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Business agreements objectives and decisions: a field research

Business
agreements
and decisions

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Abstract

Purpose – Many research studies in operations management (OM) and strategic management (SM) investigate how different kinds of firm decisions regarding business relationships can positively affect a firm's operations performance, resource endowment, and competitive position. Very few studies exist, however, that have attempted to illuminate the actual behaviors of managers when making strategic decisions about their intercompany relationships; rather, most existing studies focus on normative theory. The purpose of this paper is to explore linkages between the “set” of strategic objectives that managers are willing to pursue, the “set” of networking decisions they make, and the “set” of business agreements they sign.

Design/methodology/approach – In order to investigate and explore actual managerial behaviors with respect to networking strategy, the study adopts a field research approach based on multiple case studies. Data were collected on 13 business agreements from three manufacturing firms in the mechatronics industry in Italy. Within-case and cross-case analyses are used for theory-building purposes.

Findings – The empirical data allow identification four different archetypes of networking strategy. The archetypes capture different connections between the “set” of strategic objectives that managers are willing to pursue, the “set” of networking decisions that they consider, and the “set” of strategic agreements that they actually adopt. Specifically, the identified archetypes are named multi-alignment, multi-agreement (diversification), multi-objective, and mono-alignment (focus), and these are related to different association multiplicities among objectives, decisions, and agreements. The implications related to these archetypes are three-fold. First, the multi-alignment archetype suggests a focus not just on one kind of agreement, but also on the firm's overall portfolio of agreements, in order to facilitate understanding of how different kinds of agreements and networking decisions can play a complementary role in achieving a firm's predetermined business objective/s. Second, the multi-agreement (diversification) archetype suggests that managers can minimize the risk of losing the potentiality of network collaboration by undertaking different kinds of agreements for the same strategic objective. Third, the mono-alignment (focus) and multi-objective archetypes suggest that just one agreement can potentially pursue one or multiple strategic objectives, and thus can allow managers to minimize the cost of managing several networking relationships.

Originality/value – The originality of this study lies in its exploration of linkages between objectives, decisions and networking agreements. Unlike most of the existing papers in OM and SM, however, it does not specifically focus on: vertical or horizontal relationships; operations performance (positioning school) or resource endowment (resource-based view) strategic objectives; or any specific kind of agreement contract (outsourcing, alliance, joint venture, etc.). This paper presents four different networking strategy archetypes that represent different ways of matching a “set” of networking decisions, strategic objectives and business agreements. These are not related to either vertical or horizontal relationships, operations performance or resource endowment objectives, or any specific contract agreement form.

Keywords Networking strategy, Horizontal relationship, Vertical relationship, Strategic advantage, Field research, Italy, Operations management, Strategic management

Paper type Research paper



1. Introduction

It is abundantly evident that business agreements such as those relating to sourcing, outsourcing, agency, alliance, consortium, and industrial district membership are key business trends that have become increasingly important in recent years. With the advance of such tendencies, even the research focus has moved away from viewing firms as autonomous entities striving for competitive advantage, to consider networks of relationships in which firms are embedded and that profoundly influence their conduct and performance (Gulati *et al.*, 2000). Relationships make it possible to access and exploit resources owned by other parties and to link the parties' activities together (Ford *et al.*, 2003). Once a focal firm defines its business relationships, both vertically (with suppliers and customers) and horizontally (with competitors and firms that own complementary capabilities), its network context emerges.

There is a large body of literature that gives managers suggestions on how decisions concerning a specific form of vertical or horizontal agreement can positively impact on different strategic intents (which are usually improvements in terms of resource obtainment and performance). However, there are no studies in the literature that relate the "set" of strategic objectives that managers are willing to pursue with the "set" of networking decisions that they consider, and with the "set" of strategic agreements that they actually adopt. Indeed, most extant studies consider high-level networking decisional dimensions (e.g. make or buy), and do not consider the business agreement as a whole set of different and specific networking decisions that pursue explicit strategic intents. For example, "demanding product promotion and commercialization for non-local customers from retailers located close to them" contains a number of specific decisions in different strategic dimensions (such as make or buy, partner selection and localization, etc.) which each have their own objectives, such as cost reduction and responsiveness improvement. For this reason, it would be interesting to investigate the associations (together with their multiplicities) among agreements and networking decisions, among agreements and strategic intents, and among networking decisions and strategic intents. Focusing on associations and multiplicities (a multiplicity denotes the cardinality, i.e. number of elements – of a collection of elements) entails the following: understanding how many and which decisions are needed to reach one specific objective and, vice-versa, how many and which intents can be pursued by one specific networking decision; how many and which decisions are needed to define one specific business agreement and, vice-versa, how many and which business agreements implement a specific decision; and finally, how many and which intents are pursued by one specific business agreement and, vice-versa, how many and which business agreements are needed to pursue a specific objective.

We strongly believe that a deeper analysis is needed that takes into account the above considerations regarding companies' networking strategies. This would indeed contribute to the research stream that develops models supporting the so-called "strategic alignment", and tries to answer the call for an understanding of "how to achieve strategic fit" (Porter, 1996). Strategic fit refers to the process of linking organizational strategy, its objectives and decisions. This also relates to linking business strategy, competitive priorities, and intents with networking strategy, decisions, and agreements (Kroes and Ghosh, 2010). In fact, in order to contribute to this research stream, this paper adopts a managerial perspective and examines how firms are adopting networking strategies, i.e. how they are combining intents,

decisions and business agreements. In particular, we intend to answer the following research question:

RQ1. What are the linkages (and their multiplicities) among intents, decisions, and agreements?

We do not focus on specific kinds of agreements (e.g. only vertical or horizontal), decisions (e.g. only make vs buy or transactional vs relational bond), or objectives (e.g. only operations performance or resource endowment), unlike most of the existing papers in operations management (OM) and strategic management (SM). Indeed, the main goal of our study goes beyond the specific operations or SM interests and, instead, relies on exploring the managerial perspective when defining a networking strategy.

Networking is recognized to be especially valuable for small and medium enterprises (SMEs), even more so than for larger firms, since SMEs need to seek external resources to compensate those lacking internally. Despite this awareness, most of the empirical works to date address medium and large enterprises when exploring networking-related issues. We explore our research issue by focusing on SMEs, because making networking decisions and signing business agreements play a particularly strategic role for such companies to access resources and gain competitive advantage.

Using a grounded-theory-building approach, we collect and analyze qualitative data from three case studies. This paper presents both within-case and cross-case analyses. The main findings of the research can be summarized in the identification of four different decisional archetypes for networking strategy, whose analysis and discussion suitably answer our research question.

This paper is structured as follows. Section 2 describes the literature analysis, and Section 3 presents the field research methodology adopted. Section 4 describes the within-case analysis, while Section 5 presents the cross-case analysis. The results and the main findings are reported in Section 6, while Section 7 summarizes our conclusions.

2. Theoretical background

The main theoretical background of the research presented in this paper is based on a review of papers focusing on the specific topic of linking strategic objectives and networking decisions related to a business agreement. These papers are mainly published in OM and SM journals. Specifically, we selected the most relevant papers published in the last ten years in the top-ranked journals of the Association of Business School (ABS) classification within the OM and SM subject fields (Harvey *et al.*, 2010). Appendices 1 and 2 summarize the main results of the OM and SM review, respectively.

The first set of papers (Appendix 1) is mainly focused on vertical relationships, and explores how a buyer establishes and manages different types of relationships with (Autry and Golicic, 2010) and between (Choi *et al.*, 2002) its suppliers, and the impact that such relationships have on their operational performance, such as cost, flexibility, innovativeness, quality and time (Paulraj *et al.*, 2008). Specifically, a relevant amount of studies investigate the impact that specific characteristics of buyer-supplier relationships have on operations and business performance (Jitpaiboon *et al.*, 2009). They demonstrate that:

- Long-term relationship orientation, network governance and information technology (Zhao *et al.*, 2010) facilitate the creation of inter-organizational

communication as a relational competency that enhances buyers' and suppliers' performances in a supply-chain context.

- Outsourcing of core business-related activities, offshore outsourcing, and shorter-term outsourcing have positive effects on outsourcing firms' market value. In contrast, outsourcing of non-core business-related activities, domestic outsourcing, and longer-term outsourcing are not found to enhance firm value.
- Strategic integration with both suppliers and customers positively affects operational performance, as expressed in terms of cost, efficiency, quality, delivery, process flexibility and new product flexibility, and also performance measures such as market value and customer satisfaction.
- Buyer commitments to long-term relationships and social capital accumulation with key suppliers can improve the performance of the buying company (in terms of cost, quality, delivery and manufacturing flexibility performance).
- Supply-based decisions impact transaction cost, supply risk, supplier responsiveness and innovation.
- Coordination between a firm and its suppliers and customers effectively supports product design and development activities, and improves time-based performance (time to market, time to product and responsiveness), which in turn has a positive impact on firm performance (market share and financial performance).

The second set of papers (Appendix 2) is mainly focused on horizontal relationships and investigates why firms decide to collaborate with competitors and how different collaboration choices impact on the performance of the agreement itself. This stream of literature emphasizes how horizontal agreements enable firms to acquire, access, or develop specific desired resources and capabilities (Mitchell *et al.*, 2002). Firms may form strategic partnerships to access or acquire unique and valuable resources that they lack, or leverage "social" resources, such as reputation, status, and legitimacy. Garrette *et al.* (2009) argue that firms turn to horizontal alliances with competitors in order to implement projects that require greater resources than those available to them. The optimal configuration of formal and relational governance mechanisms in strategic alliances depends on the assets involved in the alliance, with formal mechanisms best suited to property-based assets and relational governance best suited to knowledge-based assets. In addition, different international joint venture structures affect the productivity of such strategic agreements. The selection of partners also affects the performance of the firms involved in the alliance, and depends on resource complementarities and institutional associations (reflected through both societal and network status) between the firm and its partners.

The review of these two streams of literature shows that both horizontal and vertical agreements certainly facilitate competitive advantage. However, none of these streams of literature explain the association among the "set" of strategic objectives that managers are willing to pursue, the "set" of networking decisions that they consider, and the "set" of strategic agreements that they actually adopt. The next section presents the research method we use to address this issue.

3. Research design

The objective of this study is to investigate and to build theories about linkages among networking decisions, networking objectives and business agreements. We adopt a

grounded theory approach, i.e. we seek to generate a theory grounded in empirical evidence (McGhee *et al.*, 2007; Strauss and Corbin, 1998). First, we started with the definition of our research question, which is shown in Figure 1 as the relationships and their multiplicities across objectives, decisions and agreements. Specifically, given the association (A) between two constructs (X and Y), we identified two multiplicities ($M_{A,X}$ and $M_{A,Y}$) – one for each construct in the association. $M_{A,X}$ indicates the number of objects of construct X referred to by one sole object of construct Y. For instance, in the general representation shown in Figure 1, given the association (A) between “agreement” (X) and “networking decision” (Y), the 1..n (one to many) multiplicity graphically positioned near to “networking decision” ($M_{A,Y}$) means that one agreement is associated with one to many networking decisions.

We then gathered data through interviews and developed field-based theories. Since case research has been consistently recognized as one of the most powerful research methods in the development of new theory (Voss, 2009), we collected and analyzed empirical data by conducting three case studies for the purpose of building theory according to the case-study-type taxonomy proposed by Voss (2009). Also, since we are exploring a relatively new research area, the case study approach is considered appropriate (McCutcheon and Meridith, 1993; Yin, 2009). The case study data came from interviews conducted over three small manufacturing firms from two different industries: industrial vehicles and medical equipment. The decision to use small firms was based upon the awareness that networking is particularly valuable to the small business sector (as outlined above), since it allows small firms to offset their lack of internal resources by collaborating with other firms (Szarka, 1990). Also, SMEs that adopt a networking strategy perform better (in terms of return on asset and return on expenditure) than firms that do not actively pursue the development of networks (George *et al.*, 2001). The sampling method is explained more deeply in the following section.

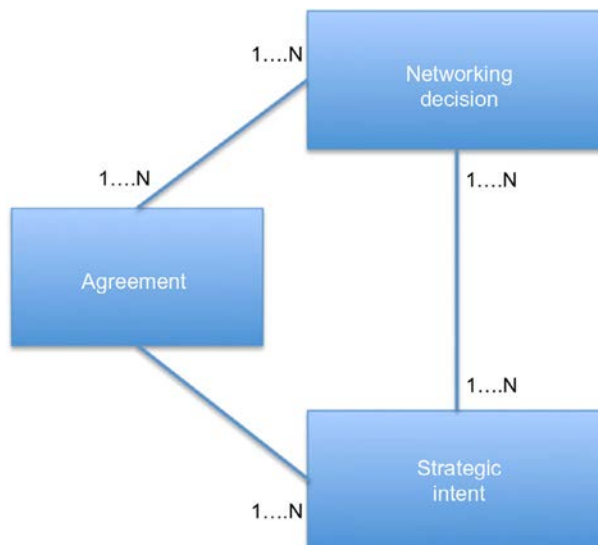


Figure 1.
Networking strategy:
main elements, and their
linkages and multiplicities

Table I gives an overview of the firms considered in our study. Fictitious company names (referring to their product) are used to ensure anonymity.

3.1 Sampling

We selected three firms in our empirical study among those belonging to the mechatronics district in Sicily (Italy). We first extracted a sample composed of all the firms of the district that, at the time of the interview, were participating in an industrial research project, whose objective was to implement an ICT platform. The platform enables the identification of the best form of business agreement with the selected partner, where a firm is actually interested in collaborating with it. The intent of the project shows similarities with our research goal, i.e. exploring the relationships between strategic intents, networking decisions, and business agreements. We thus believe that interviewing firms involved in this kind of project provides benefits in terms of offering an understanding of managers' commitments and feelings about the three main constructs of our research issue. Accordingly, the 14 companies involved in the project composed the initial sample. We conducted a first round of interviews with such companies, and finally selected three of them. The final selection was made based on the level of managers' inclination to form networking agreements, and the tendency of managers to sign business relationships due to strategic reasons. Such tendencies were assessed with reference to the number of agreements signed over recent years,

Focal firm	Products	Business activities	Number of employees	Firm age (number of years)	Annual sales volume (€)	Market areas
Industrial vehicle equipment	Sub-systems for industrial vehicles	Design and production of sub-systems for industrial vehicles Final assembly of subsystem into commercial trucks Maintenance service of industrial vehicles	35	15	4,000,000	National
X-ray	X-ray equipment for medical purposes	Design and production of customized X-ray equipment After-sales services	6	30	800,000	National
Collective transport vehicles	Components and inside furnishings for railway transportation	Design and production of components and furnishings for collective means of transport	76	21	12,000,000	National and international

Table I.
Overview of sample firms

and the number of strategic reasons declared by managers with regards to networking decisions. We thus selected the three companies that, at the time of the interview, had more networking contracts (sourcing, outsourcing, alliances, consortia, and other partnership contracts) and that seemed to make networking decisions in a strategic way.

3.2 Data collection

Semi-structured face-to-face interviews were held, from October to December 2009, with senior managers and CEOs that hold primary responsibility for making strategic decisions relating to business networking. Specifically, at industrial vehicle equipment we interviewed the general manager in the strategic and operations area; he is also the president of the mechatronics district in Sicily. At X-ray we interviewed the CEO, and at collective transport vehicles we interviewed the senior manager in the area of operations and supply chain management. We conducted two interviews per company: the first was conducted through a site visit, and generally took from one to two hours; the second consisted of a telephone call that generally lasted between 15 and 30 minutes, and was intended to clarify and/or add information to the data collected in the first round. An interview protocol was adopted as a guide for the site-visit interview. This included about ten sections: the early sections are needed to collect information about business activities, the market, and other general information, while the remainder are focused on exploring our main construct (i.e. networking decisions, business agreements, strategic intents); in cases where the managers' statements seemed to deserve further investigation, other questions were asked to obtain more details.

The semi-structured interviews were recorded as MP3 files and transcribed in detail. The interviews were conducted by two investigators in order to increase confidence in the findings by converging the observations (Eisenhardt, 1989). The role of each of the two investigators was different: one conducted the interview by asking questions to the respondents, while the other transcribed the information given in detail. The transcribed information was then reviewed by the two interviewers and checked against the recorded material. From the three analyzed companies, we ultimately collected 13 descriptions of agreements.

After the on-site interviews, we conducted a tour of all the plants visited. Through these visits we captured contextual information and in-depth understandings of each companies' products and processes. In addition, we collected information from the company web site and the contract documents provided by the managers during the interviews. These different sources of data (interviews, observations, public information from web sites, and documentation) allowed us to triangulate the information we collected (Eisenhardt, 1989; Miles and Huberman, 1994).

3.3 Data analysis

The data were collected, coded and analyzed by the two interviewers. In order to validate the findings, the researchers compared their coding, and conducted several discussion sessions to establish a deep understanding of the findings in relation to the research question. When information was missing, they collected more specific information via telephone calls with company managers and/or from the company web site. Data collection and discussion stopped when unable to provide any further information with respect to the research question.

Following the procedure suggested by Miles and Huberman (1994), we initially conducted a within-case analysis, wherein the case studies were built based on the data. The analysis of data at this stage consisted of identifying, for each agreement, the manager’s strategic intent when making networking decisions, as well as the characteristics of such decisions. Then, we perform a cross-case analysis, which consisted of two main steps. In the first step, we compared all of the specific strategic intents and networking decisions that emerged in the within-case analysis, and abstracted their definition of the specific agreement in order to define the general strategic intents and networking decisions. We then classified each of the two groups according to the three main dimensions of strategic intent and networking decision identified in the literature (Tables II and III). In the second step, we individualized the multiplicity of linkages that existed between each pair of constructs (i.e. agreement, strategic intent and networking decision) for each agreement. The configuration linking the constructs with the same multiplicity were independently identified and grouped by each of the two researchers, and four archetypes of networking strategy were identified, according to the approach of Doty and Glick (1994). The results of the within-case and cross-case analyses are presented in the next two sections.

4. Within-case descriptions

Descriptions of each case study were obtained through data triangulations, and formulated as objectively as possible with minimal subjective interpretations. Each case begins with a brief description of the firm and then proceeds to a description of each business agreement presented by the respondent. Specifically, for each agreement we present the content of the agreement itself, the characteristics of the relationship (as declared by the manager), and the strategic intent (where it exists) behind such characteristics. For the sake of clarity, before proceeding with the description of cases, a brief Wikipedia-based definition (<http://en.wikipedia.org/wiki/>) of each kind of agreement that appears in the analyzed cases (i.e. sourcing, outsourcing, agency contract, consortium, industrial district) is presented, as follows.

A sourcing agreement can be defined as a “medium-long term purchasing contract”.

An outsourcing agreement can be defined as a “deal under which the company contracts out a business function – commonly one previously performed in-house – to an external provider”.

Strategic intent dimension	Strategic intent
Globalization	1. Increase market share and/or penetrate foreign market
Knowledge	2. Increase innovation and know-how
Efficiency	3. Reduce costs
	4. Increase responsiveness
	5. Ensure dependability
	6. Achieve high quality
	7. Increase flexibility
	8. Reduce risk
	9. Reduce time-to-product/-service

Table II.
Strategic intents
emerging from the
agreements seen in the
case studies

Networking decision dimension	Networking decision	Strategic intent
Make/buy/make together	Collaborate on the design and production of products/services that respond to customer requests Combine R&D activities for new product development	Increase market share
		Increase innovation and know-how
		Increase responsiveness
	Buy components from specialized intermediate markets Outsource maintenance services for non-local customers to partners that operate in the same business Offer maintenance services for competitors' local customers Demand product promotion and commercialization for non-local customers	Increase innovation and know-how
		Reduce costs
		Increase responsiveness
		Achieve high quality
Network-based structure	Choose several suppliers from which to source the same product/service	Reduce costs
		Increase market share
	Choose local suppliers from which to source products/services	Reduce costs
		Increase flexibility
	Select small companies as partners to supply aftersales services to customers Choose partners that are local to customers Select high numbers of partners with whom to collaborate	Increase responsiveness
		Reduce time-to-product/-service
		Reduce risk
Governance mechanism	Maintain relationships with suppliers the firm has already enjoyed Constructive past experiences with	Increase responsiveness
		Increase market share and penetrate foreign market
	Be part of the mechatronics district	Ensure dependability
		Increase market share and penetrate foreign market
		Increase innovation and know-how
	Reduce costs	
	Increase responsiveness	
	Achieve high quality	

Table III.
Networking decisions
emerging from the
agreements seen in
the case-studies

An agency agreement can be defined as:

[...] a deal creating a fiduciary relationship whereby the first party (the principal) agrees that the actions of a second party (the agent) binds the principal to later agreements made by the agent as if the principal had himself personally made the later agreements.

An alliance agreement can be defined as “a partnership contract between two or more parties, made in order to advance common goals and to secure common interests”.

A consortium agreement can be defined as:

[...] an association contract of two or more individuals, companies, organizations or governments (or any combination of these entities) with the objective of participating in a common activity or pooling their resources for achieving a common goal.

An industrial district agreement can be defined as “a membership contract to an industrial district, i.e. an association of companies belonging to the same Industry and localized in a particular industry-zoned urban area”.

4.1 Industrial vehicle equipment: a firm specializing in customized products

This company, located in Palermo (Sicily), produces sub-systems for industrial vehicles, in particular equipment for collecting, handling and compacting materials, street-washing, etc. Its business activities include both the manufacturing of carpentry components (the mechanical components are externally sourced) and the loading of the equipment onto trucks. In addition, the company offers industrial vehicle maintenance services both for its products and for third party industrial vehicles. Its customers are spread over Sicily, except for a few which are located in the north of Italy. The strategy pursued by the company is to serve a restricted market by customizing its product to specific customer requirements. The general manager declares that the company utilizes four kinds of relationship agreements with others firms: sourcing, outsourcing, alliance, and industrial district membership:

- (1) *Sourcing.* The company has several sourcing agreements for mechanical components with local and non-local suppliers, and for mechanical processing and vehicle washing services with local suppliers. The company is in a trust relationship with its selected suppliers and has been collaborating with them since it was formed. Moreover, for each kind of sourcing (mechanical components, mechanical processing of existing components, vehicle washing services) the company has more than one supplier in order to reduce the supply risk; in addition, regarding mechanical components and processing, the manager declares that having several suppliers ensures that the company can increase/decrease the requested volume as required. Finally, the general manager confirms that the company prefers to use local suppliers in order to reduce lead-times and the time-to-product.
- (2) *Outsourcing.* The company outsources maintenance services to companies, located in different parts of Sicily, with whom it has long-lasting, trust-based relationships. The aim of this is to provide multi-site facilities that supply the maintenance service in close proximity to the final customer. In this manner, the company can increase its responsiveness to customer needs by exploiting the outsourcers' geographical proximity to customers, and reduce the cost of post-sale services, both in terms of operating costs (due to managing non-local operations) and capital expenditures (due to investments in different facilities). Finally, the manager states that the company has selected small companies as outsourcers in order to reduce the market entry risk.
- (3) *Alliance.* The company has alliance agreements with two big companies that produce industrial vehicles. Located in the north of Italy, these companies were previously suppliers of components for industrial vehicle equipment. According to these agreements, industrial vehicle equipment offers maintenance services for vehicles that are produced by the two companies and sold in Sicily. Thanks to these alliances, while the two companies have increased their responsiveness to Sicilian customers, industrial vehicle equipment has increased its market share and penetrated a new market segment (maintenance services for different

kinds of vehicles). Moreover, the general manager declares that by increasing its maintenance service business, the service “unit cost” decreases as a consequence of sharing the “common costs” among larger-production volumes.

- (4) *Industrial district membership.* The general manager – who is also the promoter and legal representative of the Sicilian mechatronics district – describes the reason that pushed him to constitute the district. He states that, due to the recent economic crisis, disadvantages for small and micro enterprises have increased because, with respect to medium and large companies, they are under-capitalized, have less purchasing power and low bargaining power with respect to suppliers, and face increased difficulties in obtaining financial credit. Integration between firms (through alliances and partnerships) can provide advantages for them in terms of bargaining power, not only with respect to banks, but also customers (such as the public administration in terms of calls for tenders) and suppliers. This advantage can indirectly reduce working capital expenditure in three ways: first, it enables firms to obtain a lower rate of interest on loans; second, it facilitates bargaining conditions (such as obtaining higher credit delays to suppliers) in the buyer-supplier relationships (indeed, according to the manager, belonging to a district facilitates trust relationships between member firms); third, it reduces the lead-time, and consequently inventories, by exploiting suppliers’ geographical proximity. In addition to these three main points, the general manager feels that the district focus provides the opportunity to involve firms in collaborations that can facilitate their innovation, research and industrialization. He feels that, especially for micro enterprises, being in a district represents a source of competitive advantage and that, in his practical experience, the higher the level of cooperation between the firms, the better their performance will be.

4.2 X-ray: a quality-oriented provider

X-ray has been operating for more than 25 years in the radiology industry. It produces X-ray equipment for medical purposes. The company’s business activities include: pre-sale consulting that aims to individualize the type and model of equipment provided in order to meet both customer and legal requirements; design of customized X-ray equipment; production and assemblage of equipment at customer premises; and the provision of technical support during the warranty and post-warranty period. The company’s manufacturing plant and its research and head offices are all located in Palermo. The strategy of the company is focused on the quality of their products throughout the entire life cycle. Its customers are public and private hospitals and radiology centres. The market is currently national, however the company’s CEO wishes to broaden the market to an international level through the introduction of new, customized products. Specifically, the company is developing a new product to be produced and commercialized in emerging countries, especially those located in the Mediterranean basin. Indeed, the CEO already has several contacts within companies located in Morocco. He declares that such contacts:

[...] represent excellent opportunities for collaboration not just from a market point of view but also for product development and especially for production, given the low labour costs of this country.

Regarding this intention, the CEO highlights two main advantages – geographical proximity and cultural affinity. He declares that the company has four kinds of relationship agreements with others firms: sourcing, agency, alliance and district:

- (1) *Sourcing.* The company has several sourcing agreements for mechanical components with national and international (Japan, Germany and France) suppliers that have been selected based on price, quality and technological criteria. The CEO states that the company is in a transactional relationship with these suppliers, but that it also places high levels of trust in them because of their well-known reputations at an international level. The company has always produced electrical components in-house, and has never being willing to externally source them because it has achieved a high quality standard for such components that fit well with its quality-focused business strategy. The mechanical components, on the other hand, are highly standardized, and the suppliers are allowed to modify order delivery time or even to reallocate orders to other customers. Finally, the CEO states that sourcing the mechanical components from specialized firms has allowed its company to rapidly modify existing products, and introduce new products by exploiting the flexibility afforded by using a wide range of suppliers.
- (2) *Agency.* The company (principal) has held an agency contract for two years with a Russian company (agent) for product promotion and commercialization in Russia. The CEO declares that the agency contract with the Russian company has allowed the firm to penetrate the Russian market by ensuring customers a high level of responsiveness at lower cost. In this manner, X-ray's customers can be supported, during both the pre- and post-purchasing phases, by a company with a similar cultural orientation, which is thus more responsive to their requirements and complaints. Moreover, such an agency contract has allowed the company to avoid incurring capital expenditure costs due to the offshore sales and distribution facilities provided. Finally, the CEO states that this was its first agency contract for product commercialization, and that although he had no antecedent experiences with this Russian company, he has been satisfied with the results so far.
- (3) *Alliance.* The company has an alliance agreement with a global service supplier, located in the north of Italy, for the maintenance of its biomedical equipment. The partner supplies maintenance services for X-ray's equipment to two public hospitals (one located in Palermo and the other in Rome). The CEO declares that the strategic intent of the alliance was to exploit the global customer network of this partner. On the other side, the partner was interested in acquiring access to the company's know-how and skill. In addition, the company is currently negotiating an alliance agreement with a manufacturer of mechanical components, located in Palermo, for the collaborative development of new X-ray equipment to be launched into the market next year. The partner has been selected in order to deliver the mechanical components designed by the company. The CEO declares that this choice was based on the objective of pooling different types of know-how: from one side the electronic-, electrical- and computer-related competencies of X-ray, and from the other the mechanical-related competencies of the partner. The firm has a double intent in wanting to exploit the supplier's

specialized mechanical know-how: to obtain a decrease in costs by accessing the partner's economies of scale and learning, and to acquire more expertise in the mechanical field. The CEO declares that he wishes to build a long-term and deep relationship with this partner.

- (4) *Industrial district membership*. The CEO says that the main reason behind his decision to become part of the mechatronics district is that collaboration among district partners can help to improve the quality of the company's products/processes by combining the expertise of different and complementary professional experiences. He declares that participating in the district represents one of the most powerful tools by which micro and small companies can penetrate foreign markets. Indeed, due to the competitive prices of products/services from emerging eastern countries, firms should focus on technological innovation. By being a part of the district, even the smallest companies can compete with large ones.

4.3 Collective transport vehicles: a differentiation- and quality-oriented firm

This company produces components and designs the interiors of collective transport vehicles. Since 1990, when collective transport vehicles was established, the company's production has specialized in the field of rolling stock. Currently, collective transport vehicles is included in the panel of suppliers to the most important domestic and international rolling stock manufacturers. The market within which the company operates is composed of firms within the transport industry at national and international levels. The company's business activities include both the design and the production of most of the components and internal furnishings of collective transport vehicles. Production is carried out at two sites located in an industrial area of Sicily. The strategy pursued by the company is to serve a restricted market by customizing its products to meet customer requirements, while maintaining a focus on quality. The senior manager states that the company has four kinds of relationship agreements with others firms: sourcing, alliance, consortium and industrial district membership:

- (1) *Sourcing*. The company has several sourcing agreements with respect to the mechanical and non-mechanical components needed for the production of its final goods (e.g. aluminium profiles and sheets, mechanical bellows and springs, paints, window glasses, textile fabrics and so on), for mechanical processing (e.g. zinc plating) and for logistics services. In particular, the manager specifies that for the core component, aluminium, the company carries out the design and its suppliers are only involved in the production. Most of its suppliers are from the north of Italy, while others are from the centre and the south, and two are from foreign countries (Spain and Germany). The choice to use these suppliers was initially based on their reputations (the company looked for suppliers with high capabilities, with a preference for those located in Italy), and then on the efficacy and efficiency of the collaboration. In particular, regarding the aluminium component suppliers, the selection was based on the product quality certification. The company is now in a trust relationship with all of its selected suppliers, since past collaborations have demonstrated efficacy and efficiency. Moreover, for almost all components (e.g. aluminium profiles and sheets, textile fabrics, gaskets, paints and so on) the company has a minimum of two different

suppliers in order to reduce the supply risk and, specifically regarding the aluminium profiles and sheets, to ensure that the company can increase/decrease the requested volume as needed.

- (2) *Alliance*. The company has had different kinds of alliances in the past. All of these were tender-driven. Indeed, depending on the product, the company chose partners (that were almost always their direct competitors) that owned the complementary competencies needed for the fulfilment of the product/service requested by the calls for tender. The duration of these alliances has also been determined by the tenders: the relationships have stopped at the end of the contracted period. The manager states that each collaboration of this kind has increased the company's know-how.
- (3) *Consortium*. The company has also created a consortium with other two companies that operate in the rail transport sector. The products offered by the consortium include the design and production of railway vehicle interiors. The senior manager declares that the main objective of the consortium is to acquire more contracts, on the one hand by achieving certain targets (in terms of turnover, number of employees and so on) required by some customers, and on the other hand by acquiring new technical, technological, and complementary competencies that allow the company to be more responsive to different customer requests.
- (4) *Industrial district membership*. The senior manager says that the company's decision to participate in the mechatronics district was led by the expectation that it would make it easier to find local and complementary partners with whom to pool capabilities in order to respond to new customer requirements.

5. Cross-case descriptions

For each business agreement analyzed and described in the previous sub-sections, different operationalizations for two main constructs emerge, which, respectively, refer to the strategic intent and the networking decisions of the company analyzed. Table II lists strategic intents, while Table III lists the networking decisions and the corresponding strategic intents. In the following section, we discuss how each of these areas of comparison is nested for our cases.

5.1 Strategic intent

The focal firm's strategic intent refers to the objective that the manager sets when defining a specific characteristic of the business relationship. Nine kinds of strategic intent emerge from the cross-case analysis. We classify these intents into three main strategic intent dimensions, which are inspired by the three strategic objectives individualized by Mazzola *et al.* (2009) for network formation. Table II lists these three dimensions and their corresponding strategic intents. These dimensions are described in detail below, together with some examples.

According to Mazzola *et al.* (2009), the "globalization" strategic intent dimension refers to every objective relating to entering new and global markets; in our study, it is the first strategic intent listed in Table II, and here concerns the managers' willingness to expand the firm market at a local, national, and/or international level. Such intent occurs in eight agreements, and is pursued through different networking decisions.

For example, industrial vehicle equipment's alliance includes the acquisition of maintenance service commitments. In X-ray's alliance, such commitments relate to a partnership with a company that has a very extended customer network, which X-ray is able to access thanks to the agreement itself. In addition, the strategic intent to increase market share refers to penetrating foreign markets by increasing innovation through collaboration (e.g. membership of the mechatronics district). Finally, such intent relates to the acquisition of more contracts by increasing strength in terms of dimension, resources and competencies (e.g. industrial vehicle equipment's mechatronics district membership, and collective transport vehicles' membership of the consortium).

On the other side, the "knowledge" strategic intent dimension refers to every objective relating to the development of new knowledge: in our study, this is the second strategic intent in Table II, and is concerned with the managers' desire to acquire new and complementary knowledge and competencies. Such intent occurs in three different agreements (i.e. industrial vehicle equipment's membership of the mechatronics district, and X-ray's alliance and sourcing), and mainly refers to the ability to develop new products, or modify existing ones, by creating new knowledge and capabilities by pooling different and complementary competencies and capabilities.

Finally, the "efficiency" strategic intent dimension refers to every objective relating to efficiency achievement; in our study, this is the third group of strategic intents listed in Table II, and refers to the managers' desires to improve efficiency and responsiveness. This intent occurs the most frequently. For example, the intent to increase responsiveness occurs in three agreements, and is pursued by different networking decisions. In particular, in X-ray's agency contract such intent refers to the ability to serve non-local customers during both the pre- and post-purchasing phases, and is pursued by engaging partners that are located close to the customers to complete these phases. In addition, the increasing responsiveness strategic intent refers to the ability to design and manufacture products that respond to specific and different customers requirements. This intent is pursued by pooling new technical, technological, and complementary competencies with companies that compete/operate in the same sector (e.g. collective transport vehicles' consortium and mechatronics district membership).

5.2 Strategic networking decision

Here, strategic networking decisions refer to choices made regarding business relationships with one or more firms, which aim to pursue one or more strategic objectives. 12 strategic networking decisions emerge from the cross-case analysis. These decisions are classified into three main networking decision dimensions, which extend the three kinds of decision proposed by Nordin (2008) with respect to service sourcing. Table III lists these three dimensions, the corresponding networking decisions, and the corresponding strategic intents with which they are associated. Each dimension is described in detail below, together with some examples of networking decisions.

The "make/buy/make together" networking decision dimension is an extension of the "make or buy issues" considered by Nordin (2008) with respect to service sourcing. It refers to the extent to which different operations are conducted internally, sourced externally, or provided by somebody else. An example of this is the managers' desire

to collaborate with other companies (that own complementary capabilities) for the design and production of customized products/services. This decision occurs in two agreements, and aims to pursue different strategic objectives. In the collective transport vehicles alliance, the decision refers to a tender-driven collaboration with partners that own the complementary service/product requested by the call for tender. This enables the firm to acquire more customer orders and consequently increase its market share. In collective transport vehicles' consortium, the decision refers to the development of a product for specific customer requirements (i.e. railway vehicle interiors). In particular, the strategic intent of creating such a consortium is to increase the firm's technical competencies and dimensions. Indeed, two particular requirements allow the firm to acquire more orders.

The "network-based structure" networking decision dimension is an extension of the "supply-based structure" suggested by Nordin (2008) with respect to service sourcing. It refers to decisions about the dimension of the network (e.g. number of partners/suppliers), its international expansion (e.g. localization of partners/suppliers), and the level of leadership the focal firm wields over its network (e.g. level of bargaining power). An example is choosing several suppliers for the same component. This decision occurs in two sourcing agreements from two of the case study companies, and aims to pursue two main objectives. For industrial vehicle equipment, having several suppliers for mechanical components and processing ensures the company can both reduce the supply risk and increase the volume flexibility. For collective transport vehicles, the choice to have, at a minimum, two different suppliers for all kinds of components ensures that the firm can reduce the supply risk and, for specific products such as aluminium profiles and sheets, to increase the volume flexibility, which is a necessity for such components.

The "governance mechanism" networking decision dimension is an extension of the "nature of buyer-seller relationship" posited by Nordin (2008) with regards to service sourcing. It refers to decisions about the intensity of the relationship between a firm and the partners/suppliers it has selected (i.e. transactional vs relational bond). An example is maintaining relationships with suppliers the firm has already enjoyed a constructive past cooperative experience with. This is the case for industrial vehicle equipment's sourcing and outsourcing agreements. Indeed, for these agreements the firm selects old suppliers in order to exploit the trust-based relationship and maintain high levels of dependability.

6. Results

From our three case studies, we identify four different types of networking strategy; we refer to these as networking strategy archetypes. These archetypes answer our research question by capturing the intricacies of networking strategy as a combination of strategic networking decisions, strategic intents and business agreements, including their linkages and multiplicities (Figure 1).

We take each case study as a unit of analysis. For each case study, we first consider each agreement and the corresponding strategic intent/s and networking decision/s, as expressed in Tables II and III, respectively. We then individualize the existing associations between each pair of constructs (i.e. agreement, strategic intent and networking decision), which is identified by two multiplicities ($M_{A,X}$: $M_{A,Y}$), as explained in the research design section.

Finally, we group the configurations of networking decisions, strategic intents and business agreements associated with the same multiplicity; we individualize four different kinds of configurations, which we refer to as networking strategy archetypes.

A description of each of the four archetypes follows. Each archetype is identified by a name that tries to summarize, as closely as possible, its conceptual content. The description of each archetype underlines the multiplicity of the linkages between the business agreements implemented, the strategic networking decisions undertaken, and the strategic intents pursued. Then, we underline the empirical evidence from which the archetype is derived. In addition, for each archetype, one piece of evidence is explained through a table (Tables IV-VII), which illustrates and describes the multiplicities of the linkages among the constructs, as depicted by the specific evidence.

6.1 Multi-alignment archetype

The multi-alignment archetype describes a networking strategy type wherein a specific agreement implements N networking decisions, and pursues N strategic intents; vice-versa, a specific networking decision is implemented by one or more agreements, and a specific strategic intent is pursued by one or more agreements. In addition, a specific networking decision pursues one or more strategic intents; and, vice-versa, a specific strategic intent is pursued by one or more networking decisions. This finding applies to the cases of industrial vehicle equipment and X-ray. Table IV illustrates and describes the evidence that emerged from the industrial vehicle equipment case study.

6.2 Multi-agreement archetype (diversification)

The multi-agreement archetype describes a networking strategy type wherein a specific agreement implements one or more networking decisions and pursues just one strategic intent; and, vice-versa, a specific networking decision is implemented by one or more agreements and a specific strategic intent is pursued by more than one agreements. In addition, a specific networking decision pursues just one strategic intent; and, vice-versa, a specific strategic intent is pursued by more than one networking decision. This finding applies to the case of collective transport vehicles. Table V illustrates and describes this evidence.

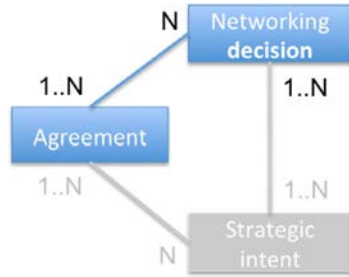
6.3 Multi-objective archetype

The multi-objective archetype describes a networking strategy type wherein a specific agreement implements just one networking decision and pursues N strategic intents; and, vice-versa, a specific networking decision is implemented by just one agreement and a specific strategic intent is pursued by just one agreement. In addition, a specific networking decision pursues N strategic intents; and, vice-versa, a specific strategic intent is pursued by just one networking decision.

This finding applies to industrial vehicle equipment, X-ray and collective transport vehicles.

In Table VI, the linkages among the constructs, and their multiplicities, are illustrated and described, as depicted by the alliance agreement of industrial vehicle equipment.

Linkage and multiplicity illustration



Linkage and multiplicity description

From agreement to networking decision

The agreement “sourcing” is linked to (implements) the following networking decisions:

- Choose several suppliers from which to source the same products/services
- Choose local suppliers from which to source products/services
- Keep suppliers you have already had past cooperative experiences with

The agreement “outsourcing” is linked to (implements) the following networking decisions

- Choose several suppliers from which to source the same products/services
- Demand maintenance services for non-local customers from partners that operate in the same business
- Select small companies as partners to supply aftersales services to customers
- Keep suppliers you have already had past cooperative experiences with
- Choose partners that are local to customers

From networking decision to agreement

The networking decision “choose several suppliers from which to source the same products/services” (and also “choose local suppliers from which to source products/services”) is linked to (is implemented by) the following agreements:

- Sourcing
- Outsourcing

The networking decision “demand maintenance services for non-local customers from partners that operate in the same business” (and also “select small companies as partners to supply aftersales services to customers” and “choose partners that are local to customers”) is linked to (is implemented by) the following agreement:

- Outsourcing

The networking decision “keep suppliers you have already had past cooperative experiences with” is linked to (is implemented by) the following agreements:

- Sourcing
- Outsourcing

From agreement to strategic intent

The agreement “sourcing” is linked to (pursues) the following strategic intents:

- Ensure dependability
- Increase flexibility
- Reduce risk
- Reduce time-to-product/-service

The agreement “outsourcing” is linked to (pursues) the following strategic intents:

- Ensure dependability
- Increase responsiveness
- Reduce costs
- Reduce risk
- Reduce time-to-product/-service

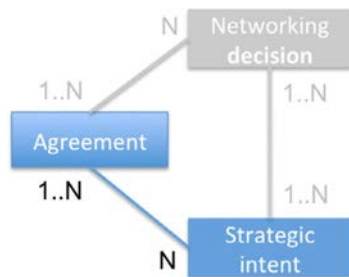
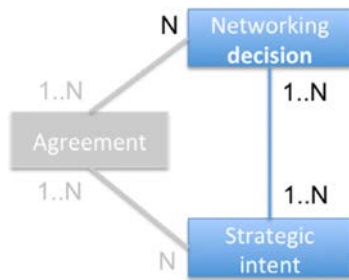


Table IV.
Multi-alignment
archetype: evidence from
industrial vehicle
equipment

(continued)

Linkage and multiplicity illustration



Linkage and multiplicity description

From strategic intent to agreement

The strategic intent “increase flexibility” is linked to (is pursued by) the following agreement:

Sourcing

The strategic intent “reduce costs” (and also “increase responsiveness”) is linked to (is pursued by) the following agreement:

Outsourcing

The strategic intent “reduce risk” (and also “increase dependability” and “reduce time-to-product/-service”) is linked to (is pursued by) the following agreements:

Sourcing

Outsourcing

From networking decision to strategic intent

The networking decision “choose several suppliers from which to source the same products/services” is linked to (pursues) the following strategic intents:

Increase flexibility

Increase responsiveness,

Reduce risk

The networking decision “choose local suppliers from which to source products/services” is linked to (pursues) the following strategic intents:

Increase responsiveness

Reduce time-to-product/-service

The networking decision “keep suppliers you have already had past cooperative experiences with” is linked to (pursues) the following strategic intent:

Ensure dependability

The networking decision “demand maintenance services for non-local customers from partners that operate in the same business” is linked to (pursues) the following strategic intent:

Reduce costs

The networking decision “choose partners that are local to customers” is linked to (pursues) the following strategic intents:

Reduce time-to-product/-service

Increase responsiveness

The networking decision “Select small companies as partners to supply aftersales services to customers” is linked to (pursues) the following strategic intent:

Reduce risk

From networking decision to strategic intent

The strategic intent “ensure dependability” is linked to (is pursued by) the following networking decision:

Keep suppliers you have already had past cooperative experiences with

The strategic intent “increase flexibility” is linked to (is pursued by) the following networking decision:

Choose several suppliers from which to source the same products/services

(continued)

Table IV.

Linkage and multiplicity illustration	Linkage and multiplicity description
	<p>The strategic intent “reduce risk” is linked to (is pursued by) the following networking decisions: Choose several suppliers from which to source the same products/services Select small companies as partners to supply aftersales services to your customers</p> <p>The strategic intent “reduce time-to-product/-service” is linked to (is pursued by) the following networking decisions: Choose local suppliers from which to source products/services Choose partners that are local to customers</p> <p>The strategic intent “increase responsiveness” is linked to (is pursued by) the following networking decisions: Choose several suppliers from which to source the same products/services Choose partners that are local to customers Choose local suppliers from which to source products/services</p> <p>The strategic intent “reduce costs” is linked to (is pursued by) the following networking decision: Demand maintenance services for non-local customers from partners that operate in the same business</p>

Table IV.

6.4 Mono-alignment (focus)

The mono-alignment archetype describes a networking strategy type wherein a specific agreement implements just one networking decision and pursues just one strategic intent; and, vice-versa, a specific networking decision is implemented by just one agreement and a specific strategic intent is pursued by just one agreement. In addition, a specific networking decision pursues just one strategic intent; and, vice-versa, a specific strategic intent is pursued by just one networking decision.

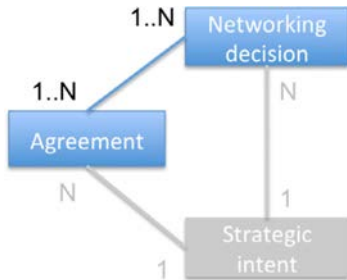
This finding applies to the case of X-ray. Table VII illustrates and describes such evidence.

The archetypes presented above represent an answer to our research question by capturing the intricacies of networking strategy as a combination of strategic networking decisions, strategic objectives and business agreements, along with their linkages and multiplicities. Table VIII summarizes these results by listing the archetypes, the empirical evidences from which they emerged, their definitions, and the illustrative representations that graphically capture the classification of networking strategies we derived from the present research.

7. Discussion and conclusions

This paper adopts a managerial perspective in order to investigate how firms design their networking strategy as a combination of different kinds of agreements, networking decisions and strategic intents. Specifically, we explore the existence of relationships and focus on multiplicities of associations among networking decisions, strategic intents and business agreements. Using three case studies, we identify four archetypes that, in different ways, relate networking strategy constructs, and classify networking strategies into four different groups. The analysis shows that managers, as theory suggests, always define their business networking strategy by aligning intents,

Linkage and multiplicity illustration



Linkage and multiplicity description

From agreement to networking decision

The agreement “alliance” (and also “mechatronics district membership”) is linked to (implements) the following networking decision:

Collaborate for the design and production of products/ services that respond to customer requests

The agreement “consortium” is linked to (implements) the following networking decisions:

Collaborate for the design and production of products/services that respond to customer requests

Select high numbers of partners to collaborate with

From networking decision to agreement

The networking decision “collaborate on the design and production of products/services that respond to customer requests” is linked to (is implemented by) the following agreements:

- Alliance
- Consortium
- Mechatronics district membership

The networking decision “select high numbers of partners to collaborate with” is linked to (is implemented by) the following agreement:

- Consortium

From agreement to strategic intent

The agreement “alliance” (and also “consortium” and “mechatronics district membership”) is linked to (pursues) the following strategic intent:

Increase market share and/or penetrate foreign market

From strategic intent to agreement

The strategic intent “increase market share and/or penetrate foreign market” is linked to (is implemented by) the following agreements:

- Alliance
- Consortium
- Mechatronics district membership

From networking decision to strategic intent

The networking decision “collaborate on the design and production of products/services that respond to customer requests” (and also “select high numbers of partners to collaborate with”) is linked to (pursues) the following strategic intent:

Increase market share and/or penetrate foreign market

From networking decision to strategic intent

The strategic intent “increase market share and/or penetrate foreign market” is linked to (is pursued by) the following networking decisions:

- Collaborate for the design and production of products/ services that respond to customer requests
- Select high numbers of partners to collaborate with

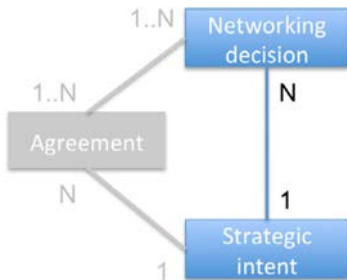
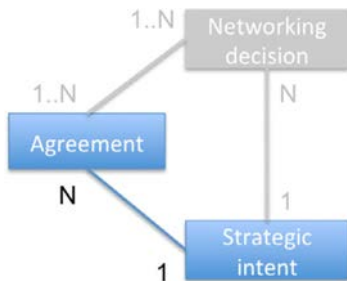
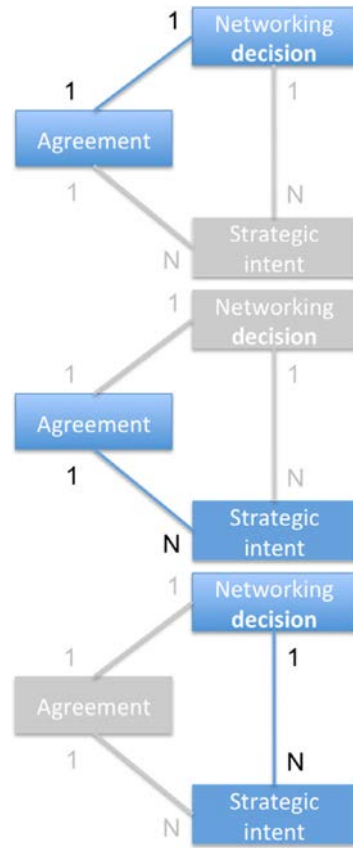


Table V. Multi-agreement (diversification) archetype: evidence from collective transport vehicles

Linkage and multiplicity illustration



Linkage and multiplicity description

From agreement to networking decision
The agreement “alliance” is linked to (implements) the following networking decision:
Offer maintenance services to competitors’ local customers

From networking to agreement
The networking decision “offer maintenance services to competitors’ local customers” is linked to (is implemented by) the following agreement:
Alliance

From agreement to strategic intent
The agreement “alliance” is linked to (implements) the following strategic intents:
Increase market share and/or penetrate foreign market
Reduce costs

From strategic intent to agreement
The strategic intent “increase market share and/or penetrate foreign market” (and also “reduce costs”) is linked to (is pursued by) the following agreement:
Alliance

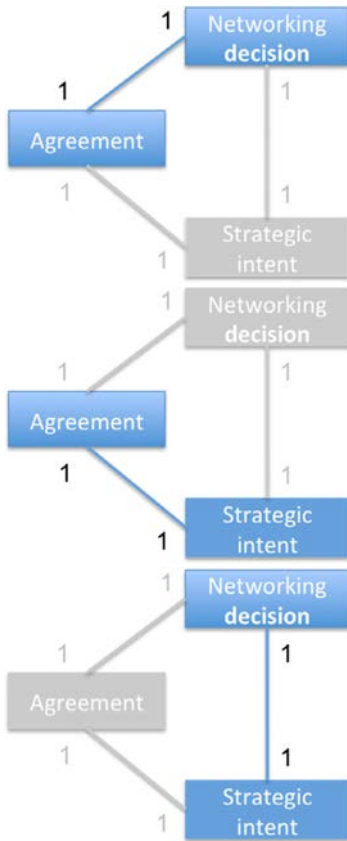
From networking decision to strategic intent
The networking decision “offer maintenance services to competitors’ local customers” is linked to (pursues) the following strategic intents:
Increase market share, and/or
Reduce costs

From strategic intent to networking decision
The strategic intent “increase market share and/or penetrate foreign market” (and also “reduce costs”) is linked to (is pursued by) the following networking decision:
Offer maintenance services to competitors’ local customers

Table VI.
Multi-objective archetype: evidence from industrial vehicle equipment

decisions, and business agreement characteristics. However, what theory does not tell us is that there may be many different and complex combinations of the three elements mentioned above when formulating a networking strategy. In this study, we approach such an issue by focusing on the multiplicity of relations among them. In fact, we find interesting results. Sometimes managers define and adopt a single business agreement contract to pursue a specific strategic objective; sometimes they use a set of agreements to reach the same objective; and sometimes they choose a specific business agreement to reach a set of objectives. Things get more complex still if we also consider the element “networking decision” as a connecting bridge between strategic objectives and choices regarding business agreements. Furthermore, even in this case, empirical analysis shows that one decision (which can be made to pursue either one or many objectives) sometimes impacts on different agreements, and sometimes on just one. Similarly, one agreement can be influenced by just one manager’s networking decisions, or by many.

Linkage and multiplicity illustration



Linkage and multiplicity description

From agreement to networking decision
The agreement “sourcing” is linked to (implements) the following networking decision:

Buy components from specialized intermediate markets

From networking decision to agreement

The networking decision “buy components from specialized intermediate markets” is linked to (is implemented by) the following agreement: Sourcing

From agreement to strategic intent

The agreement “sourcing” is linked to (implements) the following strategic intent: Achieve high quality

From strategic intent to agreement

The strategic intent “achieve high quality” is linked to (is pursued by) the following agreement: Sourcing

From networking decision to strategic intent

The networking decision “buy components from specialized intermediate markets” is linked to (pursues) the following strategic intent: Achieve high quality

From strategic intent to networking decision

The strategic intent “achieve high quality” is linked to (is pursued by) the following networking decision: Buy components from specialized intermediate markets

Table VII.
Mono-alignment (focus) archetype: evidence from X-ray

When investigating business-to-business relationships, our study suggests that the focus should not be on one kind of agreement, but on the firm’s overall portfolio of agreements, in order to understand how different agreements can play a complementary role in achieving a firm’s predetermined business objectives, both in terms of resources and operational performance. This introduces the need for new and innovative theories to explain and describe networking strategy as a complex set of elements, together with their linkages and the multiplicities of their relationships. For example, it would be interesting to investigate the optimal level of contracts to meet the ideal trade-off between networking management costs and networking strategic benefits. Also, firms’ characteristics could play an important role in their networking strategy. For example, the mono-alignment strategy is pursued only by X-ray, which is the smallest company of the three considered in this study. Therefore, it would be interesting to investigate how firms’ characteristics, in terms of size, industry and core activities, push managers to implement specific kinds of networking strategies.

Table VIII.
Summary of
networking strategy
archetypes

Archetype	Multi-alignment	Multi-agreement (diversification)	Multi-objective	Mono-alignment (focus)
Empirical evidence from case studies	<p>(1) Sourcing and outsourcing (from industrial vehicle equipment)</p> <p>(2) Agency contract (from X-ray)</p> <p>(3) Alliance (from X-ray)</p>	<p>(1) Alliance, consortium, mechatronics district membership (from collective transport vehicles)</p>	<p>(1) Mechatronics district membership (from industrial vehicle equipment)</p> <p>(2) Mechatronics district membership (from X-ray)</p> <p>(3) Alliance (from industrial vehicle equipment)</p> <p>(4) Alliance (from X-ray)</p> <p>(5) Sourcing (from collective transport vehicles)</p>	<p>(1) Sourcing (from X-ray)</p>
Definition	<p>A specific agreement implements N networking decisions and pursues N strategic intents; and, vice-versa, a specific networking decision is implemented by one or more agreement/s and a specific strategic intent is pursued by one or more agreement/s. In addition, a specific networking decision pursues one or more strategic intent/s; and, vice-versa, a specific strategic intent is pursued by one or more networking decision/s</p>	<p>A specific agreement implements one or more networking decision/s and pursues just one strategic intent; and, vice-versa, a specific networking decision is implemented by one or more agreement/s and a specific strategic intent is pursued by more than one networking decision</p>	<p>A specific agreement implements just one networking decision and pursues N strategic intents; and, vice-versa, a specific networking decision is implemented by just one agreement and a specific strategic intent is pursued by just one agreement. In addition, a specific networking decision pursues N strategic intents; and, vice-versa a specific strategic intent is pursued by just one networking decision</p>	<p>A specific agreement implements just one networking decision and pursues just one strategic intent; and, vice-versa, a specific networking decision is implemented by just one agreement and a specific strategic intent is pursued by just one agreement. In addition, a specific networking decision pursues just one strategic intent; and, vice-versa, a specific strategic intent is pursued by just one networking decision</p>
Illustrative description				

This study has both theoretical and practical implications. It contributes to theory development in both OM and SM studies in two main ways. First, the identified archetypes represent an attractive development in theory by offering a new taxonomy of networking strategies. They suggest a diverse mode of interpreting networking strategy by considering the multiplicity of relations among intents, decisions and business agreements. Second, by reviewing both OM and SM (Appendices 1 and 2), it emerges that most of the studies in business networking to date have focused on just one kind of agreement (i.e. sourcing, alliance, joint venture) as a strategic tool. However, the existence of multi-agreement and multi-alignment archetypes shows that managers often make simultaneous use of different kinds of agreements to pursue one or more objectives. This tells us that new theoretical models explaining the strategic fit within business networking strategy formulation are highly necessary.

The paper has also many implications for practitioners. First of all, viewing the networking archetype configuration as a combination of agreements, networking decisions and strategic intents can lead managers to consider each of these elements when formulating any kind of business relationship. Second, each of the four archetypes provides managers with a specific suggestion. The multi-alignment archetype suggests that managers who are willing to pursue *N* strategic intents should identify how many networking decisions (from one to many) are needed to pursue each of the identified intents, and how many kinds of agreements (from one to many) are required to implement such decisions. The multi-agreement (diversification) archetype suggests that managers should undertake different kinds of agreements that pursue the same strategic intent in order to minimize the risk of losing potential network collaborations. Just as finance managers diversify their portfolio to reduce risk by investing in a variety of assets, so should networking managers diversify their business agreements portfolio in order to increase the probability of success in pursuing their strategic objectives. The multi-objective archetype suggests to practitioners that multiple strategic objectives can potentially be pursued by signing just one agreement that implements a single networking decision. This means that precise and calculated business agreement specifications can lead to the obtainment of more than one strategic objective, thus minimizing the cost of managing several networking relationships. Managers should take this into account, rather than simply signing contracts in response to sole objectives. The attempt to minimize the costs of managing several relationships is also stressed in the mono-alignment archetype, which suggests that managers who are willing to pursue a single intent should sign just one agreement.

The framework shown in Figure 2 shows that managers who decide to pursue either one or many strategic intents generally choose between two options. One is shown in the lower side of the framework, and consists of the decision to adopt just one business agreement that implements a single networking decision. In this case, the main benefit relates to minimizing the cost of managing several kinds of business agreements. The other option is represented by the upper side of the framework, and consists of the choice to adopt one to many business agreements and networking decisions. The main benefit of this is that it presents the possibility to exploit the complementary and positive effects that many networking decisions and agreements generate, either by minimizing the risk of losing potential business networks, or by complementarily achieving the same strategic intent/s.

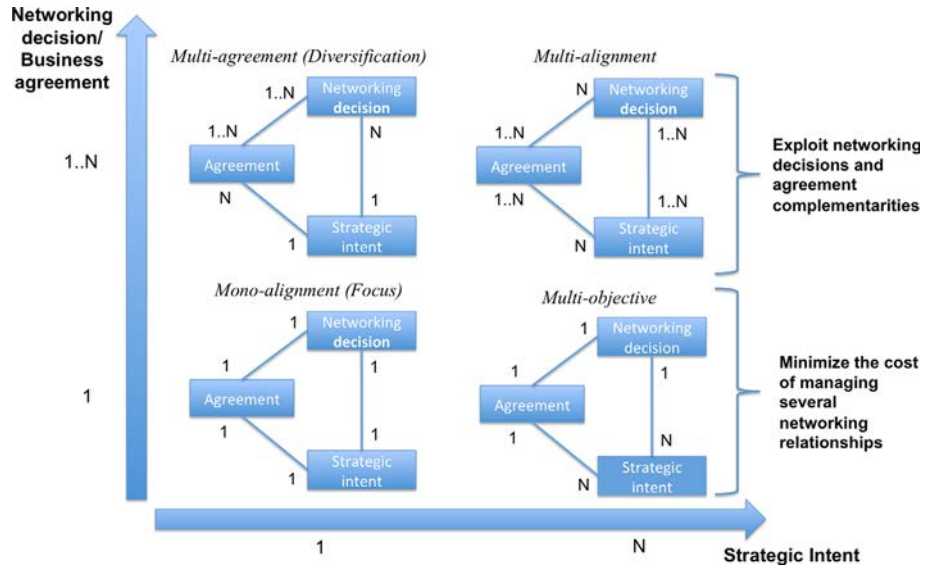


Figure 2.
Networking strategy
framework

The main limitation of this study lies in its exploratory nature and its lack of confirmatory analysis for external validity (Eisenhardt, 1989). By using a small set of information and data, we are able to identify empirical evidence for the four archetypes described in the previous section. However, enlarging the data set would probably allow new or additional kinds of relationships (in terms of multiplicities) to emerge among the investigated business networking elements (i.e. strategic intents, networking decisions, and business agreements). In order to continue exploring such issues and to test our preliminary results and findings, further research will consist of collecting larger samples of empirical data on business agreements, and using cluster analysis or other classification methods to identify further types of networking strategies and compare them with those specified in this study.

The results of the present study show that managers opt for different networking strategy configurations as a combination of agreements, networking decisions and strategic objectives. This finding points to several areas in which additional research may be particularly fruitful. First, there may be much to learn about the reasons and the drivers behind networking strategy configuration choice by investigating the endogenous and external variables that influence such a choice. Second, it would be valuable to examine whether the networking decisions made by managers effectively allow firms to pursue their predetermined strategic intents by conducting a longitudinal study that covers the overall period from the elaboration of networking decisions, to after their implementation.

References

- Autry, C.W. and Golicic, S.L. (2010), "Evaluating buyer-supplier relationship-performance spirals: a longitudinal study", *Journal of Operations Management*, Vol. 28 No. 2, pp. 87-100.
- Bakshi, N. and Kleindorfer, P. (2009), "Co-opetition and investment for supply-chain resilience", *Production and Operations Management*, Vol. 18 No. 6, pp. 583-603.

-
- Belderbos, R., Lykogianni, E. and Reinilde, V. (2008), "Strategic R&D location by multinational firms: spillovers, technology sourcing, and competition", *Journal of Economics & Management Strategy*, Vol. 17 No. 3, pp. 759-779.
- Bell, G. (2005), "Research notes and commentaries – clusters, networks, and firm innovativeness", *Strategic Management Journal*, Vol. 26 No. 3, pp. 287-295.
- Bierly, P. and Gallagher, S. (2007), "Explaining alliance partner selection: fit, trust and strategic expediency", *Long Range Planning*, Vol. 40 No. 2, pp. 134-153.
- Chacar, A. and Lieberman, M. (2003), "Organizing for technological innovation in the US pharmaceutical industry", *Advances in Strategic Management*, Vol. 20, pp. 317-340.
- Choi, T.Y. and Krause, D.R. (2006), "The supply base and its complexity: implications for transaction costs, risks, responsiveness, and innovation", *Journal of Operations Management*, Vol. 24 No. 5, pp. 637-652.
- Choi, T.Y., Wu, Z., Ellram, L. and Koka, B. (2002), "Supplier-supplier relationships and their implications for buyer-supplier relationships", *IEEE Transactions on Engineering Management*, Vol. 49 No. 2, pp. 119-130.
- Creane, A. (2008), "Input suppliers, differential pricing, and information sharing agreements", *Journal of Economics & Management Strategy*, Vol. 17 No. 4, pp. 865-893.
- Doty, D.H. and Glick, W.H. (1994), "Typologies as a unique form of theory building: toward improved understanding and modelling", *Academy of Management Review*, Vol. 19 No. 2, pp. 230-251.
- Droge, C., Jayaram, J. and Vickery, S.K. (2004), "The effects of internal versus external integration practices on time-based performance and overall firm performance", *Journal of Operations Management*, Vol. 22 No. 6, pp. 557-573.
- Eisenhardt, K. (1989), "Building theories from case study research", *Academy of Management Review*, Vol. 14 No. 4, pp. 532-550.
- Ford, D., Gadde, L.E., Håkansson, H. and Snehota, I. (2003), *Managing Business Relationships*, 2nd ed., Wiley, Chichester.
- Garrette, B., Castaner, X. and Dussauge, P. (2009), "Horizontal alliances as an alternative to autonomous production: product expansion mode choice in the worldwide aircraft industry 1945-2000", *Strategic Management Journal*, Vol. 30 No. 8, pp. 885-894.
- George, G., Wood, J.R., D. R. and Khan, R. (2001), "Networking strategy of boards: implications for small and medium-sized enterprises", *Entrepreneurship & Regional Development*, Vol. 13 No. 3, pp. 269-285.
- Gulati, R., Nohria, N. and Zaheer, A. (2000), "Strategic networks", *Strategic Management Journal*, Vol. 21 No. 3, pp. 203-215.
- Harvey, C., Kelly, A., Morris, H. and Rowlinson, M. (2010), *Academic Journal Quality Guide*, 4th ed., The Association of Business Schools, London.
- Hoetker, G. and Mellewigt, T. (2009), "Choice and performance of governance mechanisms: matching alliance governance to asset type", *Strategic Management Journal*, Vol. 30 No. 10, pp. 1025-1044.
- Hoffmann, R.H. (2007), "Strategies for managing a portfolio of alliances", *Strategic Management Journal*, Vol. 28 No. 8, pp. 827-856.
- Hung, S. (2002), "Mobilising networks to achieve strategic difference", *Long Range Planning*, Vol. 35 No. 6, pp. 565-566.
- Ingram, P. and Baum, J. (2001), "Interorganizational learning and the dynamics of chain relationships", *Advances in Strategic Management*, Vol. 18, pp. 109-139.

- Jian, L., Ding, F. and Vinod, L. (2000), "Using data envelopment analysis to compare suppliers for supplier selection and performance improvement", *Supply Chain Management*, Vol. 5 No. 3, pp. 143-150.
- Jiang, B., Belohlav, J.A. and Young, S.T. (2007), "Outsourcing impact on manufacturing firms' value: evidence from Japan", *Journal of Operations Management*, Vol. 25 No. 4, pp. 885-900.
- Jitpaiboon, T., Dangols, R. and Walters, J. (2009), "The study of cooperative relationships and mass customization", *Management Research Review*, Vol. 32 No. 9, pp. 804-815.
- Karim, S. and Mitchell, W. (2004), "Innovating through acquisition and internal development: a quarter-century of boundary evolution at Johnson & Johnson", *Long Range Planning*, Vol. 37 No. 6, pp. 525-547.
- Krause, D.R., Handfield, R.B. and Tyler, B.B. (2007), "The relationships between supplier development, commitment, social capital accumulation and performance improvement", *Journal of Operations Management*, Vol. 25 No. 2, pp. 528-545.
- Kroes, J.R. and Ghosh, S. (2010), "Outsourcing congruence with competitive priorities: impact on supply chain and firm performance", *Journal of Operations Management*, Vol. 28 No. 2, pp. 124-143.
- Lai, K., Cheng, T.C.E. and Yeung, A.C.L. (2005), "Relationship stability and supplier commitment to quality", *International Journal of Production Economics*, Vol. 96 No. 3, pp. 397-410.
- Li, J., Zhou, C. and Zajac, E.J. (2009), "Control, collaboration, and productivity in international joint ventures: theory and evidence", *Strategic Management Journal*, Vol. 30 No. 8, pp. 865-884.
- Li, W., Humphreys, P.K., Yeung, A.C.L. and Cheng, T.C.E. (2007), "The impact of specific supplier development efforts on buyer competitive advantage: an empirical model", *International Journal of Production Economics*, Vol. 106 No. 1, pp. 230-247.
- McCutcheon, D.M. and Meredith, J.R. (1993), "Conducting case study research in operations management", *Journal of Operations Management*, Vol. 11 No. 3, pp. 239-256.
- McGhee, G., Marland, G.R. and Atkinson, J.M. (2007), "Grounded theory research: literature reviewing and reflexivity", *Journal of Advanced Nursing*, Vol. 60 No. 3, pp. 334-342.
- Mazzola, E., Bruccoleri, M. and Perrone, G. (2009), "A strategic framework for firm networks in manufacturing industry: an empirical survey", *CIRP Annals – Manufacturing Technology*, Vol. 58 No. 1, pp. 387-390.
- Miles, M.B. and Huberman, A.M. (1994), *Qualitative Data Analysis: Grounded Theory Procedures and Techniques*, Sage, London.
- Mitchell, W., Dussauge, P. and Garrette, B. (2002), "Alliances with competitors: how to combine and protect key resources?", *Journal of Creativity and Innovation Management*, Vol. 11 No. 3, pp. 203-223.
- Nordin, F. (2008), "Linkages between service sourcing decisions and competitive advantage: a review, propositions, and illustrating cases", *International Journal of Production Economics*, Vol. 114 No. 1, pp. 40-55.
- Paulraj, A., Lado, A.A. and Chen, I.J. (2008), "Inter-organizational communication as a relational competency: antecedents and performance outcomes in collaborative buyer-supplier relationships", *Journal of Operations Management*, Vol. 26 No. 1, pp. 45-64.
- Porter, M.E. (1996), "What is strategy?", *Harvard Business Review*, Vol. 74 No. 6, pp. 61-78.

-
- Rhee, B., Verma, R. and Plaschka, G. (2009), "Understanding trade-offs in the supplier selection process: the role of flexibility, delivery, and value-added services/support", *International Journal of Production Economics*, Vol. 120 No. 1, pp. 30-41.
- Rosenzweig, E.D., Roth, A.V. and Dean, J.W. (2003), "The influence of an integration strategy on competitive capabilities and business performance: an exploratory study of consumer products manufacturers", *Journal of Operations Management*, Vol. 21 No. 4, pp. 437-456.
- Salvador, F., Forza, C., Rungtusanatham, M. and Choi, T. (2001), "Supply chain interactions and time-related performances: an operations management perspective", *International Journal of Operations & Production Management*, Vol. 21 No. 4, pp. 461-475.
- Shipilov, A., Rowley, T. and Aharonson, B. (2006), "When do networks matter? A study of tie formation and decay", *Advances in Strategic Management*, Vol. 23, pp. 481-519.
- Strauss, A. and Corbin, J. (1998), *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 2nd ed., Sage, Newbury Park, CA.
- Swink, M., Narasimhan, R. and Wang, C. (2007), "Managing beyond the factory walls: effects of four types of strategic integration on manufacturing plant performance", *Journal of Operations Management*, Vol. 25 No. 1, pp. 148-164.
- Szarka, J. (1990), "Networking and small firms", *International Small Business Journal*, Vol. 8 No. 2, pp. 10-22.
- Tsai, W. (2000), "Social capital, strategic relatedness and the formation of intraorganizational linkages", *Strategic Management Journal*, Vol. 21 No. 9, pp. 925-939.
- Villalonga, B. and McGahan, A. (2005), "The choice among acquisitions, alliances, and divestitures", *Strategic Management Journal*, Vol. 26 No. 13, pp. 1183-1208.
- Voss, C. (2009), "Case research in operations management", in Karlsson, C. (Ed.), *Researching Operations Management*, Routledge, New York, NY.
- Yang, H., Lin, Z. and Lin, Y. (2010), "A multilevel framework of firm boundaries: firm characteristics, dyadic differences, and network attributes", *Strategic Management Journal*, Vol. 31 No. 3, pp. 237-261.
- Yin, R.K. (2009), *Case Study Research: Design and Methods*, 4th ed., Sage, Thousand Oaks, CA.
- Zhao, X., Zhao, H. and Hou, J. (2010), "B2B e-hubs and information integration in supply chain operations", *Management Research Review*, Vol. 33 No. 10, pp. 961-979.

Further reading

- Lin, Z.J., Peng, M.W., Yang, H. and Sun, S.L. (2009), "How do networks and learning drive M&AS? An institutional comparison between China and the United States", *Strategic Management Journal*, Vol. 30 No. 10, pp. 1113-1132.

(Appendices follow overleaf.)

Table A1.
Operations management
studies

Authors	Journal	Objectives	Decisions	Kinds of agreement contracts
Autry and Golicic (2010)	<i>Journal of Operations Management</i>	Improve operations performance	Type of relationship with suppliers	Sourcing
Kroes and Ghosh (2010)	<i>Journal of Operations Management</i>	Improve supply chain and business performance	Outsourcing decisions	Outsourcing
Bakshi and Kleindorfer (2009)	<i>Production and Operations Management</i>	Improve supply chain resilience	Co-competition vs competition in the context of managing supply chain security	Cooperative contract
Rhee <i>et al.</i> (2009)	<i>International Journal of Production Economics</i>	Achieve superior business performance	Supplier selection	Sourcing
Nordin (2008)	<i>International Journal of Production Economics</i>	Achieve competitive advantage	Service sourcing decisions Make-or-buy issues Supply-based structure	Sourcing
Paulraj <i>et al.</i> (2008)	<i>Journal of Operations Management</i>	Improve operations performance	Nature of buyer-seller relationship Type of relationships with suppliers Network governance	Sourcing
Jiang <i>et al.</i> (2007)	<i>Journal of Operations Management</i>	Improve firm's market value	Information technology Outsource or not Outsourcing either core or non-core activities Offshore or domestic outsourcing	Outsourcing
Krause <i>et al.</i> (2007)	<i>Journal of Operations Management</i>	Improve operation performance	Outsourcing term Commitment term Level of cognitive capital sharing Level of information sharing Level of involvement in supplier's activities Length of relationships with key suppliers Level of reliance on suppliers	Sourcing

(continued)

Authors	Journal	Objectives	Decisions	Kinds of agreement contracts
Li <i>et al.</i> (2007)	<i>International Journal of Production Economics</i>	Improve competitive advantage	Supplier development efforts	Sourcing
Swink <i>et al.</i> (2007)	<i>Journal of Operations Management</i>	Improve manufacturing-based competitive capabilities and business-level performance	Level of integration with customers and suppliers	Sourcing
Choi and Krause (2006)	<i>Journal of Operations Management</i>	Improve operations performance	Level of complexity of the supply base	Sourcing
Lai <i>et al.</i> (2005)	<i>International Journal of Production Economics</i>	Ensure quality	Relationship stability and supplier commitment	Sourcing
Droge <i>et al.</i> (2004)	<i>Journal of Operations Management</i>	Improve time-based and firm performance	The level of integration with suppliers and customers for design and development activities	Sourcing
Rosenzweig <i>et al.</i> (2003)	<i>Journal of Operations Management</i>	Improve competitive capabilities and business performance	The level of integration with supply chain entities	Sourcing
Choi <i>et al.</i> (2002)	<i>IEEE Transactions on Engineering Management</i>	Improve operations performance	Type of relationship structure among suppliers	Sourcing
Salvador <i>et al.</i> (2001)	<i>Production and Operations Management Journal</i>	Improve time-related performance	Governance mechanism with customers and suppliers	Sourcing
Jian <i>et al.</i> (2000)	<i>Supply Chain Management</i>	Improve operations performance	Supplier selection	Sourcing

Table AI.

Appendix 2

Table AII.
Strategic management studies

Authors	Journal	Objectives	Decisions	Kinds of agreement contracts
Yang <i>et al.</i> (2010)	<i>Strategic Management Journal</i>	Acquire necessary external resources	Non-partnering, allying or acquiring	Acquisition Alliance
Garrette <i>et al.</i> (2009)	<i>Strategic Management Journal</i>	Product expansion	Make or ally	Alliance
Hoetker and Mellevigt (2009)	<i>Strategic Management Journal</i>	Improve alliance performance	Governance mechanisms	Alliance
Li <i>et al.</i> (2009)	<i>Strategic Management Journal</i>	Improve IJV productivity	Control and collaboration mechanism to adopt in IJV (partner commitment, partner knowledge contributions, partner risks)	International joint venture
Belderbos <i>et al.</i> (2008)	<i>Journal of Economics and Management Strategy</i>	Capture a larger share of profits on the foreign market (for the leading firm) Defend home market position	Strategic R&D location (foreign vs local)	Inter-firm R&D spillover
Creane (2008)	<i>Journal of Economics and Management Strategy</i>	Increase profits related to the buyer-supplier relationship	Level of information-sharing with suppliers	Sourcing
Hoffmann (2007)	<i>Strategic Management Journal</i>	Improve company performance	Choice among different types of portfolio of alliances	Alliance
Bierly and Gallagher (2007)	<i>Long Range Planning</i>	Obtain resources and capabilities	Alliance partner selection	Alliance
Shipilov <i>et al.</i> (2006)	<i>Advances in Strategic Management</i>	Share complimentary resources	Partner selection	Partnership
Bell (2005)	<i>Strategic Management Journal</i>	Increase innovation	Collaborative firm location	Cluster
Villalonga and McGahan (2005)	<i>Strategic Management Journal</i>	Acquire intangible resources to diversify, expand and/or complement firm's resource endowment	Acquisitions, alliances or divestitures	Acquisitions
Karin and Mitchell (2004)	<i>Long Range Planning</i>	Increase value and innovation	Redefinition of unit and firm boundaries	Divestitures
Chacar and Lieberman (2003)	<i>Advances in Strategic Management</i>	Increase innovation	Strategic R&D location (foreign vs local)	Acquisition
Hung (2002)	<i>Long Range Planning</i>	Gain access to a structure of network resources in order to achieve strategic differentiation	Rely on very different social network relations	Inter-firm R&D spillover
Ingram and Baum (2001)	<i>Advances in Strategic Management</i>	Acquire operating know-how	Build chain between hotels	Social network
Tsai (2000)	<i>Strategic Management Journal</i>	Exchange resources	Network formation	Chain relationship
				Not specified

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