve development, but that such effects are not essential for the cooperation at the same time. These cases argue that the cooperation should be of a professional nature at all times. Cultural fits are welcome, but not requisite. Consequently, these cases do not often include cultural fits in the perception of a partner as a decisive factor. In the second argumentation, one case does include cultural proximity as a decisive factor for a partner fit.

Per case analysis

BDSU and ElectronicPCBs most clearly diminish cultural understandings in their perception of a partner fit. A quote is deducted from both cases:

#R1, Operative Director, BDSU: *“L: Do you yet know whether SoftwareTechx has a similar organizational culture as BDSU?”*

J: It is too early to assess that. We think cultures are similar, but we will have to cooperate to assess whether this is the case....

...L: Is it doable to cooperate with an organization that strongly differs on culture?

J: Yes that is doable. It will be less cozy in cooperation, more formal. But cooperation is possible. As I said before, it is about hard work. And apart from that, we always adopt swiftly to other organizations.”

And for ElectronicPCBs:

#R9, Director, ElectronicPCBs: *“L: ... Does another organizations culture play a role in the assessment of a partner?”*

H: Well, no, let's see, we would not avoid a cooperation if we do not get along too well. Then we would just put a different individual there. Towards some cooperations I am a better fit, towards others godfried and towards others my brother. In such a context the good-cop bad-cop scenario is played, one person brings the good news and the other the bad news. That is necessary, it is not possible to get along with all clients a suppliers.

L: Does the way you operate consequently differ from normal practice, do you have to adopt?

H: Yes, but that is normal. Organizations are al ways organized differently, or function differently. That is no problem. One must be commercial enough to adopt.

L: To the people as well?

H: Yes, definitely to the people. Ultimately we have to be able to get along with everyone.”

Both BDSU and ElectronicPCBs do acknowledge that cultural similarities are beneficial, but do not let such understandings impact a preference for a partner. Curiously, both BDSU and ElectronicPCBs mention that they adopt to other organizations' individuals. Also, BDSU and ElectronicPCBs have been assessed as highly flexible organizations towards partners in cooperation earlier (paragraph 4.2.3). A explanation for BDSU and ElectronicPCBs neglecting cultural differences between organizations might be that both organizations have the adoptive ability to adjust to any culture rather than consider it beforehand. In this sense, the organizations actually would include the importance of culture in cooperation, but do not consider it as a selection criterion beforehand.

In the case of Plasticproces, the respondents differ on the importance of culture towards a partner fit:

#R5, Adjunct Director, Plasticproces: *"L: Is it of importance that people can get along on a cultural level towards cooperation?"*

B: It is necessary that people can get along on a technical level. On a cultural level one assesses personal preference, it makes cooperating easier. It is easier when there are no language barriers, religion barriers or political barriers. But we do not speak about religion and politics. Such aspects are not of importance towards the component that we are producing. It may smoothen cooperation but it is not a requisite.

#R6, Director, Plasticproces: *L: Does organizations' cultures also influence a partner fit?*

M: Yes, I think it always has an influence. With some organizations it is easier to get along than others, the mentality may fit better than others. But, eventually I think that it is about individuals. Apart from what the organizational culture is, it is of importance that our technical buyers, engineers talk with our salesmen. If those individuals can get along, the development often has a lot of potential.

The director of Plasticproces (M), values a cultural fit between personnel as an accelerator of development, whilst the adjunct director (B) disregards the importance of it. The adjunct director quite literally interpreted a fit on cultural level as generalized international differences, such as language, extreme political differences and religious perspectives. The director of Plasticproces more specifically addressed the individual dynamics. In this research, the term 'cultural fit' more specifically assesses the directors (M) interpretation; how individuals get along based on personality. Further analysis concluded that the Plasticproces director neither selected for cultural fits prior cooperations.

The PCBprintx case is the only case that factors a cultural fit as a decisive factor in a perception of partner fit. This is expressed in the following quote:

#R3, Director, PCBprintx: *"In your cooperations personnel from various organization come together. Does an 'us' and 'them' culture easily emerge?"*

T: If the project runs smoothly and the cultures fit, a 'we' feeling easily emerges.

L: Is it problematic if this would not emerge?

T: Not necessarily. If the assignments are clear and people execute their assignments, it is possible. If people do not get along they should set this aside. The most important thing is that the product is produced. But it is favorable when a 'we' feeling is existent. To present the product as one unit.

L: Can culture be the decisive factor in partner assessment?

T: That is difficult to assess up front. Only once cooperation starts you will notice with whom individuals get along or not. Then you notice the capable and less capable individuals. So yes, it happens often that we accept a second project on the terms that certain individuals join the project. With these individuals we just know that our people perceive a fit, and that that project will succeed consequently. In that sense an organization is selected on its personnel that have to join the project.

L: So, the culture is regarded for cooperation up front?

L: Yes, certainly. But you cannot always assess it up front. We have also been cooperating with an organization, and concluded half way that this cooperation is not going to work. We will not engage in any more cooperations with that organization.

Initially, PCBprintx complied to the other cases' argumentation, that cultural fits may smoothen cooperation but are not requisite. Later on, the PCBprintx director mentions that PCBprintx does select partners with whom a cultural fit is present over others. Fairly, it is argued that cultural fits are difficult to incorporate upfront, especially when the organization is unknown. However, by making

use of past experience with organizations projects can be designed in such a manner that like-minded people are put together.

The cases agreed that cultural similarities may smoothen social dynamics in cooperations. The control case illustrates that the acknowledgement of such a benefit for cooperation is not self-evident within organizations:

#R9, CEO, EveryTechnics: *L: What do you concern with the largest magnitude in cooperation? A trust relationship, knowledge, location, decision making structure or something completely else?*

H: Performance. Whether they perform. Performance is linked to knowledge and structure.

L: So if they perform, the culture can be disregarded?

H: I do not care about that. Who performs, can deliver. When I get an employee, whether that employee is dutch, Polish, Turkish, they are all welcome. Neither do I only want Brabantse engineers.

The quote above illustrates that the consensus among cases that culture may influence outcomes, whether it is incorporated in a partner fit or not, is not that natural. Apparently not all organizations make similar assumptions.

Lastly, the Opticon case has not been discussed regarding a cultural fit. In the Opticon case, cultural fits were interpreted as certain horizontalness and openness of organizations. This research does not contradict that organizational structure may influence organizational culture, but the boundaries of this research do not allow for the assessment of such relationships.

Geographic proximity as accelerator of cultural fit

Cases uniformly agreed that geographical distance results in more face to face contact in this research. In the context of cultural proximities, the cases that acknowledged the potential benefits of culture agreed that regular face to face contact stimulates development of shared cultures. Since consensus is concerned, one quote is used to illustrate the finding:

#R1, Operative Director, BDSU: *L: And regarding culture, you mentioned that SoftwareTechxs' culture is not that clear yet. Would the settlement of SoftwareTechx nearby help in constructing a shared culture?*

J: I think it would. Not for me necessarily, but rather for my colleagues who are actually going to be cooperating. For them it would be easier to see each other regularly. That allows them to build something, to bond. That is just needed. We have various German clients and our engineers visit them like two times a year to bond. This way they can form an image regarding who the person is behind the telephone or computer, but this is not sufficient to bond really. In order to truly bond, regular face to face contact is needed.

Essentially, the cases agreed that more face to face contact seems to allow for bonding between individuals. A comparison with cooperations that pertain large geographical signifies that bonding and the creation of shared cultures is more problematic in such cooperations.

4.4.2.2.1 Cognitive fit

The cognitive fit, or cognitive proximity, concerns understandings that individuals perceive through communication on a certain cognitive level. In most cases, cognitive fits were rather assumed than

exceptional. In a research context where most respondents were engineers, understandings were assumed. Luckily variety in data emerged in few cases through which analysis was possible.

Per case analysis

For 5 out of 6 cases, the data indicated that engineers communicate smoothly using a similar sort of jargon which creates for understandings. Even though high-tech segments differ largely, the respondents indicated that ‘engineering jargon’ allows for understandings. Two short quotes are extracted to illustrate that organizations assume the presence of such jargon with individuals:

#R1, Operative Director, BDSU: *“L: When you regard partners with whom you could cooperate potentially, does it occur that it is easier to communicate with certain organizations than others?....*

.....L: OK. But that does not concern a specific jargon, that individuals do not understand each other due to various jargons?

J: No no that is not it. Engineers understand each other, the engineering language is common in this branche. We do not perceive any problems with that.”

#R5, Adjunct Director, Plasticproces:: *“L: That is a summary. Would you say that your employees comply on norms, values and believes as well?*

B: That is difficult. Look, a client from the same Brabant has the same background, but a client from Germany differs. I can’t expect of our personnel to know how Germans behave exactly. But, engineers speak the same language in 90% of cases. Engineers know what they need, what the goal is. And that is what connects people. We do not have to drink a beer together, but we work towards the same goal. Therefore engineers mostly get along just fine.

The Plasticproces case mentions that such understandings ‘connect’ engineers in general. This may support that cognitive fits not only allow engineers to communicate, but also positively influence the partner fit. Since assumptions are still concerned, more analysis is required to establish a relationship between cognitive fits and a partner fit.

The Opticon case contained a paragraph that allows for more in depth analysis regarding the relationship between cognitive understandings and partner fit:

#R2, CTO, Opticon: *“L: How do you organize for that, effective communication?*

E: You call it effective communication, I do not regard it as effectivity. It is an organic process. When do you get the idea, this was fun, I want to devote energy to this to let it develop? This often comes from persons. I think that contacts with organizations, if you dig for the core, ultimately are based on individuals. Persons that know each other, that understand each other on a certain level. It is really difficult to force this.

L: But up front, it must be hard to assess whether people can get along in such a manner.

E: Yes, yes. That is true. That is concerned with unpredictability. But rationally it is only logical that potential intersections emerge through the fact that individuals cooperate on similar products, individuals that understand each other on processes that are similar, systems that intersect and so on. In such situations sparkles between people emerge.”

The above illustrates that Opticon does assess partners on how cognitive understandings are formed on an individual level. The Opticon CTO argues that individuals that understand each other and work in similar environments are likely to get along. This is deemed desirable as individuals form the core of cooperation.

The data that most significantly supports the importance of a cognitive fit for a partner fit originated from the ElectronicPCBs case. The ElectronicPCBs case is the single case where cognitive understandings were not assumed but rather problematic. The ElectronicPCBs directors have a commercial background rather than an engineering one. Their cognitive bases are rooted in commercial jargon and perspectives instead of technical ones, like in the other cases. This provided valuable data on the importance of the jargon and understandings in this research's high-tech segments. Whereas previous illustrations have shown that the cases' engineers prefer to communicate using technical jargon, the ElectronicPCBs directors prefer to communicate with individuals with whom they can easily achieve more commercial understandings. In turn, misunderstandings emerge during communication with engineers and developers:

#R8, Director, ElectronicPCBs: *"L: Even though knowledge bases differ, do you understand what other organizations do or communicate?"*

A: *That is a very difficult subject that you just mentioned. The understanding is the most difficult thing in our branch. The hardest part is the translation and understanding of the requirements of the product to the requirements for the developers and the other way around.*

L: *Is that because you operate in different branches?*

A: *Yes. The developers have an whole other way of communicating. They are really focused on their work, that is hard to explain. It is really difficult, I am starting to understand it and our technical guy mostly involves in such conversations, but it is really difficult to explain something to a developer in basic language.*

L: *So they speak a different type of jargon?*

A: *Yes, they live in a remarkable world, and since I am not from the branch, I have a hard time understanding their world...." "....The communication is very hard, between engineers and commercial minded people.*

L: *OK. So for you, it is an advantage if someone that is commercial minded also speaks engineering jargon?*

A: *Yes, definitely. Because, we have to translate something. A client comes to ElectronicPCBs and says, I have this specific product, can you develop it? Then it is my job as the commercial minded person to translate it to the developer, the client wants this and that, and that. Sometimes this is really difficult, as I do not speak the language."*

When the interview was conducted, the director discussed engineers and developers as if it was necessary to approach them in a cautious way, to not cause any problems. The citation above illustrates that the ElectronicPCBs director finds it hard to connect with engineers and developers. The developers are described as if they speak a rare foreign language. The directors prefer to cooperate with engineers that also possess a certain commercial jargon, in order to form understandings. When reflected on cognitive understandings, this makes sense as their cognitive base is more commercially oriented than technically. This supports that the cases include individual cognitive understandings in the partner fit they assess.

Geographic proximity as potential accelerator of cognitive understanding

It was expected that the data would show that geographic proximity moderates the forming of cognitive understandings. Initially, cognitive understandings were expected to form on organizational level, to assess what organizations know. Cases responded that geographic proximity accelerates innovations as knowledge transfer smoothens and improves. However, during analysis it became clear

that cognitive understandings should rather be conducted on individual levels than organizational levels. On organizational level, cognitive understandings basically resemble a specific expertise of an organization. On an individual level, cognitive understandings assess the understandings of individuals and the consequent possibility to connect. The effect of geographic proximity on cognitive understandings as intended could not accurately be assessed from this data set as the data concerned the influence of geographic proximity on how it accelerates knowledge sharing on an organizational level. Even though it is likely that geographic proximity influences cognitive understandings like it influences cultural understandings, no actual support can be extracted from the data.

4.4.2.2.3 Organizational fit

The organizational fit, or cooperative fit, is an aspect that is more tangible to assess than individual understandings. It was found that all cases in this research are characterized by flat/horizontal organizational structures. Even EveryTechnics, counting 1100 FTE, is structured by few organizational layers and rather has a large sequence of autonomous engineering teams. The majority of cases agree that proximity of such structures favors the partner fit through favorable cooperative structures. The cases whom did, argued that organizations that have comparable organizational structures typically agree on the timely manner in which decisions should be made.

Per case analysis

BDSU, PCBprintx and ElectronicPCBs argued that comparable structures may benefit the cooperative structure. The BDSU case is used to illustrate benefits that are perceived from comparable structures:

#R1, Operative Director, BDSU: *“L: Is your department autonomous towards decisive power?”*

J: Yes. We are pretty autonomous. We rapport monthly but we are allowed to make decisions independently.

L: And at SoftwareTechx, how is that organized there?

J: That is a good question. I believe it is relatively the same. They have a few hundred employees as well. They have a general director, or two I believe. Below they have their departments that are located nationally, and that are autonomous. I think that is comparable to our operations.

L: Do you perceive that as an advantage, such comparability?

J: Yes, regarding decision making. If you have many hierarchical layers decision making is inevitably slow, as decisions have to cross many layers. You even have to wonder if the right people are included in the project group to make certain decisions. Currently, we are doing well. Like with LogisticTechX as well, CEOs and department directors are included in the project group so decisions can be made.

The illustration above illustrates how these cases perceive an organizational fit as favorable towards a partner fit. It is argued that project groups should be able to make decisions swiftly, which requires the involvement of individuals that have decisive power within their respective organizations. PCBprintx respondents add a limitation that such decisions have certain budget limits on which higher organizational layers should be contemplated. Also, a dislike towards cooperations with organizations that have hierarchical structures is expressed. In the ElectronicPCBs case, the directors mentioned that ElectronicPCBs actually ceased cooperating with larger hierarchical organizations. In their example,

ElectronicPCBs cooperated with Phillips where ElectronicPCBs developed a minor component for a larger product. On spur of a moment, Phillips decided to cancel the production leaving ElectronicPCBs with nothing. Consequently, ElectronicPCBs prefers to cooperate with small to medium –sized organizations with whom they can set their own course of development and production. Their experience and current preference is demonstrated in the following quote:

#R8, Director, ElectronicPCBs: *“L: During cooperation with other organizations, do you perceive it as an advantage if the organization has as similar organizational structure?”*

A: *It is not a must, but I do regard it as favorable. I prefer to cooperate with organizaitons that maintain short lines, that make swift decisions.*

L: *So how do you cooperate with a Phillips for example, which is known for its bureaucratic processes?*

A: *We do not cooperate with Phillips. We consciously stopped cooperating.*

L: *Because their structures differ?*

A: *Yes. Just like PCBMACHINEINT., we do not cooperate with PCBMACHINEINT. either. At certain points we had to decide whether we wanted to work for larger cooperations. We decided not to, as we were building a network of small to medium sized organizations that did not influence the way we work....””we had a period where we developed for Phillips. One moment to the next, they decided that the production of the particular product was cancelled, so we were removed from their supplier list. I did not want to build my organization toward such cooperations. At that moment we had plenty of projects with small to medium sized businesses. We decided that we would rather cooperate with such businesses towards products than for Phillips or other large organizations.”*

The citation above demonstrates that for ElectronicPCBs, organizational structures influence a partner fit significantly. Larger organizations with hierarchical structures are not considered for cooperation due to a mismatch on organizational fit in the partner fit. This complies to the coordinative role that ElectronicPCBs currently has in projects. With the inclusion of larger organizations, such a role may not be obtainable as such organizations typically coordinate smaller suppliers like ElectronicPCBs.

A peculiarity regarding the organizational fit occurred in the Plasticproces case. The adjunct-director perceived variety of organizational structures as favorable. The adjunct director argued that a variety of decision-making in cooperations due to various organizational structures benefits the organizations’ portfolio. Such variety assumedly ensures continuity of cash flow:

#R5, Adjunct director, Plasticproces: *“L: Ok. And in cooperation, is it of importance that organizational structures are comparable towards decision making?”*

B: *I hope not, otherwise we would have problems with certain organizations. If I regard structures of certain organizations such as PCBMACHINEINT., Talis or Phillips, these are very different from ours....” “...Do you have a preference for organizations where decisions are made more swiftly?”*

B: *No, I prefer the variety. The longer and swift decision making. Swift decision making is involved with the technical developments, with organizaitons that have to develop in a time to market fashion. For example, the telecommunication industry where developments have to be delivered every two or three years. The benefit of projects where decision making is not as swift, is that the products have a long life cycle. For such projects we can produce our components for 20 years. There are pros and contras.*

The adjunct director illustrates a benefit of cooperation with various organizational structures on an, which is an interesting view. Likely, the operational level for which the adjunct director is responsible made him interpret the question regarding decision making towards a client portfolio. This had not

been intended, but is a very rational thought. It is unlikely that this research's cases solely develop towards innovations in a time to market fashion. Consequently, their portfolio would also need certain 'cash cows' that finance more complex development projects. Plasticproces its director in turn complied to the argumentation that BDSU, PCBprintx and ElectronicPCBs provided. The director interpreted the question on the level of the cooperation like other directors/ CEO's in this research did.

Geographic proximity as potential accelerator of decision making

From the data, it could not directly be assessed how geographic proximity moderates cooperative structures towards decision making. The ElectronicPCBs and BDSU cases indicated that such proximity smoothens decision making in cooperation, whereas the Plasticproces case disregards this importance. This may be related to the coordinative role that ElectronicPCBs and BDSU maintain within cooperation, where decision making may significantly alter the course of the innovation. For Plasticproces, less importance on decision making is involved as the organizations often comply to decisions that were set up front. During the course of the innovation, decision making is less present. This data is substantial to create a suspicion towards a moderation effect, but the characteristics of the effect could not be deducted.

TABLE 9: PARTNER FIT ASSESSMENT PER CASE

Cases	BDSU	Opticon	PCBprintx	Plasticproces	ElectronicPCB	EveryTechnics
Cultural fit	No, Rather adopts to cultures	No, Interprets organizational structures as cultures	Yes, Actively assesses culture in cooperation forming	Yes, Acknowledges benefits, but does not actively assess	No, Rather adopts to cultures	No, Supplier should perform regardless of characteristics
Cognitive fit	Yes, Assumes an 'engineering' fit	Yes, Cognitive Understandings create for 'sparkles' between individuals	Yes, Assumes an 'engineering' fit	Yes, Assumes an 'engineering' fit	No, Finds it hard to connect with engineers	No, Supplier should perform regardless of characteristics
Organisational fit	Yes, Prefers autonomous project groups	Could not be assessed	Yes, Prefers autonomous project groups	Yes, Prefers autonomous project groups	Yes, Prefers autonomous project groups Made a notion of the favourability of various decision making trajects	No, Supplier should perform regardless of characteristics

4.5 OPEN SUPPLY NETWORKS: THE DANGER OF LOCK-IN

This research assesses the potential danger of networks that develop or have developed geographically, like the Brainport region. Cases indicated that most of their current network evolved around their geographic location. It is feared that the network's mechanisms as described in paragraph 4.3.1 and 4.4.1 form a restricting factor to cooperation. Organizations in a network may lock in to 'known' organizational relationships that are geographically nearby. Such an inside focus could cause for tunnel vision and the neglecting of outside opportunities. From the data, two cases their experience in the Brainport region network illustrate such a limitation of the network:

#R9, CEO, EveryTechnics: *"Does it matter whether organizations are located nearby, or are located in for example Noord-Holland or Zuid Holland?"*

H: Honestly, I dislike how the region gives itself a pat on the back. The outside world perceives this as negative. We really think we are the smartest region. Others do not take this in vain.

L: Is that why you want to operate outside of the network?

H: No, it is not that I dislike the region. I was born in this region so I have nothing against it. I just think that we receive too much attention and gratitude from the government. We have to be more humble, we are not as good as we think. Go visit China and ask, can you tell me about Eindhoven? No one will know. Or in America, we are not famous. If you ask about the Brainport region, I am sure not 1% knows it, whereas everyone knows Silicon valley. We have to maintain an outside view instead of looking at each other. That happens too much.

This remark emerged spontaneously, as a response towards an unrelated question. Even though the EveryTechnics director has been assessed to dislike open supply network practices, this remark should not easily be disregarded as subjective bias. Instead, an opinion of an organization that is not actively included in the open supply network may perceive the situation more objectively. A passage from the ElectronicPCBs case furthermore strengthens the suspicion that the Brainport region may be subject to certain lock-in behavior. The new directors of ElectronicPCBs joined the Brainport region relatively late. When they first entered the network they clearly did not feel as if the network was open to outsiders:

#R8, Director, ElectronicPCBs: *L: Does a network have anything to do with inter-organizational trust?*

A: Partly. Something else comes into play. Me myself, I come from Kempen. Kempen is the ground base of VDL. VDL originated in our village. The VDL is typified by strength through cooperation. It is an organization that truly implemented cooperation in their business model and still does so. The cooperation principles that developed in the Kempen, were grounded by VDL. The organizations cooperate in a specific way there. Being honest, I bought ElectronicPCBs in 2010 and I arrived in Best. I was like, let's approach my college organizations and see how we can cooperate, but nothing like that happened. Similarly here at the Eindhoven Airport. There are some organizations with whom we could cooperate, but for some reason this does not come off the ground. It is about the willingness to cooperate, the willingness to invest in cooperation, because it is all about investing. What you just mentioned, are you open towards new organizations in the network? Yes I am, but that also incorporates risk. That means that I am going to cooperate with a supplier that I do not know. That is a form of risk, is he going to deliver, does he comply to the agreements, does he deliver what I need. We remain open, as a new organization brings a new opportunity. However, in our case, it has taken a while before we were invited to cooperate.

Even though most cases clearly indicate to remain open to other organizations, a citation as portrayed above raises uncertainty regarding the openness of the network. This creates for speculation whether the cases answered with desirability bias when questioned about their openness to organizations

outside of the network. An alternative explanation might be that ElectronicPCBs was disregarded as potential partner as their director did not possess the engineering jargon, due to which no cognitive understandings could be developed. A second analysis on the openness of cases towards organizations outside of the network concluded that BDSU is the only case that provided an actual example of a cooperation with an organization outside of the direct network:

#R1, Operative Director, BDSU: *“L: Did you have prior connections to SoftwareTechx?”*

J: No, they are completely new. SoftwareTechx originated in the north of the country. They rarely operate in this region....”

“... And SoftwareTechx, was that an organization that had a good reputation in the network, did you know anything about that?”

J: No we had no clue. Through various conversations and presentations SoftwareTechx gave us a confident feeling. Eventually there were X other organizations, which we had to tell that they would never fulfill the role in the project.

L: Including organizations that you know? They dropped out versus an unknown organization?

J: Yes. We knew all of those organizations actually. SoftwareTechx was the only new organization.

L: So this organization was the best?

J: Yes. SoftwareTechx had the best fit. We were really convinced that they would be able to realize what is needed for the project.

Apart from BDSU, Plasticproces and ElectronicPCBs did imply openness outside of the network, but no specific or reliable examples were discussed. Such remarks could therefore not be validated like in the BDSU case. Opticon and PCBprintx respondents mentioned that they prefer to cooperate with known partners in development projects. The data in this research does not have the capacity or explaining power to conclude whether the Brainport network is open to organizations outside of the network or not as the quantity and reliability of cases does not allow for such conclusions. However, experiences that are described in the citations above do imply that the geographic determined network may not always be as open to organizations outside of the network as claimed. If this would be the case, a realistic project fit would only include cases that are located within the network.

TABLE 10: OPENNESS TOWARDS ORGANIZATIONS OUTSIDE OF THE NETWORK ASSESSMENT

	BDSU	Opticon	PCBprintx	Plasticproces	ElectronicPCB	EveryTechnics
Claim of attitude towards suppliers outside of the network	Open, Example provided	Closed,	Closed, Knows most PCB organizations. Stays in this network.	Open, No example provided	Open, Experience	Open, As long as they perform

CONCLUSION & DISCUSSION

5.1 CONCLUSION

The aim of this research was to understand how proximity, or organizational similarity, affects the willingness to cooperate and perceived partner fit. The results of six case studies in a high-tech open supply network suggest that organizations' proximity positively and directly affect the perceived partner fit. In the context of an open supply network, the willingness to cooperate was found to concern cooperation with a specific partner aimed at innovations. Consequently, an organization's perceived partner fit largely determined whether the organization is willing to cooperate. The results suggested that a perceived partner fit should be supportive towards innovations. A supportive partner fit creates confidence that relational rent can be generated. It was found to be constructed through two fits:

1) *The project fit* included complementarity of market segment and expertise to the requirements of the specific project. The project fit largely complies to the original intent of the perceived partner fit variable. Organizations assess another organizations' fit towards potential competitive advantage. Complementary expertise to the project was considered a resource of such advantage. An addition was made, that the specialism of the market segment organizations operate in was also included.

2) *The partner fit* complements the project fit towards a supportive partner fit as a result of the proximities' effect. It is constructed through fits on four out of five proximities; cultural, cognitive, organizational and geographic proximity. Cultural and cognitive proximity were included in the perception of partner fit through preference for inter-organizational individuals that bond in cooperation. Highly adoptive organizations did not include cultural proximity, but did acknowledge the importance of cognitive proximity for a partner fit. Organizational proximity was included in the perception of partner fit through preference for autonomous decision making processes in cooperation. Furthermore, geographic proximity was found to result in more supportive perceptions of partner fit as it strengthens cultural proximity. At last, higher degrees of social proximity diminish the need to construct partner fit perceptions. Through social proximity that embeds network mechanisms, perceptions of a specific partner fit may already be present.

These findings lead to the conclusion that the proximities have a direct positive effect on the perceived partner fit. Consequently, the proximities have an indirect positive effect on the willingness to cooperate, because the perception of a supportive partner fit is a condition for such willingness. Thus, proximities that assess organizational similarity partly determine whether organizations are willing to cooperate with a specific partner, because it positively affects a supportive partner fit.

Conclusions towards the research problem only partly explain organizations' willingness to cooperate in open supply networks. The explorative nature of this research yielded additional conclusions:

1) The willingness to cooperate is subject to the presence of the Brainport thought. The Brainport

thought incorporates certain regional routines towards development that resemble open supply network routines. The presence of such routines is a condition that determines whether organizations are willing to cooperate towards innovations, or internally develop. Non presence indicates that an organization does not fit in the open supply network model this research suggests.

2) Confidence in partner cooperation determines whether organizations adhering to the Brainport thought are willing to cooperate with a specific partner. It assesses whether organizations expect the cooperation to be satisfactory.

3) The Brainport open supply network may be subject to lock-in behavior due to repetitive cooperations around a geographic core. Repetitive cooperation with 'known' organizations may lead to the neglecting of opportunities that organizations outside of the network offer.

Regional routines that resemble open supply network routines are appealed to as 'the Brainport thought'. Cases in which the Brainport thought is present applied early supplier integration, open innovation routines and flexibility in co-development. The Brainport thought has been assessed relatively to the possibilities to practice open supply network routines. In this sense, organizations that had less possibilities to e.g.: initiate projects, include suppliers, make investments, could still be assessed with the presence of the Brainport thought. In turn, organizations that have a wide spectrum of possibilities to practice open supply network routines but do so limitedly, may not be assessed with Brainport thought. This indicates that the Brainport thought is not merely an assessment of open supply network routines. It rather concerns organizations' freedom to operate such routines in development or not. Organizations that adhere to the Brainport thought fit this research's suggested model, and may be willing to cooperate with a specific partner aimed at innovations.

Confidence in partner cooperation is the factor that determines whether organizations adhering to the Brainport thought are willing to cooperate with a specific partner or not. Organizations build such confidence through the expectation that cooperation will be satisfactory. Two expectations are concerned: generating relational rent and non-opportunistic partner behavior. This resulted in two conditions for partner assessment:

1) The perceived partner fit consists of a supportive partner fit perception. A supportive partner fit perception creates confidence that relational rent can be generated in cooperation with a specific organization. Conclusions on how a supportive partner fit is constructed have been presented earlier.

2) Confidence against opportunistic behavior is present. This is what confidence in partner cooperation originally contained. Confidence that a partner will not behave opportunistically was found to be built through trust and control mechanisms, in line with Das & Teng (1998). In our research, trust mechanisms included the act of investing and creating for goodwill. Investments were found to be mostly asset specific. Goodwill was created through obvious efforts such as international visits. These mechanisms signaled commitment to the project rather than free-riding behavior. Control

mechanisms included structural specifications and effective communication. Structural specifications prevented intellectual property that was shared and developed in cooperation from being abused. The most used structural specifications were nondisclosure agreements. Effective communication served to control a partner's compliance to the agreed objectives of the cooperation and therefore helped to reduce opportunistic behavior.

Compliance to both conditions results in confidence in partner cooperation. Organizations adhering to the Brainport thought, and confident in partner cooperation, are willing to cooperate. Compliance to only one of the partner assessment conditions is not likely to result in a willingness to cooperate.

Lastly, the results show that the Brainport open supply network may be subject to lock-in behavior around its geographical core. Examples indicated that organizations repetitively cooperate with organizations within the network. This may suggest that they are neglecting cooperative opportunities outside of the network. Only two organizations were found to be open towards organizations outside of the network, whereas other organizations indicated to preferably cooperate with known organizations inside the network.

Thus, our analysis suggest an open supply network model of cooperation that is different from the conceptual model that we expected when we derived the question how organizations' proximities affect a perceived partner fit and willingness to cooperate. This open supply network model explains how organizations that include open supply network routines in development may be willing to cooperate with specific partners.

5.2 THEORETICAL IMPLICATIONS

The insights derived from this research primarily contribute to conceptualizing open supply networks that is emerging in the supply chain management literature. More insight is provided towards the open innovative and flexible character of supplier networks. Furthermore, this research contributed to theory development concerning the willingness to cooperate in open supply networks. Such willingness was found to be subject to conditions based on transaction cost economics (Das & Teng, 1998), a resource based view of the firm (Dyer & Singh, 1998), economic geography (Boschma, 2005) and interpretative findings. Consequently, this research contributed to these respective theories as these are validated in new contexts. The implications are discussed respectively.

The contribution to open supply network conceptualization relates to an organization's assessment on open supply network involvement. By combining Chesbrough's (2003) open innovation characteristics and Braziotis' (2013) supplier network characteristics, we helped to construct the basis for a tool that identifies an organization's open supply network involvement. The tool assesses whether an organization practices open supply network routines in the frame of cooperative possibilities that the organization has compared with outsourcing or internal development of R&D.

Theory was developed that better explains the willingness to cooperate of organizations that practice open supply network routines in cooperation. Das & Teng's (1998) framework on confidence in cooperation and the resource-based relational view (Dyer & Singh, 1998) on cooperation have been used to assess what (de)motivates organizations to cooperate with a specific partner. Das & Teng's (1998) framework was found to be applicable in open supply networks; open innovation practices are vulnerable to opportunistic behavior. Confidence in partner cooperation as defined in Das & Teng (1998) did not suffice to explain an expectation of satisfactory partner cooperation in the context of an open supply network. The expectation that high-tech organizations in an open supply network require a resource-based incentive to cooperate was justified. The resource-based generation of relational rent (Dyer & Singh, 1998) was validated, extended and complemented through alternative generators of relational rent.

In line with Dyer & Singh (1998), it was validated that high-tech organizations that embed open supply network routines indeed assessed a potential partners' fit based on the expectation to generate relational rent in cooperation. In our research complementary human and physical specific assets are considered as resources of expertise that may generate relational rent.

The resource-based generation of relational rent (Dyer & Singh, 1998) was extended as organizations assessed market segment separately from expertise. Expertise of high-tech organizations may cover various market segments. Organizations in market segments further develop specific specialisms out of such expertise. Organizations expected to generate relational rent with organizations that do not only have the expertise, but operate in specialized market segments of what is needed.

The resource-based partner fit perception was complemented with the proximities derived from Boschma's (2005) study. In addition to Dyer and Singh's (1998) adopted and extended concepts, partner fit perception that generates relational rent included cultural and cognitive fits on an individual level, and an organizational fit. Social proximity resembled network theory mechanisms through which perceptions of confidence and a partner fit may already be present. Boschma's (2005) economic geographical claim that geographic proximity increases innovative performance through the strengthening of other proximities was not found to be completely true. Geographical proximity has a limited effect on the perception of a partner fit. The cases suggest the importance of geographic proximity of partners for the accelerated development of cultural proximity. Cognitive and organizational proximity may also be affected positively by geographic proximity when it comes to perceiving partner fit.

5.3 PRACTICAL IMPLICATIONS

This research primarily helps managers to better take into account the consequences of the context they may operate in: an open supply network. Secondly, it provides managers with assessment criteria for partner cooperation in open supply networks. At last, it has practical implications and recommendations for Brainport Industries.

Through this research, managers may better comprehend the open supply network routines operating within their organization as well as organizations around them. Many organizations are probably unaware of the open supply network concept as it is relatively new in literature. Such comprehensions may help organizations to rethink cooperation strategies towards (open) innovation practices including various stakeholders and being flexible. It may motivate organizations to co-develop, or coordinate co-development instead of outsourcing or vertically integrating.

Managers conscious of open supply network involvement may use this research's partner assessment framework that determines confidence in partner cooperation. Using this framework, managers may assess potential partners on their project fit, partner fit and potential opportunistic behavior. Also, managers might consider to cooperate with partners that are located nearby as cooperation with such partners may elapse smoothly. Lastly, managers are informed of the networks' importance. Positive experiences, negative experiences and information from trusted organizations in the network should explicitly be considered in partner assessment processes.

Brainport Industries is provided with a tool that identifies open supply network routines. This can be used as selection criteria for innovative organizations that want to settle on the BIC. Furthermore, Brainport Industries may use this research's framework in the design of the BIC. Organizations that are similar regarding proximities and have complementary resources are likely to cooperate. Location wise it would be favorable to locate such organizations close to one another.

It is advised that the open character of the BIC should be approached with caution. This research found that organizations fear opportunistic behavior regarding IP. Obligations of IP openness may therefore scare-off organizations to settle on campus. Lastly, BIC should monitor the danger of lock-in behavior on the BIC. Organizations should not become too campus oriented regarding cooperations.

5.4 Limitations & further research

This research's conclusions cannot easily be generalized to organizations in open supply networks. Our research aim of conceptualization and theory development comes with limited external validity. The limited capacity of cases does not allow for generalizable interpretations of results to other open supply networks than Brainport Industries Campus. Open supply networks differ on various characteristics such as industry, scale, region and organization types due to which this research's conclusions may not be applicable for other open supply networks. Concerning the Brainport open supply network specifically, the cases are a limited selection of organizations that are active in this open supply network. Even though the cases varied on many criteria, the heterogeneity of the network cannot be depicted through the limited selection of cases in this research. Therefore, the explaining power of the results model and conclusions should be interpreted towards the cases that were included in this research. Future research should repeat investigations in different open supply

networks. Also, more organizations from the Brainport open supply network should be included. Comparison of open supply networks may result in generalizable conclusions.

The reliability of case results may have been affected in the process of data gathering, where we did not manage to gather data from multiple respondents per case in all of the cases. The assessment of organizations' motivations and barriers to cooperate had to be conducted from respondents that were highly-layered organizationally. Consequently, in some cases only one respondent could be used for analysis as others were not available for interviewing. To compensate an extra case was added, but unfortunately a similar situation emerged where only one suitable individual could be interviewed. Even though all respondents were found to have complete overviews of their organizations' cooperations and considerations, reliability may have been affected as remarks could not be validated. Decreased reliability require cautious interpretation of conclusions. In future research, more respondents should be included per case. Also, a separate questionnaire should be included that is specified to the lower level employees. By doing so, more reliable conclusions can be derived from various perspectives.

Relationships found in qualitative research are difficult to assess in terms of the effect size. Two moderators were found: geographic proximity and confidence in partner cooperation. Regarding geographic proximity, some distinctions of effect size could be made. Whether organizations were foreign, located outside of the open supply network or nearby altered the effect. Regarding confidence in partner cooperation only logistic values could be conducted. The cases would either perceive satisfactory partner cooperation or they would not. This was found to be very case specific. Furthermore, the Brainport thought and willingness to cooperate also contain logistic values due to the lack of quantitative data. Unfortunately, the boundaries of this research did not allow for such assessment. In future research, quantitative analysis enables determining the effect sizes of both moderators and more regular causal relations. Such research could also quantify the presence of a Brainport thought and the willingness to cooperate numerically rather than assess logistic values.

At last, interpretative bias may have occurred during analysis of causal relations. Possibly, other researchers would interpret results differently. Also, not all causes of phenomenon may have been measured in data gathering. Internal validity may have been affected due to non-measurement of alternative causes. Some causal effects could not be validated due to a lack of confirmatory data, and alternative respondents would likely have introduced alternative causal relationships.

In future research, in repetition of this study, the inclusion of multiple researchers may control for interpretative bias. An increase of respondents per case would also decrease such bias and non-measurement values. Furthermore, the combination of concepts that define this research's theory development should be repeated. Such research would either justify or contradict this research's theoretical conclusions. At last, factor analysis should be conducted to validate proposed variables.

For example, it could be validated whether proximities are indeed loadings for the perceived partner fit factor.

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LITERATURE LIST

- Boon, S. D., & Holmes, J. G. 1991. The dynamics of interpersonal trust: Resolving uncertainty in the face of risk. In R. A. Hinde & J. Groebel (Eds.), *Cooperation and prosocial behavior*: 190 -211. Cambridge, England: Cambridge University Press.
- Boschma, R. A. (2005). Proximity and innovation: A critical assessment. *Regional Studies*, 39(1), 61-74. doi:10.1080/0034340052000320887
- Brainport industries (n.d). Lidmaatschap: is deelname aan Brainport industries Coöperatie iets voor u?. Retrieved from <http://www.brainportindustries.com/nl/ledenoverzicht/aanmelden-lidmaatschap>
- Brainport Industries, (n.d). Over ons. Retrieved from: <https://www.brainport.nl/over-brainport/het-verhaal-van-brainport?hsCtaTracking=42e65ac8-0252-436b-a722-5a47a4df05ea%7Cc7e1da81-79de-4b25-bea0-a5c9ba7c99e0>
- Braziotis, C., Bourlakis, M., Rogers, H., & Tannock, J. (2013). Supply chains and supply networks: distinctions and overlaps. *Supply Chain Management-an International Journal*, 18(6), 644-652. doi:10.1108/scm-07-2012-0260
- Brown, Houghton G., Marshall Scott Poole, and Thomas L. Rodgers. "Interpersonal traits, complementarity, and trust in virtual collaboration." *Journal of Management Information Systems* 20.4 (2004): 115-138.
- Cheng, C. C. J., & Huizingh, E. (2014). When Is Open Innovation Beneficial? The Role of Strategic Orientation. *Journal of Product Innovation Management*, 31(6), 1235-1253. doi:10.1111/jpim.12148
- Chesbrough, H. (2003). The logic of open innovation: Managing intellectual property. *California Management Review*, 45(3), 33-+.
- Chesbrough, H. W. (2003). The era of open innovation. *Mit Sloan Management Review*, 44(3), 35-41.
- Choi, T. Y., & Hong, Y. (2002). Unveiling the structure of supply networks: case studies in Honda, Acura, and DaimlerChrysler. *Journal of Operations Management*, 20(5), 469-493. doi:10.1016/s0272-6963(02)00025-6
- Klein, B., Crawford, R. G., & Alchian, A. A. 1978. Vertical integration, appropriable rents, and the competitive contracting process. *Journal of Law and Economics*, 21: 297-326.
- Das, T. K. (2006). Strategic alliance temporalities and partner opportunism. *British Journal of Management*, 17(1), 1-21.

- Das, T. K., & Teng, B. 1997b. The dialectics of strategic alliances. Paper presented at the annual meeting of the Academy of Management, Boston, MA.
- Das, T. K., & Teng, B. S. (1998). Between trust and control: Developing confidence in partner cooperation in alliances. *Academy of Management Review*, 23(3), 491-512.
doi:10.5465/amr.1998.926623
- Deutsch, M. 1962. Trust, trustworthiness, and the F Scale. *Journal of Abnormal and Social Psychology*, 61: 138-140
- Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*, 23(4), 660-679.
doi:10.2307/259056
- Dyer, J. H., Kale, P., & Singh, H. (2004). *When to ally and when to acquire*. Harvard Business Review.
- Edquist C. and Johnson B. (1997) Institutions and organizations in systems of innovation, in Edquist C. (Ed.) *System of Innovation. Technologies, Institutions and Organizations*, pp. 41–63. Pinter, London.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, 14(4), 532-550.
- Eisenhardt, K. M., & Schoonhoven, C. B. (1996). Resource-based view of strategic alliance formation: Strategic and social effects in entrepreneurial firms. *Organization Science*, 7(2), 136-150.
doi:10.1287/orsc.7.2.136
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of advanced nursing*, 62(1), 107-115.
- Enkel, E., Gassmann, O., & Chesbrough, H. (2009). Open R&D and open innovation: exploring the phenomenon. *R & D Management*, 39(4), 311-316.
- Fawcett, Stanley E., Gregory M. Magnan, and Matthew W. McCarter. "Benefits, barriers, and bridges to effective supply chain management." *Supply Chain Management: An International Journal* 13.1 (2008): 35-48.
- Forbes, 2014. 11 Of The Best Strategic Brand Partnerships In 2014. Retrieved from <https://www.forbes.com/sites/michellegreenwald/2014/12/11/11-of-the-bestsmaestmost-interesting-strategic-brand-partnerships-of-2014/#6fc3c64538f8>

- Gertler, M. S. (1995). Being there- Proximity, organization, and culture in the development and adoption of advanced manufacturing technologies. *Economic Geography*, 71(1), 1-26.
doi:10.2307/144433
- Gittelman, M. (2007). Does geography matter for science-based firms? Epistemic communities and the geography of research and patenting in biotechnology. *Organization Science*, 18(4), 724-741. doi:10.1287/orsc.1070.0249
- Glaser, B. & Strauss, A. (1967). *The discovery of grounded theory. Strategies for qualitative research*. Chicago: Aldine Publishing Organization.
- Gulati, R. (1998). Alliances and networks. *Strategic management journal*, 19(4), 293-317.
- Granovetter, Mark. 1982. "The Strength of Weak Ties: A Network Theory Revisited." Pp. 103-30 in *Social Structure and Network Analysis*, edited by P. V. Marsden and N. Lin. Beverly Hills, CA: Sage.
- Hosmer, L. T. 1995. Trust: The connecting link between organizational theory and philosophical ethics. *Academy of Management Review*, 20: 379-403.
- Inkpen, A. C., & Beamish, P. W. 1997. Knowledge, bargaining power, and the instability of international joint ventures. *Academy of Management Review*, 22: 177-202.
- Kanter, R. M. 1994. Collaborative advantage: The art of alliances. *Harvard Business Review*, 72(4): 96-108.
- Kee, H. W., & Knox, R. E. 1970. Conceptual and methodological considerations in the study of trust and suspicion. *Journal of Conflict Resolution*, 14: 357-366.
- Klibi, W., Martel, A., & Guitouni, A. (2010). The design of robust value-creating supply chain networks: A critical review. *European Journal of Operational Research*, 203(2), 283-293.
doi:10.1016/j.ejor.2009.06.011
- Knoben, J., & Oerlemans, L. A. G. (2006). Proximity and inter-organizational collaboration: A literature review. *International Journal of Management Reviews*, 8(2), 71-89.
doi:10.1111/j.1468-2370.2006.0012.x
- Kogut, B. 1989. The stability of joint ventures: Reciprocity and competitive rivalry. *Journal of Industrial Economics*, 38(2): 183-198
- Larson, A. 1992. Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative Science Quarterly*, 37: 76-104.

- Malterud, K. (2001). Qualitative research: standards, challenges, and guidelines. *The lancet*, 358(9280), 483-488.
- Mohr, J., & Spekman, R. (1994). Characteristics of partnership success – Partnership attributes, communication behavior and conflict-resolution techniques. *Strategic Management Journal*, 15(2), 135-152. doi:10.1002/smj.4250150205
- Mowery, D. C., Oxley, J. E., & Silverman, B. S. 1996. Strategic alliances and interfirm knowledge transfer. *Strategic Management Journal*, 17: 77-91.
- Morgan, K. (2004). The exaggerated death of geography: learning, proximity and territorial innovation systems. *Journal of Economic Geography*, 4(1), 3-21. doi:10.1093/jeg/4.1.3
- Park, S. H., & Ungson, G. R. (2001). Interfirm rivalry and managerial complexity: A conceptual framework of alliance failure. *Organization science*, 12(1), 37-53.
- Perols, J., Zimmermann, C., & Kortmann, S. (2013). On the relationship between supplier integration and time-to-market. *Journal of Operations Management*, 31(3), 153-167. doi:10.1016/j.jom.2012.11.002
- Petersen, K. J., Handfield, R. B., & Ragatz, G. L. (2005). Supplier integration into new product development: coordinating product, process and supply chain design. *Journal of Operations Management*, 23(3-4), 371-388. doi:10.1016/j.jom.2004.07.009
- Roy, S., Sivakumar, K., & Wilkinson, I. F. (2004). Innovation generation in supply chain relationships: A conceptual model and research propositions. *Journal of the Academy of Marketing Science*, 32(1), 61-79. doi:10.1177/0092070303255470
- Scarborough H., Swan J., Amaeshi K., and Briggs T. (2013) Exploring the role of trust in the deal-making process of early-stage technology ventures *Entrepreneurship Theory & Practise* 37(2), 1203-1228.
- Selnes, F., & Sallis, J. (2003). Promoting relationship learning. *Journal of Marketing*, 67(3), 80-95.
- Schiele, H. (2010). Early supplier integration: the dual role of purchasing in new product development. *R & D Management*, 40(2), 138-153.
- Schiele, H. (2012). Accessing Supplier Innovation By Being Their Preferred Customer. *Research-Technology Management*, 55(1), 44-50. doi:10.5437/08956308x5501012
- Selnes, F., & Sallis, J. (2003). Promoting relationship learning. *Journal of Marketing*, 67(3), 80-95.

- Teece, D. J. 1987. Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. In D. J. Teece (Ed.), *The competitive challenge: Strategies for industrial innovation and re- newal*: 185-219. Cambridge, MA: Ballinger.
- Trice, H. M., & Beyer, J. M. (1993). *The cultures of work organizations*. Prentice-Hall, Inc.
- Tyndall, G.R. (2000), "The global supply chain challenge", *Supply Chain Management Review*, Vol. 3 No. 4, pp. 13-15.
- Un, C. A., Cuervo-Cazurra, A., & Asakawa, K. (2010). R&D Collaborations and Product Innovation. *Journal of Product Innovation Management*, 27(5), 673-689.
- Van Echtelt, F. E. A., Wynstra, F., van Weele, A. J., & Duysters, G. (2008). Managing supplier involvement in new product development: A multiple-case study. *Journal of Product Innovation Management*, 25(2), 180-201. doi:10.1111/j.1540-5885.2008.00293.x
- Verspagen, B., & Duysters, G. (2004). The small worlds of strategic technology alliances. *Technovation*, 24(7), 563-571. doi:10.1016/s0166-4972(02)00123-2
- Wall Street Journal. 1986. Jet engine pact of Rolls-Royce, GE is scrapped. (November 20).
- Wernerfelt, B. (1984). A resource-based view of the organization. *Strategic management journal*, 5(2), 171-180.
- Williamson, O. E. (1981). The economics of organization: The transaction cost approach. *American journal of sociology*, 87(3), 548-577.
- Williamson, O. E. 1985. *The economic institutions of capital- ism*. New York: Free Press.
- Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan*, 9.

APPENDIX A: QUESTIONNAIRE

1. Is your organization embedded in strategic alliances/cooperations? Yes/no
- 1.1 Can you describe this/these cooperation (s)?

Pick one of the cooperations/alliances that seems to have an open-innovative character and continue on this cooperation. If not embedded in cooperations (unlikely) ask for perceptions or past cooperations.

2. In this case, why did you choose to cooperate with this organization?

WILLINGNESS TO COOPERATE Y

If a past or recent cooperation is discussed, ask questions as depicted below. If not or discussing future cooperations, ask “would you” questions.

3. To what degree did/do you take risk in the cooperation?
4. Were investments in e.g. equity included at the formation of the cooperation?
5. How do you contribute to effective communication in the cooperation?
6. To what degree did/do you adopt to the other organization?
7. Did/Do you have control measures in place that comfort/secure the cooperation?
- 7.1 What type of measures?

Relaties (After proximities)

8. Are you more willing to cooperate with partners that you can communicate with using jargon?
- 8.1 Why (not)?
9. Are you more willing to cooperate with partners you have experience with?
- 9.1 Why (not)?
10. Are you more willing to cooperate with partners that share your organizations’ values, norms and beliefs?
- 10.1 Why (not)?

PERCEIVED PARTNER FIT Y

11. What do you aim to gain from cooperations with other organizations?
12. How do you assess whether a partner can offer what you ‘need’?
- 12.1 What is it that you look for/need in cooperations?
- 12.1.1 (if not mentioned in response) Is it physical assets that you look for or intangible ones such as knowledge sharing/development?
13. Would you say you get returns that you would not have accomplished on your own?
- 13.1.1 Can you elaborate?
14. What experience does your organization have in cooperation forming?

Relaties (After proximities)

15. Do you perceive partners that more or less have the same knowledge and understandings as more capable than others?
- 15.1 Why (not)?
16. Do you perceive partners that more or less have the same decision making structure as more capable than others?
- 16.1 Why (not)?

PROXIMITY

Cognitive

17. Would you say the organizations learn from each other?
 - 17.1.1 Yes: What is it that you learned?
 - 17.1.2 No: Is learning not an objective of your cooperation?
18. Do you use specific jargon when communicating?
19. Would you say the organizations understand each other's doing and activities?
 - 19.1 What is it you (don't) understand/have knowledge of?
20. (Follow-up) Did you have cooperations in which you learned far more/less?
 - 20.1 Yes: what made the difference?

Organizational

21. Could you describe the organizational structure of your organization?
22. How does decision making occur in your organization?
 - 22.1 Hierarchical/autonomous? Centralized/decentralized?
23. How does decision making occur in the organization you cooperate with?
 - 23.1 Hierarchical/autonomous? Centralized/decentralized?
24. How would you typify the cooperation regarding the way you cooperate?
 - 24.1 (if not mentioned in response) How is the cooperation controlled and by whom?
E.g. hierarchical, joint venture, equity venture, loosely coupled?
25. How does decision making occur in the cooperation?
 - 25.1 (if not mentioned in response) How is it different from your organization?
 - 25.2 (if not mentioned in response) Autonomous, on the spot, intensive contact?
26. (Follow up) Did you have cooperations in which the decision making was more/less favorable?
 - 26.1 Yes: what made the difference?

Social

27. Did your organization have cooperative experience with the other organization before you engaged into the cooperation? Yes/no
 - 27.1 Yes: What did this experience consist off?
 - 27.2 No: How did you know about this organization?
28. Do you usually cooperate with organizations that you already worked with or that you do not have experience with?
29. (Follow-up) Why do you prefer to cooperate with a organization you (don't) have experience with?

Institutional

30. When cooperating with another organization, is there a "them" and "us" culture?
31. Is 'the way of doing things' in the cooperation different from normal practice?

32. Do you think people in your organization are like minded regarding their beliefs, values and norms?

32.1 Are you able to put them into words?

33. (Follow-up) Did you have cooperations in which the external colleagues were more like minded?

33.1 How did you notice this?

Geographical

34. To what extent do you have spatial distance in cooperations?

35. Do you think cooperations thrive from spatial closeness?

35.1 Why (not)?

36. Why do you (not) settle on BIC campus?

37. Is your spatial distance/closeness related to the smoothness of cooperations?

37.1 Yes: How so?

37.2 No: Do the employees not thrive from intensive contact?

38. Is your spatial distance/closeness related to how decisions are made in cooperations?

38.1 Yes: How so?

38.2 No: Does closeness not make it easier to cooperatively make decisions or control the other organization?

39. Is spatial distance/closeness related to who you cooperate with: known or unknown organizations?

39.1 Yes: How so?

39.2 No: Is closeness not related to the repetitiveness of partners? Does closeness not make it easier to cooperate with unknown partners?

40. Is spatial distance related to shared cultures between your and the other organization?

40.1 Yes: How so?

40.2 No: Does closeness not allow both organizations' employees to develop or adopt cultures?

APPENDIX B: RESPONDENT OVERVIEW INTERVIEWS

Respondent #	Respondent	Function	Case	Interview duration	Interview date
R1	Jaap Klaassen	Director Operative Systems	BDSU	55 minutes	22/8/2017
R2	Arnoud de Haas	CTO	Opticon	46 minutes	8/9/2017
R3	Victor Schiedoorn	Director	PCBprintx	58 minutes	28/8/2017
R4	Wim Janssen	Custom project manager	PCBprintx	30 minutes	28/8/2017
R5	Henk van Schie	Adjunct Director	Plasticproces	50 minutes	8/9/2017
R6	Jan van Veenendaal	Director	Plasticproces	38 minutes	8/9/2017
R7	Mark ter Hag	Director	ElectronicPCB	50 minutes	25/9/2017
R8	Frits ter Lau	Director	ElectronicPCB	58 minutes	25/9/2017
R9	Loris de Bie	CEO	EveryTechnics	41 minutes	16/8/2017

APPENDIX C: SECONDARY DATA

SAMEN MAKEN WE DE TOEKOMST

De wereld om ons heen verandert razendsnel. De internationale concurrentiepositie van Nederland wordt continu uitgedaagd. Een vernieuwende route naar toekomstig economisch en maatschappelijk succes, ligt in het vinden van oplossingen voor grote maatschappelijke uitdagingen. Hoe blijven we langer gezond? Hoe maken we onze mobiliteit duurzamer en efficiënter? Hoe voorzien we in de groeiende behoefte aan schone energie en gezond voedsel? Deze vragen dwingen ons om creatief en effectief te handelen. Brainport, met Eindhoven als hart, heeft hierin als een van de belangrijkste pijlers van de Nederlandse economie een doorslaggevende rol. Als innovatieve toptechnologieregio is Brainport bepalend voor de concurrentiekracht van Nederland. De combinatie van hightech, design én een uniek samenwerkingsmodel bepaalt de kracht van Brainport. Samen verzilveren we kansen die een snel veranderende wereld ons biedt. Zo draagt Brainport, als hightech groeiversneller, bij aan meer economische groei én aan een duurzame, gezonde en veilige samenleving.



VANDAAG: AANTREKKINGSKRACHT DOOR SYNERGIE

SAMEN INNOVEREN

In Brainport gaan hightech en design hand in hand met hoogwaardige maakindustrie en ondernemerschap. Samenwerking en kennisdeling zitten in ons DNA. Ze vormen de basis voor de kenmerkende open innovatie die Brainport slim en sterk maakt. Deze Brabantse manier van doen stelt ons in staat een groeiversneller te zijn; zowel op economisch als op maatschappelijk en persoonlijk vlak.

Groei in welvaart en welzijn, dát zijn onze drijfveren. Om groei te realiseren, gaan we steeds nieuwe verbindingen aan. Niet alleen binnen de Triple Helix samenwerking tussen bedrijven, overheden en onderwijs- en kennisinstellingen, maar steeds vaker daarbuiten. Ook zoeken we naar verbindingen tussen sectoren en met andere economisch sterke regio's in de wereld. Juist in de verbinding ligt onze kracht. Daar waar hightech raakt aan maatschappelijke uitdagingen, ontstaat synergie. Voorbeelden hiervan zijn o.a. te zien op campussen als de Automotive Campus, Food Tech Park Brainport, TU/e

Campus en High Tech Campus Eindhoven. Op deze slimste plaatsen van Nederland, werken duizenden onderzoekers, ontwikkelaars en ondernemers in honderden bedrijven en instituten samen aan de ontwikkeling van baanbrekende technologieën en producten van morgen.

Door samenwerking ontstaat synergie. Samen zijn we slimmer, sterker en kunnen we beter reageren op veranderingen dan ieder afzonderlijk. Hierdoor hebben we een grote aantrekkingskracht op anderen en brengen we zowel het individu als de economie in beweging. Samen realiseren we groei. Dit heeft grote aantrekkingskracht op talentrijke studenten, kenniswerkers, ondernemers en investeerders van over de hele wereld. Niet voor niets ontving Brainport hiervoor de titel 'Slimste regio van de wereld'.



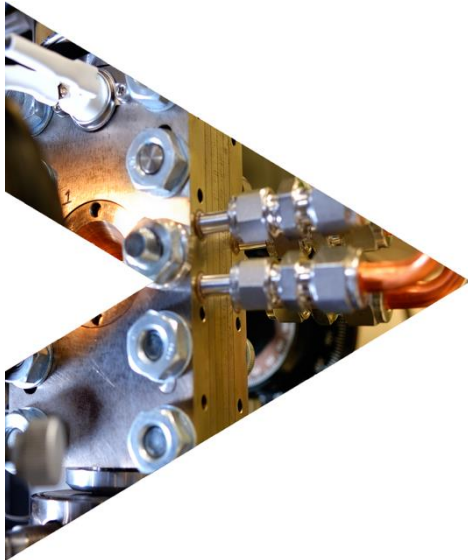
GISTEREN: VERTROUWEN ALS BASIS

SAMEN PIONIEREN

Die unieke samenwerking, waarbij vertrouwen leidend is, komt voort uit de historie van de regio. In een omgeving waar met schaarse middelen - arme landbouwgrond en geen grondstoffen - toch een inkomen vergaard moest worden, ontwikkelde zich het besef dat men elkaar nodig heeft om te overleven en te groeien. Als begin 20e eeuw een maakindustrie opbloeit, met Philips en DAF als meest invloedrijke spelers, wordt Eindhoven een echte 'organization town' met uitstraling naar de hele regio. Afsplitsingen van onder andere Philips leggen de basis voor de hedendaagse keten van kennis en slimme innovatie. Grote bedrijven zoals Philips, NXP, PCBMACHINEINT., VDL en vele kleinere bedrijven vormen een uniek ecosysteem.

Na het faillissement van DAF en de reorganisatie van Philips in de jaren '90, gaan in de regio ruim 36.000 arbeidsplaatsen verloren. De regio staat aan de rand van de afgrond. De toenmalige bestuurders kiezen op initiatief van Rein Welschen, de oud-burgemeester van Eindhoven, voor een nieuwe manier van samenwerken. Hij is samen met Henk de Wilt, bestuursvoorzitter van TU/e en Theo Hurks, voorzitter van de Kamer van Koophandel, de initiator van een nauwe Triple Helix samenwerking tussen overheid, kennisinstellingen en bedrijfsleven. Samen trekken ze investeringen aan en halen bijvoorbeeld TNO naar Eindhoven. Uit deze samenwerking is in 2005 Stichting Brainport voortgekomen met een eigen ambitie en strategie. Een unieke samenwerking, die in 2010 internationaal bekroond wordt met de Eurocities Award voor de stad Eindhoven.

Brainport maakte de afgelopen 20 jaar een enorme transitie door. Van een regio met krimpende industrie en grote werkloosheid naar een internationale hightech hotspot in een mondiaal netwerk. Deze transitie, van maakindustrie tot kennis- en vertrouwensketen, is kenmerkend voor de strategische wendbaarheid en de mentaliteit van de regio. De manier van werken vormt de basis voor open innovatie en leert ons dat kennis delen leidt tot vermenigvuldiging van die kennis. Het is juist die mentaliteit die Brainport zijn kracht geeft.



MORGEN: DE TOEKOMST START HIER

SAMEN GROEIEN

We hebben hard gewerkt om een toonaangevend hightech centrum van Europa te worden, met sterk ontwikkelde specialisaties op het gebied van bijvoorbeeld mechatronica, robotica en ‘advanced materials’. Brainport levert een grote bijdrage aan de nationale export en domineert de top van de Nederlandse R&D bedrijven. Dit schept veel nieuwe banen in en buiten de regio. Brainport levert de meeste Nederlandse patenten (44%) en dubbel zo veel als Europese topregio's als Stockholm en München. Eindhoven heeft volgens de Financial Times, na Londen en Helsinki, Europa's beste investeringsklimaat. Dat toont onze potentie aan, maar die mooie positie is niet vanzelfsprekend. We moeten ons blijven ontwikkelen, continu vernieuwen en nieuwe allianties aangaan.

Technologische ontwikkelingen gaan razend snel en zetten onze wereld op zijn kop. Stilstaan is geen optie, we moeten meebewegen en adaptief zijn. Door continu te ontwikkelen en nieuwe technologieën te omarmen, realiseren we groei. Iedereen kan meedoen. Bij de Triple Helix samenwerking betrekken we burgers, klanten, consumenten, investeerders, designers en corporaties. Samen springen we in de achtbaan van hightech ontwikkelingen. Een enerverende tocht waar we nieuwe markten creëren door oplossingen te vinden voor problemen waar de mensheid mee worstelt. Zo zal Brainport ook in de toekomst economisch voorop blijven gaan.

Om dit mogelijk te maken, blijven we de komende jaren werken aan het behouden en aantrekken van meer R&D, goed gekwalificeerd personeel op alle niveaus, meer startende en snel groeiende innovatieve bedrijven én investeerders om ze vleugels te geven. Om bedrijven, investeerders, kenniswerkers en technische arbeidskrachten naar onze regio te halen en te behouden, verbeteren we het vestigingsklimaat en gaan vernieuwende samenwerkingsvormen en internationale verbindingen

aan. Onze aantrekkingskracht moet zo groot zijn, dat er continu nieuwe initiatieven en nieuwe vormen van samenwerking kunnen ontstaan.

Brainport zal ook in de toekomst het verschil maken. Met een gigantisch netwerk en steeds wisselende coalities, kunnen we inspelen op een snel veranderende wereld. Samen zijn we in staat om producten en diensten te ontwikkelen die een passend antwoord bieden op toekomstige maatschappelijke uitdagingen. Brainport is en blijft de hightech groeiversneller van de Nederlandse economie.

Retrieved from: <https://www.brainport.nl/over-brainport/het-verhaal-van-brainport?hsCtaTracking=42e65ac8-0252-436b-a722-5a47a4df05ea%7Cc7e1da81-79de-4b25-bea0-a5c9ba7c99e0>

APPENDIX D: ANALYSIS SCHEMES

Condition 1	Consensus amongst cases	Dispute amongst cases	Implications for model
Open innovative intentions	A mindset for the region, that resemblances open supply network practices was found. All cases except EveryTechnics are included in open-innovation. However, some cases are initiators of open innovation and some are included externally. This mindset needs trust, contra opportunism and that the partner is supportive, in order to evolve in willingness to openly cooperate.	Initiators (BDSU, PCBprintx, Plasticproces) were found to be very flexible towards others. In contrast, Plasticproces and Opticon were less flexible or adoptive. Plasticproces wants to preserve their core competences and Opticon their fear towards opportunistic behavior causes them to be less adoptive towards other organizations.	Flexibility and open innovative characteristics are added to the model. These independents determine the level Brainport Thought in the context of this research. The Brainport thought is the predecessor for the willingness to openly cooperate. However, inter-organizational trust is a requisite in this relationship. Without trust, no transition from ‘thought’ to willingness

Condition 2	Consensus amongst cases	Dispute amongst cases	Implications for model
Confidence contra opportunism	Structural specifications: cases that mentioned NDA’s agreed that structural specifications can help in controlling organizations, but it is no substitute for trust. Investments: All cases indicated the importance of investments Goodwill was introduced. Even though	Opticon actively uses experience to avoid opportunistic behavior. Suppliers that they cooperated with for many years, can be trusted. This could not directly be measured for other organizations. PCBprintx introduced the social control through a third supplier.	Two of the trust builders that had been included in the literature review have been confirmed, and two have been added. Structural specifications, risk taking and goodwill directly influence the inter-organizational trust as they provide confidence contra opportunism. Social

	investments can be regarded as goodwill as well, other types of goodwill such as making an effort were introduced.	Even though direct relationships were not conducted for other organizations, no relationships or statements were found that contradict the finding. The argumentation that past experience and social control create confidence contra opportunism is held.	proximity also has a direct effect, as reputation 'filters' opportunistic organizations out of the network and credits other organizations with trusted reputations.
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Condition 3	Consensus amongst cases	Dispute amongst cases	Implications for model
A supportive partner fit	A supportive partner fit creates inter-organizational trust through the expectation that the partner is supportive in cooperation. The market segment, expertise, and cooperative structure are project dependent and have a structural nature. The cultural and cognitive understandings are partner dependent and are more variable. All proximities, or organizational characteristics, affect the perceived partner fit. On a structural level, the market segment and expertise are most	Most cases agree that organizational proximity benefits cooperation as decision making smoothens. However, one Plasticproces respondent argues that diverse cooperative structures benefit the client-portfolio. Cases do still cooperate with various organizational structures, except voor ElectronicPCBs. They refuse to cooperate with larger, hierarchical structures. Organizations that adopt easily seem to value cultural understandings as less important than others. Cognitive	Proximities that had an effect on the willingness to cooperate now only have a weak indirect effect through the perceived partner fit and inter-organizational trust. An indirect relationship from the perceived partner fit on the willingness to openly cooperate has been found. The focus in the model has changed. The expected influence of the organizations' proximities on the willingness to cooperate is diminished by the central role of the inter-organizational trust.

	<p>important. Reputation and experience from social proximity in a network are an evaluative tool to assess expertise. On a variable level, cognitive understandings create the best personal fit.</p> <p>Geographic proximity is associated with more frequent face to face contact. This is regarded as positive, but not as requisite for a supportive partner fit.</p>	<p>understandings are assumed by most cases, except ElectronicPCBs whose directors do not have cognitive understandings. This difference indicated the importance of the cognitive understandings.</p>	
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