Organizational Innovation Practices

A strategy-as-practice perspective on performance increasing configurations of organizational innovations in Dutch manufacturing SMEs

B.H.L. Bekkenutte
S083907

Masterthesis Strategic Management
August 2016

Supervisor: P.E.M. Ligthart

Second examiner: P. Vaessen

Table of contents

Chapter 1 Introduction

Companies can achieve competitive advantage through innovation. Innovation might even be one of a few lasting sources of competitive advantage (Dess and Picken 2000; Tushman and O'Reilly, 1996). Nowadays it is not as much a choice as it is a necessity for organizations to innovate in response to changing customer demands and lifestyles and in order to capitalize on opportunities offered by technology and changing marketplaces, structures and dynamics (Baragheh 2009). Innovation is a means to respond to changes in a company's internal or external environment or as a preemptive action taken to influence the environment (Damanpour, 1991). The adoption of innovation is intended to ensure adaptive behaviour, changing the organization to maintain or improve its performance (Damanpour 2009). Because of its importance innovation, and how it is managed, is a key strategic issue. Different dimensions of innovation can be distinguished. Although most attention has been given to technological innovation (Mothe et al 2015), there is a form of innovation that is less visible, but not less important. According to Schumpeter innovation can be distinguished in five different types: new products, new production methods, new markets, new sources of supply and new forms of organization (in Armbruster 2008). It is this last category that has been emphasized in later research, and is referred to as organizational innovation. This form contains aspects that go beyond the sole focus of technical innovation (Armbruster, 2008). Organizational innovations in general are innovations within companies, but can more specifically relate to non-technical process innovation.

Organizational innovations are very important for a company's competitiveness. Its increasing relevance can be explained by the fact that organizational innovations influence performance of organizations. First, Organizational Innovations are seen as enablers and facilitators for technological innovations. Second, organizational innovations can be an immediate source of competitive advantage and third, they are relevant as prerequisites of knowledge development in companies (Porch, 2006).

Although the importance of organizational innovations has been acknowledged, a clear understanding of the phenomenon is lacking. There is no consensus on a definition of the term organizational innovation and it has been subject to different interpretations within different strands of literature, resulting in an ambiguous phenomenon (Armbruster 2008, Lam 2005). Although there is an increasing awareness of the importance of organizational innovation for the competitiveness of enterprises, the empirical basis for measuring organizational innovation is scattered (Porch 2006). Integrating the existing definitions in an overview, and elucidate on distinguishing features, will help clarify the actual contribution of organizational innovations and create consistency about the phenomenon. It is relevant to study organizational innovations separately from other more technological innovations, because they emerge and develop in a different way than product

innovations and are affected by different actors. Administrative and technical innovations can affect different aspects of organizational performance (Totterdell, 2002). Possible benefits of innovation to organizations can go beyond just economic benefits and might also include administrative efficiency, staff well being, personal growth, increased satisfaction, improved group cohesiveness and better interpersonal communication (West and Anderson, 1996).

The performance effects of Organizational Innovations are created trough the implementation of organizational innovation practices. In addition to the theory, I include actual practices of organizational innovations and investigate what they contribute to the performance of an organization. Organizational innovations are intangible, non-material (Edquist 2001). This characteristic asks for a specific approach in analysis. A mixed methods approach is most appropriate because it facilitates instruments that are able to collect information about non-visible practices in companies as well as the more visible aspects.

In the organizational innovation research there are numerous organizational innovation practices that achieve most competitive advantage when implemented in synergistic combinations (Mothe et al 2015). Therefore, it is not only interesting to see what practices are implemented, but particularly what configurations of organizational innovation practices organizations choose and if these combinations result in superior organizational performance. The intention is to subtract configurations of organizational innovation practices that, in relation to strategy, lead to superior performance in Dutch manufacturing SMEs. These types of organizations characterize the Dutch manufacturing industry and are presumed to play a leading role in innovation (Hilmola et al. 2015).

The goal of this masterthesis is to create a clear overview of the concept of Organizational innovation and its related business practices, in order to provide managers of manufacturing businesses with insight in combinations of organizational practices enhancing performance.

The research question is: **What is organizational innovation and what configurations of organizational innovation practices contribute to the performance of Dutch manufacturing firms?**

In the next sections I will try to answer the research question. The first paragraph is focused on Innovations in general, because organizational innovation is a specific form of innovation. This specific form is defined in varying ways, therefore it is important to get an overview of the different definitions of organizational innovation. These contain several distinguishing characteristics, which will be elaborated on. The different types within the overarching concept of organizational innovations are highlighted in the third section of paragraph two. The process and scope of Organizational innovations will also be analyzed in order to understand every aspect of the phenomenon. Organizational innovations are implemented as organizational practices. Applying a strategy-as-practice (SAP) approach will help to identify relevant elements and contribution of organizational innovation. The SAP approach in combination with micro foundations focuses on the

ways in which actors are enabled by organizational and wider social practices in their decisions and actions. The relevant practices will be defined and compared. As a result, hypotheses about the practices and their relation to the organization's performance are developed.

In Chapter three this strategy as practice approach will be integrated in the methodology. A mixed methods approach will be conducted to retrieve useful information about organizational innovations and its related practices. In chapter four the results of both the qualitative and quantitative part of the analysis will be elaborated on. In chapter five the conclusion and recommendations are stated.

Chapter 2 Theoretic Framework

To understand organizational innovation it is essential to first obtain insight in the general concept of innovation. Innovation is a very broad and complex phenomenon. It consists of several forms, including organizational innovation. The broad amount of definitions will be analyzed and combined in a clear overview. I will highlight some important characteristics of the phenomenon and the different types that exist. Furthermore, the process and scope of organizational innovation will be addressed. The practice approach will be elaborated on at the end of this chapter and to conclude some propositions are drawn based upon the theory.

§2.1 Innovation

Innovation in itself is a very complex phenomenon. The term is often confused with invention, but they have two separate meanings. Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to carry out the idea in practice (Fagerberg, 2005). It is the development and implementation of new ideas by people who over time engage in transactions with others within an institutional context (Van de Ven et al 1986). Here innovation is seen as a process. Schumpeter distinguished five different types of innovations: new products new methods of production, new sources of supply, the exploitation of new markets, new ways to organize business. Schumpeter emphasizes innovations as outcomes (in Armbruster 2008). Crossan and Apaydin (2010) see innovation as both a process and an outcome: Innovation is the production or adoption, assimilation, and exploitation of a value added novelty in economic and social spheres; renewal and enlargement of products, services and markets; development of new methods of production; and establishments of new management systems (Crossan & Apaydin 2010). Innovations occur in various social entities and contexts, such as organizations or economies (Baragheh 2008). Innovations are important for organizations because they enable them to advance, compete and differentiate themselves successfully in their marketplace (Baragheh, 2008).

Innovations can be classified within different typologies. Damanpour (1984) made some clear distinctions between several innovations. They can be radical or incremental, product or process and administrative or technical innovations.

Innovations create changes in the structure and functioning of the adopting entity. The extent of these changes is different for each innovation. A radical innovation produces fundamental changes and represents clear departures from existing practices. Incremental innovations result in little departures from existing practices (Damanpour 1991). The object of the innovation defines whether it refers to a product or process innovation. Product innovation is about the creation or improvement of products, while process innovation is about how to produce them (Fagerberg, 2005). Product innovations are new products or services introduced to meet an external user or market need, and process innovations

are new elements introduced into an organization's production or service operation (Damanpour and Gopalakrishnan 2001). A last distinction that Damanpour makes has to do with the separation between social structure and technology. Technical innovations pertain to products, services and production process technology. They are related to basic work activities and can concern either product or process (Damanpour & Evan 1984). Administrative innovations involve organizational structure and administrative processes. They are indirectly related to the basic work activities. This distinction between more social and technical innovations is also integrated in Damanpour´s definition of innovation, where new products and methods of production are more technological and new sources of supply, the exploitation of new markets and new ways to organize business are non-technological (Vaessen et al 2015). Armbruster (2008) used these distinctions for a clear framework which distinguishes technical product innovations, non-technical product innovations, technical process innovations and non-technical process innovations also known as organizational innovation. Technical product innovation is the development of new products or technologies supported by research and development activities of the companies. Technical process innovation aims at finding new process technologies in order to produce more cheaply, faster and in higher quality. Product-service innovation offers the customers several services which go along with the new product. And organizational innovation comprises the development and implementation of new organizational structures and processes to offer customers more flexibility and efficiency (Armbruster 2008). This last specific type of innovation forms the main focus for the rest of this thesis.

§2.2 Organizational Innovation

2.2.1 Definitions

When reviewing literature that contains definitions of organizational innovation it is clear that researchers approach the topic from different directions. There is no consensus on a definition of the term organizational innovation (Lam, 2005). The different definitions developed can be subdivided within two main categories: innovations in the organizations and a more specific definition of innovation of the organizations. These two categories and their implications for theory will be elaborated on.

2.2.1.1 Innovations in the organization

In a general sense organizational innovation refers to the creation or adoption of an idea or behavior new to the organization (Lam, 2005). It distinguishes itself from other innovation research because of its level of analysis. Innovations can take place on a micro-level (individual), a macro-level (industry) and a meso-level (the firm). This last category, innovation at firm-level, is labeled as organizational innovation. Innovation research also focuses a lot on innovation at the level of the organization, therefore there are many communalities with this type of organizational innovation and innovation in general. The early contributions to organizational innovation see innovation as a necessity to adapt to

new developments within the environment of the business organization. Where Innovation can be defined as the implementation of new procedures or ideas, whether a product of invention or discovery (Evan and Black, 1967). These innovations can be categorized in administrative or technical innovations. According to some scholars adoption of a new idea or behaviour by an organization instead of implementation is also sufficient for organizational innovation (Daft 1978). Damanpour (1984) defined organizational innovation as the implementation of an internally generated or borrowed idea – whether pertaining to a product, device, system, process, policy, program, or service – that was new to the organization at the time of adoption. Organizational innovation is used to refer to the broad meaning of innovation or innovative behaviour in organizations or organizational adoption of innovations. Within these broad meanings innovation is defined to encompass a range of types including new products or process technologies, new organizational arrangements or administrative systems (Lam 2005). Van de Ven (1986) believes that making a distinction between administrative or technical innovations often results in a fragmented classification of the innovation process. Most innovations involve both new technical and administrative components, dividing this causes negligence of a substantial part of the process. I do not agree to omitting this separation, because research indicated that organizational innovations can achieve individual competitive advantage (Porch 2005). Most technical innovations will be followed by administrative innovations, but this does not necessarily work the other way around. To see what the actual contribution of administrative innovations is these need to be analyzed separately.

The definitions stated above hardly differ from the general innovation research. They do acknowledge different types of innovations within the firm. Organizational innovations can be either technical or administrative (Evan and Black 1967; Damanpour 1984), or may include product or process technologies, new organizational arrangements or administrative systems (Slappendal 1996; Sorensen and Stuart 2000). These different typologies lie at the heart of the more specific definition of the term Organizational innovation. The label above does not represent Organizational innovation for the rest of this thesis.

2.2.1.2 Innovation <u>of</u> the organization

Early research on innovation has mainly focused on technical innovations (Mothe et al 2015). Although not labeled as organizational innovations, specific changes to the organization that stimulated innovations in organizations are already mentioned (Hage 1998). It are these changes of the organization that are nowadays acknowledged as major contributors to competitive advantage of organizations.

As mentioned earlier innovation within the context of the firm can be divided in four main categories (Armbruster 2008). One of these categories, non-technical process innovation, is labeled “organizational innovation”. This type of innovation is evidently different from the general innovation

within the context of the organization. In order to stay competitive organizations needed additional innovations next to technological innovations (Andreassen, 1995). Instead of the actual outputs of product and process innovations, these innovations focused more on the intangible factors of the firm(Coriat and Leguehennec in Porch 2005).

The importance of the more social side of innovation in addition to pure technical elements has led to increasing research on a specific type of innovation: organizational innovation. According to Coriat and Leguehennec (2005) technological changes usually go together with changes in skills distributions information flows, action patterns and cultures within the organization. Organizational innovations can occur without dramatic changes in the technical competences the organization holds. I chose the term innovation of the organization for this specific innovation, because it reflects on new changes of the organization. What these innovations actually are will be highlighted in the following section.

Organizational innovations are categorized as the non-technical process innovations of a firm (Kinkel, Lay and Wengel 2004). In this sense it is related to what Damanpour describes as administrative innovations. They involve the organizational structure and administrative processes. Some scholars do explicitly include the production process. Organizational innovations are changes in the production process and in the interaction between agents that make this process possible (Pettigrew and Fenton, 2000). Organizational innovations are indirectly related to the basic work activities of an organization and more directly related to its management, they occur in the social system of an organization (Damanpour 1984, 1991). It includes those rules, roles, procedures and structures that are related to the communication and exchange among people and between the environment and people(Damanpour 1984). This social aspect also returns in the definition of Edquist, who labels them as organizational process innovations (Edquist 2001). Organizational process innovations have no technological elements at all, they are new ways to organize work; a new organizational form is introduced. They have to do with the coordination of human resources(Edquist et al 2001). Coriat(1995) also acknowledges the importance of information, organizational innovation is defined as any new technique of division of labor at intra- or inter-firm level which enables savings to be made in the use of resources, or a better adaptation of products to consumer needs and market variations. They are based on original and efficient methods in the management of information (Coriat 1995).

Greenan(2003) places the emphasis on decision making power. These innovations are a change in the way decision making units are structured within the firm, the way decision making power and skills are distributed within the firm and between decision making units and the type of information and communication structures that are in place (Greenan, 2003). Organizational innovation is the use of new managerial and working concepts and practices in the firm's processes and structures(Armbruster 2008). Organizational innovation is the introduction of new organizational forms of work and cooperation (Belak, 2005). It is not only restricted within the boundaries of the firm. There are also academics that, besides innovative changes to a firm's nature, structure or arrangements, include

changes in beliefs, rules or norms (Sapprasert 2012). A highly cited definition is the one developed by the OECD and Eurostat(2005). They state that organizational innovation is a new or significantly improved knowledge management system implemented to better use or exchange information, knowledge and skills within the firm; a major change to the organization of work within the firm, such as change in management structure or the integration of different departments or activities; new or significant change in the firm's relationship with other firms.

A strongly related concept to organizational innovation is workplace innovation. Workplace innovation is the implementation of new and combined interventions in the fields of work organization, human resource management and supportive technologies. Non-technological innovation is seen as the broader concept of workplace innovation, in which also dynamic management, new marketing practices and external collaboration are included (Pot 2011). It is fuelled by open dialogue, knowledge sharing, experimentation and learning in which diverse stakeholders including employees, trade unions, managers and customers are given a voice in the creation of new models of collaboration and new social relationships. Workplace innovation seeks to build bridges between the strategic knowledge of the leadership and the tacit knowledge of frontline employees. It seeks to include all stakeholders in the dialogue (Totterdell, 2012). Workplace innovation is seen as being located at the interface of management innovation and employee driven innovation. This makes the process neither top down, nor bottom up but a mix of these two processes. Successful workplace innovation depends not on following a linear process of change towards a defined end but on the ability to create innovative and self-sustaining processes of development by learning from diverse sources, by creating hybrid models and by experimentation (Totterdell 2012).

2.2.2. Features of Organizational Innovations

In order to clarify the phenomenon organizational innovation an elaboration of important features, extracted from theory is helpful. Subsequently its characteristics, types, scope and process will be analyzed and elaborated on.

2.2.2.1. Characteristics

The term organizational innovation has been the source for many differing definitions in literature. Although these definitions might deflect on some points, several distinctive characteristics can be subtracted.

Both the general and the specific definitions have in common that they all focus on organizations. The level of analysis of the innovations is the firm. This does not exclude influences on organizational innovation from other levels, such as the environmental level, or the individual level. It is also possible that innovations occur beyond an organizations boundary, but there is always a link with the organization (Armbruster, 2008). The Organization includes the way decision-making units are structured within the firm, the way decision-making power and skills are distributed within the firm

and between decision making units, and the type of information and communication structures take place (Greenan 2003). The organization is the structure and processes. Organizational innovations may concern particular departments, respectively functions or may affect the overall structure and strategy of the company as a whole.

To classify as an organizational innovation there needs to be at least some sort of innovation. Earlier in this thesis I have elaborated on the characteristics of innovation. An important feature for organizational innovation is that there needs to be some sort of novelty. For the understanding of this thesis new does not require being new to the world or to an industry. Sufficient is the implementation of an organizational method that has not been used before in the firm and is the result of strategic decisions taken by management (Coriat 1995). New to the adopting firm is the minimum entry level (Damanpour 1984, Coriat 1995). Novelty is what distinguishes a change from an innovation. In the literature these terms are many times mixed up. A new change in the organization equals an organizational innovation.

Organizational Innovations are focused on the non-technical renewal or new adjustments of processes regarding the organization. They have an internal focus (Van de Ven, 1986). A production process is the system of process equipment, work force, task specifications material inputs, work and information flows that are employed to produce a product or service (Utterback & Abernathy 1974). Where technological process innovations are new elements introduced into an organization's production or service operations, such as input materials, task specifications, work and information flow mechanisms, and equipment used to produce a product or render a service (Damanpour 1991).

Despite the fact that some scholars recognize all innovations within a company as organizational innovation for this thesis only non-technical innovations will be encountered as organizational innovations, because the non-technical part is the essential distinguishing element from other types of innovations. According to Edquist organizational innovations have no technological elements at all (Edquist et al 2001). This excludes product innovation, a new technology or combination of technologies introduced commercially to meet a user or market need. Also process innovation, which is aimed at the system of process equipment, work force, task specifications, material inputs, work and information flows, that are employed to produce a product or service, will not be considered an organizational innovation (Utterback and Abernathy, 1974). An essential feature of an organizational innovation is that it focuses on new and more efficient ways of managing the relations between tasks and functions along the production chain (Coriat in Andreassen 1995). This implies that organizational innovations have always some sort of social element. The innovations affect the social system of the organization, the relationship among people who interact to accomplish a particular goal or task. It also includes those rules, roles procedures and structures that are related to the communication and

exchange among people and the environment and people (Cummings Srivastva, 1977). It is possible that technical innovations are used for organizational innovation, but they do not condition the existence of the organizational innovation (Coriat 1995).

Organizational innovations are intangible, non-material (Edquist 2001). Unlike product innovations their introduction does not result in tangible goods. These innovations have an internal focus and have to do with changes in rules, roles, procedures and structures of the organization. These can be formalized, but often exist without any direct visual evidence.

Like innovation in general organizational innovations requires novelty. These novelty's are focused on (a part) of the firm and change the processes of the firm. A specific characteristic of organizational innovations is that they bring about changes in the social system of the firm. These changes are non-technical and intangible, but might affect the technical system as well.

2.2.2.2. Types

Organizational innovations can be subdivided in different types. Armbruster(2008) categorized them as either structural or procedural. Structural organizational innovations influence, change and improve responsibilities, accountability, command lines and information flows as well as the number of hierarchical levels, the divisional structure of functions or the separation between line and support functions. Procedural organizational affect routines, processes and operations of a company. Organizational innovations are not limited within the companies boundaries, they may include new organizational structures or procedures that go beyond a company's boundaries.

Damanpour (1984) focuses on the impact that organizational innovations can have. A radical organizational innovation produces fundamental changes and represents clear departures from existing practices. Incremental innovations result in little departures from existing practices (Damanpour 1991). Organizational innovations are of two different kinds according to Wengel (2000), structural and managerial, which usually interrelate. Structural innovations encompass responsibilities, accountability, command lines and information flows. They change the number of hierarchical levels, the divisional structure of functions or the separation between line and support functions. Managerial innovations affect the operations and procedures of the enterprise such as the specifications of the responsibilities, the contents of commands and of information flows and the way they are dealt with. They concern speed and flexibility of production and the reliability of products and production processes (Wengel 2000). Managerial innovations are also seen as introduction of improved relationships between managers and subordinates and new styles of management which encourage and activate all employees to make work organization a collective resource of innovation. And methodological innovations, introduction of new management and cooperation which support managerial innovations in realization (Mulej 2002). A different approach of typology has been

developed by Totterdell et all (2002). They classify HRM innovations, work design innovations and organizational restructuring innovations within the organizational innovations. Edquist sees managerial innovations as labor-saving organizational innovation, whereas changes in work organization are capital-saving organizational innovations (Edquist et al 2001).

The different types mentioned above can be combined into three categories, structural innovations, procedural innovations and managerial innovations. The structural innovations are labor-saving and imply organizational restructuring, it affects the relations within the company. The second type is the procedural innovation, which is related to work design innovation and affects the content of the work and peoples relations towards this. The last type is the managerial innovation which is focused on the Human relation side of the organization. It affects the relation between managers and employees. These three types can either be radical or incremental and inter or intra-firm.

2.2.2.3. Scope

Organizational Innovations take place at the firm level. This does not implicate that each innovation affects every apart of the organization. Organizational innovations may concern particular departments respectively functions or may affect the overall structure and strategy of the company as a whole (Armbruster 2008). It is even possible that innovations go beyond the boundary of the organization, referring to inter-organizational innovations (Armbruster, 2008).

Organizational Innovations can either be radical or incremental in relation to the impact of the innovation for the organization (Damanpour, 1991). Radical innovations produce fundamental changes in the activities of an organization and represent clear departures from existing practices. Incremental innovations result in little departure from existing practices (Dewar & Dutton, 1986). A common practice when implementing organizational innovations is using pilots. This means that a very small area of the enterprise uses the innovation and there might not be any impact on the overall performance of the business at all (Armbruster 2008).

2.2.2.4. Process

Organizational Innovations are implemented top-down, in contrast to most technological innovations (Daft 1978). The implementation of changes to the structure and processes of enterprises can be instigated by a new understanding of the current organization in its market situation. (Armbruster, 2008). External drivers for the implementation of organizational innovations are turbulent and dynamic markets as well as heterogeneous customer demands together with the greater market power of customers. This requires more flexible structures and less hierarchy in enterprises in order to promote more decision power in places where the relevant information is directly available (Burns and Stalker, 1961; Mintzberg 1979; Armbruster 2008). The organizational innovations implemented in response to the changes in the organizational environment enable companies to improve their performance as long as the market situation does not change. Organizational innovations can also be a

reaction to new technological innovations, because Organizational innovation can enable and even enhance the effect of technological innovation on firm performance (Chandler, 1962, Lam 2004). Internal drivers of organizational innovations can be available knowledge and resources (Crossan & Apaydin 2010). These determine competitive advantage of organizational innovations because they cannot be readily assembled through markets (Teece et al 1992). Important factors of organizational innovations are innovation leadership, managerial levers and business processes (Crossan & Apaydin 2010). The support and guidance of leaders is vital in promoting innovative efforts at the initial creative stage, as it contributes to effective interaction among group members (Crossan & Apaydin). Equally important is their ability to create conditions for the subsequent implementation of the innovation. Managerial levers can be summarized in five types: missions/goals/strategies, structures and systems; resource allocation; organizational and knowledge management tools and culture. These five managerial levers together enable core innovation processes.

Workplace innovation is seen as being located at the interface of management innovation and employee driven innovation. This makes the process neither top down, nor bottom up but a mix of these two processes. Successful workplace innovation depends not on following a linear process of change towards a defined end but on the ability to create innovative and self-sustaining processes of development by learning from diverse sources, by creating hybrid models and by experimentation (Totterdell 2012). They are initially developed trough processes of trial and error and learning by doing within the innovating firms.

The innovation process consists of five different stages: initiation, portfolio management, development and implementation, project management and commercialization (Crossan & Apaydin 2010). Organizational Innovations are not likely to follow a similar path, because most organizational innovations are diffused to new firms by copying the vanguard firms (Edquist, 2001). Boer and During (2003) compared the processes of product, process and organizational innovation and showed that there are surprisingly few differences. Utterback and Abernathy (1974) developed a Dynamic Model of product and process innovation. This model consists of three different stages of the production process and are referred to as uncoordinated, segmental and systemic. The uncoordinated phase is in the early life of the process, where the rate of change is very high. The segmental stage is a more mature stage, the process becomes more elaborated and tightly integrated. In the last stage, the systemic stage the process is well integrated and improvements become increasingly more difficult and costly.

The process of organizational innovations can be instigated by sources from within or outside the firm and will most of the time be implemented top-down. Workplace innovations have a more mixed approach of the organizational innovation process. The innovation process of organizational innovation is not specifically defined in different stages, but is not likely to be identical to the process

of product innovation. The innovations can take place in the early stage of the production process, the uncoordinated stage, or the more mature stages, the segmental or systemic stages.

The term organizational Innovation in research has been used in a variety of definitions. Yet it is possible to make a main distinction. First organizational innovation is used as a label for innovations within the firm. In this context there is no specific distinguishing characteristic from the term innovation. Organizational Innovation as innovation of the organization is a specific type of innovation. It is the non-technical process innovation that yields changes in the social system of the innovation, that are new to the organization. Organizational innovation can be specified in several types relating to their position within the firm. These are managerial innovations, structural innovations and procedural innovations. These different types of organizational innovations are implemented trough the introduction of several practices, the next section will elaborate on these practices.

§2. 3 Organizational Innovation as Practice

A strategy as practice perspective has the ability to explain how strategy-making is enabled and constrained by prevailing organizational and societal practices (Vaara & Withington 2012). Relating this perspective to organizational innovation will enable to explain strategic related issues of practices regarding innovation. SAP approach does not solely pay attention to the development of innovations coerced by top management, but integrates the role of other factors in this process. Practices are accepted ways of doing things, embodied and materially mediated, that are shared between actors and routinized over time. The actors that play a role in these practice are called practitioners and built of praxis. This approach will uncover the activity inside the process of innovation. It delves deeper into what is actually going on. A related concept are micro-foundations. These can be studied on an individual or organizational level. Microfoundations are the underlying individual-level and group-level actions that shape strategy, organization, and, more broadly, dynamic capabilities, and lead to the emergence of superior organizational-level performance (Eisenhardt et al 2010).

Practices of innovation represent the espoused theories that guide this activity, such as shared routines of behavior, norms and procedures that can be altered according to the activity in which they are used. Praxis refers to actual activities or theories-in-use that constitute the fabric of innovation. Practitioners are those who actually perform praxis, and what they actually do affects a company's innovation (Crossan & Apaydin 2010). A Strategy-as-Practice approach helps to analyze the link between Organizational Innovations and performance, by outlining the actual activities that contribute to this relation.

2.3.1 Surveys on Organizational Innovation

The acknowledgement of the increasing importance of organizational innovation has led to several surveys regarding the subject. There are two important surveys from which most of organizational innovation data has been subtracted; The European Community Innovation survey (CIS), the European Manufacturing Survey. These surveys are practice based and relate to the manufacturing industry, which makes them suitable for this thesis. These surveys all used different operationalized definitions for the phenomenon organizational innovation.

The OECD in cooperation with Eurostat developed one of the first elaborated reports on the phenomenon organizational innovation. They created a frequently copied definition: “Organizational innovation is a new or significantly improved knowledge management system implemented to better use or exchange information, knowledge and skills within the firm; a major change to the organization of work within the firm, such as change in management structure or the integration of different departments or activities; new or significant change in the firm's relationship with other firms”. According to this report organizational innovations are intended to increase a firm’s performance by reducing administrative costs or transaction costs, improving workplace satisfaction, gaining access to non-tradable assets, or reducing costs of supplies. There are three types of organizational innovations. Innovations in business practices involve the implementation of new methods of organizing routines and procedures for the conduct of work. Innovations in the workplace organization involve the implementation of new methods of distributing responsibilities and decision making among employees for the division of work within and between the firm activities, as well as new concepts for the structuring of activities. The last type has to do with a firm’s external relations and involve the implementation of new ways of organizing relations with other firms or public institutions.

The Community Innovation Survey 2010 (CIS), is a survey of innovation activity in enterprises and use the definitions of the Oslo Manual 2005. They state that Organizational change is the most important form of non-technological innovation. The Fourth Community Innovation survey (CIS4) included the measurement of organizational innovation and used the following definitions to identify different types of organizational change. Implementation of new or significantly improved management systems to better use or exchange information knowledge and skills. A major change to the organization of work within the enterprise, such as changes in the management structure or integrating different departments or activities. Introduction of new or significant changes in the relations with other firms, such as alliances, partnership, outsourcing and sub-contracting. Changes to the design or packaging of a good or service. Introduction of new or significantly changed sales methods or distribution channels.

At last the European Manufacturing Survey (EMS), which is part of the ISI, defines Organizational innovation as changes in structure and processes of an organization by implementing new managerial and working concepts and practices such as the implementation of team work in

production performance based wage systems or just-in-time concepts. The PORCH report, which contains the results of the German Manufacturing Survey, states that it is not advisable to consider organizational innovation as a homogenous phenomenon, here the different practices come into place. The organizational innovations are seen as inputs to create several different outputs. Each organizational innovation practice will have different implications for the four output dimensions, quality, flexibility, innovation ability (product innovation) and costs.

2.3.2 Practices of Organizational innovations and Propositions

By taking a SAP approach Organizational innovation behaviour of companies is studied by analyzing the more specific practices adopted by the companies. These practices do not show what managers intended, but show what is actually being realized within the company. By studying the practices, the actual content of organizational innovations can be analyzed. The surveys mentioned above all contain several practices. The most important practices are highlighted in Appendix B.

The organizational innovation practices can all be relevant to the improvement of the performance of an organization. An adoption approach that is characterized by organizations introducing singular innovations as well as non-innovative firms, has less competitive advantage than firms introducing synergistic organizational innovation (Mothe et al 2015). Therefore, it is not only interesting to analyze practices individually, but look at configurations of practices. There are several perspectives contributing to the relation between strategy, practices and performance. Delery and Doty (1996) distinguished three interesting perspectives from the Strategic Human Resource Management theory: the universalistic approach, the contingency approach and the configurational approach.

These perspectives are all applicable to the organizational innovations practice issue. The Universalistic approach states that some practices are generally better than others and organizations should adopt these organizational practices. The contingency approach states that in order to be effective an organization's innovation policy must be consistent with other aspects of the organization, most importantly it's strategy. The configurational approach is concerned with patterns of practice systems that best match with other organizational characteristics such as strategy.

For this research the focus lies not on practices in general, but on organizational innovation practices. Another key element in this research is performance. The outcome of every innovation practice will eventually influence performance, direct or indirect. Performance is a very broad construct and can indicate financial or non-financial measures. Both indicators are important to measure the influence of organizational innovation. For example, the OECD claims that organizational innovation increases firm performance trough reducing costs as well as gaining access to non-tradable assets or improving workplace satisfaction. The role of Small and medium enterprises has grown over the past few years (Hilmola et al. 2015). The European commission has defined Small and Medium enterprises as enterprises which employ fewer than 250 persons and which have an annual turnover

not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million.[1] The Dutch manufacturing industry is characterized by small and medium enterprises, from 10 to 50 employees (Ligthart et al. 2008). This type of company is presumed to play a leading role regarding innovation. Therefore, the hypotheses will be tested on Dutch manufacturing SMEs. Improved performance in SMEs trough the introduction of organizational innovation practices can be explained by the following statements.

SMEs are seen as the drivers of innovation. Because of their size they are able to act flexible on the markets. Implementing the right strategy is a key issue in a firm's survival. A suitable typology of strategies in relation to innovation has been developed by Miles and Snow (1978). Their three strategy types, prospector, defender and analyzer are characterized by specific elements in coping with internal and external problems. A defender is focused on stability, they choose a limited set of products in a narrow market and compete trough competitive pricing or high quality products. These organizations tend to strive for efficiency and are characterized by a centralized structure. The prospector is in many ways the opposite of the defender. Their prime capability is finding and exploiting new market opportunities. Instead of efficiency they are focused on flexibility and effectiveness. The analyzer strategy tries to combine the exploitative nature of the defender strategy with the more explorative prospector. The last typology is the analyzer, a hybrid form. It tries to find a balance between the strong points of the previous two. They strive to simultaneously locate and exploit new product and market opportunities while maintaining a firm core of traditional products and customers.

The ambidextrous debate states that you should find the right balance between exploration and exploitation in order to achieve superior performance. The basic problem confronting an organization is to engage in sufficient exploitation to ensure its current viability and, at the same time, to devote enough energy to exploration to ensure its future viability (Levinthal, 1993). The analyzer strategy should therefore achieve better performance. Therefore, the next hypothesis is:

H1: Companies executing an analyzer strategy achieve better performance than companies executing either a defender or prospector strategy.

The Universalistic approach states that the introduction of specific practices will always result in better organizational performance. These practices can be seen as best practices. According to this theory, choice of strategy does not have any implications for the 'best practices'. All organizations should adopt these practices. The number and diversity of organizational innovation practices makes it assumable that some practices are introduced more often than others, irrespectively the organization's strategy. Porter and Siggelkow(2008) introduce a slightly similar phenomenon, generic activities,

[1] COMMISSION RECOMMENDATION of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises

context independent activities that set the bar for competition. Therefore, the following hypothesis can be stated:

H2: There are specific organizational innovation practices that have a positive relationship on performance for every organization in the manufacturing industry.

Strategy does not only affect performance of companies, but determines actions made by the companies. Organizations will make choices dependent on their strategy. The contingency approach looks at the relationship between organizational practices and the choice of strategy of an organization. It states that practices have to be implemented consistent with the organizations strategy. The alignment of strategy and individual organizational innovation practices creates conditions where superior performance can be achieved. The three strategy types, defender, analyzer and prospector have different implications for the innovation activities of organizations. According to the contingency perspective organizations should chose organizational innovation practices that fit with their innovation strategy. Therefore, organizational innovation practices are likely to differ between organizations that adopt different strategies. The hypothesis can be stated as follows:

> *H3: The introduction of organizational innovation practices will be contingent on an organizations strategy.*

The configurational perspective first identifies unique patterns of practices, i.e. a specific configuration or set of practices, that are regarded as maximally effective. The configurations that maximize horizontal fit should be derived, and linked to alternative strategic configurations in order to maximize vertical fit. When this horizontal and vertical fit is found, the configurations of practices will create synergistic effects and the organizations will achieve the best performance (Delery and Doty, 1996). In an organizational innovation practice perspective this should lead to a maximum fit between configurations of organizational practices based on one of the three strategies.

Lean Production is acknowledged as a configuration of practices, it is a tightly coupled system where the constituent elements hold together in mutual dependence (Shah & Ward 2007). It is a configuration often implemented by Dutch manufacturing firms. Lean production is an integrated socio-technical system whose main objective is to eliminate waste by concurrently minimizing supplier, customer, and internal variability (Shah and Ward 2007). They also proposed ten practices from which the lean configuration is built. It is a concept that encompasses the following practices: supplier feedback; Just-in-time delivery; supplier development; just-in-time production; continuous flow; set up time reduction; total productive maintenance; statistical process control; employee involvement. The individual elements might be associated with better performance, but firms that are

able to implement the complete set achieve distinctive performance outcomes that can result in sustainable competitive advantage (Shah and Ward 2007).

Total Quality Management is also a widely adopted management program. It takes holistic and innovative companywide approach to quality management and strives for continuous improvement in all the functions of an organization to ultimately improve performance. This Approach can have some overlap with Lean management. It consists of the following practices: visionary leadership, internal and external cooperation, learning, process management, continuous improvement, employee fulfillment, and customer satisfaction (Wiengarten et al, 2013).

Lean and Total Quality management might indicate possible configurations. Translating the configurational perspective to the organizational innovation practices, leads to the following hypothesis:

H4: A specific set of organizational innovation practices that best fits the organization's strategy will be positively related to organizational performance.

Porter and Siggelkow (2008) validate the theories of Delery and Dutton and argue that there should be a fit between the activities within a firm. They propose a theory of contextuality: the value of individual activities is influenced by other activity choices made by a firm (contextuality of activities) and how activities interact can also depend on other activity choices made by a firm (contextuality of interactions). Activities that are not affected by other activity choices are generic, they set the bar for competition. Activities whose value is affected by many other firm choices are strategy-specific activities. The sustainable competitive advantages of organizational innovations are created by the fact that in order to implement these activities organizations need to make them compatible with structure, culture and systems of the adopting organization, so eventually become unique to the adopting organization (Damanpour, 1996). The choices made by firms to. This last category allows firms to create and implement different strategic positioning on the market. Activities can relate to a variety of actions within the firm. In this thesis I will limit them to practices. When companies have reached the vertical and horizontal fit mentioned above it is possible that additional choices can lead to changes in performance. For example, a new organizational practice, or specific type of performance. This leads to the following hypothesis:

H5: The relationship between strategy specific organizational innovation practices and performance is influenced by specific organizational choices of the firm.

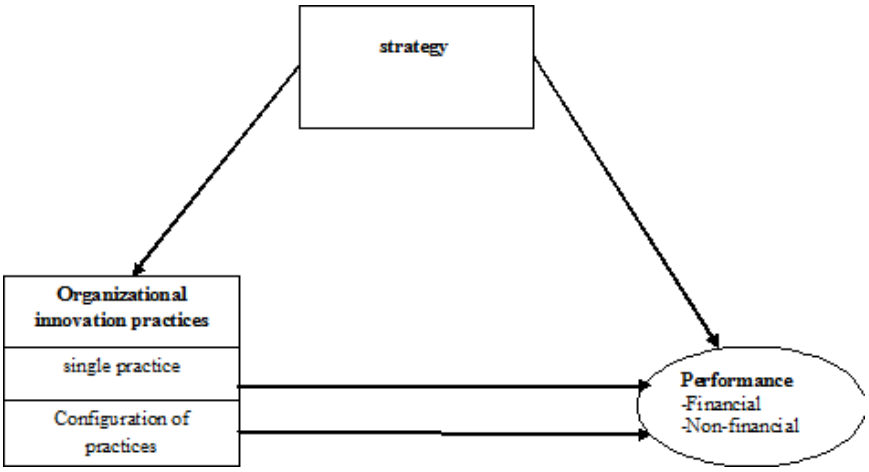

Figure 1. *Conceptual Model:*

Chapter 3 Methodology

In the next chapter I will elaborate on the preparation of the research. First the chosen methodological approach in the given research context is addressed. The sample and its selection method that will yield the data for the research are described in detail. Furthermore, the operationalization of the variables as starting point of the analysis will be discoursed. At last the measures taken to guarantee the validity and reliability of the research are discussed.

§ 3.1 Context

The existing Organizational innovation research is fragmented and. This thesis is intended to provide a more holistic view on organizational innovations and its practices, therefore a mixed methods research is the most appropriate methodological approach (Venkatesh et al 2013). A mixed methods approach includes both a quantitative and qualitative analysis and is known for its strength with respect to understanding and explaining complex organizational and social phenomena (Venkatesh et al. 2013). The invisibility of organizational innovation practices asks for a thorough analysis, that a mixed methods approach can provide.

The quantitative analysis will contribute to test the hypotheses developed in the second chapter. From a large data set some conclusions can be drawn. Conclusions on the first two hypotheses are likely to come from the quantitative data. The qualitative part of the research functions as a both a confirmation and exploration of the practices. The interviews might show if the relations proposed do actually occur in reality and fulfill a confirmative role. Furthermore, the qualitative study gives the researcher the opportunity to explore practices implemented in the organizations and results reached by the organizations, that are not included in the EMS questionnaire. This gives the opportunity to test the actual contributions as they are chosen and perceived in practice. The possible interplay between practices, praxis and practitioners might become more clear trough this method.

§ 3.2 Sample

The data will be retrieved from two different angles. For the quantitative study the results from the European Manufacturing Survey questionnaire will be used, the qualitative data of the analysis will be harvested from interviews with employees from small and medium Dutch manufacturing firms. The European Manufacturing Survey has been conducted in organizations from 18 different countries in 2012, including The Netherlands. Manufacturing firms with at least 20 employees were targeted. I am interested in the Dutch SMEs with approximately 50 employees. The data of the respondents meeting these criteria will be used for further analysis.

The qualitative part of the analysis will be based on in depth interviews with employees from similar Dutch manufacturing firms. Eight organizations, from different industry sectors, were prepared to

contribute to my research and I conducted one interview at each of these firms. To categorize the sectors in which the companies operate I have used the division of the EMS. This led to the following overview:

Company	Industry sector
1. CF1	Construction and Furniture
2. E1	Electronical
3. M1	Machinery
4. CF2	Construction and Furniture
5. Fo1	Food
6. Fo2	Food
7. M2	Machinery

Table 3.1 *overview of interviewees*

§ 3.3 Instruments

The European Manufacturing Survey (EMS) covers a core of indicators on the innovation fields "technical modernization of value adding processes", "introduction of innovative organizational concepts and processes" and "new business models for complementing the product portfolio with innovative services". These indicators are elaborated in several questions, agreed upon in the EMS consortium and are surveyed in all participating countries. The EMS 2009 and 2012 questionnaire both include the Netherlands. For this thesis the questions on the topic of “introduction of innovative organizational concepts and processes” are most relevant. The Survey covers most of the constructs represented in the conceptual model, hence it is possible to operationalize the constructs and relations of the hypotheses.

The Questionnaire of the EMS survey (2012) includes the section introduction of organizational concepts and processes. In chapter 2 I have defined organizational innovations as a heterogeneous concept. To gain insight about the role of organizational innovation within companies it is necessary to focus on the practices introduced. The concepts and processes in the questionnaire each have a different focus, that cover the typologies distinguished in chapter 2. There are 4 categories of organizational concepts and processes, organization of production; organization of work; standards and audits; and Human Resource Management. The underlying questions of these categories represent most of the practices of the overview (appendix B) and will all be included in the analysis. This leads to the following overview, in which the questions are labeled accordingly:

Practice	EMS questions
Value Stream Mapping	H08a
Manufacturing Cells	H08b
Just in Time	H08c
Single Minute Exchange of Die	H08d
Total Production Maintenance	H08e
Quality Management	H08f
5s Method	H08g
Knowledge Management	H08h
Upskilling	H08i
Continuous improvement	H08j
Self-Organized teams	H08k

Autonomous task groups	H08l
Visual Management	H08m
ISO 9000	H08n
Supply chain management	H08q
Supervisor Support	H08r
Participative Job design	H08u,
Education program	H08v
Environmental Audits	H08p, H08q
Six Sigma	H08o
Communication structure	H08s
Knowledge maintenance	H08t
Training	H08w

Table 3.2 *Organizational Innovation Practices and EMS indicators*

The practices above will be analyzed individually, but based on theory it is also possible to compose configurations that after implementation will create synergistic effects. Lean Manufacturing and Total Quality management are two concepts consisting of several practices. Although in Literature the configurations might overlap, I made a distinction between these two approaches in relation to their practices. Lean Management is focused on eliminating errors, while TQM regards the improvement of current practices. Based on this distinction I chose the configurations. The analysis will clarify whether these configurations are justified.

Configuration	**EMS question**
Lean	H08a, H08c, H08e
Total Quality Management	H08f, h08j, h08n, h08w,

Table 3.3 *Configurations of practices and EMS indicators*

Strategy is an important variable in the model. The choice of strategy might influence the adopted practices, the configuration of the practices and the performance of the firms. The strategies of the organizations are categorized according to the typologies of Miles and Snow (1978). They developed three strategies, the prospector, the defender and the analyzer. A prospector focuses on finding new products and market opportunities, while the defender has a limited set of quality products and tries to compete trough market penetration. The Analyzer tries to combine these two strategies. To appropriately translate these strategies to the EMS survey it is important to know what activities form an organization's competitive position. Question h02a and H02a1 of the survey ask the companies to rank these activities in order of importance. Their scores indicate what activities they value and determine their chosen strategies. A low score, 1 is most important, on product innovation and customer adjustment indicates a prospector strategy. A low score on price, quality and delivery time indicates a defender strategy. The analyzer strategy are the remaining organizations.

Strategy	**EMS question**
Prospector	H02a3, H02a4
Defender	H02a1, H02a2, H02a5
Analyzer	H02a1, H02a2, H02a3, H02a4, H02a5

Table 3.4. *Innovation Strategy indicators*

The dependent variable in the conceptual model is performance. Both the OECD and the European Manufacturing Survey have defined output indicators of Organizational innovation. These innovations are aimed at reducing costs and increasing quality, flexibility and innovation ability, the OECD adds workplace satisfaction as result of organizational concepts. The intended results can be translated to question of the EMS survey, which provides for several of these indicators. Section 19 of the survey includes questions about production lead time, flexibility, delivery time and scrap rate. These cover the output indicators costs, flexibility and quality. Innovation ability can be measured by the amount of new products introduced. An overall indicator is growth in annual turnover, which will be included as a performance indicator. The measurement of workplace satisfaction in relation to the survey will be harder. The amount of HRM organizational concepts introduced, might indicate workplace satisfaction. In my research I also want to see whether choice of strategy influences performance. Therefore, the performance indicators will be divided in two categories: efficiency and effectivity performance indicators. Efficiency is related to achieve results with as little resources as possible, and includes production lead time, delivery on time, scrap rate. Performance focused on effectivity also includes results in workplace satisfaction and other non-financial measures.

Performance	**EMS question**
Annual Turnover	H20a
Production Lead Time	H19a
Delivery on Time	H19e
Scrap rate	H19f
Flexibility	H19c, H19d

Table 3.5 *Performance indicators*

The information that can be retrieved trough the survey is bound by the questions asked. Another instrument has to be deployed to explore practices introduced that go beyond the survey. A mixed methods study obliges the researcher to conduct both a quantitative as a qualitative analysis, with appropriate instruments. The purpose of the qualitative analysis is to confirm the data of the EMS survey and retrieve data beyond the boundaries of the survey. Therefore, the most appropriate measurement instrument in this context is an interview. An interview allows the researcher to address the topic with the interviewee, but leave it open to his or her interpretation. The interview will be semi-structured, the topics and leading questions are predetermined. The main guidelines are set, but it is possible to elaborate on interesting subjects and change sequence of questions during the interview (Baarda, De Goede & Teunissen, 2005). After a small introduction the interview addresses 6 main topics. First there are some questions about the background of the organization. Then the organizations innovations activities will be addressed and specified to organizational innovations. Subsequently the role of universalistic, contingency, configurational and contextual influences on innovation activities will be addressed. The interviews will be recorded, transcribed and coded and the results will be processed anonymously. The interview script is included in Appendix E.

§ 3.4 Validity & Reliability

Both the qualitative and quantitative part of the analysis have to meet the conditions of Validity and Reliability. The Validity looks whether the instruments actually measures what they were designed to measure. Reliability is the ability to produce the same results under the same conditions (Field 2009). The qualitative and quantitative methods of research differ in their criteria to meet the required conditions, they will be discussed separately. For a mixed methods analysis, the researcher also needs to provide an explanation of how the findings are integrated from both qualitative and quantitative studies (Venkatesh 2013).

The constructs in the quantitative analysis are developed based on the literature review according to the existing theory. Such an operationalization guarantees construct validity. The EMS survey does already assure some accurate constructs, others are translated according to the theory.
The Interview is semi-structured, this particular interview is reliable because it guarantees a similar approach every time the interview is conducted. The topics addressed are theory based and retracted from the literature review. This adds to the construct validity of the interview. The fact that the interview is open adds to the validity of the research because it allows for information that can be an enrichment for the existing data.

The combination of both approaches enhances the validity of the research as a result of triangulation. The same constructs are measured from different research angles, enhancing their measurement of the same construct from different perspectives. Both approaches are based on data retrieved from participants meeting the same criteria. The characteristics of the interviewees are similar to those of the participants of the survey. The quantitative data provided 137 cases, which makes it able to generalize retrieved relationships. Unfortunately, the qualitative data gave 8 responses and does not have a representative of each industry sector mentioned in the survey. This means that the qualitative data can be used in this thesis, but are only valid for these specific cases.

Chapter 4 Results

In this chapter the results of the mixed methods analysis will be displayed. First the quantitative data will be elaborated on. The general results and relationships retrieved from these data will be discussed and the hypotheses are tested based on these results. The second part of this chapter highlights the results from the conducted interviews. Constructs and relationships are defined in accordance with the qualitative statements. The hypotheses will also be tested for the qualitative data. To conclude, both results are combined in order to generate universal statements.

§4.1 Quantitative results

The Quantitative analysis is used to draw some general conclusions. The EMS survey provides a large dataset including Dutch manufacturing companies and a broad amount of interesting organizational innovation practices and performance indicators. The first section of this paragraph is focused on the descriptives of the main variables in the quantitative analysis. In the next section the relations between these variables are discussed.

§ 4.1.1. Descriptives

The quantitative data are retrieved from the European Manufacturing Survey 2012. The first condition is inherent to being included in the survey, namely the fact that companies are active in the manufacturing industry. Furthermore, organizations have to be Dutch and of small or medium size. This requirement is in accordance with the recommendation of the European Commission, thus comprises organizations up to approximately 250 employees. This leads to the inclusion of 139 companies, divided over seven different industry sectors. The companies have an average size of 196 employees.

Dutch	**Manufacturing**	**SMEs**
Number	**Mean**	**Median**
139	196	42

Table 4.1 *EMS survey respondents*

The manufacturing industry consists of seven sectors. Most companies are active in the metal, chemical or machinery industry, whereas the Construction and Food sector are the least represented. The companies included belong to the following categories.

Industry sectors	Frequency
Metals and metal products	34
Food, Beverages and Tobacco	10
Textiles, Leather, Paper and Board	16
Construction, Furniture	10
Chemicals	27
Machinery, Equipment Transport	27
Electrical and Optical equipment	15

Table 4.2 *Industry sector represented in EMS survey*

When basic assumptions are met the first construct of the conceptual model, the company's strategy, can be elaborated on. The strategies are based on the typologies of Miles and Snow (1978). A prospector focuses on finding new products and market opportunities, while the defender has a limited set of quality products and tries to compete trough market penetration. The Analyzer tries to combine these two strategies (Miles and Snow 1978). The strategies are based on the degree of importance for several activities of the organization: price, quality, product innovation, product adjustments and delivery time. A prospector strategy is characterized by low scores, indicating importance, on product innovation and customer adjustment. Low scores on price, quality and delivery time indicate a defender strategy. The strategies have a correlation of -.730 which indicates that these are opposite strategies. The scores of the indicator variables are translated into a table and when an organization scores 1 on prospector and 3 on defender, it has a prospector strategy and vice versa. The other scores, indicate an analyzer strategy. This leads to 73 organizations with defender strategy, 56 with an analyzer strategy and 10 with a prospector strategy. As expected most manufacturing SMEs do conduct either a defensive or analytic strategy.

Strategy	Number
Defender	73
Analyzer	56
Prospector	10

Table 4.3 *Strategy of SMEs in EMS survey*

The division of strategies across the different industry sectors shows that defenders are most popular in the construction

	Defender	Analyzer	Prospector
Metals and metal products	58.8%	41.2%	0

Food Beverages and Tobacco	20%	60%	20%
Construction, Furniture	75%	25%	0
Chemicals	51.9%	40.7%	7.4%
Machinery, Equipment Transport	55.6%	37%	7.4%
Electrical and Optical equipment	26.7%	46.7%	26.7%

Table 4.4. *Strategy per industry sector*

There are 22 organizational innovation practices included in the analyses (table 3.2). To measure the internal consistency of the Organizational innovations I conducted a reliability analysis. The organizational innovation concepts of the survey show a Cronbach's Alpha of .9. Which indicates that all separate practices are part of one construct. Deleting one of these items does not lead to a significant change in the Cronbach's Alpha, all concepts can be included. There are organizations that did not introduce any of the concepts, while two of the included firms have introduced all of the concepts. The mean of 8.5 shows that most organizations have introduced more than one of the organizational innovation concepts. This makes it interesting to look at the configurations of these concepts. The organizational innovation concept that is used the most is work instructions (mean .7), while organizations barely adopted the Energy audit 50001 (mean 0.0750).

The last construct included is performance. Several indicators are used to build this construct. The analyses of the survey, yielded the following data regarding performance.

	Turnover in million euros	**Production Lead time**	**On time**	**Scrap rate**	**Flexibility increase**	**Flexibility decrease**
Mean	98.7192	33.4845	89.4353	3.3624	29.1917	2.3444
min	0.90	.25	0	0	0	0
max	5650	365	100	4.62	400	90
Median	8	15	95	2	20	15

Table 4.5. *Performance indicators of EMS survey*

These performance indicators showed abnormal scores on skewness and kurtosis, which could be solved by transforming the indicators. For the following analyses, the transformed data are included.

§ 4.1.2. Relations

As has been highlighted in chapter two, organizational innovations according to Armbruster (2008) have a positive influence on performance. Each organizational concept has been tested on its influence on performance. All the concepts are included in a regression model, to see if there are significant results on the different performance indicators, this means 22 variables. After excluding the missing values, 115 respondents remain, this exceeds the 5:1 ratio (Hair et al, 2005). Furthermore, the performance indicators had to be transformed in order to reach acceptable values for kurtosis and skewness.

	lnTurnover	**lnProdLEadTIme**	**lnOntIme_ref**	**Ln scraprate**	**lnFlexincrProd**	**LnFlexdecrProd**
Mean	2.4872	2.7561	1.8407	1.0504	2.9376	2.3444
Mode	2.40	1.79	2.40	.69	3.04	3.04
Skewness	1.581	.328	.381	.979	-.971	-1.004
Kurtosis	4.248	-0.89	-.197	1.213	2.202	-.116

Table 4.6. *Performance indicators after transformation*

All the variables score between 3 and -3 on skewness and kurtosis after transformation. Only lnturnover exceeds these limits. This variable will be included in the model, but is seen as the least representative for actual contributions. At last the multicollinearity has to be tested. All of the regression models show values of tolerance exceeding 0.50, which indicates no multicollinearity. The models included all of the organizational concepts as predictors and one of the performance indicators as dependent variable, they showed the following results:

	Turnover	**Production lead time**	**On time**	**Scrap rate**	**Flex increase**	**Flex decrease**
R square	.863	.486	.342	0.490	.265	.423
Adjusted R^2	.807	.276	0.073	.282	-0.035	.187
F change	1.1413	.749	.972	2.151	.978	.785
Sig F change	.139	.774	.508	0.008	.501	.723

Table 4.7. *Regression results per Performance indicator*

The table above shows that there is no strong direct effect of the organizational innovation concepts on performance. Only performance indicator scrap rate has a significant model. The concepts that have a significant contribution to scrap rate performance are Total product maintenance and ISO14031. Scrap rate looks at the percentage of the products that has to be edited or fully scrapped from the production. Both the organizational innovation practices have a negative relation with scrap rate,

which means a positive outcome. Both the TPM (-917) and ISO 14031(-.730) decrease the percentage of products that have to be edited or fully scrapped from the production. The Beta Coefficients show what variables are the best predictors of the dependent variable. Total Product Maintenance is the best predictor for scrap rate, followed by ISO 14031.

	B	**Beta**	**Sig**
TPM	-.917	-.554	.000
ISO 14031	-.730	-.381	.003

Table 4.8 *Scrap Rate Coefficients*

Most companies introduce more than one practice. Only 6 of the 139 companies included did not introduce any, whereas 9 companies introduced only one organizational innovation concept. The fact that organizations tend to introduce several practices combined makes it interesting to analyze the patterns of concepts. The regression analysis including the variable number of organizational innovations introduced yields a significant effect on performance indicator on time.

The innovation most frequently introduced is Standardized working instructions with a mean of 0.733, followed by continuous improvement (mean 0.6417) and ISO 9000 (mean 0.6). The least popular practice is ISO 50001 with a mean of 0,0750. Also six sigma (0.2083), Total Cost of Ownership (0.2167) and ISO 14031(0.2250) are not introduced by many of the companies. The strategies defender and prospector are opposite strategies, based on the typologies of Miles and Snow. A defender is focused on quality and efficiency, a prospector on innovation and an analyzer tries to combine these. To create a more detailed representation of the introduction of organizational innovation practices it is useful to account for the different strategies of the companies. In order to make a relevant comparison the frequency of concepts when accounting for strategy has been expressed in percentages (table 4.8). Standardized working instructions is the concept that companies introduce the most when executing a defender strategy, as well as an analyzer or prospector strategy. It is introduced the most in prospector companies, where 80% of the organizations use this innovation concept. The scores for defender and analyzer are 71.2% respectively 76.8%.

Based on the introduction of these practices when executing different strategies, it is possible to create a profile of the different attitudes towards organizational innovation. The table shows that companies overall introduce the same concepts, but there are some deviations in practices.
In particular, the defender and analyzer strategy seem to correspond a lot. The practices do differ in frequency and importance for each of the strategies. The defender and analyzer strategy implement more practices than prospector companies. The unique practices for each company are highlighted in

the table. Defenders differentiate themselves on innovation training, Analyzers on Aging management and Prospectors on team work and visual management.

Defender	**%**	**Analyzer**	**%**	**Prospector**	**%**
Standardized work instructions	71.2	Standardized work instructions	76.8	Standardized work instructions	80
Continuous improvement	64.4	Continuous improvement	67.9	Task Integration	80
ISO 9000	61.6	Task integration	62.5	ISO 9000	70
5S	54.8	5S	58.9	Continuous improvement	60
Task integration	50.7	ISO 9000	55.4	VaStM	40
Pull production	49.3	Pull production	46.4	CUPRF	40
VaStM	45	Experience Time	*46.4*	*Team*	*40*
Idea Generation	43.8	VaSTm	*44.6*	*Visual Management*	*40*
Experience Time	43.8	Idea Generation	44.6		
Innovation Training	*41.1*	*Aging Management*	41		
CuPRF Customer	35.6	CUPRF	37.5		

Table 4.8. *Innovation Practice per Strategy*

A defender strategy introduces standardized work instructions, continuous improvement, ISO 9000, 5S, Task integration, Pull production, Value Stream Mapping, Idea Generation, Experience Time, Innovation Training and Manufacturing cells. All concepts correspond also to the analyzer strategy except for Innovation Training. A defender strategy is focused on price, quality and delivery time.
The analyzer can be profiled by the practices standardized work instructions, continuous improvement, Task integration, 5s method, ISO 9000, Pull production, experience time, Value Stream mapping, Idea generation, aging management and manufacturing cells.
The prospector introduces standardized work instructions, Task integration, ISO 9000, continuous improvement, Value Stream mapping, manufacturing cells, Teamwork and Visual management. It deviates on more practices than the other two strategies.

The analysis of practices introduced by the companies shows that strategy does not have a distinguishing effect on the single practices. Organizations show a predominantly similar pattern of practices introduced, despite the strategy chosen. Here the practices that score above median value are included. Because the three configurations overlap for the majority of the practices, it is possible to form a common configuration. This configuration consists of the practices Value Stream mapping,

Manufacturing cells, Pull production, 5s method, Standardized work instructions, Task integration, Continuous improvement, ISO 9000, Idea generation, Experience time and Innovation training. This configuration of "best practices" is tested for its effect on the different performance indicators. Leading to the following significant results.

	R squared	Adjusted R squared	F Change	Sig F change
lnOnTime_Ref	0.195	0.134	7.70	0.007

Table 4.9 *Regression of best practices configuration*

The configuration has a significant effect on the performance indicator On time. Looking at the coefficients, this configuration has a B sore of -.089 and a Beta score of -.272, which indicates that this configuration decreases the products delivered not on time.

As for the configurations of Lean and TQM defined in the previous chapter, these do not seem to be introduced as a configuration. Lean consists of the practices Value Stream Mapping, Pull production and Total product maintenance. These practices are introduced by many of the organizations but Total product maintenance is one of the least introduced practices. Nonetheless Pull production and value stream mapping seem to be introduced a lot as part of the Lean configuration. The Total Quality management, consisting of Quality management, Continuous improvement, ISO and Innovation Training.

The last interesting relationship to observe is the one between strategy and performance. It is possible, although not trough innovations practices, that one of the constructed strategies has more impact on firm performance than others. A regression analysis with the three strategies as predictors of performance does not show many significant results. Only the Results of the dummy variable analyzer on the decrease of production shows a significant value. This means that Analyzers are able to be more flexible than defenders.

	Ln turnover	Prod lead time	On time	Scraprate	Flexincr	Flex decr
R squared	.792	.352	.230	.143	.079	.274
Adjusted r2	.772	.290	.156	0.061	-0.10	.205
F change	.273	.400	2.689	.317	.394	4.422

Sig Fchange	.762	.672	0.073	.729	.675	0.014

Table 4.10. *Regression Dummy analyzer on flexibility decrease.*

§ 4.1.3. Conclusion

Based on the quantitative analyses it can be stated that organizational innovation practices do have a significant effect on performance in Dutch manufacturing SMEs. Also a configuration of innovations does increase performance. The choice of strategy does affect an organization's performance, but does not determine the choice of organizational innovation practices, or the configuration of practices.

§ 4.2 Qualitative results

The Qualitative results are retrieved from the interviews. These interviews were conducted at firms meeting the same criteria as the EMS participants, Dutch manufacturing SMEs. The interview was aimed at confirming the quantitative data and exploring new additional data. The following section shows the results of this analysis and its implications for the different constructs of this research.

The interview was conducted at 7 organizations. These organizations are all of small or medium size, ranging from 40 to 84 employees. Together they represent four main industry sectors, machinery (2), construction and furniture (2), food (2) and electronical (1). This means that there are three manufacturing industry sectors not represented in the qualitative analysis.

§ 4.2.1. Strategy

According to Hilmola et al (2015) SMEs in the manufacturing industry create competitive advantage by offering the customer superior value. This can be achieved through cost advantage, the same product at a lower price, or value advantage, a product with more benefits as competitors. There are also companies that focus on a combination of cost and value advantage. Miles and Snow (1978) made a typology of three possible strategies, that can be applied by de Dutch Manufacturing SMEs: Prospector, defender and analyzer. These include a company's attitude towards innovation. As SMEs are seen as the drivers of innovation within their industry it will be interesting to analyze their actual activities on these matters.

Remarkable is the difference in deliberateness of the strategies in the companies cooperating in the interview. In some organizations there is an absence of any written strategy, while in others strategy is fully elaborated on. The absence of a deliberate strategy does however not implicate lack of direction in the activities of the companies. The interviewees all recited several goals for their future performance. A common mentioned goal was growth. The means to achieve this growth differ and that is where the statements of Hilmola (2015) are confirmed by the organizations, they are mostly focused on cost or quality, or try to balance these. The focus on costs is important in a lot of the organizations. Companies try to reduce their costs by optimizing and finding more efficient ways to

operate. Quality is also a key strategic issue for many of the participants, the distinctiveness of the products determines their competitive advantage. These organizations lean towards a defender strategy, also a strategy where both cost and quality are equally important occurred. Fo2 is one of the companies that explicitly mentions this in their strategy: *Quality means delivering the best product for the customer at the lowest price possible*."

The different industry sectors represented by the participants do not evidently imply a particular strategy. A clear distinction in strategy based on the industry sector is not visible.

An additional aspect to the strategies, not represented by Miles and Snow (1978), is the organizations strategy towards employees. One company described this as "employability". The SMEs aim for good working conditions, in order for employees to conduct their work.

	Overall Strategy
E1	Wij willen eigenlijk verder groeien in de markt, dat is strategisch met betrekking tot de groei van het bedrijf. Strategisch met betrekking tot de activiteiten is toch de niche op blijven zoeken. Wij zijn een niche speler.
F1	We hebben de strategie niet echt heel duidelijk op papier, maar we hebben wel de ambitie om in ieder geval binnen dit pand verder te groeien. Binnen de kaders van dit pand willen we nog efficiënter produceren, nog sneller produceren, waardoor we capaciteitsgrootte kunnen realiseren.
M2	In feite gestage groei realiseren met een gelijkblijvende rentabiliteit.
CF1	Nummer 1 in productinnovatie en productie.
Fo2	Kwaliteit maal effectiviteit is vertrouwen. Kwaliteit wil dan zeggen een kwalitatief goed product leveren, het beste product voor de klant, op een zo effectief mogelijke manier, dus een lage kostprijs zodat de klant uiteindelijk het hoogste saldo overhoudt.
CF2	Wij zijn een denkfabriek. Dus wij proberen met name projecten van grote schaal te verkopen door een stukje innovatie en integrale productontwikkeling en op die manier onze producten af te kunnen zetten. We maken maatwerk.
M1	Marktconforme producten ontwerpen, leveren, produceren, service-en, in plaats van echt de projecten.

Table 4.11 *Quotes regarding Strategy*

Although SMEs are seen as the innovative drivers of their industry, this does not seem to be a priority within their strategies. For most organizations a strategy regarding the topic of innovation is lacking. Innovation is only for a small part of the SMEs a focal point in the strategy. Only CF1 mentioned it when asking about their company's strategy. For this company product innovation is an essential element of its activities. This does not implicate that innovation is not present in the remaining SMEs. Other companies do mention innovation as part of their business practice. It does not regard state of the art innovations, but mainly adjustments to already existing products, or customer demands. Not one of the organizations is unable to adjust their products. There are some organizations that are leaning towards standardization, but if necessary adjustments can be made to the products. Where the former companies indicate innovation to improve the functionality of the product, other companies highlight its role in cost reduction. Companies that focus more on a cost-advantage strategy execute innovation activities to reduce the costs of their products. This might be trough innovations in the product and process, but also by introducing organizational concepts.

	Innovation Strategy
M2	Innovatie is bij ons, dat hoor je ook niet in onze strategie terugkomen, dat is eigenlijk geen doel op zich.
F2	Dus wij willen ook continu veranderen, continu verbeteren en innovatief zijn.
E1	En dan zit de innovatie meer in de kostprijsontwikkeling en niet zozeer in de functionaliteit van het product.

Table 4.12 *Quotes regarding innovation strategy*

§ 4.2.2. Organizational innovation practices

Organizational innovations have an internal focus, while product innovations are market focused and receive more managerial attention and resources (Van de Ven 1986). This is visible in the behavior of the companies towards organizational innovation. The organizations interviewed do not explicitly aim for organizational innovations in their strategy, but the organizations have undertaken innovation activities. When asking about these activities the participants did not make a clear distinction between the different types of innovations. The framework of Armbruster (2008) which distinguishes technical product innovations, non-technical product innovations, technical process innovations and non-technical process innovations is not applicable. The separation between technological and non-technological innovations does not seem evident in practice. Although most of the organizations do not have deliberate goals regarding organizational innovation, they do conduct several activities in this field. The classification structural, procedural and managerial is applicable to indicate the focus of the innovations.

The organizational innovation practices that focus on structure influence, change and improve responsibilities, accountability, command lines and information flows as well as the number of hierarchical levels, the divisional structure of functions or the separation between line and support functions (Armbruster, 2008). A common characteristic that all companies mentioned was that they have a flat organization, the lines within the organization are short. Decision making is in some cases done by one or a small group of persons. Restructuring is a common mentioned practice. For example, the change from project-oriented to more standardized ways of organization leads to shifts in hierarchy and content of work. Some organizations have reviewed the entire organization and deleted functions (Fo1, Fo2, M1, CF2). Other companies are forced to add new functions and layers within the organization because of growth. These changes do not just affect the relationships within the organization, but might also cause alterations in the physique of the workplace.

The transfer of information is an essential element for the operations of a company. As mentioned earlier the organizations have a flat structure, which enables direct communication. This direct approach has advantages, but the companies still focus on the improvement of their information flows. Fo2 developed an organization information structure, to outline all processes, information and communication within the company. A related aspect is the organization of the consultative structure.

Organizations want more structure in their communication and see opportunities to involve employees from different parts of the organization to outline the entire process.

The majority of organizational innovation practices conducted by the firms are those of procedural nature, affecting the routines, processes and operations of a company (Armbruster 2008). As mentioned before the structures of the organizations are flat, there are not many hierarchical levels. Organizations describe this as a positive feature, but it also encourages ad hoc operations. For example, E1 describes their way of consultation: *I walk to someone and say were going to do this, on to the next. I'm flying through the company.* This is not an ideal situation and many companies aim for more professionalism, a more deliberate way of operating. There are several procedural organizational concepts that organizations introduce to achieve this goal. A common mentioned concept is the implementation of ISO 9001, or parts of it. Although it is intended to provide organizations with a quality certificate, you see that organizations use it as a tool to map their processes and improve or eliminate certain steps in the process. M1: "*We use ISO as a steppingstone. . It is not our goal to achieve the ISO certificate, but to gain understanding in our processes."* In the food and construction sector there are other accreditations similar to ISO that focus on quality and are also implemented. A procedural concept that is introduced by all the organization are work instructions. This tool is related to ISO 9001. All of the companies interviewed have implemented this practice, although its importance differs for each company. For some organizations it is just a tool to display how certain products have to be made, while for other companies work instructions secure certain quality issues. Elaborate instructions guarantee that employees know how to enact and honor strict requirements. It allows companies to define the procedures and tasks of each function and acts as a guarantee for quality.

Just-in-time management is a practice that is adopted by many manufacturing SMEs. For these companies it is mainly important to deliver to their customers within a short amount of time. As a consequence, some companies have a large amount of stock to meet their customers' demands. There are also companies that meet strict requirements throughout the whole chain. So the concept is implemented both on the supply and demand side of the companies.

The introduction of Lean management is an issue that occupies most of the organizations. Most of the organizations see it as a value adding concept. But the actual implementation is hard for organizations due to several reasons (time, knowledge and supervisors). Many organizations are either in the process of implementation, or have the intention to introduce Lean management in the future. The steps that are already undertaken for the introduction of Lean include a lot of physical elements. M2: "*the design of the process has been changed, is more logic"*. E1: "*a flow has been created, the processes are defined and no material is wasted."*

Managerial concepts receive a lot of attention in the Dutch manufacturing SMEs. The human relation side of these companies is very important. As Fo2 pointed out: *"The keys to success are our employees and the way we treat them, that makes the difference"*. Organizations have created opportunities to work at flexible hours. Also constant revision of people and their position in the company is something that is important for the organizations, to ensure a fit for the employees. Involvement of employees in the improvement of the organization is desired. CF1 has introduced a reward system coupled to improvement ideas. Involvement of employees and their contribution also differs for each company, due to the difference in education between employees. Fo1: *"For the CEO and the floor manager work is almost a hobby, but I think it is difficult for some employees to revise their daily activities and look for a smarter, better way to execute them.*" In company Fo2 they developed a digital system for ideas of improvement, which resulted in 400 ideas in one year. Feedback on subsequent steps is given to the petitioner to stimulate employees to involve in these processes. Some organizations have introduced self-organized teams. An innovation that relies on the responsibilities of employees. These companies also create possibilities for organizations to develop their competencies trough training.

Performance management is introduced in one of the companies. This management concept implies several practices to measure the actual production and create more efficiency, while at the same involving employees in the process.

M1:	We hebben op zich best wel een platte organisatie. We hebben ook vrij recent een grote reorganisatie doorgemaakt, niet vanwege de financiële crisis, maar wel vanuit de gedachte, vanuit een projectorganisatie naar een meer gestandaardiseerde gedachte met minder mensen meer doen.
M1	Het ISO dwingt ons straks om een gestructureerde overlegstructuur erin te brengen. We hebben nu een ongestructureerde overlegstructuur met het management. Er is ook wel behoefte om dat meer te structureren.
Fo1	Performancemanagement, dat je de mensen op de vloer bepaalde targets meegeeft, die in het groter strategisch plan weer terugkomen.
CF2	Wij proberen steeds meer naar just-in-time te gaan. En dat is dan best wel een grote wijziging in de manier van werken, de manier waarop wij onze bestellingen definiëren uiteindelijk en hoe wij onze specificaties maken. Dus er wordt veel meer op gericht dat daar door inkoop met leveranciers goede afspraken gemaakt worden over just-in time leveringen .
E1	Je ziet Lean terug als je kijkt naar hoe de fabriek is ingericht. Wij hebben dan ook het visuele aspect toegepast. Er is een ruimte waar het onderhanden werk klaar staat. Er is belijnd, er mag niks buiten lijnen staan. De werkplekken zijn allemaal identiek ingericht. Er is bepaalde stroom van materialen, de processen zijn wel wat beschreven, er mag niks weggegooid worden. Er worden op bepaalde vasten momenten iets opgeruimd, dan wel niet opgeruimd. Zo zit het een beetje erin. Het is niet helemaal lean maar het gaat die kant op.
Fo2	Het opzetten van een competentiematrix is iets wat ik met mijn medewerkers gedaan heb. Grote betrokkenheid creëren bij medewerkers door ze veel verantwoordelijkheid te geven. En zelfsturende afdelingen, daar voeren we beleid op, eigen verantwoordelijkheid.

Table 4.13 *Quotes regarding organizational innovation practices*

§4.2.3. Performance

Organizational innovations will eventually influence performance, whether direct or indirect. The concepts introduced might be focused on different aspects of the organization and therefore differ in results. One of the performance measures mentioned by several companies is increase of turnover. Another important result and presumably more directly related to organizational innovation is efficiency, in general achieving more with less. Efficiency is often linked to reduction of costs, located in several parts of the organization. To deduct unnecessary costs within an organization transparency and clarity of a process have to be reached. The reduction of production time is also a very useful and important indicator. Performance on these areas are also mentioned by several of the organizations, often as a result of organizational practices introduced. Professionalism is seen as a result of a more structured organization with deliberate communication, as *Fo1 called it: "the organization is more rigid, more delineated.* Making everything more structural, has as a consequence that people are more bound to the content of their job.

Quality is also a very important result for the companies. Quality in either product or process. Organizations have certain standards for their products that have to be met, but also guarantees within their process resulting in the best end product possible.

Flexibility is also a performance that organizations aim for. The possibility to immediately adjust to changes in their operations. Especially for companies that have a lot of product innovation activities it is essential to operate flexible, Product adjustment also asks for some flexibility within the company's business practices.

Besides the performance achievements of a more financial nature there are also non-financial results. There are organizations that have made achievements in sustainability, in their products or their plants. Also employability is something that was mentioned by companies. Providing excellent conditions for employees, enhancing their willingness and ability to work. This also leads to low absenteeism and minimal loss of employees. Furthermore, it creates an atmosphere where employees are willing to share information with each other.

	Performance
M1	Meer omzet, met minder mensen.
E1	Als je ziet door dat gestructureerd te doen, hele orders maken, orders afmaken, geen deelleveringen en dat soort dingen, zie je gewoon in financiële zin de omzet per uur toenemen. Daar zie ik het aan. Dus ik haal er meer per uur uit.
Fo2	Kwaliteit wil dan zeggen kwalitatief goed product leveren, het beste product voor de klant, op een zo effectief mogelijke manier, dus een lage kostprijs zodat de klant uiteindelijk het hoogste saldo overhoudt.
CF1	Op het moment dat je ziet dat het fout gaat kun je heel snel ingrijpen.
CF2	Dat betekent dat je flexibel moet zijn op heel veel gebieden. Want eigenlijk is het voor ons altijd een verassing met welke informatie je van start gaat om uiteindelijk je product te bedenken."
M1	Het verder professionaliseren van de organisatie op zich.

Fo2	Ja, je merkt het omdat je weer met de afzet aan het stijgen bent en iedereen lekker in zijn vel zit en je ziet iedereen met plezier werken"
M2	Grosso modo, want dat is een beetje afhankelijk van wat we maken, is de levertijd van een week of zes naar een week of een/anderhalf gegaan.

Table 4.14 *Quotes regarding performance*

§ 4.2.4. Universalistic approach

Dutch manufacturing SMEs are active in introducing organizational concepts in their business operations. The practices introduced are different for each company, but there are some concepts that are adopted by several organizations. These might support the universalistic beliefs that greater use of specific organizational innovation practices will always result in better organizational performance, independent of the industry sector organizations operate in (Delery and Doty 1996). When asking about such practices there are not many organizations that highlight this as a reason to introduce these common used practices. CF2 mentions that due to the shift in their sector, because of the crisis, organizations started to focus on the costs. Many organizations implemented Lean, this seemed like an effective concept and their organization introduced this concept as well. Also the successes that Lean has created in the auto-industry are an incentive for organizations to introduce the concept within their operations. But there is a huge gap between copying it from successful companies, to translating it into a company's best practice. An important concept related to the implementation of many organizational innovation practices is the mapping of the organization. Including the flow of materials and information required to bring a product to a customer, but also the people within the company. When companies have a clear visualization of their process they are able to eliminate errors and might introduce other concepts. This practice is conducted by many of the Dutch manufacturing SMEs.

Related to the universalistic approach are the generic practices (Porter and Siggelkow (2008). These are practices that set the bar for competition. Just-in-time management seems to set such a bar. As M1 describes: "*customers expect you to deliver their products yesterday when they order today*". If you are not able to deliver at short notice, you start to outcompete yourself. This might be indicated as an activity that sets the bar for competition. Another practice that is generic for some industry sectors is the ISO. ISO is a certificate, there are customers that require companies to be ISO certificated before they attain businesses with them. E1 mentions in relation to the ISO 9001: *"I can't avoid it anymore"*.

M1	Ja, goed voor ons klinkt misschien gek, waar we veel naar kijken is de auto-industrie. Ja, die produceren zo fantastisch mooi. Lean. Ja, dat is wel een heel mooi voorbeeld.
CF2	Het was natuurlijk moeilijk om de orderportefeuille te vullen. En dan zie je dat dit soort bedrijven natuurlijk ook gaan kijken naar kosten en hoe je dat gaat doen. En uiteindelijk gaan heel veel bedrijven in de markt, collega-bedrijven en heel veel bouwpartijen, met Lean aan de slag. Onze directie is daar ook naar gaan kijken en die waren ervan overtuigd dat we daar ook in mee moesten gaan. Dus er is een heel traject hier opgezet.
E1	Het verder uitwerken van ISO moeten wij al heel lang, maar wij hebben er gewoon geen tijd voor gehad, of geen tijd voor genomen, prioriteiten anders neergelegd. Ik ontkom er nu niet

	meer aan.
M1	Het moet sneller. Vooral ook dat, want klanten zijn ook ongeduldiger geworden. Ze verwachten eigenlijk dat je het gister al af kunt leveren als ze het vandaag bestellen. En dat is wel een trend die je steeds meer ziet, mensen willen gewoon wat minder wachten, mensen zijn ongeduldiger.
Fo2	Maar we zijn eigenlijk nog bij een ander ding begonnen en dat is het opzetten van het organisatie informatiestructuur schema. Links de leverancier en rechts de klant, wat gebeurt er nou binnen de organisatie allemaal, hoe lopen de communicatielijnen. Hoe kopen wij daar de grondstoffen in en zorgen dat de klant daar de producten van ons krijgt. Hoe lopen de lijntjes binnen de afdeling, dat moet je eerst inzichtelijk hebben en pas dan kun je daar je taken verantwoordelijkheden per functionaliteit uit afleiden plus de procedures.
M2	Wat we met de indirecte medewerkers hebben gedaan, daar hebben we een jaar lang gemeten waar gaan orders op fout, waar blijven die op liggen, wanneer is informatie niet volledig etc. Dus eigenlijk een statistische analyse gemaakt van allerlei fouten, foutkansen en oorzaken.

Table 4.15 *Quotes regarding the universalistic approach*

§ 4.2.5. Contingency Approach

In order to achieve superior performance, organizational innovation activities should be contingent on an organizations strategy (Delery and Doty 1996). This alignment is presumed by contingency theorists. The strategies of the organizations are treated previously. I first asked the interviewees whether they deliberately implemented organizational concepts enhancing their strategy or specific strategic goals. E1 explicitly mentions that most of the innovation activities performed by the organization are to reduce the cost price, this is in line with the defensive strategy they execute. A focus at efficiency and quality in strategy is combined with the implementation of Lean management. Also the ISO is introduced and they execute just-in-time management. E1 also focused on employability, for which a system was developed that makes it possible for employees to work in blocks of two hours. Furthermore, this resulted in more physical adjustments to the workplace. The implementation of ISO and parts of Lean management in company M1 is linked to the progress in professionalism and transparency of the organization. They also highlight that they are traditionally focused on innovation, they want everything better, more efficient and faster, both in products and in operations. *"When we notice that internal processes can be optimized we start to improve them"*. For the realization of the strategy of M2, continuous growth while preserving a constant profitability, no innovations were necessary. Or at least there was no direct link. The implementation of Lean and the streamline of the organization can be coupled to achieving a constant profitability. Similar strategic goals are set by Fo1, but they also strive for operational excellence. So reducing costs, while adding customer value. The organizational innovations introduced by this company are mainly focused on the restructuring of the organization, which was threefold, assigning the right people to the right jobs, improving the communication and make it more efficient, and introducing performance management. Fo2 is the only company where they deliberately incorporated organizational innovation activities as part of their strategy. As mentioned earlier they want to continuously improve, not only in their production activities, but also innovate in their organization. Resulting in a separate division in their company focusing on organizational quality.

For organizations with a strategy with more analyzer features, it is possible that the focus shifts from organizational innovations that achieve more efficiency, to concepts that create flexibility. A focus on product innovation besides cost and quality asks for a more flexible organization. One of these companies also introduced Lean, but the implementation throughout the whole organization failed. This could be because of the breach between the intended strategy and focus of this specific organizational innovation.

Organizations have the intention to introduce several practices in order to create more structure and clarity, but they mention that these aspects do not have the focus of management. The priority of the organizations lies in reaching their goals, which most of the time is completing their orders and finding new markets. Subsequently organizations start to look at how to organize in a more efficient way. This might be the reason that most organizations do not mention a direct link between the strategy of the organization and the introduction of organizational innovation practices, although the activities conducted do indicate the existence of this connection.

Fo2	Dus dit is onze strategie en de manier waarop we hem dus uitgerold hebben naar de medewerkers om draagvlak te krijgen, betrokkenheid een hele belangrijke. Dat is wel gelukt. En alle beslissingen die wij nou moeten nemen hangen wij echt op aan deze kapstok. Dat maakt het heel makkelijk om de beslissing te nemen af en toe.
CF2	Dat betekent dat je flexibel moet zijn op heel veel gebieden. En ik denk als je flexibel moet zijn, zeker met wat er gevraagd wordt in deze tijd, dat je dat moet afbreken. De menselijke factor wordt alleen maar belangrijker eigenlijk.

Table 4.16 *Quotes regarding the contingency approach*

§ 4.2.6. Configurational Approach

The companies that cooperated in this interview all introduced organizational innovation practices. According to the configurational scholars the practices introduced are most effective when implemented in coherence with other practices. The configuration of such practices leads to a synergistic effect and thus competitive advantage.

An organizational innovation strategy is lacking in almost all of the organizations, considerate composed sets of practices were not likely to emerge in these companies. Companies do acknowledge relations between several organizational innovation practices. When asking about the coherence between different practices E1 stated: *"When focusing on one practice, other things occur. There is a causal relation between everything."*

Because some practices function as a label for several practices there are configurations of organizational innovations implemented by the organizations.

Het Nieuwe Werken is a term that has come up. It consists of different practices, so can be seen as a configuration. For this organization it consists of open workspace, clean desk policy, calibration of

assessments. These are tightly coupled HRM practices intended to change responsibilities, information, cooperation and culture within the company.

The most common configuration is Lean. It is also mentioned as practice, but has implications on several areas. A first comment on the implementation of Lean in these organizations is that it is not limited to merely non-technical elements. It affects the physique of the organization as well as the organization of routines and procedures for the conduct of work. Shah and Ward (2007) stated that implementation of all elements of the configuration will eventually lead to sustainable organizational performance. There is not one organization that has adopted all of the elements, most of the organizations are still in the process of implementing Lean or have the intention to implement it in the future. But the organizations do acknowledge that when more Lean practices are implemented, the operations will benefit. M2 acknowledges that the implementation of Lean in their production resulted in a review of other processes and enhanced their results.

There are organizations that focus on quality and continuous improvement, which might indicate a more Total Quality management approach. Fo2 is a company that has a lot of cooperation, has the intention to continuously improve and also introduced several soft practices to involve employees and improve their competencies.

M2:	Op het moment dat je eigenlijk de productie zodanig georganiseerd hebt dat je daar heel snel zaken doorheen trekt dan wordt het heel snel duidelijk dat je vaak eenzelfde fout maakt. Dus dat grijpt wel heel erg op elkaar in. Daarom zijn we dat ook opgestart met de hele indirecte club, om dat zo te doen. En daar is ook dat multidisciplinaire gestart van laten we nou eens van te voren heel goed nadenken van wat gaan we maken.
E1:	ik denk, employability en Lean management dat heb je nodig om Just in time te kunnen leveren
Fo2	Bijvoorbeeld het opzetten van een competentiematrix is iets wat ik met mijn medewerkers gedaan heb. Grote betrokkenheid creëren bij medewerkers door ze veel verantwoordelijkheid te geven. En zelfsturende afdelingen, daar voeren we beleid op, eigen verantwoordelijkheid.

Table 4.17 *Quotes regarding the configurational approach*

§4.2.7. Contextual Approach

The contextual approach of Porter and Siggelkow (2008) takes into account the differences in firm activities. The choices that firms make regarding their strategy, performance, or innovation activities might impact the organizational innovation practices and their results.

A strategy-specific activity that seems to be critical for the implementation of certain organizational innovations is whether organizations are project-oriented or more standardized. A more standardized organization executes a different implementation for organizational innovations then project oriented companies.

Another important factor is management's attitude towards the organizational innovations. As stated earlier organizational innovations are less visible and lead to indirect performance, which often

results in less attention from managers. In CF2 they introduced Lean management, but a companywide implementation failed due to lack of support of their management. The prior experiences of managers, might influence their conception towards organizational innovation practices. Positive experiences in the same or other companies influences their attitude.

Some organizations had planned to rebuilt their plants, because of these activities there was also a possibility to make adjustments that related to Lean. Important activities are also the technical adjustments organizations make in their production, which might lead to changes in organizational innovation.

M1:	Het jasje zat echt heel strak, we hadden geen ruimte om voldoende spullen die klaar waren door te sturen naar het warehouse. En daardoor zijn we eigenlijk gaan verbouwen, maar ook wel met de gedachte van het moet efficiënter het moet beter het moet sneller.
CF2	Voor de implementatie van Lean zijn er trainingen geweest met mensen ook op de productievloer, maar ik denk dat er toch met name weinig draagvlak bij de leiding ook was om daar genoeg op in te zetten. En het ook succesvol te krijgen.
Fo1	Dus binnen de kaders van dit pand willen we nog efficiënter produceren, nog sneller produceren, waardoor we capaciteitsgrootte kunnen realiseren. Dat is eigenlijk kort gezegd voor de komende jaren de doelstelling,
Fo1	Bedrijfscultuur en de manier van werken. Eigenlijk heb jij de vraag al een beetje gesteld dat er eigenlijk een cultuurtje komt dat iedereen altijd mee aan het denken is over hoe het beter kan. Dat je eigenlijk gewoon met 40 man het bedrijf aan het besturen bent en niet alleen maar met de bovenste laag.
M2	

Table 4.18 *Quotes regarding the contextual approach*

§ 4.3 Mixed methods results

The mixed methods analysis is conducted to gain a more holistic view on the topic of organizational innovation practices. When combining the results of both the quantitative and qualitative analysis it is possible to see whether the analyses conform, oppose, or amplify each other.

The Strategy in the quantitative analysis was based on the importance of several activities within the company. A defender strategy, where price, quality and delivery time are the most important pillars, is adopted by 73 of the organizations. The second most adopted strategy is the analyzer, that combines the activities of both defenders and prospectors. Hence the prospector focuses on product innovation and customer adjustments. Prospectors are a minority in the survey. A similar result is confirmed by the participants of the interview. The majority of the companies executes a defender strategy, some organizations try to focus on both explorative and exploitative activities. None of the organizations interviewed can be categorized as pure prospectors. The majority of the strategies are focused on price or quality, which corresponds to a more defensive strategy. Some of the companies are actively seeking new market opportunities, these can be categorized as analyzers. As for the role of innovation

in the companies, it should be noted that only one company mentions innovation as a core activity in its strategy. In some companies strategy is not explicit, let alone an innovation strategy is present. The innovation activities are predominantly focused on product and process innovation. Organizational innovation is present in the organizations operations, but seem to receive less attention, or are harder to define.

The organizational innovation practices in the survey are diverse and represent new and common used organizational innovation concepts. These are introduced by most of the organizations, only 6 of the 139 companies in the survey did not introduce any of the organizational innovation concepts. And most of the organizations introduced several of the concepts. The most frequently introduced concepts are standardized working instructions, continuous improvement and ISO 9000. This pattern is also present in the qualitative analysis. Introduction of ISO 9001, Work instructions and continuous improvement is mentioned quiet often. Another concept, which is a bundle of practices, occurs at many of the participants' firms. The introduction of Lean is seen as favorable for the organizations. That is why many companies are trying to implement this concept. Also concepts focused on Human Resources are highlighted as important. Strategy does not play a conclusive role in the choice of organizational innovation practices. It can be stated that organizations, despite their chosen strategy, make a configuration of a few best organizational innovation practices.

The survey asks for specific indicators of performance, the employees do mention some of these indicators, but also highlight performance regarding their employees wellbeing. The survey limits the performance indicators to the questions included, therefore the interview was used to broaden the scope of performance and also ask about non-financial performance. Furthermore, it is possible to see the actual relationship between practices, practitioners and praxis. The survey is focusing on the general practices, while the interview makes it possible to deepen into the role of practitioners, leading to the actual praxis within the companies. An interesting addition from the interviews is that the introduction of practices is many times not finished, or is an ongoing process, therefore the actual results of these practices are hard to measure.

§ 4.4 Hypotheses

When combining both results of the quantitative and qualitative research it is possible to test the hypotheses drawn in chapter two.

H1: Companies executing an analyzer strategy achieve better performance than companies executing a defender or prospector strategy.

A balance between exploration and exploitation activities will lead to the best performance. The analyzer tries to combine both of these activities and is likely to achieve better performance results. The survey has shown that this strategy does result in the best performance. The interviews revealed that the Dutch manufacturing companies are tending towards an analyzer strategy, whether this resulted in better performance is hard to conclude. The fact that organizations want to combine both explorative and exploitative actions supports this hypothesis.

H2: there are specific organizational innovation practices that have a positive relationship with performance for every organization in the manufacturing industry.

The introduction of specific organizational innovation practices, also known as best practices, will always result in better organizational performance (Demery and Doty 1996). SMEs in the Dutch manufacturing industry introduce several organizational practices. The most popular practices do not seem to differ when taking into account different industry sectors. Without accounting for industry sector or organization, the same practices are introduced. This might indicate the presence of best practices. The most frequently introduced practice measured in the survey is Standardized and detailed working instructions. This concept provides instructions designed to ensure consistent, timely and repeatable processes. It will contribute to a company's efficiency, because it enables standardized work. Also Continuous improvement, a management concept that tries to initiate favorable changes in companies by taking incremental but continuous steps, is a frequently introduced practice. Their actual contribution to performance does not become clear. According to the quantitative analysis only TPM and ISO 14031 have a positive effect on performance, these or not the most applied practices.

The qualitative part of the analysis does not explicitly confirm this hypothesis. Only two of the participants stated that there are practices that will achieve better performance regardless of industry sector or company. But looking at the practices actually introduced in the different organizations, there also seems to be a trend in the introduction of practices. In particular work instructions are highlighted as an important concept introduced. The differing industry sectors do not seem to influence this concept. Therefore, it can be stated that there are best organizational practices, that organizations should introduce.

H3: The relationship between individual organizational innovation practices and performance will be contingent on the organizations strategy.

The strategy of an organization defines the course of the actions taken by the company. This will also result in organizational practices adopted by these organizations. Whether the practices introduced will result in beneficial outcomes depends on the match between strategy and practice. For this thesis three strategies are categorized, defender, analyzer and prospector. The Quantitative results do not show many devious outcomes when taking into account the strategy of the organizations. The most frequently introduced practices are the same for all three strategies, and the least introduced are also

similar. The participants in the interview confirm the statement above. The organizations overall introduce the same concepts, but most of the organizations execute a slightly similar defender strategy. Organizational innovation practices are not contingent on an organization's strategy.

H4: A specific set of organizational innovation practices that best fits the organization's strategy will be positively related to organizational performance.

Organizations that introduce more than one organizational innovation practice will create more competitive advantage than singular or non-innovative firms. This statement is confirmed by the regression analysis. The number of organizational innovations introduced results in a decrease of deliveries not on time. Knowing that this relation exists makes it interesting to zoom in on the combinations of practices that exist and which ones actually result in performance increase. Although the overall configurations are equal there are some unique practices for each strategy.

A defender strategy introduces standardized work instructions, continuous improvement, ISO 9000, 5S, Task integration, Pull production, Value Stream Mapping, Idea Generation, Experience Time, Innovation Training and Manufacturing cells. All concepts correspond also to the analyzer strategy except for Innovation Training. A defender strategy is focused on price, quality and delivery time.

The analyzer can be profiled by the practices standardized work instructions, continuous improvement, Task integration, 5s method, ISO 9000, Pull production, experience time, Value Stream mapping, Idea generation, aging management and manufacturing cells.

The prospector introduces standardized work instructions, Task integration, ISO 9000, continuous improvement, Value Stream mapping, manufacturing cells, Teamwork and Visual management. It deviates on more practices than the other two strategies.

The relation between differing practices and strategy is not very clear. But it could be stated that introduction of the matching practices is considered to create some sort of synergistic effect, for all strategies.

The qualitative analysis confirms that organizations introduce configurations of practices. The most popular configuration in the questioned organizations is the Lean configuration. Several organizations indicate that they are introducing Lean. Not one organization has adopted all of the elements, most of the organizations are still in the process of implementing Lean or have the intention to implement it in the future. The organizations do acknowledge that when more Lean practices are implemented, the operations will benefit. Here the difference between practices and praxis becomes visible. Although several explicit [practices are mentioned the activities within the organizations do differ when executing a practice, or several activities that a play a role in organizations strategy are not recognized as practices.

The performance of organizations improves when more organizational innovation practices are combined. The composition of this configuration is best created by implementing a combination of the practices from the overall configuration. Strategy does not effect this configuration.

H5: The relationship between strategy specific organizational innovation practices and performance is influenced by specific organizational choices of the firm.

This hypothesis is hard to test based on quantitative data, because it analyses whether other organizational choices influence performance of the organization. Therefore, this hypothesis will be tested based on the qualitative data. Organizations define several conditions that influenced the success of the introduction of their organizational innovation practices. An important factor seems to be the attitude of (top) management towards the introduction of organizational innovation practices. When managers do not fully support the implementation of these practices, they are likely to fail in a successful implementation. Prior experiences of managers seem to influence their conception of organizational innovation. In the former parts of the study the practices and praxis were addressed. The contextual perspective focuses on the role of practitioners. As mentioned managers play an important role, but also employees are an important factor.

Chapter 5 Conclusion and Recommendations

§5.1 Summary

This thesis is written based on the following research question: **What is organizational innovation and what configurations of organizational innovation practices contribute to the performance of Dutch manufacturing firms?** After extensive research it is possible to formulate an answer for this question.

Innovation is one of the remaining sources for organizations to achieve sustainable competitive advantage and therefore a key strategic issue (Dess and Picken 2000; Tushman and O'Reilly, 1996). Innovation is a very broad phenomenon, consisting of different types including organizational innovation (Armbruster 2008). Organizational Innovation refers to two different types of innovation, innovation in the organization and innovation of the organization. The first addresses the creation or adoption of an idea or behavior new to the organization (Lam, 2005). The second category concerns the non-technical process innovations (Armbruster 2008). This last type is what is referred to in this thesis as organizational innovation.

Organizational innovations affect the structure and processes of an organization. The innovation more specifically regards an organizational method that has not been used before in the firm and is the result of strategic decisions taken by management, deliberate or non-deliberate. They have an internal focus and always include a social element. The innovations affect the relationship among people who interact to accomplish a particular goal or task within the organization. It includes those rules, roles procedures and structures that are related to the communication and exchange among people and the environment and people (Cummings Srivastva, 1977).

A Strategy as practice approach is used to reveal the use and importance of organizational innovations within Dutch SMEs. The characteristics of organizational innovations make it difficult to extract and define this phenomenon and its role within the organization. By studying organizational innovation practices trough the EMS survey and interviews a complete view can be created. The focus lies not only on what is coerced by management, but also the development of accepted ways of doing things, embodied and materially mediated, that are shared between actors and routinized over time.

The role of strategy on organizational innovation practices is tested using the typologies of Miles and Snow (1978). A prospector focuses on finding new products and market opportunities, while the defender has a limited set of quality products and tries to compete trough market penetration. The Analyzer tries to combine these two strategies (Miles and Snow 1978). SMEs in the manufacturing

industry do not always have a deliberate (innovation) strategy. Most organizations apply a defender or analyzer strategy. The prospector strategy is present in a very small minority of the organizations. The analyzer strategy does achieve better performance than either the defender or prospector. The advantage of a balance between exploitation and exploration activities is emphasized by the Dutch manufacturing SMEs and confirms the relevance of a hybrid strategy for performance.

However, strategy is not critical for organization's choice of individual or configurations of practices. Dutch SMEs are introducing various organizational innovation practices, but choice of practice does not seem to be dependent on an organization' s strategy.

The analysis confirms the universalistic approach. Although many different organizational innovations are introduced, a few practices can be labeled best practices, because the majority of the organizations introduces these practices. These practices are introduced by different organizations regardless of sector or strategy. The most popular practices are Standardized working instructions, continuous improvement and ISO 9000. The participants in the interviews acknowledge a contributing role of these practices in firm performance. The link between these organizational innovation practices and performance is not visible in the quantitative analysis, where only TPM and ISO 14031 has a significant influence.

The contingency approach is not acclaimed by the analyses. As stated above strategy has no critical influence on the introduction of organizational innovation practices. Organization's do not acknowledge a link between organizational innovation practices and strategy.

Introducing more than one organizational innovation practice has a positive effect on firm performance. As a result, the configuration of practices comes in play. A configuration of the practices most introduced by Dutch manufacturing SMEs, "best organizational innovation practices", has a significant effect on performance.

At last there are also contextual factors that influence the introduction of organizational innovation practices and its relation with performance. Organizational innovation practices are implemented top down, but are dependent on several choices and factors within organizations. Commitment and attitude of managers is appointed as an important factor in the success of the introduction of organizational innovation practices, but also prior experience of employees affects organizational innovation.

Overall I can conclude that organizational innovations are non-technical process innovations, that include those rules, roles procedures and structures that are related to the communication and exchange among people and the environment and people. The influence of organizational innovation can be measured by the practices introduced and seem to evoke a positive effect on performance of

Dutch manufacturing SMEs. There is not one specific configuration of practices that should be introduced to enhance performance, but a set of best organizational innovation practices exists that improve performance.

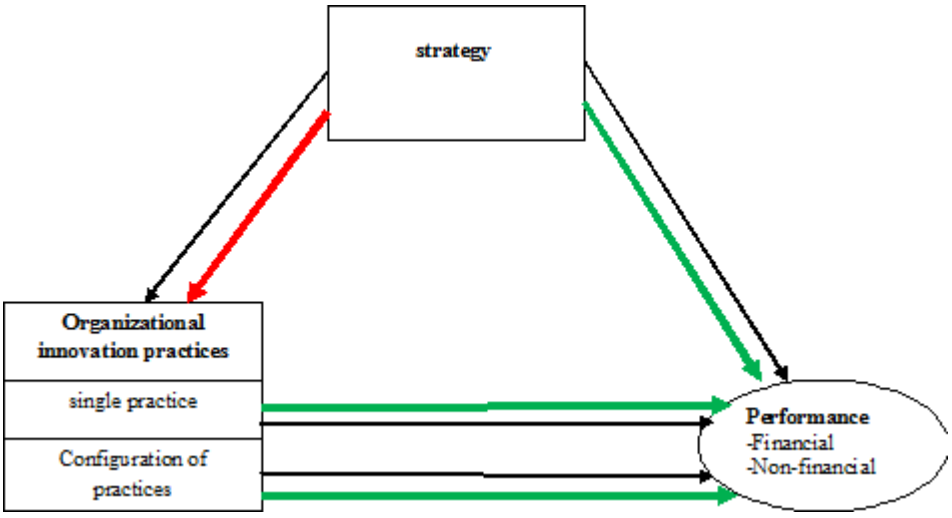

Table 5.1. *Conceptual model and tested relations*

§5.2. Discussion and Implications

This study focused at the role of individual and configurational practices on performance in accordance with the organizations strategy. The strategy as practice approach was intended to get insight in the relation between practice, practitioners and praxis (Varaa & Whittington 2012). Practices of innovation represent the espoused theories that guide this activity, such as shared routines of behavior, norms and procedures that can be altered according to the activity in which they are used. Praxis refers to actual activities or theories-in-use that constitute the fabric of innovation. Practitioners are those who actually perform praxis, and what they actually do affects a company's innovation (Crossan & Apaydin 2010). The analysis of organizational innovation in literature together with the organizational innovation surveys provided an extensive overview of organizational innovation practices. The interview was intended to see the actual activities within the organizations and gain insight in the praxis and practitioners. This perspective is especially interesting because some of the participants in the interviews acknowledged that strategy within their firm was absent. By including a strategy as practice perspective you look beyond the concrete and disseminated strategies and involve the activities that regard the similar as would a deliberate strategy.

The research pointed out that strategy does not have an influence on organizational innovation. The choice of organizational innovation practices is not determined by the strategy executed. But when looking more in depth I would state that strategy does play a larger role than can be concluded based on this research. The analysis showed that strategy formulation is not present in all the Dutch

manufacturing SMEs, therefore an innovation strategy is not likely to be included. Organizations do however execute multiple innovation activities, which are not always acknowledged as organizational innovation activities. This indicates that the introduction of organizational innovation practices is not only dependent on one coherent organization's strategy. The implementation of best organizational innovation practices could be driven by strategy, but also seem to result from experiences of employees and relating companies. Here the interaction between practice, praxis and practitioners becomes visible. The praxis carried out within the firms might not always be acknowledged by practitioners. Therefore, the link between the espoused practices and their activities is not always visible. This also works the other way around. When studying the practices based on the EMS survey, it is possible that not all activities are recognized as practices. This relation is very interesting and would bring more clarity to the topic of organizational innovation practices. Therefore, I would suggest that future research includes an embedded Strategy as Practice study on the topic of organizational innovation practices. To elaborate on the implementation of organizational innovations within SMEs and the relation with strategy.

This study showed that, although the implementation of organizational innovation practices is not dependent on strategy, the analyzer strategy has the best influence on an organizations performance. The analyzers strategy for this study was a hybrid strategy that combined the defender and prospector strategy (Miles and Snow 1978). Whereas the first are focused on price, quality, and delivery time, the latter activities regard product innovation and product adjustments. This strategy should be a mix of more exploitative activities and explorative activities. I would state that organizations should always try to combine activities focused on flexibility with efficiency. I think that for SMEs in Dutch manufacturing firms this is achievable, because they are flexible because of their size and structure, but also specialized in the products they produce. I would even state that organizational innovation makes it possible to execute an analyzer strategy. Coriat (1995) acknowledges the importance of information, organizational innovation is defined as any new technique of division of labor at intra- or inter-firm level which enables savings to be made in the use of resources, or a better adaptation of products to consumer needs and market variations. They are based on original and efficient methods in the management of information. The presumed synergy between analyzer strategy and organizational innovation should be investigated in future research.

SMEs are seen as the drivers of innovation, due to their size and resources in comparison to micro or large firms, therefore I chose to study SMEs. In the organizations included in this study decision making is relatively easy and does not include many different parts of the organization. In some cases, only the CEO decides the organization´s activities. The process of decision making might influence the role of organizational innovation. As Greenan (2003) stated, organizational innovation is the way decision making units are structured within the firm, the way decision making power and skills are

distributed within the firm and between decision making units and the type of information and communication structures that are in place. This definition indicates that organizational innovation might be more relevant when these issues are more complex. This is the case in bigger organizations. For these organizations the results of organizational innovation might become more clear. For SMEs the role of these practices is harder to indicate, because their presence and results are not very obvious. In future research larger organizations should be included to study organizational innovation practices.

According to this study Dutch Manufacturing SMEs should introduce a configuration of practices. The meaning of the configurations might be analyzed more properly. Based on this thesis it is possible to conclude that organizations should introduce a configuration of the following practices: Value Stream mapping, Customer or product oriented departments, Pull production, 5s method, Standardized work instructions, Task integration, Continuous improvement, ISO 9000, Idea generation, Experience time and Innovation training. But how this configuration should be implemented, and what synergistic effects these practices have on each other is not yet clear. Therefore, I would suggest a more elaborate research on the content of this configuration.

I would suggest managers of Dutch manufacturing SMEs to try to balance their explorative and exploitative activities. Such a strategy is likely to result in better performance. This can be achieved by introducing a configuration of organizational innovation practices. activities, which improves flexibility but also creates more efficiency.

§ 5.3 Limitations and Research Ethics

The characteristics of the phenomenon investigated in this thesis asked for a specific approach. As is stated in previous chapters the organizational innovations are hard to analyze and subtract. Looking at the practices makes it possible to understand this particular innovation more in depth. Therefore, I chose a mixed methods approach, a combination of quantitative and qualitative research. The quantitative analysis is based on the EMS survey, whereas interviews are conducted for the qualitative analysis. The two analyses are intended to be confirmative and complementary.

For the quantitative part the EMS dataset is used, this data was retrieved in earlier research among several companies in the Dutch manufacturing industry. The data for the qualitative analysis is obtained through interviews at Dutch SMEs. When collecting the interview participants, I tried to match the average firm of the EMS survey. This however has not completely succeeded. First the magnitude of the participants to the interview is much smaller. Due to the factors as time and response I only collected eight respondents. One of these participants had to be excluded, because they did not meet the entering criteria, which resulted in seven interviews suitable for the analysis. A more

extensive number of participants would add to the validity, reliability and accuracy of the results of this thesis. Therefore, the conclusions based on this thesis cannot be generalized. Second not all industry sectors are represented in the interviews. The participants included in the interview only represent four of the seven industry sectors. Comparisons based on the different industry sectors are not possible.

When conducting the interviews, I tried to be as objective as possible, following the semi-structured interview, composed at forehand. The fact that innovation, let alone organizational innovation, was interpreted differently by the participants of the interview made it hard to gather useful information. To extract some information regarding the topics that I wanted to address, I might have asked more leading questions than intended. The interviews recorded and transcribed. The transcriptions were submitted to the participants for approval. The mixed methods are hard to compare one on one, although do bring a lot of clarities and complementarities of many topics addressed in this thesis.

To confirm my research integrity, I include a signed research integrity firm.

Research integrity form - Master Thesis

Name:	Student number:
RU e-mail address:	Master specialisation:

Thesis title:
Brief description of the study:

It is my responsibility to follow the university's code of academic integrity and any relevant academic or professional guidelines in the conduct of my study. This includes:

- providing original work or proper use of references;
- providing appropriate information to all involved in my study;
- requesting informed consent from participants;
- transparency in the way data is processed and represented;
- ensuring confidentiality in the storage and use of data;

If there is any significant change in the question, design or conduct over the course of the research, I will complete another Research Integrity Form.

Breaches of the code of conduct with respect to academic integrity (as described / referred to in the thesis handbook) should and will be forwarded to the examination board. Acting contrary to the code of conduct can result in declaring the thesis invalid

Student's Signature: Date:

To be signed by supervisor

I have instructed the student about ethical issues related to their specific study. I hereby declare that I will challenge him / her on ethical aspects through their investigation and to act on any violations that I may encounter.

Supervisor's Signature: Date:

References

- Alavi, M., and D. E. Leidner. 2001. “Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues.” MIS Quarterly 25: 107–136
- Armbruster, H., Bikfalvib, A., Kinkela, S. et al. (2008) Organizational Innovation: the challenge of measuring non-technical innovation in large-scale surveys, Technovation, 28, 644-57
- Armbruster, H., Kirner, E., Lay, G., 2006. Patterns of Organisational Change in European Industry. Ways to Strengthen the Empircal Basis of Research and Policy. Fraunhofer Insitute.
- Baarda, D.B., Goede, M.P.M. De, Teunissen, J. (2005) Basisboek Kwalitatief Onderzoek, Wolters Noordhoff.
- Baregheh Anahita Jennifer Rowley Sally Sambrook, (2009),"Towards a multidisciplinary definition of innovation", Management Decision, Vol. 47 Iss 8 pp. 1323 – 1339
- Boer and During (2001) Innovation what innovation? A comparison between product, process and organizational innovation. International Journal of Technology management 22 1/2/3/ 83-107
- Community Innovation Survey Questionnaire 2010
- Coriat, B. (1995) Organisational innovation: The missing link in European competitiveness. In Andreassen et al.
- Crossan MM., Apaydin, M., 2010. A multi-dimensional framework of organizational innovation: A systematic review of the literature. Journal of management studies,
- Daft, R. (1978) A dual-core model of organizational innovation. Academy of management Journal, vol. 21 139-210
- Damanpour, F., Evan, W. (1984) Organizational innovation and performance: the problem of the organizational lag. Administrative science quarterly 29 392-409
- Damanpour, F. (1991) Organizational Innovation: A Meta-analysis of Effects of Determinants and Moderators. Acadamy of Management Journal. Vol. 34, 3, p. 555-590.
- Damanpour, F. and Gopalakrishnan, S, (2001) The dynamics of the adoption of product and process innovation in organizations. Journal of Management Studies, 38. 45-65.
- Dawson, P., and Daniel, L. (2010) ‘understanding social innovation: a provisional framework’, Int. J. Technology management, Vol. 51, No. 1, pp. 9-21.
- Delery, John E., Doty, D. Harold, (1996). Modes of theorizing in Strategic Human Resource Management: Tests of Universalistic, Contingency and Configurational Performance Predictions. Academy of Management Journal, vol 39, 4, p. 802-835
- Dess, G.G. and Picken, J.C. (2000). ‘Changing Roles: Leadership in the 21st century’. Organizational Dynamics, 28, 3, 18-34.

- Edquist c., Hommen, L., McKelvey, M. Innovation and Employment. Process innovation versus Product Innovation. Edward elgar. 2001.
- Eisenhardt, K., Furr, N., Bingham, C. Microfoundations of performance: Balancing Efficiency and Flexibility in Dynamic Environments. Organizational Science, Vol. 21, No. 6, pp. 1263-1273.
- Evangelista, R., Vezzani, A. The economic impact of technological and organizational innovations. A firm-level analysis. Research Policy Volume 39, Issue 10, December 2010, Pages 1253–1263.
- Grebliauskas Modern Organizational Forms And Their Development Trends Under Knowledge-Based Economy Knowledge-Based Economy: Management Of Creation & Development Date: September 1, 2005
- Greenan, N. (2003) Organisational change, technology, employment and skills: an empirical study of French manufacturing. Cambridge Journal of economics. Vol 27, 27 pp. 287-316
- Guide to management ideas
- Hage (1998) Organizational Innovation. History of management thought.
- Hair, Black, Anderson & Tatham, Multivariate Data Analysis, 6th edition, 2005, Pearson/Prentice Hall.
- Hilmola, O., Lorentz, H., Hillefoth, P., Malmsten, J. (2015) Manufacturing strategy in SMEs and its performance implications. Industrial Management & Data Systems. Vol 115, 6, p1004-1021.
- Holland, S., Gaston, K. and Gomes, J. (2000) critical success factors for cross-functional teamwork in new product development. International Journal of Management Reviews, volume 2, issue 3, p.p. 231-259
- Javadi, B., et al. (2013) An integrated approach for the cell formation and layout design in cellular manufacturing systems. International Journal of Production Research, Vol. 51, No. 20, 6017–6044
- Kae H. Chung. Differences In Motivational Properties Between Job Enlargement And Job Enrichment. Academy Of Management Review **date:** January 1, 1977
- Kesselring, A., Blasy, C., Scoppetta, A. (2014) Exploratory Report on Workplace Innovation. Concepts and indicators.
- Kim, L. (1980) Organizational innovation and structure. Journal of business research 8 225-245
- Lam, A., 2005. Organizational Innovation. In: Fagerberg, J., Mowery, D.C., Nelson, R.R., (eds), The Oxford Handbook of innovation. Oxford University press, Oxford, pp. 115-147
- Leslie, Lisa M Flexible Work Practices: A Source Of Career Premiums Or Penalties? Academy of Management Journal. Dec2012, Vol. 55 Issue 6, p1407-1428.

- Levinthal, D. A., J. G. March. 1993. The myopia of learning. Strategic Management J. 14 95–112.
- Ligthart, P., Vaessen, P., Dankbaar, B. (2008). Innovatie van Productie. Onderzoeksrapportage van de European Manufacturing Survey in de Nederlandse maakindustrie.
- Longoni, A., Mark Pagell, David Johnston and Anthony Veltri When does lean hurt? – an exploration of lean practices and worker health and safety outcomes. International Journal of Production Research, 2013 Vol. 51, No. 11, 3300–3320
- Manuel F. Suárez-Barraza & Tricia Smith (2014) The Kaizen approach within process innovation: findings from a multiple case study in Ibero-American countries, Total Quality Management & Business Excellence, 25:9-10, 1002-1025, DOI: 10.1080/14783363.2012.746194
- Melhem, Y., (2004). The antecedents of customer-contact employees' empowerment. Employee Relations Journal, 26(1), 72-93. DOI: 10.1108/01425450410506913.
- Miles, Raymond E. Snow, Charles C. Meyer, Alan D. Coleman, Jr., Henry J. Organizational Strategy, Structure, and Process. Academy of Management Review. Jul1978, Vol. 3 Issue 3, p546-562. 17p. 4 Charts.
- Mothe, C., UT Nguyen-Thi, P Nguyen-Van. Assessing complementarity in organizational innovations for technological innovation: the role of knowledge management practices. Applied economics. Vol. 47 no. 29 3040-3-58
- OECD, 2005, Oslo Manual-Guidelines for collecting and interpreting innovation data, Paris.
- Polley, D. and Ribbens, B. (1998), "Sustaining self-managed teams: a process approach to team wellness", Team Performance Management, Vol. 4 No. 1, pp. 3-21.
- Porter, M., Siggelkow, N. (2008) Contextuality within Activity Systems and Sustainability of Competitive Advantage. Academy of Management Perspectives. p. 34-56
- Ramstad, E. (2014) Can High-Involvement Innovation Practices improve productivity and the Quality of Working-life simultaneously? Management and Employee views on comparison. Nordic journal of working life studies, volume 4 number 4
- Sapprasert, K., and Clausen, T., 2012. Organizational innovation and its effects. Industrial and corporate change, volume 21, number 5, pp. 1283-1305.
- Schumpeter, J., 1934. The Theory of Economic Development. Harvard University Press, Cambridge, MA.
- Slappendel, C. Organization Studies (Walter de Gruyter GmbH & Co. KG.). 1996, Vol. 17 Issue 1, p107. 23p.

- Talib, F., Zillur Rahman M.N. Qureshi, (2011),"A study of total quality management and supply chain management practices", International Journal of Productivity and Performance Management, Vol. 60 Iss 3 pp. 268 – 288
- Totterdell, P., Leach, D., Birdi, K., Clegg, C. and Wall, T. (2002) An investigation of the contents and consequences of major organizational innovations. International Journal of Innovation Management, vol. 6, No. 4, pp. 343-368.
- Totterdell, P., Exton, R., Exton O., and Gold M., (2012) Closing the gap between evidence-based and common practice – Workplace innovation and public policy in Europe. Lifelong Learning in Europe.
- Tushman, M.L. and O'Reilly, C.A. (1996). Ambidextrous organizations: Managing Evolutionary and revolutionary change. California Management Review, 38, 4, 8-30.
- Vaara, E., Whittington, R. (2012) Strategy-as-Practice: Taking social practices seriously. The Academy of Management Annals, vol. 6 Number 1 285-336.
- Vaesen, P., Ligthart, P., Dankbaar, B., Technological and Organizational Innovation and Manufacturing Business Performance
- Van de Ven A. (1986) C*entral Problems in the Management of Innovation*. Management Science. Vol. 32, 5, p590-670
- Venkatesh, Viswanath. Bridging The Qualitative-Quantitative Divide: Guidelines For Conducting Mixed Methods Research In Information Systems. Mis Quarterly. Mar2013, Vol. 37 Issue 1, P21-54. 34p
- Wengel 2000 Analysis of Empirical Surveys on Organisational Innovation and Lessons for Future Community Innovation Surveys "Surveying Organisational Innovation on a European Level – Challenges and Options". Scientific Follow-up of the Community Innovation Survey (CIS) Project CIS 98/191
- Wiengaryten, F., Fynes, B., Cheng, E. Chavez, R. 2013 Taking an innovative approach to quality practices: exploring the importance of a company's innovativeness on the success of TQM practices. International Journal of Production Research. Vol 51, 10, p. 3055-3074.

Appendix

A. Table of definitions of organizational Innovation

Author	Source	Definition	Practices
Greenan, N. 2003	Organizational change, technology, employment and skills: an empirical study of French manufacturing. Cambridge journal of economics, 27, 287-316	The way decision making units are structured within the firm, the way decision making power and skills are distributed within the firm and between decision making units and the type of information and communication structures that are in place.	
Edquist et al 2001	Edquist c., Hommen, L., McKelvey, M. Innovation and Employment. Process innovation versus Product Innovation. Edward elgar. 2001	Organizational process innovations have no technological elements, they are new ways to organize work; a new organizational form is introduced. New ways to organize business activities such as production or R&D and have no technological elements. They have to do with the coordination of Human Resources	Just in time production; total Quality management; lean production; new organizational forms
Porch final report	Patterns of Organisational Change in European Industry. Ways to Strengthen the Empirical Basis of Research and Policy. Fraunhofer Instituten.	An organizational innovation is the implementation of a significant change in business practices, workplace organization or external relations, intended to improve the firm's innovative capacity or performance characteristics.	Decentralization; Team work; Cross-functional teams; Cooperation of production; Outsourcing; Continuous improvement; TQM; Flexibility of work schedules; Upskilling; Regular individual appraisal; Performance based wage systems; Knowledge management; Just in time; Zero buffer; Simultaneous engineering; Supply chain management
Mulej	How innovative are the Business and Management of the Slovenian manufacturing enterprises? Our economy No. 3-4 p.p. 217-237	Organizational innovation is the introduction of new organizational forms of work and cooperation	Human relationships; -Human resource management; Learning organization; TQM
Sapprassert	Organizational innovation and its effects. Industrial and corporate change, volume 21, number 5, pp. 1283-1305	innovative changes to a firm's nature, structure or arrangements, include changes in beliefs, rules or norms	
CIS 4	Community Innovation Survey 4	Implementation of new or significantly improved management systems to better use or exchange information knowledge and skills. A major change to the organization of work within the enterprise. Introduction of new or significant changes in the relations with other firms. Changes to the design or packaging a good or service. Introduction of new or significantly changed sales methods or distribution channels.	change in management structure; -integrating different departments or activities ; Alliances; Partnerships Outsourcing ; Subcontracting
OECD 2005	Oslo Manual-Guidelines for collecting and interpreting innovation data, Paris.	Organizational innovation is a new or significantly improved knowledge management system implemented to better use or exchange information, knowledge and skills within the firm; a major change to the organization of work within the firm, such as change in management structure or the integration of different departments or activities; new or significant change in the firm's relationship with other firms.	Practices for codifying knowledge; education Training systems; Management systems for general production; Supply chain management systems; Business reengineering; Lean production; Quality management systems; Decentralization of group activity and management control; Formal/informal work; Centralization of activity; Build to order production system; Integration; Collaboration; Integration; outsourcing

EMS ISI	Patterns of Organisational Change in European Industry. Ways to Strengthen the Empirical Basis of Research and Policy. Fraunhofer Instituten.	Organizational innovation as changes in structure and processes of an organization by implementing new managerial and working concepts and practices	such as the implementation of team work in production performance based wage systems or just-in-time concepts.
Mothe et al 2015	Assessing complementarity in organizational innovations for technological innovation: the role of knowledge management practices. Applied economics. Vol. 47 no. 29 3040-3-58	Organizational innovation consist of business practices, knowledge management, workplace organizational and external relations.	business practices: TQM; Lean management; Process reengineering; Supply chain management knowledge management workplace organization: Teamwork; Decentralization; Integration; New decision making external relations: Partnerships; Outsourcing; subcontracting
Armbruster 2008	Organizational Innovation: the challenge of measuring non-technical innovation in large-scale surveys, Technovation, 28, 644	Organizational innovation is the use of new managerial and working concepts and practices.	teamwork in production; supply chain management; quality management systems; cross functional teams; decentralization manufacturing cells; reduction hierarchical level; just in time management; Task integration; simultaneous engineering; Continuous improvement; Zero buffer principles; Outsourcing; offshoring; Cooperation; Just in time
Ramstad	2014	High involvement innovation practices	Decentralized decision making; Supervisor support; Competence development; Internal and external cooperation
Damanpour	1984	Administrative innovations occur in the social system of an organization. It includes those rules, roles, procedures and structures that are related to the communication and exchange among people and between the environment and people.	new way to recruit personnel; new way of resource allocation; new way to structure tasks
Pettigrew and Fenton	Pettigrew, A.M. and Fenton, E.M. (2000): The innovating organization, Londen: Sage Publications	Organizational innovations are changes in production process and in the interaction between agents that make this process possible.	
Dortmund Brussels position paper on WI		Workplace innovation is a social process which shapes work organization and working life, combining their human, organizational and technological dimensions	Participative job design; Self-organised teams; Continuous improvement; High involvement innovation; Employee involvement in corporate decision making

B. Overview of organizational Innovation Practices

Decentralization is more widely distributing decision-making to bring it closer to the point of service or action (Porch 2005). the process of distributing (decision- making) power away from the centre of an organization (Damanpour X). Organizations often decentralize when they feel their systems and processes are becoming too slow, because too much decision making is being referred to the centre. Decentralization is a structural organizational innovation, it has implications for the responsibilities and hierarchical levels within the firm. It has an important effect on the flexibility of the firm. The decentralization of functions can be changed into product or customer oriented departments.

Team work is an enduring cooperation of two or more employees accomplishing their regular daily work tasks. They are interdependently linked to the achievement of mutually agreed goals (Porch). Team work increases the variety of skills and responsibilities within the team, which influences the flexibility.

Cross-functional teams: the use of individuals from different parts of the organization to develop solutions to process related problems that affect the institution as a system(Porch). The group of people applies different skills with a high degree of interdependence (Holland, Gaston and Gomes 2000). People with different educational backgrounds will increase creativity for better coping with complex and multi-faced tasks and to find innovative solutions.

Cooperation of production, R&D or administrative activities: association of legally independent but economic dependent companies to achieve a common benefit. It involves cooperation with other companies and their employees. This will result in new information within the firm.

Relocation and Outsourcing: process of moving parts of the company to a different location. Or delegation of non-core operations to external companies that have specialized in these operations. A transfer of some activities to other companies could reduce costs.

*Continuous Improvement Processe*s: management concept that tries to initiate favorable changes in companies by taking incremental but continuous steps. Kaizen is an example of CIP. Everybody in the company should be seeking a better way of doing their job all the time by constantly eliminating muda (non-value-adding activities) and streamlining the work processes (Imai, 1997). It has both influences on the innovation ability of the firm and quality of the process.

Total Quality Management: set of systematic activities carried out by the entire organization to effectively and efficiently achieve company objectives in order to provide products and services with a

level of quality that satisfies the customer at the appropriate time and price. TQM is a total system approach which works horizontally across functions and departments, involving all employees, top to bottom, and extends backwards and forwards to include the supply chain and customer chain (Talib 2011). TQM practices result in set-up time reduction, allowing improved schedule attainment and correspondingly faster response to market demands (Talib 2011). According to Talib et al (2011) TQM consists of several practices: Top management Commitment, Costumer focus, training and education, continuous improvement and innovation, supplier management, employee involvement.

Flexible work: Employees take part in the decision process of when to work, afford employees control over when, where, or how much they work (Leslie et al 2012). Flexible working hours comprise a higher autonomy for accomplishing tasks and are usually based on a trusty relationship between employer and employee. Flexible work practices have a positive effect on flexibility and workplace satisfaction, but do also affect cost reductions.

Upskilling: Improving skills, by training, broadening of competencies and giving more responsibilities to employees. This practice has different facets. The first is job enlargement, adding more task elements to an existing job. When a job is enlarged, the worker performs a large work unit involving a variety of task elements rather than a fragmented job (Chung 1977). Task integration allows workers to perform managerial functions previously restricted to managerial and supervisory personnel. If founded on enlarged jobs, it allows workers to perform more task components, and also to have more control over the tasks they perform (Cheung 1977). Empowerment means giving employees more authority and discretion in performing work tasks and giving them autonomy to solve all issues related to their work (Melhem 2004).

Regular individual appraisals: meetings between employees and their managers where feedback on work content and work load can be given as well as to review the achievements and to set objectives for the following period.

Performance-based wage systems: wage system that is based on either the performance of an individual, the department or business unit or the entire organization. A higher performance is linked to a higher wage.

Knowledge management: concerned with strategy, process and instruments to acquire, store, share and secure organizational and individual knowledge, common understandings, insights and core distinctions. Identify and leverage the collective knowledge in an organization to help the organization compete (Alavi and Leidner 2001).

Just in time: strategy for inventory management in which raw materials and components are delivered from the vendor or supplier immediately before they are needed in the manufacturing process. Reduce inventory and associated costs. There are three phases of Just in Time management; Kanban, production planning and global management. Implementing this practice will require some technical adjustments. Just in time is a main source of cost reduction.

Zero-buffer: eliminate all buffers during production process within the company, saving space, time and money. Each step in the production process is completed by the time the subsequent process has to start in order to finish production at a certain point of time.

Simultaneous engineering: simultaneously designing products and the processes for manufacturing those products through the use of cross-functional teams to assure manufacturability and to reduce cycle time.

Supply chain management: coordinated set of techniques to plan and execute all steps in the global network used to acquire raw materials from vendors, transform them into finished goods, and deliver both goods and services to customers. SCM focuses on coordination and configuration of the processes that are necessary to make products on time (no delay), reproducibly, and in a satisfactory condition (quality assurance) together with handling procurement of the material/service inputs. SCM takes a vertical view of the relationship between the buyer and supplier, focusing on the performance of upstream and downstream organizations (Talib et al. 2011). They see Lean production as a practice of Supply chain management.

Manufacturing cells: Cellular manufacturing (CM) involves the formation of part families based upon their similar processing requirements and the grouping of machines into manufacturing cells to produce the formed part families. A part family is a collection of parts which are similar either because of geometric shape and size or similar processing steps required in their manufacture (Groover 1987). A manufacturing cell consists of several functionally dissimilar machines which are placed in close proximity to one another and dedicated to the manufacture of a part family (Javadi et al. 2013).

Lean production is an integrated socio-technical system whose main objective is to eliminate waste by concurrently minimizing supplier, customer, and internal variability (Shah and Ward 2007).

New organizational forms/structures: Changes in the organizations structures in reaction to changes in the market through new organizational shapes facilitated by the use of new technology that give rise to different interpersonal relations and, management systems. Possible forms are formation of network-

like structures, virtual organizations, self-managing teams, learning organizations, real time discussion groups, etc. (Grebliauskas 2005).

Self-organised teams A self-organised team is recognized as a self-regulated, semi-autonomous small group of employees whose members determine, plan and manage their day-to-day activities and duties under reduced or no supervision. The concept of self-organized, self-directed, or self-managed work teams (the terms are often used interchangeably) has now been used for several decades and is popular as a means to make work organizations more effective and to improve productivity (Polley and Ribbens, 1998).

High involvement innovation practices are work, managerial and organizational practices that support continuous improvement and broad participation of employees and other participants such as customers. There are three main practices according to Ramstad (2014) decentralized decision making, supervisor support and competence development.

Competence development: individuals' skills and proficiency enhancement of the organization throughout the working career

Supervisor support employee's belief concerning the extent to which supervisors value their contributions and care about their well-being.

Value Stream Mapping: VSM is a technique that could be applied to nearly any value chain, in order to analyze and re-engineer the flow of materials and information required to bring a product to a customer.

C. Table of Practices of organizational innovations and their Features

Practice	Conceptual	Type	Scope	Output
Just in time	EMS	Procedural	Firm level	Costs,
Total Quality Management	CIS, EMS	Procedural	Firm level	Quality, Job satisfaction
Lean Production	CIS	Procedural	Firm level	Quality Costs
New Organizational Forms	EMS	Structural	Firm level	Flexibility, job satisfaction
Decentralization	CIS, EMS	Structural	Intra-firm	Flexibility, innovation ability
Team Work	CIS, EMS	Procedural	Team level	Job satisfaction, Flexibility, Quality, Innovation ability
Cross Functional Teams	EMS	Structural	Workplace level	Innovation ability, Quality, flexibility
Cooperation of production	CIS, EMS	structural	Inter-firm	Innovation ability, Non-tradable, costs
Outsourcing	CIS, EMS	Structural	Inter-firm	Costs, non-tradeable assets
Continous improvement	EMS	Procedural	Intra-firm incremental	Quality, Innovation ability, costs
Flexibility of work schedules	EMS	Managerial	Intra-firm	Job satisfaction, flexibility
Upskilling	EMS,	Managerial	Individual level	Job satisfaction, Flexibility, quality
Regular Individual Appraisal	EMS	Managerial	Workplace level	Quality , job satisfaction
Performance based wage system	EMS	Managerial	Workplace level	Job satisfaction
Knowledge management	CIS, EMS	Procedural	Firmlevel	Non tradable assets
Zero Buffer	EMS	Procedural	Inter-frim level	Cost
Simultaneous engineering	EMS	procedural	Firm level	Cost, Innovation ability
Supply chain management	CIS, EMS	Procedural	Inter-firm	Cost , flexibility
Manufacturing cells	CIS, EMS	Structural	Workplace level	Cost reduction
Participative job design	EMS	Workplace innovation	Workplace level	Job satisfaction
Self-organised teams	EMS	Workplace innovation	Workplace level	Job satisfaction
High involvement innovation		Workplace innovation	Firm level	job satisfaction innovation ability
Employee involvement in corporate decision making	EMS	Workplace innovation	Firm level	job satisfaction
Supervisor support	EMS	Workplace innovation	Workplace level	Job satisfaction
New way to recruit		Managerial	Firm level	

personnel				
Educating/training Systems	EMS	Managerial	Individual level	Job satisfaction, flexibility
Alliances	EMS	Structural	Inter-firm evel	Non-tradeable assets, costs

Table 2. Practices of organizational innovations and their features

D. Quantitative results

Statistics

		Turnover in million euros	lnTurnover	ProdLead Time	lnProdLeadTime	OnTime	lnOnTime_rf	Scraprate percentage scrap	lnScraprate	FlexIncrProd	lnFlexIncrProd	FlexDecrProd	lnFlexDecrProd
N	Valid	125	125	137	137	136	136	133	133	133	133	131	131
	Missing	14	14	2	2	3	3	6	6	6	6	8	8
Mean		98.7192	2.4872	33.4845	2.7561	89.4353	1.8407	3.3624	1.0504	29.1917	2.9376	15.9962	2.3444
Std. Error of Mean		55.01483	.12272	4.97709	.10333	1.45180	.09070	.55531	.06993	3.48457	.09236	1.21556	.10601
Median		8.0000	2.1972	15.0000	2.7726	95.0000	1.7918	2.0000	1.0986	20.0000	3.0445	15.0000	2.7726
Mode		10.00	2.40	5.00[a]	1.79[a]	90.00	2.40	1.00[a]	.69[a]	20.00	3.04	20.00	3.04
Std. Deviation		615.0845	1.37208	58.25532	1.20949	16.93078	1.05778	6.40411	.80644	40.18606	1.06518	13.91271	1.21333
Variance		378329.0	1.883	3393.682	1.463	286.651	1.119	41.013	.650	1614.919	1.135	193.563	1.472
Skewness		8.114	1.581	3.733	.328	-3.441	.381	4.943	.979	6.346	-.971	1.691	-1.004
Std. Error of Skewness		.217	.217	.207	.207	.208	.208	.210	.210	.210	.210	.212	.212
Kurtosis		66.785	4.248	16.319	-.089	13.138	-.197	29.367	1.213	55.077	2.202	5.605	-.116
Std. Error of Kurtosis		.430	.430	.411	.411	.413	.413	.417	.417	.417	.417	.420	.420
Range		5649.10	8.00	364.75	5.68	100.00	4.62	50.00	3.93	400.00	5.99	90.00	4.51
Minimum		.90	.64	.25	.22	.00	.00	.00	.00	.00	.00	.00	.00
Maximum		5650.00	8.64	365.00	5.90	100.00	4.62	50.00	3.93	400.00	5.99	90.00	4.51
Sum		12339.90	310.90	4587.38	377.58	12163.20	250.34	447.20	139.71	3882.50	390.70	2095.50	307.12

a. Multiple modes exist. The smallest value is shown

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.901	.900	22

Item Statistics

	Mean	Std. Deviation	N
oi_VaStM	.4583	.50035	120
oi_CuPrF	.3583	.48152	120
oi_PullPr	.4583	.50035	120
oi_OpSwT	.3250	.47034	120
oi_TPM	.2917	.45644	120
oi_TQM	.2750	.44839	120
oi_5S	.5500	.49958	120
oi_StWIn	.7333	.44407	120
oi_TaskIn	.5833	.49507	120
oi_ConIm	.6417	.48152	120
oi_Team	.3333	.47338	120
oi_VisM	.3333	.47338	120
oi_i9000	.6000	.49195	120
oi_6Sig	.2083	.40782	120
oi_i14031	.2250	.41933	120
oi_i50001	.0750	.26450	120
oi_TCO	.2167	.41370	120
oi_Idgen	.4500	.49958	120
oi_AgingM	.3500	.47897	120
oi_ExpTime	.4417	.49867	120
oi_TalMngt	.3250	.47034	120
oi_InnoTr	.3917	.49017	120

Statistics

Org_Inn Number of Process Organization innovations

N	Valid	139
	Missing	0
Mean		8.4892
Std. Error of Mean		.47416
Median		8.0000
Mode		13.00
Std. Deviation		5.5903
Variance		31.252
Skewness		.340
Std. Error of Skewness		.206
Kurtosis		-.852
Std. Error of Kurtosis		.408
Range		21.00
Minimum		.00
Maximum		21.00
Sum		1180.0

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.888[a]	.789	.775	.65895	.789	57.178	7	107	.000	
2	.889[b]	.791	.775	.65887	.002	1.027	1	106	.313	
3	.890[c]	.792	.772	.66344	.001	.273	2	104	.762	
4	.893[d]	.797	.773	.66205	.005	1.218	2	102	.300	2.076

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

e. Dependent Variable: lnTurnover

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	173.795	7	24.828	57.178	.000[b]
	Residual	46.461	107	.434		
	Total	220.257	114			
2	Regression	174.241	8	21.780	50.172	.000[c]
	Residual	46.016	106	.434		
	Total	220.257	114			
3	Regression	174.481	10	17.448	39.641	.000[d]
	Residual	45.776	104	.440		
	Total	220.257	114			
4	Regression	175.549	12	14.629	33.376	.000[e]
	Residual	44.707	102	.438		
	Total	220.257	114			

a. Dependent Variable: lnTurnover

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

e. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.922	.240		-8.004	.000		
	Food	1.303	.253	.253	5.162	.000	.821	1.218
	Textile	.166	.211	.040	.788	.433	.746	1.340
	Construction	.839	.253	.163	3.321	.001	.821	1.219
	Chemical	.594	.190	.166	3.124	.002	.699	1.430
	Machinery	.635	.191	.177	3.318	.001	.691	1.447
	Electronic	.362	.229	.080	1.582	.117	.773	1.293
	lnSize number of employees 2011 (log)	1.033	.055	.841	18.732	.000	.977	1.024
2	(Constant)	-1.919	.240		-7.988	.000		
	Food	1.344	.256	.261	5.257	.000	.801	1.248
	Textile	.188	.212	.046	.886	.378	.738	1.354
	Construction	.826	.253	.160	3.269	.001	.819	1.221
	Chemical	.605	.190	.169	3.175	.002	.697	1.435
	Machinery	.632	.191	.176	3.303	.001	.691	1.448
	Electronic	.386	.230	.085	1.681	.096	.765	1.308
	lnSize number of employees 2011 (log)	.999	.064	.814	15.547	.000	.719	1.392
	Org_Inn Number of Process Organization innovations	.013	.013	.054	1.013	.313	.706	1.416
3	(Constant)	-1.876	.249		-7.542	.000		
	Food	1.387	.264	.269	5.254	.000	.761	1.314
	Textile	.174	.215	.042	.809	.421	.729	1.371
	Construction	.830	.255	.161	3.259	.002	.818	1.222
	Chemical	.623	.194	.174	3.212	.002	.682	1.466
	Machinery	.641	.194	.179	3.297	.001	.678	1.475
	Electronic	.435	.244	.096	1.784	.077	.689	1.451
	lnSize number of employees 2011 (log)	.994	.065	.810	15.249	.000	.708	1.412
	Org_Inn Number of Process Organization innovations	.015	.013	.058	1.091	.278	.695	1.440
	dAnalyzer	-.087	.136	-.031	-.637	.525	.860	1.163
	dProspector	-.144	.267	-.026	-.538	.592	.827	1.210
4	(Constant)	-1.994	.259		-7.683	.000		
	Food	1.359	.265	.264	5.130	.000	.753	1.328
	Textile	.151	.215	.037	.700	.486	.725	1.380
	Construction	.764	.259	.148	2.957	.004	.791	1.265
	Chemical	.587	.196	.164	3.000	.003	.668	1.497
	Machinery	.631	.197	.176	3.210	.002	.661	1.513
	Electronic	.407	.244	.090	1.668	.098	.685	1.460
	lnSize number of employees 2011 (log)	1.000	.065	.815	15.324	.000	.704	1.420
	Org_Inn Number of Process Organization innovations	.028	.016	.113	1.731	.086	.466	2.145
	dAnalyzer	-.070	.136	-.025	-.516	.607	.853	1.172
	dProspector	-.149	.267	-.027	-.557	.579	.825	1.212
	cOI_DAnalyzer	-.032	.024	-.079	-1.342	.183	.577	1.732
	cOI_DProspector	-.060	.061	-.047	-.983	.328	.879	1.138

a. Dependent Variable: lnTurnover

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.589[a]	.347	.304	.97402	.347	8.129	7	107	.000	
2	.589[b]	.347	.298	.97857	.000	.009	1	106	.927	
3	.593[c]	.352	.290	.98416	.005	.400	2	104	.672	
4	.604[d]	.365	.291	.98357	.013	1.062	2	102	.350	1.791

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

e. Dependent Variable: lnProdLeadTime

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.984	7	7.712	8.129	.000[b]
	Residual	101.513	107	.949		
	Total	155.497	114			
2	Regression	53.992	8	6.749	7.048	.000[c]
	Residual	101.505	106	.958		
	Total	155.497	114			
3	Regression	54.766	10	5.477	5.654	.000[d]
	Residual	100.731	104	.969		
	Total	155.497	114			
4	Regression	56.820	12	4.735	4.894	.000[e]
	Residual	98.677	102	.967		
	Total	155.497	114			

a. Dependent Variable: lnProdLeadTime

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

e. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.415	.355		6.802	.000		
	Food	-1.497	.373	-.346	-4.010	.000	.821	1.218
	Textile	-.302	.312	-.087	-.967	.336	.746	1.340
	Construction	-.823	.373	-.190	-2.206	.030	.821	1.219
	Chemical	-.818	.281	-.272	-2.910	.004	.699	1.430
	Machinery	.802	.283	.267	2.837	.005	.691	1.447
	Electronic	-.377	.338	-.099	-1.116	.267	.773	1.293
	lnSize number of employees 2011 (log)	.146	.081	.142	1.792	.076	.977	1.024
2	(Constant)	2.414	.357		6.768	.000		
	Food	-1.502	.380	-.347	-3.957	.000	.801	1.248
	Textile	-.305	.315	-.088	-.967	.336	.738	1.354
	Construction	-.822	.376	-.190	-2.188	.031	.819	1.221
	Chemical	-.820	.283	-.272	-2.897	.005	.697	1.435
	Machinery	.803	.284	.267	2.825	.006	.691	1.448
	Electronic	-.380	.341	-.100	-1.114	.268	.765	1.308
	lnSize number of employees 2011 (log)	.151	.095	.146	1.577	.118	.719	1.392
	Org_Inn Number of Process Organization innovations	-.002	.020	-.009	-.092	.927	.706	1.416
3	(Constant)	2.399	.369		6.502	.000		
	Food	-1.501	.392	-.347	-3.831	.000	.761	1.314
	Textile	-.287	.319	-.083	-.899	.371	.729	1.371
	Construction	-.825	.378	-.191	-2.185	.031	.818	1.222
	Chemical	-.800	.288	-.266	-2.782	.006	.682	1.466
	Machinery	.834	.288	.277	2.890	.005	.678	1.475
	Electronic	-.328	.362	-.086	-.906	.367	.689	1.451
	lnSize number of employees 2011 (log)	.146	.097	.142	1.511	.134	.708	1.412
	Org_Inn Number of Process Organization innovations	-.002	.020	-.011	-.114	.910	.695	1.440
	dAnalyzer	.091	.202	.038	.448	.655	.860	1.163
	dProspector	-.244	.397	-.053	-.615	.540	.827	1.210
4	(Constant)	2.559	.386		6.637	.000		
	Food	-1.468	.394	-.339	-3.731	.000	.753	1.328
	Textile	-.258	.320	-.075	-.806	.422	.725	1.380
	Construction	-.742	.384	-.171	-1.932	.056	.791	1.265
	Chemical	-.746	.291	-.248	-2.567	.012	.668	1.497
	Machinery	.838	.292	.279	2.871	.005	.661	1.513
	Electronic	-.291	.362	-.076	-.802	.424	.685	1.460
	lnSize number of employees 2011 (log)	.137	.097	.133	1.415	.160	.704	1.420
	Org_Inn Number of Process Organization innovations	-.020	.024	-.095	-.824	.412	.466	2.145
	dAnalyzer	.070	.203	.029	.345	.731	.853	1.172
	dProspector	-.234	.397	-.051	-.589	.557	.825	1.212
	cOI_DAnalyzer	.040	.035	.118	1.137	.258	.577	1.732
	cOI_DProspector	.096	.090	.090	1.066	.289	.879	1.138

a. Dependent Variable: lnProdLeadTime

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.369[a]	.136	.079	.98868	.136	2.406	7	107	.025	
2	.437[b]	.191	.129	.96145	.055	7.146	1	106	.009	
3	.480[c]	.230	.156	.94649	.040	2.689	2	104	.073	
4	.525[d]	.276	.191	.92714	.045	3.193	2	102	.045	1.802

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

e. Dependent Variable: lnOnTime_rf

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.466	7	2.352	2.406	.025[b]
	Residual	104.590	107	.977		
	Total	121.057	114			
2	Regression	23.072	8	2.884	3.120	.003[c]
	Residual	97.985	106	.924		
	Total	121.057	114			
3	Regression	27.889	10	2.789	3.113	.002[d]
	Residual	93.167	104	.896		
	Total	121.057	114			
4	Regression	33.379	12	2.782	3.236	.001[e]
	Residual	87.677	102	.860		
	Total	121.057	114			

a. Dependent Variable: lnOnTime_rf

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

e. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.883	.360		5.225	.000		
	Food	-1.298	.379	-.340	-3.426	.001	.821	1.218
	Textile	-.049	.317	-.016	-.154	.878	.746	1.340
	Construction	-.455	.379	-.119	-1.201	.232	.821	1.219
	Chemical	-.352	.285	-.132	-1.233	.220	.699	1.430
	Machinery	.147	.287	.055	.513	.609	.691	1.447
	Electronic	-.046	.343	-.014	-.135	.893	.773	1.293
	lnSize number of employees 2011 (log)	.029	.083	.032	.349	.728	.977	1.024
2	(Constant)	1.868	.350		5.330	.000		
	Food	-1.452	.373	-.380	-3.894	.000	.801	1.248
	Textile	-.132	.310	-.043	-.427	.670	.738	1.354
	Construction	-.408	.369	-.107	-1.105	.272	.819	1.221
	Chemical	-.393	.278	-.148	-1.414	.160	.697	1.435
	Machinery	.158	.279	.060	.567	.572	.691	1.448
	Electronic	-.141	.335	-.042	-.422	.674	.765	1.308
	lnSize number of employees 2011 (log)	.158	.094	.173	1.682	.095	.719	1.392
	Org_Inn Number of Process Organization innovations	-.052	.019	-.278	-2.673	.009	.706	1.416
3	(Constant)	1.709	.355		4.814	.000		
	Food	-1.587	.377	-.415	-4.213	.000	.761	1.314
	Textile	-.055	.307	-.018	-.181	.857	.729	1.371
	Construction	-.425	.363	-.111	-1.171	.244	.818	1.222
	Chemical	-.414	.277	-.156	-1.497	.137	.682	1.466
	Machinery	.185	.277	.070	.666	.507	.678	1.475
	Electronic	-.200	.348	-.059	-.574	.567	.689	1.451
	lnSize number of employees 2011 (log)	.166	.093	.183	1.786	.077	.708	1.412
	Org_Inn Number of Process Organization innovations	-.056	.019	-.303	-2.939	.004	.695	1.440
	dAnalyzer	.434	.194	.207	2.237	.027	.860	1.163
	dProspector	.018	.382	.004	.046	.963	.827	1.210
4	(Constant)	1.860	.363		5.119	.000		
	Food	-1.492	.371	-.391	-4.021	.000	.753	1.328
	Textile	-.001	.302	.000	-.002	.998	.725	1.380
	Construction	-.284	.362	-.074	-.786	.434	.791	1.265
	Chemical	-.425	.274	-.160	-1.554	.123	.668	1.497
	Machinery	.291	.275	.110	1.058	.292	.661	1.513
	Electronic	-.156	.342	-.046	-.456	.650	.685	1.460
	lnSize number of employees 2011 (log)	.170	.091	.187	1.865	.065	.704	1.420
	Org_Inn Number of Process Organization innovations	-.082	.023	-.441	-3.572	.001	.466	2.145
	dAnalyzer	.398	.191	.190	2.084	.040	.853	1.172
	dProspector	-.010	.374	-.003	-.027	.978	.825	1.212
	cOI_DAnalyzer	.073	.033	.243	2.187	.031	.577	1.732
	cOI_DProspector	-.080	.085	-.084	-.938	.350	.879	1.138

a. Dependent Variable: lnOnTime_rf

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.371[a]	.138	.081	.70961	.138	2.444	7	107	.023	
2	.372[b]	.138	.073	.71280	.000	.044	1	106	.835	
3	.379[c]	.143	.061	.71744	.005	.317	2	104	.729	
4	.396[d]	.157	.058	.71873	.013	.813	2	102	.446	1.931

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

e. Dependent Variable: lnScraprate

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.613	7	1.230	2.444	.023[b]
	Residual	53.879	107	.504		
	Total	62.492	114			
2	Regression	8.635	8	1.079	2.125	.040[c]
	Residual	53.857	106	.508		
	Total	62.492	114			
3	Regression	8.961	10	.896	1.741	.081[d]
	Residual	53.531	104	.515		
	Total	62.492	114			
4	Regression	9.801	12	.817	1.581	.109[e]
	Residual	52.691	102	.517		
	Total	62.492	114			

a. Dependent Variable: lnScraprate

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

e. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.365	.259		1.412	.161		
	Food	-.445	.272	-.162	-1.637	.105	.821	1.218
	Textile	.189	.227	.087	.833	.407	.746	1.340
	Construction	.302	.272	.110	1.110	.270	.821	1.219
	Chemical	.086	.205	.045	.420	.676	.699	1.430
	Machinery	-.266	.206	-.139	-1.290	.200	.691	1.447
	Electronic	-.017	.246	-.007	-.069	.945	.773	1.293
	lnSize number of employees 2011 (log)	.171	.059	.262	2.883	.005	.977	1.024
2	(Constant)	.366	.260		1.408	.162		
	Food	-.436	.277	-.159	-1.577	.118	.801	1.248
	Textile	.194	.230	.089	.846	.399	.738	1.354
	Construction	.299	.274	.109	1.094	.277	.819	1.221
	Chemical	.088	.206	.046	.429	.669	.697	1.435
	Machinery	-.266	.207	-.140	-1.287	.201	.691	1.448
	Electronic	-.012	.249	-.005	-.047	.963	.765	1.308
	lnSize number of employees 2011 (log)	.164	.070	.250	2.354	.020	.719	1.392
	Org_Inn Number of Process Organization innovations	.003	.014	.022	.209	.835	.706	1.416
3	(Constant)	.316	.269		1.175	.243		
	Food	-.485	.286	-.177	-1.697	.093	.761	1.314
	Textile	.214	.233	.098	.918	.361	.729	1.371
	Construction	.294	.275	.107	1.069	.287	.818	1.222
	Chemical	.072	.210	.038	.344	.731	.682	1.466
	Machinery	-.271	.210	-.142	-1.288	.201	.678	1.475
	Electronic	-.056	.264	-.023	-.212	.833	.689	1.451
	lnSize number of employees 2011 (log)	.169	.070	.258	2.392	.019	.708	1.412
	Org_Inn Number of Process Organization innovations	.002	.015	.011	.105	.917	.695	1.440
	dAnalyzer	.114	.147	.076	.773	.441	.860	1.163
	dProspector	.115	.289	.040	.398	.691	.827	1.210
4	(Constant)	.355	.282		1.259	.211		
	Food	-.450	.288	-.164	-1.565	.121	.753	1.328
	Textile	.232	.234	.106	.992	.323	.725	1.380
	Construction	.340	.281	.124	1.213	.228	.791	1.265
	Chemical	.059	.212	.031	.279	.781	.668	1.497
	Machinery	-.227	.213	-.119	-1.065	.289	.661	1.513
	Electronic	-.043	.265	-.018	-.163	.871	.685	1.460
	lnSize number of employees 2011 (log)	.172	.071	.263	2.425	.017	.704	1.420
	Org_Inn Number of Process Organization innovations	-.006	.018	-.048	-.359	.720	.466	2.145
	dAnalyzer	.102	.148	.068	.688	.493	.853	1.172
	dProspector	.102	.290	.035	.352	.725	.825	1.212
	cOI_DAnalyzer	.024	.026	.112	.935	.352	.577	1.732
	cOI_DProspector	-.048	.066	-.070	-.723	.471	.879	1.138

a. Dependent Variable: lnScraprate

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.209[a]	.044	-.019	.99764	.044	.701	7	107	.671	
2	.268[b]	.072	.002	.98757	.028	3.193	1	106	.077	
3	.281[c]	.079	-.010	.99327	.007	.394	2	104	.675	
4	.284[d]	.081	-.028	1.00202	.002	.096	2	102	.909	1.976

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

e. Dependent Variable: lnFlexIncrProd

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.886	7	.698	.701	.671[b]
	Residual	106.497	107	.995		
	Total	111.383	114			
2	Regression	8.001	8	1.000	1.025	.422[c]
	Residual	103.382	106	.975		
	Total	111.383	114			
3	Regression	8.779	10	.878	.890	.545[d]
	Residual	102.604	104	.987		
	Total	111.383	114			
4	Regression	8.971	12	.748	.745	.705[e]
	Residual	102.412	102	1.004		
	Total	111.383	114			

a. Dependent Variable: lnFlexIncrProd

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

e. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.282	.364		9.026	.000		
	Food	.450	.382	.123	1.177	.242	.821	1.218
	Textile	-.052	.320	-.018	-.162	.872	.746	1.340
	Construction	.374	.382	.102	.979	.330	.821	1.219
	Chemical	-.214	.288	-.084	-.743	.459	.699	1.430
	Machinery	-.108	.290	-.042	-.373	.710	.691	1.447
	Electronic	.042	.346	.013	.122	.903	.773	1.293
	lnSize number of employees 2011 (log)	-.060	.083	-.068	-.714	.477	.977	1.024
2	(Constant)	3.292	.360		9.145	.000		
	Food	.556	.383	.152	1.451	.150	.801	1.248
	Textile	.006	.318	.002	.018	.985	.738	1.354
	Construction	.342	.379	.093	.902	.369	.819	1.221
	Chemical	-.186	.286	-.073	-.651	.517	.697	1.435
	Machinery	-.116	.287	-.045	-.403	.687	.691	1.448
	Electronic	.108	.344	.033	.312	.755	.765	1.308
	lnSize number of employees 2011 (log)	-.148	.096	-.170	-1.538	.127	.719	1.392
	Org_Inn Number of Process Organization innovations	.035	.020	.199	1.787	.077	.706	1.416
3	(Constant)	3.219	.372		8.642	.000		
	Food	.488	.395	.133	1.235	.220	.761	1.314
	Textile	.037	.322	.013	.115	.909	.729	1.371
	Construction	.334	.381	.091	.877	.383	.818	1.222
	Chemical	-.204	.290	-.080	-.703	.484	.682	1.466
	Machinery	-.115	.291	-.045	-.394	.695	.678	1.475
	Electronic	.058	.365	.018	.159	.874	.689	1.451
	lnSize number of employees 2011 (log)	-.142	.098	-.163	-1.457	.148	.708	1.412
	Org_Inn Number of Process Organization innovations	.033	.020	.187	1.654	.101	.695	1.440
	dAnalyzer	.181	.204	.090	.888	.377	.860	1.163
	dProspector	.104	.400	.027	.260	.795	.827	1.210
4	(Constant)	3.254	.393		8.284	.000		
	Food	.506	.401	.138	1.263	.209	.753	1.328
	Textile	.048	.326	.016	.148	.883	.725	1.380
	Construction	.363	.391	.099	.928	.356	.791	1.265
	Chemical	-.203	.296	-.080	-.686	.494	.668	1.497
	Machinery	-.096	.298	-.038	-.322	.748	.661	1.513
	Electronic	.068	.369	.021	.183	.855	.685	1.460
	lnSize number of employees 2011 (log)	-.142	.099	-.163	-1.438	.154	.704	1.420
	Org_Inn Number of Process Organization innovations	.028	.025	.157	1.127	.262	.466	2.145
	dAnalyzer	.174	.206	.086	.841	.402	.853	1.172
	dProspector	.100	.404	.026	.247	.805	.825	1.212
	cOI_DAnalyzer	.015	.036	.051	.409	.683	.577	1.732
	cOI_DProspector	-.009	.092	-.009	-.093	.926	.879	1.138

a. Dependent Variable: lnFlexIncrProd

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.458[a]	.210	.158	1.08308	.210	4.056	7	107	.001	
2	.461[b]	.213	.153	1.08605	.003	.416	1	106	.520	
3	.524[c]	.274	.205	1.05260	.062	4.422	2	104	.014	
4	.531[d]	.282	.198	1.05713	.008	.556	2	102	.575	2.039

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

e. Dependent Variable: lnFlexDecrProd

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.305	7	4.758	4.056	.001[b]
	Residual	125.518	107	1.173		
	Total	158.823	114			
2	Regression	33.796	8	4.225	3.582	.001[c]
	Residual	125.027	106	1.180		
	Total	158.823	114			
3	Regression	43.594	10	4.359	3.935	.000[d]
	Residual	115.229	104	1.108		
	Total	158.823	114			
4	Regression	44.836	12	3.736	3.343	.000[e]
	Residual	113.987	102	1.118		
	Total	158.823	114			

a. Dependent Variable: lnFlexDecrProd

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

e. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.271	.395		5.752	.000		
	Food	.502	.415	.115	1.209	.229	.821	1.218
	Textile	-1.469	.347	-.421	-4.230	.000	.746	1.340
	Construction	-.441	.415	-.101	-1.063	.290	.821	1.219
	Chemical	-.131	.313	-.043	-.418	.677	.699	1.430
	Machinery	-.035	.315	-.012	-.112	.911	.691	1.447
	Electronic	.147	.376	.038	.392	.696	.773	1.293
	lnSize number of employees 2011 (log)	.090	.091	.086	.992	.324	.977	1.024
2	(Constant)	2.275	.396		5.746	.000		
	Food	.544	.421	.124	1.291	.199	.801	1.248
	Textile	-1.446	.350	-.414	-4.131	.000	.738	1.354
	Construction	-.454	.417	-.104	-1.090	.278	.819	1.221
	Chemical	-.119	.314	-.039	-.380	.705	.697	1.435
	Machinery	-.038	.315	-.013	-.121	.904	.691	1.448
	Electronic	.173	.379	.045	.457	.649	.765	1.308
	lnSize number of employees 2011 (log)	.055	.106	.052	.516	.607	.719	1.392
	Org_Inn Number of Process Organization innovations	.014	.022	.066	.645	.520	.706	1.416
3	(Constant)	2.010	.395		5.093	.000		
	Food	.298	.419	.068	.711	.479	.761	1.314
	Textile	-1.335	.341	-.383	-3.913	.000	.729	1.371
	Construction	-.480	.404	-.110	-1.189	.237	.818	1.222
	Chemical	-.189	.308	-.062	-.613	.541	.682	1.466
	Machinery	-.040	.309	-.013	-.129	.898	.678	1.475
	Electronic	-.017	.387	-.004	-.043	.965	.689	1.451
	lnSize number of employees 2011 (log)	.077	.103	.074	.744	.458	.708	1.412
	Org_Inn Number of Process Organization innovations	.006	.021	.029	.294	.770	.695	1.440
	dAnalyzer	.641	.216	.267	2.969	.004	.860	1.163
	dProspector	.422	.424	.091	.995	.322	.827	1.210
4	(Constant)	1.904	.414		4.596	.000		
	Food	.252	.423	.058	.597	.552	.753	1.328
	Textile	-1.365	.344	-.391	-3.969	.000	.725	1.380
	Construction	-.559	.413	-.128	-1.354	.179	.791	1.265
	Chemical	-.202	.312	-.066	-.646	.520	.668	1.497
	Machinery	-.081	.314	-.026	-.257	.798	.661	1.513
	Electronic	-.045	.390	-.012	-.115	.909	.685	1.460
	lnSize number of employees 2011 (log)	.078	.104	.075	.751	.454	.704	1.420
	Org_Inn Number of Process Organization innovations	.021	.026	.100	.816	.416	.466	2.145
	dAnalyzer	.661	.218	.276	3.037	.003	.853	1.172
	dProspector	.430	.427	.093	1.007	.316	.825	1.212
	cOI_DAnalyzer	-.040	.038	-.115	-1.044	.299	.577	1.732
	cOI_DProspector	-.001	.097	-.001	-.008	.994	.879	1.138

a. Dependent Variable: lnFlexDecrProd

Regression analysis Number of organizaitonal innovations on On Time.

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.369[a]	.136	.079	.98868	.136	2.406	7	107	.025	
2	.437[b]	.191	.129	.96145	.055	7.146	1	106	.009	
3	.480[c]	.230	.156	.94649	.040	2.689	2	104	.073	
4	.525[d]	.276	.191	.92714	.045	3.193	2	102	.045	1.940

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

e. Dependent Variable: lnOnTime_rf

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.466	7	2.352	2.406	.025[b]
	Residual	104.590	107	.977		
	Total	121.057	114			
2	Regression	23.072	8	2.884	3.120	.003[c]
	Residual	97.985	106	.924		
	Total	121.057	114			
3	Regression	27.889	10	2.789	3.113	.002[d]
	Residual	93.167	104	.896		
	Total	121.057	114			
4	Regression	33.379	12	2.782	3.236	.001[e]
	Residual	87.677	102	.860		
	Total	121.057	114			

a. Dependent Variable: lnOnTime_rf

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

e. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.883	.360		5.225	.000		
	Food	-1.298	.379	-.340	-3.426	.001	.821	1.218
	Textile	-.049	.317	-.016	-.154	.878	.746	1.340
	Construction	-.455	.379	-.119	-1.201	.232	.821	1.219
	Chemical	-.352	.285	-.132	-1.233	.220	.699	1.430
	Machinery	.147	.287	.055	.513	.609	.691	1.447
	Electronic	-.046	.343	-.014	-.135	.893	.773	1.293
	lnSize number of employees 2011 (log)	.029	.083	.032	.349	.728	.977	1.024
2	(Constant)	1.868	.350		5.330	.000		
	Food	-1.452	.373	-.380	-3.894	.000	.801	1.248
	Textile	-.132	.310	-.043	-.427	.670	.738	1.354
	Construction	-.408	.369	-.107	-1.105	.272	.819	1.221
	Chemical	-.393	.278	-.148	-1.414	.160	.697	1.435
	Machinery	.158	.279	.060	.567	.572	.691	1.448
	Electronic	-.141	.335	-.042	-.422	.674	.765	1.308
	lnSize number of employees 2011 (log)	.158	.094	.173	1.682	.095	.719	1.392
	Org_Inn Number of Process Organization innovations	-.052	.019	-.278	-2.673	.009	.706	1.416
3	(Constant)	1.709	.355		4.814	.000		
	Food	-1.587	.377	-.415	-4.213	.000	.761	1.314
	Textile	-.055	.307	-.018	-.181	.857	.729	1.371
	Construction	-.425	.363	-.111	-1.171	.244	.818	1.222
	Chemical	-.414	.277	-.156	-1.497	.137	.682	1.466
	Machinery	.185	.277	.070	.666	.507	.678	1.475
	Electronic	-.200	.348	-.059	-.574	.567	.689	1.451
	lnSize number of employees 2011 (log)	.166	.093	.183	1.786	.077	.708	1.412
	Org_Inn Number of Process Organization innovations	-.056	.019	-.303	-2.939	.004	.695	1.440
	dAnalyzer	.434	.194	.207	2.237	.027	.860	1.163
	dProspector	.018	.382	.004	.046	.963	.827	1.210
4	(Constant)	1.860	.363		5.119	.000		
	Food	-1.492	.371	-.391	-4.021	.000	.753	1.328
	Textile	-.001	.302	.000	-.002	.998	.725	1.380
	Construction	-.284	.362	-.074	-.786	.434	.791	1.265
	Chemical	-.425	.274	-.160	-1.554	.123	.668	1.497
	Machinery	.291	.275	.110	1.058	.292	.661	1.513
	Electronic	-.156	.342	-.046	-.456	.650	.685	1.460
	lnSize number of employees 2011 (log)	.170	.091	.187	1.865	.065	.704	1.420
	Org_Inn Number of Process Organization innovations	-.082	.023	-.441	-3.572	.001	.466	2.145
	dAnalyzer	.398	.191	.190	2.084	.040	.853	1.172
	dProspector	-.010	.374	-.003	-.027	.978	.825	1.212
	cOI_DAnalyzer	.073	.033	.243	2.187	.031	.577	1.732
	cOI_DProspector	-.080	.085	-.084	-.938	.350	.879	1.138

a. Dependent Variable: lnOnTime_rf

Table 1

		InnovationStrategy 1 "defender" 2 "analyzer" 3 "prospector"		
		1.00	2.00	3.00
		Count	Count	Count
oi_VaStM	1,00 user	33	25	4
oi_CuPrF	1,00 user	26	21	4
oi_PullPr	1,00 user	36	26	3
oi_OpSwT	1,00 user	24	16	2
oi_TPM	1,00 user	23	12	3
oi_TQM	1,00 user	20	14	2
oi_5S	1,00 user	40	33	5
oi_StWIn	1,00 user	52	43	8
oi_TaskIn	1,00 user	37	35	8
oi_ConIm	1,00 user	47	38	6
oi_Team	1,00 user	22	20	4
oi_VisM	1,00 user	25	16	4
oi_i9000	1,00 user	45	31	7
oi_6Sig	1,00 user	18	9	
oi_i14031	1,00 user	17	11	2
oi_i50001	1,00 user	7	2	
oi_TCO	1,00 user	13	14	2
oi_Idgen	1,00 user	32	25	2
oi_AgingM	1,00 user	23	23	3
oi_ExpTime	1,00 user	32	26	3
oi_TalMngt	1,00 user	22	19	3
oi_InnoTr	1,00 user	30	20	2

```
compute Prospector= mean(CompinProd, Compcustad).
compute Defender= mean(CompPrice , CompDeliv, CompQuali).
FREQUENCIES Prospector Defender /stats=all.
```

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.888[a]	.789	.775	.65895	.789	57.178	7	107	.000	
2	.888[b]	.789	.773	.66201	.000	.014	1	106	.905	2.017

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

c. Dependent Variable: lnTurnover

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	173.795	7	24.828	57.178	.000[b]
	Residual	46.461	107	.434		
	Total	220.257	114			
2	Regression	173.802	8	21.725	49.572	.000[c]
	Residual	46.455	106	.438		
	Total	220.257	114			

a. Dependent Variable: lnTurnover

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.922	.240		-8.004	.000		
	Food	1.303	.253	.253	5.162	.000	.821	1.218
	Textile	.166	.211	.040	.788	.433	.746	1.340
	Construction	.839	.253	.163	3.321	.001	.821	1.219
	Chemical	.594	.190	.166	3.124	.002	.699	1.430
	Machinery	.635	.191	.177	3.318	.001	.691	1.447
	Electronic	.362	.229	.080	1.582	.117	.773	1.293
	lnSize number of employees 2011 (log)	1.033	.055	.841	18.732	.000	.977	1.024
2	(Constant)	-1.927	.244		-7.896	.000		
	Food	1.307	.256	.254	5.110	.000	.807	1.239
	Textile	.169	.213	.041	.792	.430	.739	1.354
	Construction	.839	.254	.163	3.307	.001	.820	1.219
	Chemical	.595	.191	.166	3.111	.002	.697	1.435
	Machinery	.634	.192	.177	3.298	.001	.690	1.449
	Electronic	.364	.231	.080	1.579	.117	.767	1.303
	lnSize number of employees 2011 (log)	1.029	.061	.839	16.792	.000	.797	1.254
	OI_profile Profile Number of Process Organization innovations	.003	.022	.006	.120	.905	.790	1.266

a. Dependent Variable: lnTurnover

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.589[a]	.347	.304	.97402	.347	8.129	7	107	.000	
2	.590[b]	.348	.298	.97831	.000	.065	1	106	.799	1.795

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

c. Dependent Variable: lnProdLeadTime

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.984	7	7.712	8.129	.000[b]
	Residual	101.513	107	.949		
	Total	155.497	114			
2	Regression	54.046	8	6.756	7.059	.000[c]
	Residual	101.451	106	.957		
	Total	155.497	114			

a. Dependent Variable: lnProdLeadTime

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.415	.355		6.802	.000		
	Food	-1.497	.373	-.346	-4.010	.000	.821	1.218
	Textile	-.302	.312	-.087	-.967	.336	.746	1.340
	Construction	-.823	.373	-.190	-2.206	.030	.821	1.219
	Chemical	-.818	.281	-.272	-2.910	.004	.699	1.430
	Machinery	.802	.283	.267	2.837	.005	.691	1.447
	Electronic	-.377	.338	-.099	-1.116	.267	.773	1.293
	lnSize number of employees 2011 (log)	.146	.081	.142	1.792	.076	.977	1.024
2	(Constant)	2.401	.361		6.658	.000		
	Food	-1.484	.378	-.343	-3.926	.000	.807	1.239
	Textile	-.294	.315	-.085	-.933	.353	.739	1.354
	Construction	-.822	.375	-.190	-2.191	.031	.820	1.219
	Chemical	-.814	.283	-.271	-2.878	.005	.697	1.435
	Machinery	.800	.284	.266	2.816	.006	.690	1.449
	Electronic	-.369	.341	-.097	-1.085	.281	.767	1.303
	lnSize number of employees 2011 (log)	.136	.091	.132	1.502	.136	.797	1.254
	OI_profile Profile Number of Process Organization innovations	.008	.033	.023	.255	.799	.790	1.266

a. Dependent Variable: lnProdLeadTime

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.369[a]	.136	.079	.98868	.136	2.406	7	107	.025	
2	.441[b]	.195	.134	.95911	.059	7.700	1	106	.007	1.651

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

c. Dependent Variable: lnOnTime_rf

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.466	7	2.352	2.406	.025[b]
	Residual	104.590	107	.977		
	Total	121.057	114			
2	Regression	23.549	8	2.944	3.200	.003[c]
	Residual	97.508	106	.920		
	Total	121.057	114			

a. Dependent Variable: lnOnTime_rf

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.883	.360		5.225	.000		
	Food	-1.298	.379	-.340	-3.426	.001	.821	1.218
	Textile	-.049	.317	-.016	-.154	.878	.746	1.340
	Construction	-.455	.379	-.119	-1.201	.232	.821	1.219
	Chemical	-.352	.285	-.132	-1.233	.220	.699	1.430
	Machinery	.147	.287	.055	.513	.609	.691	1.447
	Electronic	-.046	.343	-.014	-.135	.893	.773	1.293
	lnSize number of employees 2011 (log)	.029	.083	.032	.349	.728	.977	1.024
2	(Constant)	2.029	.354		5.739	.000		
	Food	-1.431	.371	-.375	-3.860	.000	.807	1.239
	Textile	-.133	.309	-.044	-.431	.667	.739	1.354
	Construction	-.473	.368	-.124	-1.286	.201	.820	1.219
	Chemical	-.394	.277	-.148	-1.422	.158	.697	1.435
	Machinery	.169	.279	.064	.607	.545	.690	1.449
	Electronic	-.127	.334	-.038	-.381	.704	.767	1.303
	lnSize number of employees 2011 (log)	.135	.089	.148	1.515	.133	.797	1.254
	OI_profile Profile Number of Process Organization innovations	-.089	.032	-.272	-2.775	.007	.790	1.266

a. Dependent Variable: lnOnTime_rf

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.371[a]	.138	.081	.70961	.138	2.444	7	107	.023	
2	.372[b]	.139	.074	.71261	.001	.099	1	106	.753	1.951

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

c. Dependent Variable: lnScraprate

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.613	7	1.230	2.444	.023[b]
	Residual	53.879	107	.504		
	Total	62.492	114			
2	Regression	8.664	8	1.083	2.133	.039[c]
	Residual	53.829	106	.508		
	Total	62.492	114			

a. Dependent Variable: lnScraprate

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.365	.259		1.412	.161		
	Food	-.445	.272	-.162	-1.637	.105	.821	1.218
	Textile	.189	.227	.087	.833	.407	.746	1.340
	Construction	.302	.272	.110	1.110	.270	.821	1.219
	Chemical	.086	.205	.045	.420	.676	.699	1.430
	Machinery	-.266	.206	-.139	-1.290	.200	.691	1.447
	Electronic	-.017	.246	-.007	-.069	.945	.773	1.293
	lnSize number of employees 2011 (log)	.171	.059	.262	2.883	.005	.977	1.024
2	(Constant)	.353	.263		1.343	.182		
	Food	-.434	.275	-.158	-1.576	.118	.807	1.239
	Textile	.197	.230	.090	.856	.394	.739	1.354
	Construction	.303	.273	.111	1.111	.269	.820	1.219
	Chemical	.090	.206	.047	.435	.665	.697	1.435
	Machinery	-.268	.207	-.140	-1.293	.199	.690	1.449
	Electronic	-.010	.248	-.004	-.041	.967	.767	1.303
	lnSize number of employees 2011 (log)	.162	.066	.248	2.458	.016	.797	1.254
	OI_profile Profile Number of Process Organization innovations	.008	.024	.032	.315	.753	.790	1.266

a. Dependent Variable: lnScraprate

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.209[a]	.044	-.019	.99764	.044	.701	7	107	.671	
2	.315[b]	.099	.031	.97276	.056	6.544	1	106	.012	1.985

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

c. Dependent Variable: lnFlexIncrProd

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.886	7	.698	.701	.671[b]
	Residual	106.497	107	.995		
	Total	111.383	114			
2	Regression	11.078	8	1.385	1.463	.179[c]
	Residual	100.304	106	.946		
	Total	111.383	114			

a. Dependent Variable: lnFlexIncrProd

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.282	.364		9.026	.000		
	Food	.450	.382	.123	1.177	.242	.821	1.218
	Textile	-.052	.320	-.018	-.162	.872	.746	1.340
	Construction	.374	.382	.102	.979	.330	.821	1.219
	Chemical	-.214	.288	-.084	-.743	.459	.699	1.430
	Machinery	-.108	.290	-.042	-.373	.710	.691	1.447
	Electronic	.042	.346	.013	.122	.903	.773	1.293
	lnSize number of employees 2011 (log)	-.060	.083	-.068	-.714	.477	.977	1.024
2	(Constant)	3.146	.359		8.773	.000		
	Food	.574	.376	.157	1.527	.130	.807	1.239
	Textile	.027	.313	.009	.088	.930	.739	1.354
	Construction	.391	.373	.107	1.048	.297	.820	1.219
	Chemical	-.174	.281	-.068	-.620	.537	.697	1.435
	Machinery	-.128	.283	-.050	-.454	.651	.690	1.449
	Electronic	.118	.339	.037	.348	.729	.767	1.303
	lnSize number of employees 2011 (log)	-.158	.090	-.182	-1.759	.081	.797	1.254
	OI_profile Profile Number of Process Organization innovations	.083	.033	.265	2.558	.012	.790	1.266

a. Dependent Variable: lnFlexIncrProd

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.458[a]	.210	.158	1.08308	.210	4.056	7	107	.001	
2	.458[b]	.210	.150	1.08796	.000	.042	1	106	.838	1.891

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

c. Dependent Variable: lnFlexDecrProd

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.305	7	4.758	4.056	.001[b]
	Residual	125.518	107	1.173		
	Total	158.823	114			
2	Regression	33.355	8	4.169	3.522	.001[c]
	Residual	125.468	106	1.184		
	Total	158.823	114			

a. Dependent Variable: lnFlexDecrProd

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, OI_profile Profile Number of Process Organization innovations

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.271	.395		5.752	.000		
	Food	.502	.415	.115	1.209	.229	.821	1.218
	Textile	-1.469	.347	-.421	-4.230	.000	.746	1.340
	Construction	-.441	.415	-.101	-1.063	.290	.821	1.219
	Chemical	-.131	.313	-.043	-.418	.677	.699	1.430
	Machinery	-.035	.315	-.012	-.112	.911	.691	1.447
	Electronic	.147	.376	.038	.392	.696	.773	1.293
	lnSize number of employees 2011 (log)	.090	.091	.086	.992	.324	.977	1.024
2	(Constant)	2.259	.401		5.632	.000		
	Food	.513	.420	.117	1.220	.225	.807	1.239
	Textile	-1.461	.350	-.419	-4.170	.000	.739	1.354
	Construction	-.440	.417	-.101	-1.055	.294	.820	1.219
	Chemical	-.127	.315	-.042	-.404	.687	.697	1.435
	Machinery	-.037	.316	-.012	-.117	.907	.690	1.449
	Electronic	.154	.379	.040	.406	.685	.767	1.303
	lnSize number of employees 2011 (log)	.081	.101	.078	.804	.423	.797	1.254
	OI_profile Profile Number of Process Organization innovations	.007	.036	.020	.205	.838	.790	1.266

a. Dependent Variable: lnFlexDecrProd

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.458[a]	.210	.158	1.08308	.210	4.056	7	107	.001	
2	.461[b]	.213	.153	1.08605	.003	.416	1	106	.520	
3	.524[c]	.274	.205	1.05260	.062	4.422	2	104	.014	
4	.531[d]	.282	.198	1.05713	.008	.556	2	102	.575	1.962

a. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

e. Dependent Variable: lnFlexDecrProd

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.305	7	4.758	4.056	.001[b]
	Residual	125.518	107	1.173		
	Total	158.823	114			
2	Regression	33.796	8	4.225	3.582	.001[c]
	Residual	125.027	106	1.180		
	Total	158.823	114			
3	Regression	43.594	10	4.359	3.935	.000[d]
	Residual	115.229	104	1.108		
	Total	158.823	114			
4	Regression	44.836	12	3.736	3.343	.000[e]
	Residual	113.987	102	1.118		
	Total	158.823	114			

a. Dependent Variable: lnFlexDecrProd

b. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery

c. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations

d. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector

e. Predictors: (Constant), lnSize number of employees 2011 (log), Construction, Food, Electronic, Textile, Chemical, Machinery, Org_Inn Number of Process Organization innovations, dAnalyzer, dProspector, cOI_DProspector, cOI_DAnalyzer

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.271	.395		5.752	.000		
	Food	.502	.415	.115	1.209	.229	.821	1.218
	Textile	-1.469	.347	-.421	-4.230	.000	.746	1.340
	Construction	-.441	.415	-.101	-1.063	.290	.821	1.219
	Chemical	-.131	.313	-.043	-.418	.677	.699	1.430
	Machinery	-.035	.315	-.012	-.112	.911	.691	1.447
	Electronic	.147	.376	.038	.392	.696	.773	1.293
	lnSize number of employees 2011 (log)	.090	.091	.086	.992	.324	.977	1.024
2	(Constant)	2.275	.396		5.746	.000		
	Food	.544	.421	.124	1.291	.199	.801	1.248
	Textile	-1.446	.350	-.414	-4.131	.000	.738	1.354
	Construction	-.454	.417	-.104	-1.090	.278	.819	1.221
	Chemical	-.119	.314	-.039	-.380	.705	.697	1.435
	Machinery	-.038	.315	-.013	-.121	.904	.691	1.448
	Electronic	.173	.379	.045	.457	.649	.765	1.308
	lnSize number of employees 2011 (log)	.055	.106	.052	.516	.607	.719	1.392
	Org_Inn Number of Process Organization innovations	.014	.022	.066	.645	.520	.706	1.416
3	(Constant)	2.010	.395		5.093	.000		
	Food	.298	.419	.068	.711	.479	.761	1.314
	Textile	-1.335	.341	-.383	-3.913	.000	.729	1.371
	Construction	-.480	.404	-.110	-1.189	.237	.818	1.222
	Chemical	-.189	.308	-.062	-.613	.541	.682	1.466
	Machinery	-.040	.309	-.013	-.129	.898	.678	1.475
	Electronic	-.017	.387	-.004	-.043	.965	.689	1.451
	lnSize number of employees 2011 (log)	.077	.103	.074	.744	.458	.708	1.412
	Org_Inn Number of Process Organization innovations	.006	.021	.029	.294	.770	.695	1.440
	dAnalyzer	.641	.216	.267	2.969	.004	.860	1.163
	dProspector	.422	.424	.091	.995	.322	.827	1.210
4	(Constant)	1.904	.414		4.596	.000		
	Food	.252	.423	.058	.597	.552	.753	1.328
	Textile	-1.365	.344	-.391	-3.969	.000	.725	1.380
	Construction	-.559	.413	-.128	-1.354	.179	.791	1.265
	Chemical	-.202	.312	-.066	-.646	.520	.668	1.497
	Machinery	-.081	.314	-.026	-.257	.798	.661	1.513
	Electronic	-.045	.390	-.012	-.115	.909	.685	1.460
	lnSize number of employees 2011 (log)	.078	.104	.075	.751	.454	.704	1.420
	Org_Inn Number of Process Organization innovations	.021	.026	.100	.816	.416	.466	2.145
	dAnalyzer	.661	.218	.276	3.037	.003	.853	1.172
	dProspector	.430	.427	.093	1.007	.316	.825	1.212
	cOI_DAnalyzer	-.040	.038	-.115	-1.044	.299	.577	1.732
	cOI_DProspector	-.001	.097	-.001	-.008	.994	.879	1.138

a. Dependent Variable: lnFlexDecrProd

InnovationStrategy 1 "defender" 2 "analyzer" 3 "prospector" * dDefender Crosstabulation

Count

		dDefender		
		.00	1.00	Total
InnovationStrategy 1 "defender" 2 "analyzer" 3 "prospector"	1.00	0	73	73
	2.00	56	0	56
	3.00	10	0	10
Total		66	73	139

InnovationStrategy 1 "defender" 2 "analyzer" 3 "prospector" * dAnalyzer Crosstabulation

Count

		dAnalyzer		
		.00	1.00	Total
InnovationStrategy 1 "defender" 2 "analyzer" 3 "prospector"	1.00	73	0	73
	2.00	0	56	56
	3.00	10	0	10
Total		83	56	139

InnovationStrategy 1 "defender" 2 "analyzer" 3 "prospector" * dProspector Crosstabulation

Count

		dProspector		
		.00	1.00	Total
InnovationStrategy 1 "defender" 2 "analyzer" 3 "prospector"	1.00	73	0	73
	2.00	56	0	56
	3.00	0	10	10
Total		129	10	139

Prospector * Defender Crosstabulation

Count

		Defender											
		2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00	5.33	Total
Prospector	1.50	1	0	0	0	0	0	1	1	1	3	0	7
	2.00	0	0	0	0	0	1	4	2	0	1	0	8
	2.50	0	0	0	0	2	4	3	0	0	0	0	9
	3.00	0	0	0	4	1	1	4	1	1	0	0	12
	3.50	0	0	6	7	2	1	5	0	0	0	0	21
	4.00	0	9	4	10	0	1	1	0	0	0	0	25
	4.50	7	3	2	1	4	1	0	1	0	0	1	20
	5.00	17	0	5	2	0	0	0	0	0	0	0	24
	5.50	6	3	2	2	0	0	0	0	0	0	0	13
Total		31	15	19	26	9	9	18	5	2	4	1	139

E. Interviewscript

Introductie

Welkom bij dit interview. Mijn naam is Brechtje Bekkenutte masterstudent Business administration aan de Radboud Universiteit. Momenteel ben ik bezig met een onderzoek naar organisatorische innovaties binnen Nederlandse productiebedrijven. Dit onderzoek zal worden verwerkt in een masterthesis ter afsluiting van mijn master Strategic Management. Dit interview maakt deel uit van het onderzoek en zal een klein uur in beslag nemen.
Ik ben met name geïnteresseerd naar de organisatorische innovatie praktijken die binnen uw organisatie worden uitgevoerd en wat de reden hiervoor is. Ik heb uw organisatie uitgekozen omdat ik mij in mijn onderzoek richt op innovatiepraktijken binnen productiebedrijven met circa 50 werknemers. Door uw ervaringen binnen de organisatie heeft u een goede kijk op welke praktijken er allemaal worden uitgevoerd en de redenen waarvoor deze zijn uitgekozen.
Graag zou ik het interview op willen nemen, indien u daar geen bezwaar tegen heeft. De opnamen zullen alleen door mij worden geluisterd en dienen om te voorkomen dat informatie verloren gaat en bieden mij de mogelijkheid de onderzoeksresultaten zo precies mogelijk weer te geven. De informatie uit de interviews zullen worden geanonimiseerd. Het transcript van het interview zal ik weer aan u voorleggen om u de gelegenheid te geven dit na te kijken en eventuele aanvullingen of aanpassingen te doen.
De interviewresultaten zullen worden opgenomen in mijn uiteindelijke onderzoeksverslag, dat zal worden gelezen door mijn begeleiders. Uiteraard ontvangt ook u een kopie van dit eindrapport, evenals andere deelnemende organisaties.
In het interview zullen de volgende thema's worden behandeld.

1. Uw begrip van organisatorische innovatiepraktijken
2. Huidige praktijken binnen uw organisatie
3. Achtergrond van de invoering van de praktijken
4. Invloed op prestaties van het bedrijf

Datum:
Tijd:
Locatie:
Naam geïnterviewde:

<u>Achtergrond</u>

1. Wat is uw functie binnen het bedrijf
2. Wat is uw achtergrond
3. Wat doet uw bedrijf
4. Hoeveel werknemers heeft uw bedrijf
5. Zou u de strategie van uw bedrijf in 2 zinnen kunnen omschrijven
6. Hoe ziet uw productieproces eruit

<u>Innovatie</u>
In algemene zin kan innovatie worden gezien als invoeren van vernieuwing/ modernisering van bedrijfsprocessen en/of producten in een bedrijf.

1. Welke vernieuwingen in bedrijfsprocessen heeft het bedrijf de afgelopen drie jaar ingevoerd?
2. Welke rol speelt innovatie binnen uw bedrijf
3. Welke innovatie kunt u binnen uw bedrijf onderscheiden, waarop ligt de meeste nadruk.
4. Waarom innovatie ligt binnen uw bedrijf de meeste nadruk

<u>Organisatorische innovatiepraktijken</u>.

Organisatorische innovatie wordt wel omschreven als de niet-technologische procesinnovatie. Het gaat dan om het gebruik van nieuwe management en werkconcepten en praktijken in de processen en structuren van een organisatie.

5. Welke vernieuwingen in de organisatieprocessen/ activiteiten heeft het bedrijf (de laatste drie jaar) doorgevoerd. Kunt u hier enkele voorbeelden van geven.
6. Wat is de reden geweest voor het invoeren van de praktijken.
7. Wat is de doelstelling die hiermee bereikt moet worden
8. Wat is het beleid opgesteld omtrent (organisatorische) innovatie.
9. Wat zijn de resultaten die met de invoering van de praktijken zijn bereikt

<u>Universalistic Approach</u>
De relatie tussen innovatiepraktijken, strategie en prestaties van een bedrijf worden op verschillende manieren verklaard. De volgende vragen gaan over de relaties die binnen uw bedrijfsvoering van toepassing zijn op bovenstaande factoren.

10. Welke organisatievernieuwing in het algemeen (recent, in het verleden, voor soortgelijke bedrijven) zijn van nut om in te voeren?
11. Wat zouden voor soortgelijke bedrijven als X de voordelen hiervan zijn.
12. Kunt u deze benoemen
13. Heeft u dergelijke praktijken ingevoerd
14. Wat was voor u de reden voor invoering
15. Wat zijn hiervan de resultaten op uw bedrijfsprestaties geweest?

<u>Contingency Approach</u>

16. Welke belangrijke strategische doelen stelt het bedrijf voor zichzelf voor de komende vijf jaar.
17. Wat voor invloed hebben deze doelen op het bepalen van uw innovatieactiviteiten?
18. Wat zijn veranderingen die hiervoor noodzakelijk zijn.
19. Hoe gaat dat uw bedrijfsprestaties verbeteren?

<u>Configurational Approach</u>

20. In hoeverre sluiten de innovatiepraktijken bij elkaar aan \ hangen deze samen?
21. Welke strategische doelen worden er per (set) van vernieuwingspraktijken nagestreefd?
22. Merkt u veranderingen in prestaties wanneer u gekozen innovatiepraktijken wijzigt.
23. Bent u bekend met Lean production

Nee, dan korte samenvatting over Lean en bijbehorende praktijken.

24. Welke praktijken hangen samen met Lean production?

<u>Contextual approach</u>

25. Welke nieuwe praktijken heeft u de afgelopen 3 jaar doorgevoerd.
26. Wat was het doel van deze praktijken
27. Hebben deze praktijken invloed gehad op eerder ingevoerde innovaties?
28. Tot welke veranderingen heeft dit geleid in prestaties van uw organisatie?
29. Ook niet-financiële prestatieverbeteringen?
30. Zijn er nog andere factoren van invloed geweest op de relatie tussen praktijken en prestaties?

Hiermee ben ik aan het einde gekomen van dit interview. Zijn er nog zaken die u graag zou willen bespreken? De gegevens uit dit interview zullen anoniem worden verwerkt. Ook zal ik u de uitwerkingen toesturen zodat u de mogelijkheid heeft eventuele aanpassingen of wijzigingen te doen. Voor het toesturen van het transcript en mijn uiteindelijke scriptie zou ik nog graag uw gegevens noteren.

Hartelijk dank voor uw tijd en moeite.

F. Transcripts

Company	Industry sector
1. CF1	Construction and Furniture
2. E1	Electronical
3. M1	Machinery
4. CF2	Construction and Furniture
5. Fo1	Food
6. Fo2	Food
7. M2	Machinery
8.M3	Machinery

The transcripts of the interviews are reproduced on an USB stick. This USB stick will be handed over and can be consulted for the transcripts.