Exploratory innovation

- the impact of collaborative buyer-supplier relationships, organizational learning and ethical climate -

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January, 2012
**Summary**

**Problem statement**

Innovations are of vital importance for companies in the industrial sector, in order to gain and maintain a good competitive position. Innovations are indispensable for any manufacturing firm (Hult et al., 2004; Ireland and Webb, 2006). Exploitative and exploratory innovation are two different forms of innovation (Benner and Tushman, 2003). In our study we have focused on exploratory innovation, the more radical form of innovation. Such radical improvements 'represent technical advance so significant that no increase in scale, efficiency, or design can make older technologies competitive with the new technology' (Tushman and Anderson, 1986: 441). Exploratory innovations require new knowledge, competences and relations, because they offer new technological innovation activities targeting new product/market domains (Abertnathy and Clark, 1985; He and Wong, 2004).

In view of exploratory innovation, relationships between buyers and suppliers receive much attention, where purchasing plays an important role, involving suppliers in a firm’s innovation projects (Spekman and Carraway, 2006). New technologies, needed for radical innovations, are often part of the core competences of suppliers. Therefore, buyers are advised to set up good cooperation with their main strategic suppliers in order to gain access to upcoming technologies (Zirpoli and Caputo, 2002). In order to stay innovative with the purpose of a persistent competitive advantage, and organizing and operating it in an effective and efficient manner, good cooperation between buyers and suppliers is believed to be crucial (Chen et al., 2008, Nyaga et al., 2010). Another factor could be organizational learning which can answer internal and external changes to a company, such as new information sources, new technologies, improved management applications and new competitors (Paiva et al., 2008). It is an on-going process to improve collective skills and qualities within the entire organization (Huber, 1991). Also, the ethical climate could have a positive impact on a firm’s exploratory innovations. An ethical climate is a work climate that can best be understood and approached involving organizational procedures, policy and practices with moral consequences (Cullen et al., 2003). Gonzalez-Padron et al., (2008) found that in a work environment that is characterized by ethics being valued highly, teamwork has a stronger relationship with innovation than a work environment that does not consider ethical climate on a daily basis. So far, there has been a lack of research in the field of innovation from a buyer-supplier relationship approach (Roy et al., 2004). Further research is requested, which leads to extended knowledge in the fields of ethics and purchasing. No research has been done into a combined impact of buyer-supplier relationships, organizational learning and ethical climate on exploratory innovation. This study aims to fill the gap in literature on exploratory innovation and to empirically test hypotheses deducted from literature. The problem statement is:

What is the effect of collaborative buyer-supplier relationships, organizational learning and ethical climate on exploratory innovation?

Based on literature studies, in the field of collaborative buyer-supplier relationships a distinction has been made between joint planning, joint problem solving, and flexibility. Important motivators for organizational learning derived from literature studies are market-focused learning, internally-focused learning, and relationally-focused learning.

**Research method**

In order to test the hypotheses, a questionnaire has been administered to 550 purchasing professionals within manufacturing companies in the Netherlands. The companies were ad random selected from a database of small and medium sized, manufacturing companies (50 to 500 employees). The industrial sector is important to this study, because for the major part product developments take place in this sector. The insights of purchasers were gathered in order to find out what the impact would be of collaborative buyer-supplier relationships in the product development process.
As the purchasing part for products to be developed is high among manufacturers, purchasers play an important role in the procurement that needs to be done, including in the field of innovative products. A total number of 88 questionnaires were returned that had been completed entirely by purchasing professionals, resulting in an effective response rate of 16%.

Results
Validity was secured by means of a factor analysis and a reliability analysis. The solution of the factor analysis resulted in six constructs (explanatory variables), of which the Cronbach’s Alpha coefficients were all higher than 0.70. Multiple regression analysis was used to investigate the effect of the exploratory variables on exploratory innovation. The adjusted $R^2$ is 0.38, which means that 40% of the variance in exploratory innovation can be explained by the variables in the model.

The survey data have been used to test the six hypotheses in this research. The main conclusion is that organizational learning has a positive impact on exploratory innovation. To be more precise, both internally-focused learning and relationally-focused learning have a significant, positive impact on exploratory innovation. Market-focused learning appears to have no impact on exploratory innovation. In addition, collaboration with suppliers did not seem to impact exploratory innovation as well. The study did not confirm a relationship between exploratory innovation and joint planning and joint problem solving. Furthermore, no impact on exploratory innovation could be established from the ethical climate.

Recommendations
This study leads to the following advice to practitioners:
- Realize good in-house R&D with an orientation on networks in order to enlarge innovativeness and therefore enhance performance in the field of exploratory innovation.
- Use new technologies and know-how, which support internal development of in-house R&D and which are complemented by strategic cooperation in networks.
- Do not overestimate cooperation with suppliers in the field of exploratory innovation. Instead, focus on maintaining and creating innovation-oriented networks that are centred around exploratory innovation, which is a good basis for strong in-house R&D.
- Do not expect too much from ethical climate in relation to exploratory innovation. Results do not indicate a positive impact on exploratory innovation.

Suggestions for further research:
- Case studies into innovation-oriented manufacturers, including the possibilities of early integration of purchasers in the development process of new products. It would be advised to screen manufacturers beforehand based on their innovativeness in order to come up with a good levels system of innovation.
- Cooperation between managers of various departments of a company, marketing, for instance, or R&D, purchasing, sales, and production related to innovation.
- Based on this research, remove and/or add variables to the conceptual model, such as corporate culture, leadership, etc. Moreover, various types of innovations could be distinguished in the model, such as radical and incremental innovations.
- A survey among large companies as these companies are likely to be involved differently in exploratory innovations, compared to the small and medium sized companies of our study.
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1 Introduction

1.1 Problem statement

A fast changing business environment is characterized by a rapid changing of technologies, shorter product lifetimes, more segmented and demanding customers in terms of customization, newness, quality and price. Prompt forming and changing markets, have constrained firms to be innovative. A significant part of the success of manufacturing firms is the degree of innovativeness. This involves the capacity of a firm occupied in innovation, which is the introduction of new processes, products or ideas in the organization (Hult et al., 2004).

New sources of information, new technologies, new management practices and new competitors highlight the importance of organizational knowledge in manufacturing firms (Paiva et al., 2008). The conclusion is that innovation is valuable for the continuity of a firm. For this reason, there is a revival of interest among researchers for the role of competitive strategy. The capability of a firm to learn from market changes is a source of both innovation and competitive advantage (Day, 1994). Innovation also means exploiting new technology and employing out-of-the box thinking in order to generate new value and bring about significant changes in society. It proves the skills a firm has in the field of effective organizational learning (Hippel, 1994).

In order to exploit today’s competitive advantages, it is important for firms to capture efforts while exploring innovations that will be the basis for tomorrow’s competitive advantages. This is called strategic entrepreneurship which means firms undertaking actions to exploit the innovations that result from its efforts to continuously explore innovation-based opportunities (Ireland and Webb, 2006). Underlying this strong interest is the notion that ‘really new’ products are crucial to firm survival in the current fast-changing business environment.

A distinction can be made between exploitative and exploratory innovation (Benner and Tushman, 2003). Exploitative innovations are incremental innovations, that are designed to meet the needs of existing customers or markets (Benner and Tushman, 2003; Danneels, 2002). Exploitative innovations build on existing knowledge and reinforce existing skills, processes, and structures (Benner and Tushman, 2003; Levinthal and March, 1993; McGrath, 2001). The reverse is exploratory innovations, radical innovations, which are designed to meet the needs of emerging customers or markets (Benner and Tushman, 2003; Danneels, 2002). They offer new designs, create new markets, and develop new channels of distribution (Abernathy and Clark, 1985). Exploratory innovations require new knowledge or departure from existing knowledge (Benner and Tushman, 2003; Levinthal and March, 1993; McGrath, 2001). He and Wong (2004) posit that an explorative innovation strategy contains technological innovation activities targeting new product-market domains. The study of this paper focuses on exploratory innovation.

Product innovation has been recognized as a primary means of corporate and engine modernization (Dougherty, 1992). At the same time, firms have been stimulated to develop more innovative rather than incremental products and there has been an emphasis on the development and marketing of new products (e.g. Journal of Product Innovation Management, 1998). The introduction of radical innovations in a firm that break the established pattern requires different techniques from the one that are in the subsequent focus of attention. The role of the supplier in this context is primarily to support the process of innovation of the buyer. Of course, this does not exclude (rather: also requires) new ideas from the seller to be brought into the buying firm proactively. However, a more typical case will be the buyer who already has an idea on what is wanted, but does not see a way to realize this idea, or it is simply beyond this person’s core competencies and thus incumbent on a supplier (Schiele, 2006).
It is important to keep operating innovatively, effectively and efficiently is important, especially in the perspective of supplier-buyer collaboration. Success in new product development projects and innovation tends to correlate with the quality of collaboration (Hoegl and Wagner, 2005). How to create radical, exploratory innovation is crucial to buyer-supplier collaboration (Chen et al., 2008). Cavone et al., (2000) specify that the main features of experimental programmes involve a continuous search for new technological solutions and learning processes aimed at strengthening the knowledge a firm bases to exploit programmes for exploratory learning. Given new technologies are very often closely associated with the core competencies of the inventing firm (supplier), buying firms should develop and manage collaborative relationships with their key strategic suppliers in order to gain access to key emerging technologies (Zirpoli and Caputo, 2002).

A firm may develop a competitive advantage and innovations by creating assets that specialize in conjunction with the assets of a business partner. Sako et al., (1994) emphasized a rich flow of information, leading to improved learning and better solutions by developing collaborative supplier relationships. In order to be able to understand, acquire and benefit from technology that changes rapidly, transactions have to be governed through cooperative relations (Nesheim, 2001). Nesheim (2001) found empirical evidence for a positive impact of asset specificity and the level of change related to the core on collaborative relationships in transactions with suppliers.

Competitive pressure has caused a need for exchange partners to achieve inter-firm integration between buyer and supplier (Spekman and Carraway, 2006). Firms are building more and more collaborative relationships with their supply chain partners in order to achieve efficiencies, flexibility, and a competitive advantage (Nyaga et al., 2010). Many studies have confirmed the positive effects of collaborative relationships (Dwyer et al., 1987; Heide and John, 1990; Ganesan, 1994; Daugherty et al., 2006). However, many firms struggle to achieve collaboration and/or the expected benefits (Frankel et al., 2002).

Organizational learning is a necessary resource and capability for firms seeking to sustain a competitive advantage in the marketplace (Barney, 1991). Organizational learning is defined as an organization-wide continuous process that enhances its collective ability to accept, make sense of, and respond to internal and external change. It requires systematic integration and collective interpretation of new knowledge that leads to collective action and involves risk taking such as experimentation (Huber, 1991). Double-loop learning is closely aligned with exploratory innovation (Auh and Menguc, 2005). Argyris (1982) describes the concept of double-loop learning in which an individual, organization or entity is able to achieve a goal on different occasions in order to modify the goal in the light of the experience or possibly even reject the goal. Exploration is concerned with challenging existing ideas with innovative and entrepreneurial concepts (March, 1991).

Ethical climate refers to the degree of organizational commitment to ethical responsibilities of corporate citizenship and requires the following of moral rules defining appropriate behaviour in society (Maignan and Ferrell, 2000). Business ethics are concerned with questions about the decisional freedoms involved in innovation processes (Hanekamp, 2007). Business ethics of innovation strive to give orientation in settings where products, new markets, and new environments are predominant. The provision of new products and solutions is inseparably intertwined with the consequence of their use (Hanekamp, 2005). Innovation for sustainability requires an organizational climate for sustainability grounded in ethics. In others words, an ethical climate is essential to promote innovation for sustainability (Arnaud and Sekerka, 2010). Firms have a major advantage in that they are able to respond more rapidly to changing signals in the marketplace and take advantage of new niche markets for products, the adoption of radical new technology or the introduction of new products that incorporate social and/or environmental benefits into their value (Jenkins, 2009).
Gonzalez-Padron et al., (2008) examined relationships between organizational culture, entrepreneurial innovations, and relationship quality in different ethical climates. On an increasing scale, innovation takes place outside of the isolated laboratory of a firm, but it involves the supply chain including the firm’s suppliers (Schiele, 2006). Still, there is a lack of research into innovation generation in buyer-supplier relationships (Roy et al., 2004), let alone, into the role of purchasing in fostering such innovative collaborations (Chen et al., 2004). However, no study has examined the combined impact of collaborative buyer-supplier relationships and organizational learning on exploratory innovation. Further research is also warranted, which leads to a further understanding of ethics and purchasing. This study is aimed at exploring the relationship between collaborative buyer-supplier relationships, organizational learning, ethical climate and exploratory innovation. The following problem statement is investigated in this study:

What is the effect of collaborative buyer-supplier relationships, organizational learning and ethical climate on exploratory innovation?

1.2 Research method

This study investigates the relationship between collaboration in buyer-supplier relationships, organizational learning, ethical climate and exploratory innovation. The aim of this study is to empirically test hypotheses that can be derived from the literature on factors explaining exploratory innovation. An empirical analysis is based on a survey among 550 purchasing professionals. In general terms, this study contributes to a better understanding of variables that impact exploratory innovativeness of companies. Respondents are invited to complete an on-line questionnaire. A follow-up mailing is sent in order to increase the effective response rate.
2 Literature study

2.1 Exploratory innovation

The notion of exploration and exploitation has been widely used in studies on organizational learning, strategic renewal and technological innovation (Li et al., 2008). March (1991) introduced the two concepts as follows: exploration includes things captured by terms such as search, variation, risk taking, experimentation, flexibility, discovery, and innovation. Exploitation includes things such as refinement, choice, production, efficiency, selection, implementation, and execution (March, 1991). These two concepts require different structures, processes, strategies, capabilities and cultures (Li et al., 2008).

Studies have displayed an amount of inconsistency in the interpretation of exploitation and exploration. The study of this paper emphasizes exploratory innovation. Selected interpretations/definitions of exploratory innovation are:

- Exploration is investing resources to refine and extend its existing product innovation knowledge, skills and processes (Atuahene-Gima and Li, 2004).
- Exploration is experimenting with radical new ideas or ways of doing things (Bierly and Daly, 2007).
- Investing in R&D is exploration (Cesaroni et al., 2005).
- Exploration is defined as a large variety of technological trajectories ever since a firm’s initial choice of technology (Dowell and Swaminathan, 2006).
- Exploratory collaboration is creating new competences such as those with universities and research institutes (Feams et al., 2005).
- Exploration is conducting research projects (Garcia et al., 2003).
- Explorative alliances are usually established in order to explore new technological opportunities (Hagedoorn and Duysters, 2002).
- The degree of exploration is indicated by a ‘search scope’, which defines how broadly a firm searches knowledge (Katila and Ahuja, 2002).
- Investment in unknown technological opportunities is exploration (Lee and Ryu, 2002).
- Exploration activities of managers include searching for new possibilities with respect to product, service, process or markets, which require learning of new skills and knowledge (Mom et al., 2007).
- Exploration is the scope of external information acquisition (a search view). External information acquisition is examined through a supply-side, demand-side, and a geographic side. It mixes up the value chain and knowledge dimensions (Sidhu et al., 2004).

All authors agree that exploration is a search for new knowledge, technology, competences, markets or relations (Li et al., 2008). Organizational exploration is a search for new knowledge, use of unfamiliar technologies, and creation of products with an unknown demand (Greve, 2007). Radical improvements ‘represent technical advance so significant that no increase in scale, efficiency, or design can make older technologies competitive with the new technology’. (Tushman and Anderson, 1986: 441).

Two features of exploratory innovation are important for deriving the hypothesis. First, exploratory innovation is diverse. It is difficult to obtain new technology in a routine and repeated manner, and even applying existing technology to make qualitatively new products is a process that is likely to differ all the time. As one moves towards exploitation, innovations become more homogeneous. Second, exploratory innovation is more risky than exploitative innovation because it requires acquisition of new knowledge, which is a difference that matters to the theory of risk taking.
Keeping these two differences in mind, learning rules have different consequences for exploration and exploratory innovations (Greve, 2007).

Innovation is affected by a variety of contexts (Pandey and Sharma, 2009). A literature review (Read, 2000) of research on the determinants of innovation indicate that the most important determinant of innovation identified for supporting creativity and an innovative culture in an organization were management support for innovation and an innovative culture. Amabile et al., (1996) explains that creativity requires a cognitive-perceptual style characterized by an ability to break a mental set and explore new cognitive pathways. Divergent thinking is widely considered to be an important antecedent to creativity because creative solutions are defined as unique or original in nature (Amabile, 1983). Divergent thinking involves generation of many ideas that differ from a quality perspective.

Product innovation requires a firm to have competences and each competence is constituted by a set of resources (Danneels, 2002). Customer competence gives a firm the ability to serve certain customers. Customer competence is constituted by market-related resources such as: knowledge of customer needs, preferences and purchasing procedures. Distribution and sales give access to customers, customer goodwill or franchise reflected in the reputation of a firm and its brands, and communication channels for the exchange of information between a firm and its customers during the development and commercialization of a product (Danneels, 2002). Technological competence gives a firm an ability to design and manufacture a physical product with certain features. Technological competence is constituted by technology related resources such as: design and engineering know-how, product and process design equipment, manufacturing facilities and know-how, and procedures for quality control. The fact that two types of competence have to come together in new product development has implications for the type of new products a firm pursues (Danneels 2002). Simultaneously considering exploitation and exploration of customer and technological competences leads to a matrix of new product types depicted in Figure 1.

![figure1](image_url)

**Figure 1 Competence-based new product typology**

Exploration is characterized by a difficult market potential, difficulty of technological feasibility assessment, impetus from current customers is weak, returns are unclear and remote in time, the needed scope of market and technological search is broad and project duration is long (Danneels, 2002). Exploration enhances the adaptation of an organization to a changing environment because it increases the variance of organizational activities (McGrath, 2001).
Organizational factors of an open system model, which seems to be the best fit for exploratory units of an organization, are innovation and change, non-routine task, insightful, adaptable and explorative. The terms used for this type of organization are innovative, aggressive, adaptable, and entrepreneurial (Pandey and Sharma, 2009).

The strategic entrepreneurship concept is important in that effective strategic entrepreneurship practices result in a firm being able to form a balance between opportunity-seeking (i.e. exploration) and advantage-seeking (i.e. exploitation) behaviours (Ireland et al., 2003). An ability to anticipate and properly respond to environmental change is one of the important outcomes of effective strategic entrepreneurship. An entrepreneurial culture is developed in an organization where leaders employ an entrepreneurial mind-set search for entrepreneurial opportunities existing in uncertain business environments and then determine the capabilities needed to successfully exploit those (Ireland et al., 2003).

The organizational characteristics that appear of innovative organizations are cultural characteristics, for instance, and refer to the kinds of behaviour that is valued and promoted in an organization. Four culture variables, related to the degree of innovativeness of the culture are participative decision-making, power sharing, support and collaboration, and learning and development. Participative decision-making is the degree of openness to involvement in decision-making. Power sharing is the degree of sharing information, resources and influence across various levels of organizational areas. Support and organization is the degree to which people in a group actively support and help one another in their work. Learning and development is the degree to which learning and development are encouraged in an organization (Hurley and Hult, 1998). It states that groups whose cultures are characterized by high levels of innovativeness will generate and adopt more new ideas, products and processes; that is, these will manifest greater learning through adoptions of more innovations. The innovativeness of the culture will affect the capacity to innovate positively.

In order to have entrepreneurship, one should have entrepreneurial opportunities. Entrepreneurial opportunities are situations in which new goods, services, raw materials, and organizing methods can be introduced and sold for more than the cost of production (Casson, 1982). Entrepreneurship involves creating new resources or combining existing resources in new ways in order to develop and commercialize new products, move into new markets, and/or service new customers (Ireland et al, 2003). An organization that promotes entrepreneurship is an organization that is capable of creating, learning and influencing the environment. Entrepreneurial behaviour in a learning framework involves search activities such as expending resources on the exploration of alternative possibilities, attempting to understand the relationship between organizational characteristics and outcomes, and determining the viability of organizational change (Ireland et al., 2003).

All successful companies in today’s globally competitive marketplace possess entrepreneurial and innovative capabilities for a timely and proactive response to a changing market, technological and competitive environment, and create flexible product, service and process innovation. Effectively coordinating and redeploying internal and external competencies and capabilities is vital for survival and prosperity. However, in order to sustain a competitive advantage and strategic performance in the long run, successful firms continue to invest in developing their entrepreneurial and innovative capabilities in order to remain distinct and valuable (Shum and Lin, 2010). Entrepreneurial innovations require a vision to predict what the market may come to look like by understanding and anticipating customer needs and competitor actions (Calantone et al., 2002).
Previous research has found evidence that collaborative buyer-supplier relationships influence entrepreneurial innovations. A common vision for future benefits, i.e. the development of new markets, new technologies or new capabilities, serves as the prime driver for collaboration. The development of common norms poses a precondition for characteristics as well. Both have to show a minimum level of compatibility, which enables the development of common norms, trust and a common vision. Another central characteristic is the personality of the relationship. Partnerships therefore rely on a web of personal relationships, which are not limited to CEO or sales forces or procurement. With increased personality other qualities of collaboration come into play, such as a compatibility of partners and the emotions necessarily entangled in everyday collaboration (Ploetner and Ehret, 2006).

Having experience in achieving a competitive advantage through quality improvements helps to build and maintain effective business relationships with suppliers. Chen et al., (2004) found the most relevant measures in supplier evaluation are those relating to collaborative buyer-supplier relationships. Understanding a partner’s power of innovation as part of the purchasing process has increasingly gained attention. Schiele (2006) developed a conceptual framework for identifying suppliers with a high potential of contributing to the entrepreneurial innovations capability of a firm. Firms that have a reputation for innovation with other relationships are perceived to be committed partners. Leverage of technical innovations from other buyer-supplier relationships increases the likelihood of future relationships (Johnson and Ford, 2006).

2.2 Collaborative buyer-supplier relationships

A growing need for large effectiveness in the operation of firms has forced more companies to focus on their core competencies, leading to the externalization of activities to partners and business actors, and thus, to increased dependence on each other’s resources and capabilities (Barney, 1991; Wernerfelt, 1984). The development is especially noticeable in the supply chain management philosophy: managers of companies face the fact that no organization can excel in every aspect and the integration of processes is essential in delivering value to customers. This requires intense collaboration among several actors in the supply network (Svahn and Westerlund, 2009).

The relationship between buyers and suppliers has received considerable attention. Due to the globalization of markets, corporate restructuring, and an increased focus on costs, quality, flexibility, and technology, an expanded role for procurement has emerged. Traditionally, purchasing used to be considered as a clerical function, where the relationship between buyers and suppliers tended to be adversarial. However, many organizations have moved towards a more collaborative approach. A healthy organization is considered to have structure, culture, and management processes that contribute to high levels of organizational performance. One aspect of organizational health concerns decisions regarding buyers and the development of good buyer-supplier relationships. (Spekman and Caraway, 2006).

The extended focus on cross-channel interaction has been examined in literature by comparing the types of relationship activities that foster cooperation, collaboration and/or integration. In a study of integration in US manufacturing firms, Ellinger et al., (2000) argue that overriding emphasis is the willingness of cross-functional departments to work together; to share ideas, information, and resources; and to develop and achieve collective goals. Similarly, Min et al. (2005) identified key activities within collaborative relationships, including joint planning and problem solving, the development of joint performance measures, and leveraged resources and skills. Sanders and Premus (2005) concluded that external collaboration includes activities such as sharing cost and information, developing cross-functional processes, and conducting joint planning with suppliers.
Collaborating partners work together to achieve mutual goals (Anderson and Narus, 1990; Morgan and Hunt, 1994). In buyer-supplier relationships, organizational boundaries are penetrated by the integration of activities as the supplier becomes involved in activities that traditionally are considered the responsibility of the buyer and vice versa (Yilmaz and Hunt, 2001). In literature, collaboration entails activities undertaken jointly rather than unilaterally (Heide, 1994; Zaheer and Venkatraman, 1995) as well as the flexibility to make adjustments (Bello and Gilliland, 1997; Noordewier et al., 1990).

Joint action comprises joint planning and joint problem solving. Joint planning refers to collaborative activities based on which future contingencies and consequential duties and responsibilities in a relationship are made explicit ex ante (Heide and John, 1990). It is an activity that operates as an aid or frame of reference rather than a strict specification of duties such as in a contract. Plans represent frameworks within which subsequent adaptations (e.g. joint problem solving) can be and are expected to be made (Macneil, 1981). When the actions of one partner influence the ability of the other partner to compete effectively, a need for jointly setting goals, long-term plans, responsibilities and expectations increases (Claro and Claro, 2010). Dwyer et al. (1987) suggest that the input provided in decision making and goal formulation is an important aspect of joint planning and improved planning performance. Joint planning then allows mutual expectations to be established and collaborative efforts to be specified at the outset.

Joint problem solving refers to joint activities to resolve disagreements, technical failures, and other unexpected situations (Heide and Miner, 1992; Lush and Brown, 1996). It motivates firms to continue their relationship because it assures them of the ability to reach mutually satisfactory solutions (Calantone et., 1998). Firms often attempt to persuade each other to adopt a particular solution to a problem situation. In collaboration, these persuasive attempts are more constructive than coercive or domimative (Dwyer et al., 1987). Furthermore, integrative outcomes satisfy more fully the needs and concerns of parties in a business relationship (Mohr and Spekman, 1994).

Flexibility to make adjustments is the bilateral expectation of a willingness to make adaptations in day-to-day management (Heide and John, 1990). Partners accept smooth alterations in practices and policies in the light of unforeseen or changing conditions. Flexibility is an essential relational norm (i.e., an expected pattern of behaviour, Macneil, 1981), which establishes ground rules for initial and future exchanges (Heide and John, 1990). In short-term trade, flexibility is external to the relationship and it is achieved by deliberately limiting the scope of transaction (Macneil, 1981). In a longer-term relationship, however, flexibility is incorporated into processes and it defines the bilateral expectation of a willingness to make adaptations as circumstances change. From the perspective of a supplier, it represents a guarantee that the relationship will be subject to good-faith modification if a particular practice proves detrimental in the light of changed circumstances (Claro and Claro, 2010).

Jap (1999) proposes that the coordinative efforts between suppliers and buyers distinguish truly collaborative exchange relationships from more traditional arm’s length exchanges. One characteristic of supply partnerships that has been linked to performance is the integration of decision-making between supply chain partners. A major focus in literature has been on joint activities in product design (Johnston et al., 2004). Rapidly changing technology exposes firms to risks that can be shared through joint product and process development and improvement (MacCormack and Iansiti, 1997).

Exploratory innovation of firms may be influenced by joint problem solving together with joint planning and flexibility in relation to adjustments that are important elements of collaborative relationships. Cooperation for innovation is increasingly seen as a means of lowering costs, accelerating product and process development, and maximizing commercialization opportunities. The capability of building and maintaining network relationships, such as joint ventures, supplier-buyer partnerships, and strategic alliances, is increasingly viewed as a key factor in sustaining a competitive advantage (Pannekoek et al., 2005).
Before formulating a hypothesis of collaboration (joint planning, problem solving and flexibility) in a buyer-supplier relationship in relation to exploratory innovation, each element of collaboration is discussed.

Joint planning deals with the ex ante issues in relationships. Future plans and strategic decisions can take into account exploratory innovation. Establishing a strategic supply partnership entails collaborative and interdependent work efforts with mutual planning efforts being encouraged (Ellram and Hendrick, 1995). The success of a relationship is therefore vital to an efficient and effective sourcing of goods and services. Early involvement of suppliers and customers in product design and process planning enhances opportunities for innovation (Bogdozan et al., 1998) while minimizing post-production problems (Cusumano and Takeishi, 1991). A permanent coordination of activities is crucial to the success of co-development projects between buyers and suppliers ((Fließ and Becker, 2006).

Joint problem solving is related to ex-post actions in relationships. Three overall success factors for co-development processes can be identified, namely: trust, constant communication, and achieving clear, reliable and timely decisions between partners. These include openness in communication and an early involvement of the partner in problems that might occur during the development process (Fließ and Becker, 2006).

Exploratory innovation may promote flexibility. Flexibility enables firms to introduce new products quickly, support product customization and reduce lead-times, costs and inventory, and deliver goods in a timely manner (Zhang et al., 2002, 2003). It is contended that collaborative buyer-supplier relationships may offer levels of supply chain flexibility that cannot be achieved under adversarial relations. Collaboration and strategic sourcing have shown a positive correlation with volume and modifications flexibilities in product design (Narasimhan and Das, 2001).

Considering joint planning, joint problem solving, and flexibility in a collaborative buyer supplier relationship on exploratory innovation, the hypotheses are as follows:

H1a: Joint planning in a collaborative buyer-supplier relationship has a positive impact on exploratory innovation.
H1b: Joint problem solving in a collaborative buyer-supplier relationship has a positive impact on exploratory innovation.
H1c: Flexibility in a collaborative buyer-supplier relationship has a positive impact on exploratory innovation.

2.3 Organizational learning

The learning climate and the innovation of a firm are highly correlated (Hurley and Hult, 1998; Damanpour, 1991; Sinkula et al., 1997). Organizational learning refers to an organization-wide activity of creating and using knowledge to enhance a competitive advantage. An organization committed to learning can improve its organizational capabilities in three ways. First, it is more likely to be committed to innovation, have state of the art technology, and use that technology in innovations. It is more likely to have the capacity to build and market a technological breakthrough (Calantone et al., 2002). Second, it is unlikely for the organization to miss any opportunity created by emerging market demand because it has the knowledge and ability to understand and anticipate customer needs (Damanpour, 1991). New products must reflect customer values if a risk of failure is to be minimized. Third, an organization committed to learning is likely to have a larger innovative capability than its competitors. One characteristic of such an organization is that it closely monitors actions of competitors in the market (Calantone et al., 2002).
Four components of organizational learning are identified by Calantone et al., (2002):

- Commitment to learning, which is the degree to which an organization values and promotes learning (Sinkula et al., 1997).
- Shared vision, which refers to an organization-wide focus on learning (Sinkula et al., 1997).
- Open-mindedness, which is a willingness to critically evaluate an organization’s routine and to accept new ideas (Sinkula et al., 1997).
- Intra-organizational knowledge sharing, which refers to collective beliefs or behavioural routines related to the spreading of learning among different units within an organization (Moorman and Miner, 1998).

Exploration of theoretical links between an industry structure and a firm’s capability of building activities has occurred. One of the approaches in this area is the ‘competition leads to competence’ approach, which suggests that as firms learn how to overcome specific competitive challenges, potentially valuable resources and capabilities are developed (Barnett et al., 1994). A related model in this area is labelled the ‘naive evolutionary model’ (Barnett et al., 1994). This model suggests that organizational learning is strengthened by competition. In a dynamic industry environment, firms tend to undertake greater learning. Industry structure (or dynamism) is viewed as a precursor to market opportunity (Weerawardena et al., 2006).

Marketers have fully embraced the organizational learning concept; their primary focus has been on market-focused learning, which has primarily evolved within market orientation literature (Jaworski and Kohli, 1993; Slater and Narver, 1995). Market orientation is not a sufficient condition to facilitate a type of innovation that creates a long-term competitive advantage (Baker and Sinkula, 1999) and recent literature suggest a need to incorporate all forms of learning pursued by a firm in its drive for innovation. Included among the various sources of learning available to a firm are market-focused learning, internally-focused learning, and relationally-focused learning (Weerawardena et al., 2006).

Market-focused and relationally-focused learning capabilities are externally oriented, whereas internally-focused learning capabilities reflect firm’s capacity to learn from internal sources, which are constrained within the company. The proponents of the process school of organizational learning conceptualize learning in terms of three processes, namely encompassing knowledge acquisition, dissemination, and the use of knowledge (Huber, 1991; Slater and Narver, 1995). In addition to these three processes, there is an importance of a forth one, namely unlearning. Unlearning is a process of intentionally discarding past beliefs that are no longer productive (Day, 1994).

Market-focused learning is the capacity of a firm to acquire, disseminate, unlearn, and use market information for the purpose organizational change. Literature on market-driven firms suggests that market-driven firms stand out in their ability to continuously sense and act on events and trends in their markets (Day, 1994). In a similar manner, Slater and Narver (1995) argue that a market-driven firm is well positioned to anticipate developing needs and to respond to these through the addition of innovative products and services. In order to be effective innovators, organizations need to scan the environment, analyse, and understand the industry structure in order to be alert to new opportunities, as argued by Baker and Sinkula (2002).

Along with market-focused learning, recently internally-focused learning has become a significant interest (Weerawardena et al., 2006). Internally-focused learning is a capacity and the extent to which a firm develops knowledge through internal sources and manages to disseminate, unlearn, and use this knowledge for organizational change. Internally-focused learning includes experimental learning (trial and error learning), like an experiment (developing new ways of doing things) (Huber, 1991).
A commonly pursued experimental learning activity in a manufacturing firm is in-house R&D. Such an activity is interpreted as a search process to learn and generate cumulative technical advances in specific directions. Industry-specific characteristics, such as the degree of competition, demand, appropriability conditions, and technological opportunities, can influence internally-focused learning (Cohen and Levinthal, 1990). Internally-focused learning is a core competency pertaining a strong internal focus of knowledge development, which results in a fundamental basis of competitive advantage for a firm (Weerawardena et al., 2006).

In addition to learning from markets and through internal sources, firms learn from links with other firms and external research institutions, such as universities and industry associations. Although internally-focused learning may be necessary, firms also have to access external resources and modify them in order to develop the capabilities needed to respond to environmental changes effectively (Rothwell, 1990). Relationally-focused learning is defined as a capacity and the extent to which a firm acquires knowledge through external linkages or networks, and disseminates, unlearns, and uses such knowledge for organizational change (Weerawardena et al., 2006).

It has been argued that collaborative linkages or ‘networking’ improve the potential of an organization to develop innovations (Lee et al., 2001). As Powell et al. (1996) suggest, in industries in which know-how is critical, companies must be experts at both in-house research and cooperative research with external partners such as university scientists and skilled competitors. As such, it is argued that relationally-focused-learning is a complementary learning orientation along with market-focused and internally-focused learning. Relationally-focused learning is a critical learning capability in a firm’s quest to gain positional advantages in a competitive environment (Weerawardena et al., 2006).

Environmental change defines the radicalism required in products in order to stay competitive. The environment is thus one of the main elements that influence learning, by providing, evaluating, and promoting the learning process and level of learning (Gracia-Morales et al., 2006). A firm’s learning capabilities play a crucial role in generating innovations (Sinkula et al., 1997). Organizational learning capabilities are a prerequisite for innovation. Firms operating within a competitive industry environment undertake greater learning through a broader set of learning orientations (Weerawardena et al., 2006). What may be seen as drivers of the innovation process within firms is their learning, and the point emphasized that such learning can be market-focused, internally-focused and/or relationally-focused. All these three forms of learning are closely related to exploratory innovation. Thus, hypotheses are as follows:

- **H2a** Market-focused learning has a positive impact on exploratory innovation.
- **H2b** Internally-focused learning has a positive impact on exploratory innovation.
- **H2c** Relationally-focused learning has a positive impact on exploratory innovation.

### 2.4 Ethical climate

Literature offers numerous definitions of ethics. Crane and Matten, (2004) define business ethics as a study of business situations, activities, and decisions where issues of right and wrong are addressed. Ethical practice is defined as a practice that is both legal and morally acceptable to the larger community, while unethical practice is a practice that is illegal or morally unacceptable to the larger community (Chau and Siu, 2000).

Ethical responsibility overcomes a limitation of law by creating an ethics ethos that companies can comply with (Solomon, 1994). It portrays business as being moral, and doing what is right, just, and fair. Therefore, ethical responsibility encompasses activities that are not necessarily codified into law, but nevertheless are expected of businesses by social members such as respecting people, avoiding social harm, and preventing social injury.
Ethical climate is a type of work climate that is best understood as a group of perspective climates reflecting the organizational procedures, policies and practices with moral consequences. Such climates arise when members believe that certain forms of ethical reasoning or behaviour are expected norms for decision-making within a business (Cullen et al., 2003). Ethical climate becomes a psychological mechanism through which ethical climate influences both the decision-making and the subsequent behaviour in response to ethical dilemmas. Gonzalez-Padron et al. (2008) find that in a climate valuing ethics, teamwork has a much closer relationship with innovation than in a lower ethical climate. An ethical workplace climate is important to raise innovation for sustainability (Arnaud and Sekerka, 2010).

The business community is confronted with an enormous range and complexity of ethical problems. Unethical practices appear in many forms. Besides outright fraud, one can find unfair competition, unfair communication, non-respect of agreements, and unfair attitudes towards and treatment of stakeholders through an abuse of power or due to conflicts of interest (Crane and Matten, 2004). An important hype of interest has emerged over the last decade through bonus and stock option schemes, culminating in the dot.com hype (Fassin, 2005). In all actions, a duality can be seen in the common interests and personal interests. In business, this reflects the contradiction between company interests and the interests of individuals.

In 1991, Caroll revised his four-part definition of corporate social responsibility (CSR) and organized a notion of multiple corporate social responsibilities in a pyramid construct (Figure 2). This pyramid shows economic responsibility as a basic foundation and discretionary responsibility is the apex. This revised conceptualization implies that four responsibilities are aggregative in a sense that businesses that want to be ethical must be economically and legally responsible, for instance. From this perspective, economic and legal responsibilities are socially required, ethical responsibility is socially expected, while philanthropy is socially desired (Windsor, 2001) and each of these responsibilities compromise components of the total social responsibility of a firm.

![Figure 2 A hierarchy of Corporate Social Responsibility](image)

In 1991, Wood revised the Corporate Social Performance (CSP) model. Wood (1991) introduced important refinements in the model by going beyond an identification of the different types of responsibilities to examine issues relating to the principles motivating responsible behaviour, the processes of responsiveness and the outcomes of performance.
A comprehensive and integrated CSR approach would ideally be made up of three aspects of CSP (principles, processes and outcomes), across all operations of a firm (economic, legal, ethical, and discretionary). Businesses may opt to prioritize their responsibilities and fully concentrate on the fulfilment of one or two types of responsibilities at the expense of others, but there is a risk of being judged as irresponsible, particularly if there is a focus is on the traditional economic domain (Jamali and Mirshak, 2007).

Codes of ethics have been widely studied for some time. Murphy (1995) found that more than 90% of the firms he investigated had an ethics code or some other type of ethics statement. In order to ensure that a code of conduct is much more than simply a commitment on paper, firms set up procedures to audit compliance with the code and to promote the awareness of the code. Auditing is a process in which a business measures, evaluates, reports and adapts its social impact and ethical behaviour in the light of the values and expectations of stakeholders. A more practical approach is to make use of existing certifications, such as ISO 9001 and ISO 14001. An instrument related to auditing is the publication of an annual social report. Whereas codes of conduct, ISO certifications and social reports improve the accountability of a firm to external stakeholders, other instruments are particularly useful to organize the responsibility to internal stakeholders, such as employees. An internal social handbook may clarify the position of employees by defining rules with respect to employee labour conditions (Graafland et al., 2003).

How can companies achieve added value and competitive advantage through realizing and maximizing opportunities presented by CSR? Drivers for business success are entrepreneurship, a competitive instinct and a willingness to look for innovation from non-traditional areas such as those increasingly found within the CSR agenda. These are termed Corporate Social Opportunities (CSO) and are described as commercially viable activities and social sustainability. The goal is to be able to create an environment where numerous CSOs are possible (Grayson and Hodges, 2004).

Porter and van der Linde, (1995) challenge the notion that environmental goals involve a trade-off between social benefits and private costs. The ‘Porter hypothesis’ proposes that innovation can stem from environmental issues, which can lead to a commercial competitive advantage. Porter and Kramer (2006) argue that a disconnection between CSR approaches of companies and their business strategies obscures the greatest opportunities for companies to benefit society and for them to realize a competitive advantage. Companies are willing to look for a competitive advantage by seeking opportunities in less traditional ways, e.g. through CSR. There are three dimensions to CSO – innovation, namely new products and services, serving unserved markets, and building new business models (Jenkins, 2009).

Innovations are not only there for businesses, but also - and partly for different reasons - for the state, for society, for different communities and for the economy. It can be essential to business actors to consider them comprehensively in order to adequately address the corresponding interests or problems in decisions (Hanekamp, 2007). Defining innovation as a relationship between technology and community accounts for the many times a technology can be innovative as it is deployed in different communities. This focus on the relationship also highlights the shared responsibility for the consequences of an innovation (Kaplan 1999). Innovation includes making a match between a solution and a community. In order to promote innovation for sustainability, firms need to develop a collective sensitivity to sustainability, where employees evaluate products, processes and services of the firm with careful consideration of their impact on the environment (Arnaud and Sekerka, 2010).
Radical product innovation brings significant changes such as making old products obsolete, and permitting entire markets to emerge, transform, or disappear (Kaplan, 1999). Radical product innovations could largely contribute to the achievement of environmental sustainability objectives. Sustainability in the market, a goal for most innovators, requires acknowledging the relationship between technology and community with its ethical implications, shared responsibility, and mutual goals. Business ethics plays a tremendous role in being the engine of innovation for many communities. Acknowledging that role and its accompanying responsibilities allows businesses to create value for themselves and their many stakeholders (Martin, 2008).

The innovating firm, however, has a responsibility to understand the community into which the innovation is being introduced. As with all business decisions, however, innovations carry ethical implications that should be addressed (Evans, 2004). The innovating firm has a responsibility to use technology within a given range of permissible behaviours and to incorporate rules and norms to support the technology. Businesses that shepherd innovations are left to deal with the aftermath of their ground-breaking technologies. The goal of innovation is to set up current beliefs, behaviour, relationships and technologies for a given community (Martin, 2008).

Ethical climate refers to the degree of organizational commitment to ethical responsibilities of corporate citizenship and requires following moral rules defining appropriate behaviour in society (Maignen & Ferrell, 2000). Ethical climate positively influences exploratory innovation, while ethical innovation produces a sustainable competitive advantage for a firm, creating a good technology-community relationship (Martin, 2008). Therefore, the hypothesis is as follows:

H3a: Ethical climate has a positive impact on exploratory innovation.
2.5 Conceptual model

A comprehension of ethics and purchasing can evolve and provide additional guidance for managers through testing a complementary model (Gonzalez-Padron et al., 2008). This study attempts to improve understanding of this phenomenon by exploring the effect of collaborative buyer-supplier relationships, organizational learning and ethical climate on exploratory innovation (Figure 5).

![Conceptual model diagram]

Figure 3 Conceptual model

The conceptual model is tested in the context of purchasers in manufacturing firms.
3   Methodology

3.1   Context and data collection

Empirical research is conducted to test hypotheses. This study is based on survey data collected from Dutch medium and large manufacturers with 50 to 500 employees. The survey instrument of a questionnaire is used to collect the field data. The questionnaire was administered to a cross-industry sample of 550 purchasers drawn at random from a national database, Markt Select. The sample frame included SIC-codes from 10 up to 32 (excluding) representing a wide cross-section of Dutch industry. This database provided data purchasers of firms with 50 to 500 employees in the sectors mentioned. This selection was used because it encompasses all sectors in the Dutch industry. The industrial sector is important to this research because of new product development that takes place in that sector and the possible role of purchasers in it. Purchasers of manufacturers play an increasingly large role when it comes to selecting suppliers in relation to new product development in their own firms. Especially among manufacturers, purchasers play an important role, as they have to purchase a large part of raw materials, components and semi-finished goods for production of their own firms.

Prior to data collection, the questionnaire was pre-tested and prepared for validity among four purchase managers and two academics engaged in purchasing research. They also critiqued the questionnaire for ambiguity, clarity, and appropriateness of the items used to operationalize each variable.

The questionnaire was designed, published and managed by using an online survey tool. A covering letter has been sent to respondents in order to obtain their participation. The survey was implemented online in the months of May and June 2011.

The initial mailing of the final questionnaire was sent to the selected sample in the beginning of May. A fortnight later a follow-up mailing was sent to 530 non-respondents. The response of the follow-up mailing was 10. After that the non-respondents were contacted by telephone. Various purchasing managers were unsure regarding their decision to participate and requested more information and, therefore, wanted to see the questionnaire first. Some manufacturers did not want to or were unable to participate for various reasons. A majority simply indicated that they had no interest in participating, they did not have enough time for filling out the questionnaire or firm policy forbade participation in surveys. It was hard to reach purchase managers by telephone and many times it was unsuccessful. A link to the online survey was sent when purchase managers agreed to participate.

3.2   Measurement

The variables of collaborative buyer-supplier relationships, organizational learning, ethical climate and exploratory innovation are operationalized by a questionnaire. (See appendix I)

Collaboration has three dimensions: joint planning, joint problem solving, and flexibility. The 4-item scale under joint planning refers to the proactive joint setting of goals and making the future of the relationship foreseeable (Heide and Miner, 1992). Joint problem solving is defined as the extent to which joint activities are organized to resolve disagreements, technical failures and other unexpected situations. Problem solving is reactive by nature, and the 4-item scale measuring this aspect also encompasses the attitudes of parties towards joint solutions to problems in the relationship (Heide and Miner, 1992; Lush and Brown, 1992). The norm of flexibility is defined as the extent to which a partner shows an accommodating response to changing circumstances. Flexibility was measured through a 3-item scale developed by Heide (1994).
Organizational learning entails three measurements: market-focused learning, internally-focused learning and relationally-focused learning. Market-focused learning was measured via the 8-item scale developed by Weerawardena (2003). The market-focused learning measure captures the extent to which a firm undertakes learning via acquisition of knowledge on consumer preferences and competitor behaviour. Internally-focused learning was measured via an 8-item scale of an adapted version of measures developed by Atuehene-Gima (1993). The internally-focused learning scale captures the extent to which a firm generates knowledge through internal experimental and experiential sources of learning. Relationally-focused learning was measured via an 8-item scale developed by Cohen and Levinthal, (1990) and Rothwell (1989). This measure captures the amount of knowledge a firm generates through links formed with external organizations.

The measurements for ethical climate are taken from literature. The ethical dimension of corporate citizenship of Maignan and Ferrell, (2000) is used. This measurement instrument via a 5-item scale emphasizes roles of codes of ethics, of confidentiality, reporting procedures and professional associations. It also includes values such as fairness and trustworthiness.

The measurement for exploratory innovation was adapted from Jansen et al., (2006). The 6-item scale for exploratory innovation captured the extent to which branches depart from existing knowledge and pursue radical innovations for emerging customers or markets.

The items for these eight scales were measured on a seven-point Likert-type scale ranging from 1 (= strongly disagree) to 7 (= strongly agree).

The questionnaire ended with reporting at respondent profile. Questions involved the number of employees of the organization, turnover in Euros, the procurement share, the main industry and the position of the respondent.
4 Results

4.1 Response

Questionnaires were administered to 550 industrial firms in the Netherlands. A total number of 103 were received of which 15 could not be used. These questionnaires had not been filled out completely. Since the sample consisted of 550 firms, the response rate of this study is $\frac{88}{550} = 16.0\%$.

The sample consisted of companies of various sizes. Table 4.1 provides the absolute and relative frequencies of the firm size, measured by the number of employees.

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Frequency</th>
<th>Valid percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 - 100</td>
<td>34</td>
<td>38.6</td>
</tr>
<tr>
<td>100 - 200</td>
<td>35</td>
<td>39.8</td>
</tr>
<tr>
<td>200 - 500</td>
<td>19</td>
<td>21.6</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>100</td>
</tr>
</tbody>
</table>

See table 4.2 for the turnovers of the firms that participated in the questionnaire.

<table>
<thead>
<tr>
<th>Turnover in Euros in 2010</th>
<th>Frequency</th>
<th>Valid percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 25 million</td>
<td>35</td>
<td>43.2</td>
</tr>
<tr>
<td>25 to 100 million</td>
<td>33</td>
<td>40.8</td>
</tr>
<tr>
<td>100 to 500 million</td>
<td>10</td>
<td>12.3</td>
</tr>
<tr>
<td>More than 500 million</td>
<td>3</td>
<td>3.7</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>100</td>
</tr>
</tbody>
</table>

The sample frame included SIC-codes from 10 up to 32. See table 4.3 for the representing firms of the Dutch industry.

| SIC 10 Foodstuffs         | 7         | SIC 22 Rubber and plastic products | 9 |
| SIC 11 Beverages          | -         | SIC 23 Other non-metal products/mineral products | - |
| SIC 12 Tobacco products   | 1         | SIC 24 Primary metals              | 1 |
| SIC 13 Textiles           | -         | SIC 25 Metal products (excluding machines/devices) | |
| SIC 14 Garments           | -         | SIC 26 Computers and electronic/optical devices | 1 |
| SIC 15 Leather, leather products, and shoes | 1 | SIC 27 Electric devices | - |
| SIC 17 Paper (products) and cardboard (products) | 2 | SIC 28 Other machines and devices | 12 |
| SIC 18 Printing companies, reproduction of recorded media | 2 | SIC 29 Cars, trailers, and semi-trailers | 5 |
| SIC 19 Coke oven products and petroleum processing | - | SIC 30 Other transport means | 2 |
| SIC 20 Chemical products  | 3         | SIC 31 Furniture                   | 4 |
| SIC 21 Pharmaceutical raw materials/products | - | SIC 32 Other goods | 27 |
The person who returned the questionnaire was an employee of the purchasing department or someone within the company who is directly involved with purchasing. See table 4.4.

Table 4.4 Position of the respondent (n=88)

<table>
<thead>
<tr>
<th>Position</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement director</td>
<td>21</td>
</tr>
<tr>
<td>Senior buyer</td>
<td>6</td>
</tr>
<tr>
<td>Logistics manager</td>
<td>3</td>
</tr>
<tr>
<td>Procurement manager</td>
<td>23</td>
</tr>
<tr>
<td>Purchaser/purchasing assistant</td>
<td>17</td>
</tr>
<tr>
<td>Supply chain manager</td>
<td>3</td>
</tr>
<tr>
<td>Other, namely …………………….</td>
<td>15</td>
</tr>
</tbody>
</table>

Other positions mentioned in the questionnaire were quality manager, strategic procurement officer, sales manager (2 times), procurement, logistics and automation, general manager (2 times), R&D staff officer, technical manager, purchasing planning manager, purchasing manager, operations manager, planning office team leader/procurement, plant manager, and manager.

The mean of the procurement share is 47%. See table 4.5.

Table 4.5 Procurement share

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>47.02 %</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>16.93</td>
</tr>
<tr>
<td>Number</td>
<td>74</td>
</tr>
<tr>
<td>Missing</td>
<td>14</td>
</tr>
<tr>
<td>N=88</td>
<td></td>
</tr>
</tbody>
</table>

Hereby, the respondent profile is based on of the questionnaire of the survey data.

4.2 Validity

Explanatory factor analysis (principal components analysis with varimax rotation) was used to assess the validity of the constructs and to identify a possible underlying factor structure. Seven variables entered the factor analysis: joint planning, joint problem solving, flexibility, market-focused learning, internally-focused learning, relationally-focused learning and ethical climate. However, the solution factor included only six components. The variables of joint problem solving and flexibility obviously belonged to one factor. Respondents could not differentiate between joint problem solving-items and flexibility-items. For that reason, it was decided to remove the flexibility variable from further analysis.

A clear distinction between these two variables was found in literature research of this study. The decision to remove the flexibility variable from the study was based on the fact that looking at the flexibility variable, consistency between these items in order to form one scale is worse than consistency of the items of variable joint problem solving. Besides, the items of the flexibility variable might have been interpreted in the same way as the items of the joint problem solving variable by purchasers of manufacturing firms. These involve contributing jointly to taking decisions to solve problems. In order to keep the variables clean, partly in relation to research conducted previously, the items of the flexibility variable have been removed from further research. Moreover, joint problem solving is directly involved with joint activities to a higher extent to solve problems between buyer and supplier in a good way, which is preferred for this research.
In addition, four items have been deleted because they did not load on the appropriate components. A new factor analysis resulted in a satisfactory six-factor solution, see appendix II. Most items have factor loadings that exceed the commonly recommended level of 0.50. The solution factor largely confirmed the intended factor structure, i.e. the resulting components were clearly related to the items that were supposed to constitute the corresponding constructs. Items that should be related were indeed strongly correlated (convergent validity). Items that should not be related, from a theoretical point of view, did not correlate (discriminant validity).

Furthermore, a reliability analysis using Cronbach’s Alpha was performed to ensure internal consistency of the items that constitute each construct. The coefficients of Cronbach’s Alpha are all higher than 0.70, indicating an acceptable internal consistency and reliability of the constructs, see table 4.2. Additional correlation analysis showed that items that should be related are correlated, indicating convergent validity. In addition it was found that items that should not be related from a theoretical point of view did not correlate (discriminant validity).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative buyer-supplier</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>relationships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint Planning</td>
<td>4</td>
<td>0.77</td>
</tr>
<tr>
<td>Joint Problem Solving</td>
<td>4</td>
<td>0.86</td>
</tr>
<tr>
<td>Organizational learning</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Market-focused learning</td>
<td>5</td>
<td>0.86</td>
</tr>
<tr>
<td>Internally-focused learning</td>
<td>8</td>
<td>0.95</td>
</tr>
<tr>
<td>Relationally-focused learning</td>
<td>7</td>
<td>0.91</td>
</tr>
<tr>
<td>Ethical climate</td>
<td>5</td>
<td>0.85</td>
</tr>
<tr>
<td>Exploratory innovation</td>
<td>7</td>
<td>0.82</td>
</tr>
</tbody>
</table>

The variables of joint planning, joint problem solving, market-focused learning, internally-focused learning, relationally-focused learning, ethical climate, and exploratory innovation all met the 0.7 criterion.

### 4.3 Regression analysis

We used linear multiple regression analysis to examine the hypothesised effects of the explanatory variables on exploratory innovation. The multiple linear regression checks whether, based on a correlation of various independent variables with, in this case, one dependent variable, a (predictive) connection is present, and whether it can be used to test a hypothesis. In this study, the independent variables are joint planning (JP), joint problem solving (PBS), market-focused learning (MFL), internally-focused learning (IFL), relationally-focused learning (RFL) and ethical climate (EC), and the dependent variable is exploratory innovation (EIN).

The equation shall be: $EIN = \alpha + \beta_1 \times JP + \beta_2 \times PBS + \beta_3 \times MFL + \beta_4 \times IFL + \beta_5 \times RFL + \beta_6 \times EC$

$\alpha =$ the intercept and $\beta =$ the regression coefficient
The results of the regression analysis are presented in table 4.3. The results show that joint planning has no significant effect on exploratory innovation. In addition, joint problem solving does not appear to have a significant effect on exploratory innovation either. Hence, we found no support for hypotheses 1a and 1b that assumed positive effects for a collaborative relationship with suppliers on the exploratory innovation of manufacturers.

Hypotheses 2a, 2b and 2c predicted positive effects of organizational learning on exploratory innovation. These hypotheses are partly supported by this study. Indeed, internally-focused learning and relationally-focused learning do have a positive effect on exploratory innovation. Internally-focused learning seems to have a stronger impact than relationally-focused learning. Market-focused learning appeared to have no impact, which implies no support for hypothesis 2a.

With respect to ethical climate, no significant impact could be found in this study, leaving no room for support of hypothesis 3. Exchange governance through a dominant relative power position has no significant effect on supplier opportunism.

The adjusted $R^2$ is 0.38, which means that almost 40% of the variance in exploratory innovation can be explained by the variables in the model. The results of testing the hypothesis are presented in table 4.3.

Some six hypotheses, which are documented in table 4.4, have been tested in the research. This table includes research conclusions; the fact whether or not a hypothesis is underpinned, based on the research results.
Table 4.4 Testing of hypotheses

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a Joint planning in a collaborative buyer-supplier relationship has a</td>
<td>Not supported</td>
</tr>
<tr>
<td>positive impact on exploratory innovation.</td>
<td></td>
</tr>
<tr>
<td>H1b Joint problem solving in a collaborative buyer-supplier relationship</td>
<td>Not supported</td>
</tr>
<tr>
<td>has a positive impact on exploratory innovation.</td>
<td></td>
</tr>
<tr>
<td>H2a Market-focused learning has a positive impact on exploratory</td>
<td>Not supported</td>
</tr>
<tr>
<td>innovation.</td>
<td></td>
</tr>
<tr>
<td>H2b Internally-focused learning has a positive impact on exploratory</td>
<td>Supported</td>
</tr>
<tr>
<td>innovation.</td>
<td></td>
</tr>
<tr>
<td>H2c Relationally-focused learning has a positive impact on exploratory</td>
<td>Supported</td>
</tr>
<tr>
<td>innovation.</td>
<td></td>
</tr>
<tr>
<td>H3 Ethical climate has a positive impact on exploratory innovation.</td>
<td>Not supported</td>
</tr>
</tbody>
</table>

The first conclusion is that, with regard to collaborative buyer-supplier relationships, the variables are not supported in the research. Joint planning and joint problem solving are not put forward as significant variables in relation to exploratory innovation.

The second conclusion is that one variable of organizational learning, namely market-focused learning, is not supported in the research and therefore it is not a significant variable in relation to exploratory innovation. Ethical climate does not seem to impact exploratory innovation. The two variables of organizational learning, namely internally-focused learning and relationally-focused learning, both have a positive and significant impact on exploratory innovation.
5 Conclusions, discussion and recommendations

5.1 Conclusions

Promptly forming and changing markets have forced firms to be innovative. A significant part of the success of manufacturing firms is the degree of innovativeness. The radical nature of exploratory innovations, as opposed to exploitative innovation, is appropriate to meet the needs of emerging customers or markets. Organizational learning is likely to be important for generating innovations, while the ethical climate in companies, too, could have a positive impact on exploratory innovation. On an increasing scale, suppliers are involved in the pursuit of (explorative) innovations. Still, there is a lack of research into the role of purchasing in fostering innovative collaboration. No study has examined the combined impact of buyer-supplier collaboration, organizational learning and ethical climate on exploratory innovation. This study was aimed at filling this gap in the extant literature on exploratory innovation.

A survey among purchasing professionals in the Dutch manufacturing industry has resulted in an effective response of n = 88 (16.0%). The survey data have been used to test the hypotheses of the conceptual model. The main conclusion was that organizational learning, in the form of internally-focused learning and relationally-focused learning, has a significant, positive impact on exploratory innovation. The ethical climate did not seem to influence exploratory innovation. In addition, buyer-supplier collaboration, in the form of joint planning and joint problem solving, had no impact on exploratory innovation.

5.2 Discussion

A preliminary and bold conclusion might be that exploratory innovation is all about learning, instead of collaboration with suppliers. The results of this study seem to indicate that collaboration with suppliers does not contribute to the exploratory innovation of companies. A possible explanation could be that the role of suppliers is primarily supporting the process of innovation of the buyer (Schiele, 2006) instead of actively participating in the buyer’s innovation initiatives. Explorative innovation is aimed at developing and commercializing new products for new customers/markets. Suppliers might not be able, or willing, to contribute to the marketing success of their business customers. Fließ and Becker (2006) identify three overall success factors for co-development processes in their research, namely: trust, constant communication and achieving clear reliable and timely decisions between the partners including openness in communication and early involvement of the partner in problems occurring during the development process. It seems that manufacturing firms have limited knowledge of the way suppliers can become a part of new product development processes (Lakemond et al., 2006). In this study, it remains unclear whether or not manufacturers understand and acknowledge the benefits of early supplier involvement. It could be that not all manufacturers know how to organize, plan and integrate supplier staff into the new product development process.

Supplier collaboration has two dimensions in this study, namely: joint planning and joint problem solving. The operationalization of joint planning includes items that refer to the coordination of production plans. It could be argued that information sharing and tactical integration (synchronization and coordination of operations) fail to address the highest and most difficult part of supply chain collaboration. True collaboration emerges when companies integrate human, financial and technical resources in order to create a new and better business model. Collaboration locks firms into a long-term agreement, while resources of both companies are committed at risk to the joint initiative (cf. Bowersox, 2003). The idea of joint (production) planning might not capture the scope and intention of strategic integration.
A comparable assertion can be made for the operationalization of the joint problem solving-construct. The items cover issues concerning a general idea of helping each other in a broad sense. There is a notion of mutual responsibility for realizing improvements and meeting goals. A collaborative attitude might not be sufficient for a significant contribution of the exploratory innovation of the buyer.

Nyaga et al., (2010) found that buyers and suppliers may have different perceptions of their relationship, and expect both supplier and buyer to invest in a relationship through the exchange of information and joint efforts. For this reason, a certain balance must be present that helps safeguarding the relation-specific investments of the supplier. In terms of collaborative innovation and supplier integration, different suppliers will have different needs and expectations regarding the relationship value, and each supplier has its own approach (Ellegaard et al., 2003).

In this study we found that joint planning and joint problem solving in a collaborative buyer-supplier relationship do not have a significant impact on exploratory innovation. However, the results do not imply that collaborative buyer-supplier relationships are not beneficial for companies at all. For instance, Jhonston et al., (2004) found that cooperative behaviour associated with joint activity do provide benefits for buyer-supplier relationships. The nature of these benefits however, might not cover the scope of the buyer’s exploratory innovations.

This study was limited to the explanation of exploratory innovation. No classification was used to make a distinction between different types of innovations. Typical innovation takes the form of brand or line extensions, modifications to existing products, or repositioning, which are called incremental innovations. Purchasers of the manufacturers in this study were not questioned about incremental innovation. Possibly, incremental innovations are a more common form of innovation for manufacturers.

Market-focused learning did not appear to have an impact on exploratory innovation. A reason for this could be that firms do not expect customers to envision radical innovation, and that customers cannot imagine, to a sufficient degree, whether radical innovations could turn out to be successful. Customers cannot be expected to envision new technological paradigms for delivery product category benefits. (Baker and Sinkula, 2007). This could be a reason why manufacturers focus on market-focused learning regarding radical innovations to a limited degree, or not at all. This study found no significant relationship between market-focused learning and exploratory innovation, for which the above-mentioned argumentation can be used as an explanation. These findings could contribute to the ongoing debate about the effect of market-focused learning on exploratory innovation.

Internally-focused learning refers to the capacity and the extent to which a firm develops knowledge through internal sources. Generative learning is a prerequisite to exploratory innovation to foster an innovative view for break-through innovations. The advantage of generative learning is that it is not constrained by acting strictly according to rules and existing mental models. The positive impact of internally-focused learning is accompanied by the comparable positive impact of relationally-focused learning. Innovation literature provides evidence to suggest that firms learn through internal sources and networks. Accordingly, open innovators are those that integrate external sources into their approach to R&D and competitive strategy (Laursen and Salter, 2006). This statement is underpinned by this study.
Technologically-oriented firms champion the use of their latest technologies in their new products and heavily devote their resources to R&D they excel in technical proficiency and flexibility (Zhou et al., 2005). The above-mentioned is supported by this research as the relationship of internally-focused learning and exploratory innovation both have a positive and significant impact on exploratory innovation. Through internally-focused learning and externally-focused learning, manufacturing companies will be able to develop activities to achieve or sustain greater exploratory innovation. This is strongly supported by the results of this study.

The social and ethical responsibility of companies was believed to have a positive influence on exploratory innovations, especially innovations for sustainability (Arnaud and Sekerka, 2010). In this study, we did not find any support for the hypothesis that ethical climate would have a positive impact on exploratory innovation. Apparently, companies in our sample do not experience a relationship between the ethical climate within the company and its exploratory innovations. Maybe, manufacturing firms take different stances on ethical climate. Probably, firms act in different ways depending on how they perceive their role in society. Ethical climate is rather situation-specific: it relates to profit, power plays, political-legal equations, situation of market flux, responsible images, human concerns, and sustainability and can perhaps be described as not having been completely developed and clear.

5.3 Recommendations for practitioners

Exploratory innovation is important to manufacturers in order to maintain a good defensible competitive advantage. In that respect, organizational learning is an important issue to attain a high performance regarding exploratory innovation. Organizational learning should be developed well in certain areas using the collection of new, external knowledge and in-house R&D that is operating well. Therefore, the accompanying process of learning within the organization is vital. Openness should be created within the organization in order to be able to do experiments in relation to developing new products. Stimulating this process and acquiring new knowledge and in-house R&D activities can lead to a much better performance in the field of exploratory innovation. This proposition is confirmed by the findings of this study (cf. Cohen and Levinthal, 1990). This study can indicate more precisely which parts of organizational learning have a strong relationship with exploratory innovation.

The results of this study suggest a strong relationship between exploratory innovation and internally-focused learning as well as relationally-focused learning. Recommendations for practitioners consist of two parts related to exploratory innovations. First, practitioners should have a focus on in-house R&D, distribute within the organization any knowledge that is gained through in-house R&D, and make sure R&D staff has sufficient skills. In addition, there should be a sufficient budget for R&D related activities. Organizational learning implies that companies learn from projects that have been unsuccessful. Second, practitioners should realize that exploratory innovation will turn out well by focusing on relationally-focused learning. Companies should use networks and contacts to gain information, cooperating with organizations to acquire knowledge, and looking for innovations through the use of networks. Companies should be actively engaged in sharing knowledge that has been obtained by networking. Furthermore, the externally acquired knowledge should be used for innovation purposes. It is essential to have a capacity to gain knowledge externally. Networking, cooperating with organizations, having the ability to acquire knowledge, and eventually sharing knowledge are important to come to exploratory innovation. This way, internally-focused learning and relationally-focused learning could largely contribute to exploratory innovations.
When it comes to market-focused learning, companies look for new, innovative ideas by using market information. This market information consists of collecting information about areas of sale, customers, knowledge of market segments, and knowledge about competitors when innovating. A company can compete successfully by learning from changes in the innovations market. Practitioners are advised the following when it comes to organizational learning: mainly focus on internally-focused learning and relationally-focused learning instead of market-focused learning. This study does not show any relationship between market-focused learning with information about customers, competitors, and areas of sale on the one hand and exploratory innovation on the other hand. Practitioners would be advised to realize that having in-house R&D and orienting on networks related to being innovative contribute largely to performance in the field of exploratory innovation.

As far as delivering high performance in the field of exploratory innovation is concerned, the number of new, qualitatively high-standard ideas, which have a distinctive character, is very important to a company. Organizational learning means systematically integrating and collectively interpreting new knowledge in the company that lead to actions to experiment with new innovations. In the light of internally-focused learning it is essential to have solid and qualified in-house R&D. In-house R&D takes care of safeguarding knowledge that was gained externally and is destined for innovations and it makes sure that knowledge is distributed well within the company. In-house R&D does the same thing for knowledge that was acquired independently.

With respect to internally-focused learning, one can think of developing, improving and extending skills to re-combine existing and new knowledge in cooperation with both networks that have existed for a long time and new ones. In the end, the aim is to come to new discoveries and innovations using a translation and application of acquired knowledge through networks, as well as using in-house R&D that enhances performance for exploratory innovation. Some examples of different types of networks are customer networks, manufacturing supplier networks, producer and service provider networks, producer networks and co-operations with research institutions or universities. The conclusion is that networks of collaborative relationships among companies, collaborative relationships between manufacturers and their customers, and co-operations with research institutions or universities are important to manufacturers, especially in innovative and technology-intensive industries. Practitioners increasingly need to realize that in order to tap into new technologies and know-how, the internal development of in-house R&D needs to be complemented with strategic collaboration in networks.

Joint planning in a collaborative buyer-supplier relationship involves planning production and new products. Moreover, suppliers provide buyers with sales forecasts and the nature of the cooperation is one where buyers and suppliers exchange information about long-term planning. In case of joint problem solving in a collaborative buyer-supplier relationship, problems that occur during the time of collaboration are solved together and both parties like helping each other out. Besides, responsibility for meeting goals is shared. This research shows no positive impact on exploratory innovation when it comes to joint planning, nor when it comes to joint problem solving. Therefore, practitioners should not expect too much when it comes to exploratory innovation in relation to cooperation with suppliers in the fields of joint planning and joint problem solving. Therefore, practitioners are advised not to overestimate broad cooperation with suppliers in the field of exploratory innovation. On the contrary, practitioners or manufacturers had better focus on maintaining and creating innovation-oriented networks that are centred around exploratory innovation and that offer solid support for in-house R&D.
This study has conceptualized ethical climate from a perspective of a comprehensive ethical behaviour code. A company is regarded as reliable, where honesty to all concerned is an important part of all company processes. High ethical standards imply that employees behave according to professional norms and that companies have a confidential procedure when it comes to reporting improper behaviour. This study shows no impact of ethical climate on exploratory innovation. Having a comprehensive code for ethical behaviour does not automatically have a positive impact on exploratory innovation. Also, a comprehensive code for ethical behaviour does not imply that the attitude of employees will be in conformity with these norms in relation to exploratory innovation. The results of this study suggest that practitioners should not expect too much impact from the ethical climate as a factor with a positive impact on exploratory innovations.

5.4 Recommendations for further study

This study has several limitations that should be considered in the interpretation of the findings. It would have been more favourable for this research to have selected beforehand whether firms execute innovations or not and secondly, whether they cooperative with suppliers in the area of developing new products. It was a possibility in this study that some firms cooperate with suppliers when developing new products, while others do not.

Regarding collaborative buyer-supplier relationships in relation to exploratory innovation, it was not expressed clearly, at which stage of the development process suppliers would be involved in the product development process. This could also have influenced the outcomes of this study regarding these two variables.

No significant relationship was found between market-focused learning and exploratory innovation. A possible reason could be that purchasers acted as respondents in this study, completing the questionnaire. Possibly, purchasers are less aware of affairs concerning market-focused learning of the firm in relation to developing radical innovations. Another reason could be that purchasers of manufacturers are more involved with technical competences of new products to be developed when it comes to radical innovations. It might be more likely that purchasers of manufacturers have a technical background instead of a business background, which makes them less interested in market-focused learning. Further study might include a marketer, a production manager, a sales manager and an R&D staff member.

Societal issues focus on sustainability of society regarding raw materials, energy and water. The industrial sector plays an ‘intermediary role’ between raw materials and the products that are made in the end. When it comes to the industrial sector, new product development can play an important role in sustainability of society. General questions have been asked in this research in the area of ethical climate. In case of further study, it would be wise to make a stronger link between ethical climate and sustainability of innovation.

In addition to alleviating these limitations, there are other fertile avenues for further research. In order to gain further insight into innovation-oriented manufacturers and early integration of suppliers in the product development process, manufacturers could be screened first based on their innovation capacity. After screening the degree of innovation-orientation empirical research could take place based on that, in the form of case studies with manufacturing firms. Preferably, this study would take place in the Netherlands.
Further research can be done into knowledge that is at hand within manufacturing firms to involve purchasers in developing new products with a process-oriented approach. At the same time, one could trace and get an insight into the degree of possibility to involve suppliers in the product development process at an early stage.

Good further research would involve defining the degree of cooperation between managers of various departments of a firm, such as marketing, R&D, procurement, sales, manufacturing, etc. Subjects could be doing research into innovations, executing innovations, possible cooperation with suppliers, taking innovation into production and launching the final innovation. In other words, it could involve the degree to which an innovation network is involved within a manufacturing firm.

Based on the outcomes of this study, one could remove independent variables from the concept, interpret variables differently, such as ethical climate, and add other variables, such as corporate culture, leadership, etc. This would be with the purpose of explaining innovations at manufacturers. One could also distinguish various types of innovations, such as radical and incremental innovations.

The domain of this study was manufacturers in the Netherlands. According to EIM, in the Netherlands manufacturers make up almost three quarters of R&D spending. The industrial sector is an important stimulator of R&D in the Dutch business sector. Four large enterprises (Philips, ASML, NXP, and Océ) account for 60% of R&D expenditure in the industrial sector. Chemical and pharmaceutical industries (AkzoNobel, Shell, and DSM) as well as the food industry (Unilever) are also characterized by the fact that several large enterprises make up a majority of R&D activities. This means SME firms account for more than 60% of employment of the industrial sector, but contribute to R&D less than 20%. Future research could use samples with a higher percentage of larger firms.
References


EIM, onderzoek voor bedrijf en beleid; http://www.eim.nl


## Appendix I  Operationalization of variables of conceptual model /Operationalisatie variabelen van conceptueel model

<table>
<thead>
<tr>
<th>Variable name/Naam variabele</th>
<th>Statements in English</th>
<th>Stellingen in het Nederlands</th>
<th>Source/Bron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A/ Onderdeel A</td>
<td>Please rate the statements of part A based on collaboration with a regular partner.</td>
<td>We vragen u de stellingen van onderdeel A te beoordelen op basis van samenwerking met een reguliere partner.</td>
<td>Claro and Claro (2010) Heide and Miner (1992)</td>
</tr>
<tr>
<td>Collaborative buyer-supplier relationships / Samenwerkende relatie koper-leverancier</td>
<td>Please rate the following statements on a scale of 1 (= strongly disagree) via 4 (= do not disagree, do not agree) to 7 (= strongly agree).</td>
<td>Geef uw oordeel over de volgende stellingen, op een schaal die loopt van 1 (= volledig mee oneens) via 4 (= niet mee oneens, niet mee eens) tot 7 (= volledig mee eens).</td>
<td>Claro and Claro (2010) Heide and Miner (1992)</td>
</tr>
<tr>
<td></td>
<td>1.2 Our company plans the offer of new products and varieties for the next season together with suppliers.</td>
<td>1.2 Ons bedrijf plant het aanbod van nieuwe producten en variëteiten voor het volgende seizoen samen met de leverancier.</td>
<td>Claro and Claro (2010) Heide and Miner (1992)</td>
</tr>
<tr>
<td></td>
<td>1.3 Suppliers provide us with sales forecasts of products our company buys from them.</td>
<td>1.3 De leverancier voorziet ons van verkooppromoties voor de producten die deze ons levert.</td>
<td>Claro and Claro (2010) Heide and Miner (1992)</td>
</tr>
<tr>
<td></td>
<td>1.4 Our company shares information about long-term plans with suppliers.</td>
<td>1.4 Ons bedrijf deelt informatie over langetermijnplannen met de leverancier.</td>
<td>Heide and Miner (1992)</td>
</tr>
<tr>
<td></td>
<td>2.2 Suppliers and our company do not mind owing each other favours.</td>
<td>2.2 De leverancier en ons bedrijf helpen elkaar graag.</td>
<td>Lush and Brown (1996)</td>
</tr>
<tr>
<td></td>
<td>2.3 With respect to most aspects of the relationship with suppliers, responsibility for meeting goals is shared.</td>
<td>2.3 Bij de meeste aspecten van de relatie met de leverancier is er sprake van gedeelde verantwoordelijkheid voor het behalen van doelen.</td>
<td></td>
</tr>
</tbody>
</table>
### 3. Flexibility / Flexibiliteit

2.4 Suppliers and our company are committed to realizing improvements that may benefit the relationship as a whole.

3.1 Our company is flexible in response to changes in the relationships with suppliers.
3.2 Suppliers make adjustments in order to maintain their relationships with our company.
3.3 In case of unexpected situations, suppliers and our company work out new deals.

3.1 Ons bedrijf is flexibel als het gaat om veranderingen in de relatie met de leverancier.
3.2 De leverancier doet aanpassingen om de relatie met ons bedrijf in stand te houden.
3.3 Indien zich een onverwachte situatie voordoet, maken de leverancier en ons bedrijf nieuwe afspraken.

---

### Part B/Onderdeel B

#### Organizational learning / Organisatorisch leren

Please rate the following statements on a scale of 1 (= strongly disagree) via 4 (= do not disagree, do not agree) to 7 (strongly agree).

**Our company:**

4.1 collects information about market areas.
4.2 searches for innovative ideas by using market information.
4.3 has knowledge of market segments.
4.4 has knowledge of competitors.
4.5 shares information with employees.
4.6 uses customer and competitor information when creating innovations.
4.7 reviews issues that were unsuccessful in the past.
4.8 is able to compete successfully by learning from market changes.

**Geef uw oordeel over de volgende stellingen, op een schaal die loopt van 1 (= volledig mee oneens) via 4 (= niet mee oneens, niet mee eens) tot 7 (= volledig mee eens).**

**Ons bedrijf:**

4.1 verzamelt informatie over afzetgebieden.
4.2 zoekt naar innovatieve ideeën door gebruik te maken van marktinformatie.
4.3 heeft kennis over marktsegmenten.
4.4 heeft kennis over concurrenten.
4.5 deelt informatie met werknemers.
4.6 gebruikt informatie over klanten en concurrenten bij innovaties.
4.7 onderzoekt zaken die in het verleden niet goed gingen.
4.8 kan succesvol concurreren door te leren van veranderingen in de markt.

---

#### 4. Market-focused learning / Marktgericht leren

4.1 collects information about market areas.
4.2 searches for innovative ideas by using market information.
4.3 has knowledge of market segments.
4.4 has knowledge of competitors.
4.5 shares information with employees.
4.6 uses customer and competitor information when creating innovations.
4.7 reviews issues that were unsuccessful in the past.
4.8 is able to compete successfully by learning from market changes.

**Weerawardena et al., (2006)**
**Weerawardena (2003)**

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#### 5. Internally-focused learning / Intern gericht leren

5.1 Internal R&D is undertaken.
5.2 Knowledge generated through internal

5.1 Binnen ons bedrijf is er sprake van interne R&D
5.2 De kennis die door interne R&D wordt

**Weerawardena et al., (2006)**
**Atuhene-Gima (1993)**
5.3 Our company reviews and learns from past unsuccessful R&D projects.  
5.4 R&D staff members have sufficient skill levels.  
5.5 An amount has been allocated to R&D.  
5.6 Knowledge generated through R&D is used for innovation.  
5.7 Intellectual property is significant to our company.  
5.8 Our company is capable of acquiring knowledge through R&D.  

Our company:  
6.1 uses networks and contacts in order to acquire knowledge.  
6.2 collaborates with other organizations in order to acquire knowledge.  
6.3 engages in networking activities in order to acquire knowledge.  
6.4 searches for innovation by using networks.  
6.5 shares knowledge acquired through networking.  
6.6 uses externally generated knowledge for innovation.  
6.7 reviews past unsuccessful programmes for external knowledge.  
6.8 is capable of acquiring knowledge externally.  

verkregen, wordt verspreid en gedeeld binnen ons bedrijf.  
5.3 Binnen ons bedrijf wordt geleerd van R&D-projecten die geen succes zijn geworden.  
5.4 In ons bedrijf beschikken R&D-medewerkers over voldoende vaardigheden.  
5.5 Er is budget toegekend voor R&D.  
5.6 Binnen ons bedrijf wordt R&D gebruikt voor innovatie.  
5.7 Intellectueel eigendom is belangrijk voor ons bedrijf.  
5.8 Ons bedrijf beschikt over de capaciteit om kennis te vergaren door R&D.  

Ons bedrijf:  
6.1 gebruikt netwerken en contacten voor het verkrijgen van kennis.  
6.2 werkt samen met organisaties om kennis te vergaren.  
6.3 netwerkt om kennis te vergaren.  
6.4 zoekt naar innovatie door gebruik te maken van netwerken.  
6.5 deelt kennis die is verkregen uit netwerken.  
6.6 gebruikt kennis die extern verworven is voor innovatie.  
6.7 bestudeert onsuccesvolle programma’s in het verleden voor externe kennis.  
6.8 beschikt over de capaciteit om extern kennis te vergaren.  

|  | Weerawardena et al., (2006)  
|  | Cohen and Levinthal (1990) |
### Part C/Onderdeel C

#### 7. Ethical climate / Ethisch klimaat

Please rate the following statements on a scale of 1 (strongly disagree) via 4 (do not disagree, do not agree) to 7 (strongly agree).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Our business has a comprehensive code of ethics.</td>
<td></td>
</tr>
<tr>
<td>7.2 We are recognized as a trustworthy company.</td>
<td></td>
</tr>
<tr>
<td>7.3 Fairness to all parties is an integral part of our processes.</td>
<td></td>
</tr>
<tr>
<td>7.4 A confidential procedure is in place to report misconduct.</td>
<td></td>
</tr>
<tr>
<td>7.5 Our employees follow professional standards.</td>
<td></td>
</tr>
</tbody>
</table>

Geef uw oordeel over de volgende stellingen, op een schaal die loopt van 1 (volledig mee oneens) via 4 (niet mee oneens, niet mee eens) tot 7 (volledig mee eens).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Ons bedrijf hanteert een allesomvattende code voor ethisch gedrag.</td>
<td></td>
</tr>
<tr>
<td>7.2 We worden als betrouwbare bedrijf gezien.</td>
<td></td>
</tr>
<tr>
<td>7.3 Eerlijkheid naar alle betrokkenen vormt een belangrijk onderdeel van al onze processen.</td>
<td></td>
</tr>
<tr>
<td>7.4 Voor het rapporteren van wangedrag bestaat een vertrouwelijke procedure.</td>
<td></td>
</tr>
<tr>
<td>7.5 Onze werknemers gedragen zich volgens professionele normen.</td>
<td></td>
</tr>
</tbody>
</table>

Gonzalez-Padron (2008)  
Maignan and Ferell (2000)

### Part D/Onderdeel D

#### 8. Exploratory innovation / Exploratieve innovatie

Please rate the following statements on a scale of 1 (strongly disagree) via 4 (do not disagree, do not agree) to 7 (strongly agree).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Our organization accepts demands that go beyond existing products and services.</td>
<td></td>
</tr>
<tr>
<td>8.2 We invent new products and services.</td>
<td></td>
</tr>
<tr>
<td>8.3 We experiment with new products and services in our local market.</td>
<td></td>
</tr>
<tr>
<td>8.4 We commercialize products and services that are completely new to our organization.</td>
<td></td>
</tr>
<tr>
<td>8.5 We frequently utilize new opportunities in new markets.</td>
<td></td>
</tr>
<tr>
<td>8.6 Our organization regularly uses new distribution channels.</td>
<td></td>
</tr>
<tr>
<td>8.7 We regularly search for and approach new customers in new markets.</td>
<td></td>
</tr>
</tbody>
</table>

Geef uw oordeel over de volgende stellingen, op een schaal die loopt van 1 (volledig mee oneens) via 4 (niet mee oneens, niet mee eens) tot 7 (volledig mee eens).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Onze organisatie accepteert ook orders voor producten en diensten die we tot dan toe niet leveren.</td>
<td></td>
</tr>
<tr>
<td>8.2 We vinden nieuwe producten en diensten uit.</td>
<td></td>
</tr>
<tr>
<td>8.3 Wij experimenteren met nieuwe producten en diensten in de lokale markt.</td>
<td></td>
</tr>
<tr>
<td>8.4 Wij commercialiseren producten en diensten die volledig nieuw voor onze organisatie zijn.</td>
<td></td>
</tr>
<tr>
<td>8.5 Wij maken vaak gebruik van nieuwe kansen in nieuwe markten.</td>
<td></td>
</tr>
<tr>
<td>8.6 Onze organisatie maakt regelmatig gebruik van nieuwe distributiekanalen.</td>
<td></td>
</tr>
<tr>
<td>8.7 Wij zoeken regelmatig naar, en benaderen, nieuwe klanten in nieuwe markten.</td>
<td></td>
</tr>
</tbody>
</table>

Jansen et al., (2009)  
Jansen et al., (2006)
| Open questions/Open vragen                                                                 |  |
|-----------------------------------------------------------------------------------------|  |
| **What is the number of employees of your organization in 2010, based on fulltime positions (FTE, excluding temporary workers)?** | **Wat is het aantal medewerkers in 2010 op basis van fulltime aanstellingen binnen uw organisatie (fte, excl. uitzendkrachten)?** |
| O 0-50 employees                                                                         | O 0-50 werknemers |
| O 50-100 employees                                                                       | O 50-100 werknemers |
| O 100-200 employees                                                                      | O 100-200 werknemers |
| O 200-500 employees                                                                      | O 200-500 werknemers |
| O 500 employees and up                                                                   | O 500 en meer |

<table>
<thead>
<tr>
<th><strong>What is your position?</strong></th>
<th><strong>Wat is uw functie?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>O Procurement director</td>
<td>O Inkoopdirecteur/ hoofd inkoop</td>
</tr>
<tr>
<td>O Senior buyer</td>
<td>O Senior buyer</td>
</tr>
<tr>
<td>O Logistics manager</td>
<td>O Logistiek manager</td>
</tr>
<tr>
<td>O Procurement manager</td>
<td>O Inkoopmanager</td>
</tr>
<tr>
<td>O Purchaser/purchasing assistant</td>
<td>O Inkoper/inkoopassistent</td>
</tr>
<tr>
<td>O Supply chain manager</td>
<td>O Supply chain manager</td>
</tr>
<tr>
<td>O Other, namely ………………………</td>
<td>O Anders, namelijk ………………….</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>What is your turnover in Euros in 2010?</strong></th>
<th><strong>Wat is de omzet, in euro’s, in 2010?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>O Less than 500,000</td>
<td>O Minder dan 500.000</td>
</tr>
<tr>
<td>O 500,000 to 1 million</td>
<td>O 500.000 tot 1 miljoen</td>
</tr>
<tr>
<td>O 1 to 5 million</td>
<td>O 1 tot 5 miljoen</td>
</tr>
<tr>
<td>O 5 to 10 million</td>
<td>O 5 tot 10 miljoen</td>
</tr>
<tr>
<td>O 10 to 25 million</td>
<td>O 10 tot 25 miljoen</td>
</tr>
<tr>
<td>O 25 to 100 million</td>
<td>O 25 tot 100 miljoen</td>
</tr>
<tr>
<td>O 100 to 500 million</td>
<td>O 100 tot 500 miljoen</td>
</tr>
<tr>
<td>O More than 500 million</td>
<td>O Meer dan 500 miljoen</td>
</tr>
<tr>
<td>What was the procurement share, i.e. the value of purchased products and services, as part of turnover value in 2010?</td>
<td>Wat was in 2010 het inkoopaandeel, d.w.z. de waarde van ingekochte goederen en diensten t.o.v. de omzetwaarde?</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>What is the main industry your company is active in?</strong></td>
<td><strong>In welke bedrijfstak is uw bedrijf voornamelijk werkzaam?</strong></td>
</tr>
<tr>
<td>O Foodstuffs</td>
<td>O Voedingsmiddelen</td>
</tr>
<tr>
<td>O Beverages</td>
<td>O Dranken</td>
</tr>
<tr>
<td>O Tobacco products</td>
<td>O Tabaksproducten</td>
</tr>
<tr>
<td>O Textiles</td>
<td>O Textiel</td>
</tr>
<tr>
<td>O Garments</td>
<td>O Kleding</td>
</tr>
<tr>
<td>O Leather, leather products, and shoes</td>
<td>O Leer, lederwaren en schoenen</td>
</tr>
<tr>
<td>O Paper (products) and cardboard (products)</td>
<td>O Papier(waren) en karton(waren)</td>
</tr>
<tr>
<td>O Coke oven products and petroleum processing</td>
<td>O Cokesovenproducten en aardolieverwerking</td>
</tr>
<tr>
<td>O Chemical products</td>
<td>O Chemische producten</td>
</tr>
<tr>
<td>O Pharmaceutical raw materials/products</td>
<td>O Farmaceutische grondstoffen/producten</td>
</tr>
<tr>
<td>O Rubber and plastic products</td>
<td>O Producten van rubber en kunststof</td>
</tr>
<tr>
<td>O Other non-metal products/mineral products</td>
<td>O Overige niet-metaalwaren/minerale producten</td>
</tr>
<tr>
<td>O Primary metals</td>
<td>O Metalen in primaire vorm</td>
</tr>
<tr>
<td>O Metal products (excluding machines/devices)</td>
<td>O Producten van metaal (geen machines/apparaten)</td>
</tr>
<tr>
<td>O Computers and electronic/optical devices</td>
<td>O Computers en elektronische/optische apparaten</td>
</tr>
<tr>
<td>O Electric devices</td>
<td>O Elektrische apparatuur</td>
</tr>
<tr>
<td>O Other machines and devices</td>
<td>O Overige machines en apparatuur</td>
</tr>
<tr>
<td>O Cars, trailers, and semi-trailers</td>
<td>O Auto’s, aanhangwagens en opleggers</td>
</tr>
<tr>
<td>O Other transport means</td>
<td>O Overige transportmiddelen</td>
</tr>
<tr>
<td>O Furniture</td>
<td>O Meubels</td>
</tr>
<tr>
<td>O Other goods</td>
<td>O Overige goederen</td>
</tr>
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</table>
Appendix II Factor analysis

### Rotated Component Matrix

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
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<td>.028</td>
<td>.221</td>
<td>-.040</td>
<td>.178</td>
<td>.769</td>
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<tr>
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<td>.190</td>
<td>.088</td>
<td>-.099</td>
<td>.227</td>
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<td>-.048</td>
<td>-.049</td>
<td>.037</td>
<td>-.080</td>
<td>.769</td>
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<tr>
<td>v1_4</td>
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<td>.058</td>
<td>.133</td>
<td>.234</td>
<td>.478</td>
<td>.483</td>
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<td>.142</td>
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<td>.025</td>
<td>.736</td>
<td>.031</td>
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<td>.135</td>
<td>.052</td>
<td>.790</td>
<td>.030</td>
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<td>.185</td>
<td>.193</td>
<td>.117</td>
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<td>.137</td>
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<tr>
<td>v2_4</td>
<td>.150</td>
<td>.285</td>
<td>.238</td>
<td>.036</td>
<td>.780</td>
<td>.126</td>
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<tr>
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<td>.107</td>
<td>.779</td>
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<td>.045</td>
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<tr>
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<td>.171</td>
<td>-.151</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.