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# Master thesis

Business administration

Product thinking within a project thinking world

*A study on the impact of a standardized product on the individual work practices and inter-organizational collaboration of actors within a construction project*

**Radboud Universiteit**



**Research conducted by:**

W.G. (Wytske) Maat

S4783352

**Supervision of:**

Dr. B.R. (Berber) Pas

Faculteit Management Wetenschappen

Radboud Universiteit

**Second reader:**

Dr. E. (Eline) de Jong

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## 1. Introduction

In this chapter, the research problem that will be the center of this study will be given. The goal of this research and research question will also be formulated. It will also contain an explanation of the academic and practical relevance. Lastly, the thesis outline will be discussed.

### 1.1 Problem statement

This study focuses on the construction industry where standardized products are applied. The construction industry is defined as a sector wherein ‘project thinking’ is the standard (Fearne & Fowler, 2006). This means that for every construction project a new design of the building is made. However, it seems that there is a development towards ‘product thinking’. This entails that more standardized designs are developed, which can be used for different building projects. With the goal of better product quality and more homogenous constructions, the importance of standardized processes and products becomes more and more apparent. This movement has been called ‘industrialization’, which can be seen as the interface between the culture in traditional construction and the culture in the manufacturing industry (Aapaoja & Haapasalo, 2014). The traditional construction is about developing unique products, while the manufacturing industry focuses on well-managed and standardized processes and products (Aapaoja & Haapasalo, 2014). According to Popova et al. (2020) “industrialization in construction is the process of developing and improving the use of large-scale elements of buildings of high factory readiness, using the means of mechanization and automation of construction processes” (p. 3). This shift towards industrialization entails that standardization of processes and products is necessary. But in a sector where the products (the buildings) are specifically designed for each construction project, it is a challenge to apply standardized products. Construction companies are often categorized as so-called engineer-to-order (ETO) companies, that “deliver products which are engineered to the specific requirements of the customer” (Haug et al., 2009, p. 634). Haug et al. (2009) claim that a high-engineering complexity increases the effort of ETO companies required for standardization and automation. This because only parts of the product can be standardized. A certain degree of the product always has to be adapted to the wishes of the customer. As a result, there will always be a struggle between standardization and customization.

However, more and more construction companies are moving to standardization within processes and products. “Improving a company’s operational competitive advantage has become a priority for many companies. One of the ways to achieve this objective is through

[...] standardization” (Manrodt & Vitasek, 2004, p. 1). As mentioned by Jones et al. (1994) standardization can lead to more management control, predicting and minimizing mistakes. Research has shown that these points of improvement are also relevant in the construction industry. “Construction has been blamed for its low performance and productivity, and high amount of waste. [...] Moving towards better quality and more homogenous construction can be achieved by using standardized products” (Aapaoja & Haapasalo, 2014, p. 983). A way to realize standardized products in the construction industry is throughout industrialization. In the construction industry this is also called ‘modular building’. Modular building is defined as combining a limited number of standard parts to form the final product (Muffato, 1999). In this way a standardized product is created, which leads to the possibility of repetition. The similar product can then be used at a different construction project. The application of modularity in the construction industry results in adjustments in the design of the supply chain. Research has been conducted about the impact of modularity on the supply chain. For example Voordijk et al. (2006), who analyzed the alignment of product, process and supply chain architectures. Another researcher, Baud-Lavigne (2012), investigated “the links between the standardization of products or components, and the design of the supply chain” (p. 50). Lau, Yam and Tang examined with their research “how an organization can achieve higher performance through integrating supply chain product co-development (SCPC) and modular product design” (p. 1036). The outcome of all the above mentioned research is that there is a relation between the product modularity and the design of the supply chain.

According to the principles of modularity, a product is designed based on prefabricated standardized components. The application of modular building leads to shorter lead-times, control for flexibility and cost reduction (Pero et al., 2015). The research by Gibb and Isack (2001) shows that managers in construction indicate that standard components of the product lead to lower costs, a higher quality and product that is easier to use. Besides the effects on costs, quality and use, research has shown that standardization also has an impact on working conditions. However, the impact depends on many variables and may differ from organization to organization (Poksinska, 2007). Research by Sletten and Ellingson (2020) has shown that standardization has an impact on working practices: “standardized tools increase the social workers experienced professional competence but challenge their professional knowledge base, reflective practice, and professional accountability” (p. 714). These studies show that standardization has an impact on the individual work practices within organizations.

Besides the impact of standardization on individual work practices within organizations, there is a relation between standardization and inter-organizational collaboration. Within a construction project multiple actors are involved (Aapaoja & Haapasalo, 2014). The fact that more actors are involved makes product standardization more difficult, because these actors negotiate with each other. After all, they all want to have the strongest position possible within this process of determining the standard as within the collaboration itself. Construction projects are mostly executed within inter-organizational collaborations, because of “asymmetry, economic efficiency, expertise, reciprocity and stability” (Hughes, Williams & Ren, 2012, p. 366). Standardization within an inter-organizational collaboration means that all the involved actors have to commit to the standardization of products. Research by Aapaoja and Haapasalo (2014) has shown that “a lack of collaboration between the project participants consequent upon the fragmented supply chain (and the culture and habits in general) may be one of the root causes that prevents standardization” (p. 989). The change from working with a customized product to a standardized product can be seen as disruption in business ecosystem. Aapaoja and Haapasalo (2014) summarize “that the scheme of things must be changed, and therefore construction projects should be looked at a more repetitive process” (p. 990). However, research also has shown that standardization within collaborations can be difficult. Brunsson, Rasche and Seidl (2012) emphasize that “organizations face the challenge of endowing the rules they develop with legitimacy” (p. 619). They also showed that standardization can be seen as a power dynamic whereby standards are a tool for altering institutionalized behavior and identities. Thereby it is important to involve the relevant actors. However this can also lead to inefficiency, because participants try to shape the standards in a way that suits their interests (Brunsson et al., 2012). Through continuous negotiation between actors, the standard is determined. Strauss (1978) also discusses this topic. This author claims that the persistence of standards is a social accomplishment based on ongoing negotiations. The negotiation process is also discussed by Kallinikos, Ekbja and Nardy (2015), who emphasizes the power issues that standardization entails.

In addition, however, the motives of the actors to work with a standardized product will also be investigated. The interests and experiences, both positive and negative, will be part of this master thesis. For example Öberg and Shih (2014) payed attention to the importance of alignment of interest, priorities and interaction goals to create a successful collaboration. According to the study by Hughes et al. (2012) alliance partners within the construction industry formulate the success of their collaboration among others as: “everyone contributes

towards a common aim motivated by a fair method of pain share gain share to produce a win-win outcome” (Hughes et al., 2012, p. 365). It is to be expected that, in order for product standardization to be a success, all the involved actors will need to see eye to eye on the fact that it will be a win-win situation.

## 1.2 Case description

The involved actors for this research are defined as contractors, architects, housing corporations and municipalities. These actors have been selected based on conversations with a CEO and project developer of a contractor. In addition, the interviewees that were selected, were asked which actors, according to them, are involved in construction projects and they confirm the selection of actors.

With traditional building different roles are allocated to the involved actors. Firstly, the housing corporation commissions the design and construction of a construction project. The architect then designs the building, which then by the municipality will be assessed. When the submitted building plans comply with legislation and regulations, the building license will be granted, after which the contractor can start with the building process (Bouwkunde, n.d.).

<b>Actor</b>	<b>Task / responsibility</b>	<b>Interests of standardization</b>
<b>Contractor</b>	Initiator within determining the standardized product  Building the product	Costs, quality and efficiency advantages
<b>Architect</b>	Designing the (aesthetic part of the) product	None
<b>Housing Corporation</b>	Purchasing the product	Maintaining housing stock
<b>Municipality</b>	Granting licenses	Efficiency within licensing process

Table 1: task, responsibility and interests of standardization of actors

This study will be conducted at two building projects in The Netherlands. In both building projects modular building is applied. The standardized product will be investigated in this study. The first building project is located in Enschede, The Netherlands. On the so called Robsonterrein the contractor Hodes has built 20 studios. They build these houses commissioned by housing corporation Domijn. Other important stakeholders are municipality Enschede, who is responsible for the building license, and the involved architect LKSVDD Architects. The other construction project is located in Hengelo, The Netherlands and is called de Nieuwe Es. The contractor TBI Woonlab is building several new houses on the modular building manner. TBI Woonlab is a collaboration between three construction companies,

namely, Era Contour, Hazenberg Bouw and Koopmans Bouwgroep. In this collaboration the companies develop new processes and products with regards to new construction and energetic home improvement. The partners have developed some standardized products, which are named modular buildings. These modular buildings come in three types and have each been developed for different types of customers. All three types of products are applied to the construction project in Hengelo that has been chosen for this research. Just like the other construction project, this project is commissioned by a housing corporation, which is named Welbions, and a licensing authority, which is the municipality Hengelo. The involved actors all have worked with standardized products for a while, so they have enough experience to describe the impact of working with a standardized product. In the project located in Hengelo, the construction is the following. The housing corporations each choose one of the types of standardized products that were offered by the contractor. They had the choice between different types of houses, with several options to customize, but the main elements of the houses were standardized. This means that the product that was offered (the modular buildings) was standardized. The customer could only assemble the product (the modular buildings) within the options that were given. When these limited customization options had been reviewed, the order could be confirmed (TBI Woonlab, n.d.; Hodes Huisvesting, n.d.).

As mentioned before, the application of standardized products in the construction industry can be challenging, because of the diverse actors involved and the unique products (Lau et al., 2007). That is why the main focus of this research will be on the impact of the application of standardized products within the construction industry.

### 1.3 Research question

The goal of this master thesis is to gain insight into the impact of a standardized product (the modular buildings) on the individual work practices and inter-organizational collaboration of involved actors within a construction project. The goal is that standardization within construction projects hereby can be optimized. The aim of this research is to give insight into the impact of standardized products in the construction industry. A lot has been written about the impact of modularity on the supply chain (Voordijk et al, 2006; Baud-Lavigne, 2012; Lau et al., 2007). But as mentioned before, there are more actors than only suppliers. Therefore, this research will focus on multiple actors within a construction project.

Through exploratory interviews it became clear which actors were important to serve as respondents within the data collection phase of this research. Actors like contractors,



architects, housing corporations and municipalities are involved in a construction project. This research aims to give insight into the impact of standardization on all of these different (heterogeneous) actors.

In the remainder of this research the term ‘involved actors’ will refer to the actors distinguished above, which are contractors, architects, housing corporations and municipalities. In this research individual work practices are specified as tasks, responsibilities and work autonomy. The impact of product standardization on the inter-organizational collaboration is specified as changes in power relations and types of collaborations.

The research question that will be answered in this research is: *How does product standardization impact negotiated order regarding individual work practices and inter-organizational collaboration of actors within a construction project?*

The sub questions that have been defined to help answer this question are the following:

1. What are the interests of the involved actors to develop a standardized product?
2. How is negotiated order regarding individual work practices of involved actors in the construction industry altered and (ideally) restored due to product standardization?
3. How is negotiated order regarding inter-organizational collaboration in the construction industry altered and (ideally) restored due to product standardization?

#### 1.4 Academic and practical relevance

In the existing literature a lot has been written about standardization within organizations (Baud-Lavigne et al., 2012; Brunsson, 1998; Kasiri et al., 2017; Poksinska, 2007; Sletten et al., 2020). This research is conducted in the construction industry, but standardized products can also be applied in other sectors. Previous research addresses both the impact of standardization within the organization itself and between collaborating parties. A study by Poksinska (2007) has shown that the impact of standardization on the working conditions depends on many variables and characteristics of the organization. Three of the most important variables are the content of the standard, the standardization process, and the degree of standardization. Zuiderent-Jerak (2007) has paid attention to the standardization within healthcare systems. Zuiderent-Jerak (2007) has emphasized the importance of the co-construction of standardized care trajectories and the interdependencies of medical work. The research noted above thus shows that without consensus of the people that have to work with the standard it will not lead to the desired result.

Other research about standardization has focused on the geographical aspect. Leonidou (1996) has addressed the issue of product standardization versus adaptation of Japanese multinational companies in the Middle East. He concluded that the degree of product adaptation vary among elements within a product area itself. Besides, this research concluded “that demographic and political-legal factors exhibited the greatest influence [on the degree of product adaptation] overall” (Leonidou, 1996, p. 67). This research by Leonidou (1996) deals with what determines the degree of standardization.

Another aera wherein research has been done is the effectiveness of standardization. For instance Seidl (2007) researched the effectiveness of governance codes as a means of regulation. Seidl (2007) concluded that a precondition for successful use of the code is that it is capture in self-activating cycles of mutual observations between actors (p. 721). By this the codes will be repeated and eventually processed into patterns. Research by Kwon (2008) supported the argument that “the cost effectiveness of standardization depends not just on the degree of standardization but also on the process by which the standardized procedures are created and implemented” (p. 1065). These studies observe that the most relevant aspects of the standardization process are a high level of formal objectivity in creating the standardized procedure and a fair process of resolving disputes about the standardized procedure. These observations show the impact of the standardization process on the effectiveness of standardization.

In conclusion, research has shown that the degree of standardization (Leonidou, 1996; Poksinska, 2007), the content of the standard, the standardization process (Kwon, 2008; Poksinska, 2007), the self-activating cycles of mutual observations (Seidl, 2007) and co-creation (Zuiderent-Jerak, 2007) all have an effect on the degree or effectiveness of standardization. In this master thesis the degree or effectiveness of standardization will not be researched, but the focus will be on the impact of the standardization on the individual work practices and inter-organizational collaboration of the involved actors. As mentioned before, research by Sletten and Ellingson (2020) has shown that standardization has an impact on individual work practices, such as experienced professional competence and work autonomy. On the other hand, standardized tools often challenge the professional knowledge base, reflective practice, and professional accountability of the employees.

Besides the literature on standardization in a general sense, also research has been done about standardization within the construction industry specifically. A lot has been written about modularity in combination with suppliers and construction companies. For instance, Hofman

et al. (2009) have investigated “what types of supplier relationships are needed to develop and produce a modular housing system successfully” (p. 33). Voordijk et al. (2006) focused their research on the combination of modularity and supply chain management. However, there is a lack of literature investigating the impact of standardized products (modular building) on the individual work practices of involved actors within the construction project. Actors such as contractors, architects, housing corporations and municipalities are all involved with the initiation, preparation and execution of the construction project. This means that the application of standardized products will have an impact on their individual work practices in a construction project. This research will try to fill this gap in the literature, by investigating the impact of standardized products on the whole construction chain in relation to the actors mentioned above, instead of only investigating the impact of standardized products on the supply chain.

Even though this master thesis mainly focusses on the standardization of products, it is to be expected that the results possibly also could be relevant for standardization of processes, because they often seem to go hand in hand (Aapaoja & Haapasalo, 2014). This research by Aapaoja and Haapasalo (2014), just like research by Gibb and Isack (2001), makes clear that there is a future for standardization “but only if the industry recognizes and responds to the drivers of clients and their teams” (Gibb and Isack, 2001, p. 57). This master thesis will contribute to this point, by focusing on the impact of standardization on the different actors and clarifying their interests and experiences.

The practical relevance of this research can be found in the fact that this research is conducted at the construction projects in Enschede and Hengelo, where they recognize, and even address, the problem investigated in this study. In the construction industry, different actors have mentioned their interests in working with standardized products because of quality, time and cost considerations. Network Conceptual Buildings underlines in several articles the importance of conceptual building and the challenges that this entails. In a seminar of the foundation named ‘Pioneering’ on 19<sup>th</sup> of May 2021, the presented guests emphasized the requested cultural change to achieve the goal of standardization within the construction industry. Also previous research has shown that the construction industry is struggling with applying standardized products for a while (Aapaoja & Haapasalo, 2014). Besides the fact that this research will give insight into the impact of standardized products on the individual work practices and inter-organizational collaboration of involved actors, this research will also contain some practical recommendations for the optimal application of the standardized

product within an inter-organizational collaboration. This because of the challenges that these types of collaborations involve regarding the development and application of a standardized product, such as alignment of interests and involvement of actors within determining the standard. Because of the continuously changing character of the social order, there are some possibilities expected enabling actors to strengthen their influence within the inter-organizational collaboration.

### 1.5 Thesis outline

This research is structured as follows. In the following chapter the theoretical background is outlined. The third chapter captures the methodology part, which consists of an explanation of the applied method and an indication of the data sources by explaining the process of conducting interviews. It also contains an explanation of the conducted data analysis procedure, which is the template analysis. To conclude chapter three, the research quality and research ethics are discussed. The results of the research are shown in chapter four and discussed in chapter five, where also a conclusion is given. In the last chapter, also the practical implications, reflections and recommendations are mentioned.

## 2. Theoretical background

This chapter presents a theoretical background related to the key concepts of this study. First of all, the concept of standardization is elaborated. This paragraph discusses the motives, barriers and process of standardization. Secondly, the relevant literature about individual work practices in relation to standardization is mentioned. Thirdly, the characteristics of inter-organizational collaboration are discussed. Elaborated on the previous paragraphs and discussed theories, research about negotiation and power relations is discussed in the fourth paragraph. Finally, standardization within the construction industry is covered. This chapter concludes with a conceptual model based on the most relevant literature.

### 2.1 Standardization of products and processes

There has always been a struggle between maximum standardization and customization. In other words, striving for similarity or flexibility. Standardization is defined as “the process of setting generally uniform characteristics for a particular good” (Kasiri et al., 2017, p. 92). This while customization is about adapting to specific wishes of the customer. Summarizing, standardization is about a one-size-fits-all product, while customization is about a fully personalized product. According to Kasiri et al. (2017) both concepts can presence simultaneously. Gibb and Isack (2001) claim that “standardization is the extensive use of processes or procedures, products or components, in which there is regularity, repetition and a record of successful practice” (p. 46). Which in the end leads to time, quality and operational benefits. Besides that, “by ensuring that standardized products are as close to user preferences as possible, the cost of searching for goods is reduced while the level of users’ utility is at the highest level” (Breskovic, Altmann & Brandic, 2013, p. 1000). This can be seen as a reason for companies to standardize their products or processes.

Looking at the benefits mentioned above it is expected that many companies strive for standardization. But there are also some difficulties concerning standardization. First of all, research has been done around standardization in relation to globalization. Differences between cultures suggest that clients appreciate other product specifications. For example a research by Powers and Loyka (2007) identified three main categories that influence global product standardization. Firstly, market factors such as legal requirements, consumer preferences, product use conditions and competition have an impact on the global product standardization. Secondly, two industry factors, namely market turbulence and technological turbulence influence the standardization of the products. Lastly, Powers and Loyka (2007) distinguished the company factors, which influence global standardization. They use the term

‘company factors’ to refer to sub-unit horizontal interdependence, sub-unit vertical dependence, headquarters – sub-unit trust, sub-unit acquiescence, sub-unit cooperation and centralization of decision-making authority. Also research by Leonidou (1996) addressed the issue of product standardization versus adaptation within an international market. This study confirmed previous research by showing demographic and political-legal factors exhibited the greatest influence on the degree of standardization.

In conclusion, often there is a struggle between standardization and customization.

Standardization has to goal to set generally uniform characteristics for a particular good.

Factors such as market, industry and company factors influence the degree of standardization.

Standardization can have an impact on the relationships between actors within a collaboration.

Alaimo and Kallinikos (2021) emphasize the effect of standardized programmes on creating stereotypes, whereby the perceptions of the actors match with the characteristics of the standard. Because of this indirect influence of standards on the perceptions of the actors,

Alaimo and Kallinikos (2021) claim that standardization is a type of power. They concluded that by making categories it is possible to make sense of data. Categorization is a form of setting standards, as actor will follow these shaped categories. Kallinikos et al. (2015)

elaborate on the process through which standardization is involved in the constitution of social action and practice. They discuss examples in which the application of a standard leads to a shift in work practices. The outcome of the standardization process “shifts the power dynamics of the industry in the direction of stricter control” (Kallinikos et al. 2015, p. 103).

The above noted studies show the connection between standardization and a change in work practices and relationships between the inter-organizational actors. In the following two paragraphs, the impact of standardization on the individual work practices of actors and inter-organizational collaboration will be discussed.

## 2.2 Individual work practices

As discussed in the introduction of this thesis, it is expected that product standardization has an impact on work practices of actors. Singer et al. (2020) define work practices as the process of how work occurs and what the activities of employees are. Poksinska (2007) wrote a research about working conditions, which were specified as job demands, job control, social relations and development of competence. Poksinska (2007) has shown that the impact of standardization on the working conditions depend on multiple variables and characteristics of the organization. Three of the most important variables are the content of the standard, the

standardization process, and the degree of standardization. However the impact of standardization depends on many variables and may differ from organization to organization (Poksinska, 2007). Also research by Sletten and Ellingson (2020) has shown that standardization has an impact on working practices: “standardized tools increase the [...] workers experienced professional competence but challenge their professional knowledge base, reflective practice, and professional accountability” (p. 714). Additionally, Petrakaki and Kornelakis (2016) researched the effect of a standardized technology on the work autonomy and task discretion within the healthcare sector, which they described as work practices. Work autonomy is defined as “the ability to exercise discretion” (Petrakaki and Kornelakis, 2016, p. 224). “Our findings suggest that [standardized] technologies limited the work autonomy and task discretion for both nurses and clinicians by engendering routinization, through their embodied standards” (Petrakaki and Kornelakis, 2016, p. 233).

These studies show which impact standardization can have on individual work practices. In particular, the work autonomy of the distinguished actors is expected to change because of standardization.

## 2.3 Inter-organizational collaboration

### **Type of inter-organizational collaboration**

As mentioned in the introduction of this thesis, standardization within the construction industry is complex (Aapaoja & Haapasalo, 2014). Not only because of the complex environment of flexible change, but also the great number of actors involved within the construction project and corresponding difficulties. Inter-organizational collaboration has different effects on the involved companies or the outcomes of the collaboration. Hardy et al. (2003) argued that two dimensions of collaboration can be distinguished, involvement and embeddedness. Involvement is about the deepness of the interaction between the partners. Besides, there is a partnership between the parties to work together to carry out particular activities. And the last characteristic of involvement is the presence of bi-directional flows which means that collaborating partners learn from each other. In conclusion, involvement is about deep interaction, partnership and bi-directional flows (Hardy et al., 2003). The other dimension is called embeddedness. Embeddedness starts with the characteristic of broad interaction between collaborating parties, which means that parties interact with each other on a broad scale. The collaboration is characterized by representing the interests of the involved

parties to outside parties. This is expressed in the degree of representation. Lastly embeddedness is about multi-directional flows, which means that not only the involved parties will learn from each other, also third parties can benefit from the learning capacity of the collaboration. So, embeddedness can be seen as high when there is broad interaction, representation and multi-directional flows (Hardy et al., 2003). These dimensions influence the type of effect of the inter-organizational collaboration. “Collaborations that are both involved and embedded are more likely to be associated with knowledge creation effects; those that are only involved are more likely to be associated with strategic effects; those that are only embedded are more likely to be associated with political effects” (Hardy et al., 2003, p. 342). Depending on the type of perspective, strategy or knowledge creation perspective, different factors lead to successful collaboration. According to the strategy perspective, successful collaboration will arise when the actors have “clear goals, partner selection criteria, performance monitoring and termination arrangements” (Hardy et al., 2003, p. 342). To reach the strategic goals measures are being taken to prevent opportunistic behavior. On the other hand, the knowledge creation perspective goes about the more informal relationships: “the greatest innovation may emerge from ongoing, informal and unplanned relationships” (Hardy et al., 2003, p. 342-343). This leads to a relationship based on relations and trust. Lastly, the political perspective is about increasing the influence of a company over other organizations. Embeddedness of the firms within the collaboration “seems to be a necessary, if not sufficient, condition to increase the influence of the organization in the local network” (Hardy et al., 2003). This research by Hardy et al. (2003) showed that there are different perspectives within an inter-organizational collaboration.

Besides, there are three parameters to mention that are decisive for the firm and its interaction with others: its interests, priorities, and interaction goals. These parameters indicate the firm-level motivation and how this translates into interaction with others. In the paper of Öberg and Shih (2014) these three parameters formed together the ‘logic’ of the firm. Interests are about to whether the firm wants new ideas. Priorities describe how choices are ranked by the firm. Interaction goals relate to ‘why’ the company engages in collaboration and what expectations it has arising from the interactions. These three parameters together influence the success of the collaboration. Moreover they influence the standardization process within an inter-organizational collaboration.

Overall, these studies indicate that the type of perspective on the collaboration influences the main aspects for a successful inter-organizational collaboration.



## **Barriers to partnering**

A type of relationship between different organizations is called partnering. According to Eriksson et al. (2008) more and more parties within the construction industry are inclined to focus on more collaborative relationships, also referred to as partnering. “Partnering aims to increase cooperation and integration between the actors by building trust and commitment whilst decreasing disputes” (Eriksson et al., 2008, p. 528). As shown by studies about inter-organizational collaboration there are several barriers to partnering. Eriksson et al. (2008) identified three main types of barriers to partnering: cultural, organisational and industrial barriers. Firstly, with the cultural barrier Eriksson et al. (2008) intend that the characteristics of conservatism and inflexibility of the construction industry block the ability to change. Secondly Eriksson et al. (2008) defined the industrial barrier. By this they refer to the fact that construction is a project-based industry what results in short-term relationships with opportunistic behavior. Also Aapaoja and Haapasalo (2014) claim “that a lack of collaboration between the project participants consequent upon the fragmented supply chain (and the culture and habits in general) may be one of the root causes that prevents [...] standardization” (p. 989). Thirdly, the organisational barrier “involves organisational aspects, such as resources, processes and routines” (Eriksson et al., 2008, p. 530). These aspects can limit optimal collaboration when not properly aligned. Knobens and Oerlemans (2006) have a similar approach. According to them proximity of several aspects has an impact on the success of inter-organizational collaboration. Namely the geographical, institutional, organizational, cultural, social and technological proximity influence the collaboration. Knobens and Oerlemans (2006) limited these concepts into three main dimensions relevant for inter-organizational collaboration, organizational proximity, technological proximity and geographical proximity. When the actors of a collaboration are proximate on all three dimensions: “a climate that facilitates collaboration, knowledge exchange and innovation has ensued” (Knobens and Oerlemans, 2006, p. 82).

These above discussed studies indicate that proximity between partners and barriers influence the success of the collaboration.

## **Expectations and common goal**

Also in the literature about inter-organizational collaboration attention is given to the importance of a common goal and expectations. For example Öberg and Shih (2014) pay attention to the importance of alignment of interest, priorities and interaction goals to create a

successful collaboration. According to the study by Hughes et al. (2012) alliance partners within the construction industry formulate the success of their collaboration among others as: “everyone contributes towards a common aim motivated by a fair method of pain share gain share to produce a win-win outcome” (Hughes et al., 2012, p. 365). Another important point which can be seen as one of the main reasons for failure of collaboration is the management of expectations among partners. “The main reason put forward for this high level of failure [of collaboration] was that expectations were different from results” (Hughes et al., 2012, p. 358).

Given these aspects, the alignment of interests, priorities, interaction goals and expectations are necessary for a successful collaboration.

## 2.4 Negotiation and power relations

Additionally, standardization is a social process (Timmermans and Epstein, 2010), where negotiation takes place. Seidl (2007) showed in his research that standardization is an evolving process based on the interaction of various actors. Besides, for example Timmermans and Epstein (2010) describe standards as a “phenomena that help regulate and calibrate social life by rendering the modern world equivalent across cultures, time, and geography. [...] It is fundamentally a social act” (p. 70). Timmermans and Epstein (2010) discussed in their research that most standards are built collectively with relevant actors “in order to work in a standardized way, [determining standards] require some form of buy-in by multiple others” (p. 75). Therefore, standardization can be seen as a political process in which interests of the different parties will be taken into account when determining the standard.

This political process also relates to theories about power relations within inter-organizational collaboration. Fleming and Spicer (2014) for example have written about the concept of power through organizations. In their research they discussed different faces of power (coercion, manipulation, domination and subjectification). Coercion is “the direct exercise of power by individuals to achieve certain political ends” (Fleming and Spicer, 2014, p. 4). This face of power is about coercing others in a particular way, through for example the use of critical resources. Another face of power is ‘manipulation’ hereby “actors seek to either limit the issues that are discussed or fit issues within (what are perceived to be) acceptable boundaries” (Fleming and Spicer, 2014, p. 4). This type of power is concerned with “an implicit shaping of issues considered important or relevant (Fleming and Spicer, 2014, p. 4). Coercion and manipulation are both episodic forms of influence (the direct exercise of power). The other two faces of power ‘domination’ and ‘subjectification’ are systemic forms of influence (power that is congealed into more enduring institutional structures). With

‘domination’ actors “establish influence through the construction of ideological values that become hegemonic” (Fleming and Spicer, 2014, p. 5). This face of power is about shaping preferences, attitudes and political outlook. ‘Subjectification’ goes even beyond that by seeking to “determine an actor’s very sense of self, including their emotions and identity. Normalizing a particular way of being in a social order” (Fleming and Spicer, 2014, p. 6). The systems of communication are an important factor of this face of power, because it guides behaviour.

These faces of power subsequently play out on different sites of power (power enacted ‘in’, ‘through’, ‘over’ and ‘against’ organizations). The faces and sites of power are related to the theory of negotiated order by Strauss, which will be discussed below, as this elaborates how meaning is created and maintained in organizations through human interactions.

As discussed in the introduction chapter this thesis investigates, among other things, the impact of product standardization on the actors within the inter-organizational collaboration. This leads to a focus of literature on power ‘through’ organizations. Fleming and Spicer (2014) claim that this type of power occurs when “an organization as a whole becomes a vehicle or agent to further certain political interests and goals. As an actor in its own right, organizations might wield its influence in certain markets, industries and countries to establish favorable operating environments” (p. 7). This definition of power ‘through’ organizations emphasizes the possibility of an organization to establish desired circumstances and requirements to operate within a certain market. The site of power ‘coercion through organizations’ elaborates on this. As discussed above, coercive power is about the possibility of organizations to have control over the important resources. “Critical resources can aid the organization to either control other organizations within their sector, or conversely decrease the power which other institutions have over them” (Fleming and Spicer, 2014, p. 10). Elg and Johansson (1997) pay attention to the notion of resource interdependencies. Their study demonstrates “how powerful firms can utilize their position in controlling which aspects will be highlighted and in what forums discussions will take place” (p. 378). On the other hand, their research made clear that powerful actors often “chose to participate in [...] [the] interaction process, instead of simply using coercive power to impose their will upon other actors” (Elg and Johansson, 1997, p. 378). The powerful organizations participate in the interaction process with the goal of achieving a long-term collaboration with widely supported fundamentals. Elg and Johansson (1997) underline the influence of moves that are made during the process to manipulate the outcome. This shows the possibility of actors to

influence the standardized product and the possibility to increase their power within the inter-organizational collaboration.

### **Technology and power relations**

Petrakaki and Kornelakis (2016) discussed the impact of technology on the power relations within a collaboration. As discussed in a previous paragraph, they concluded that technology not only reduce autonomy, it also redistributes it. Petrakaki and Kornelakis (2016) pointed out that redistribution of individual work practices is related to the power and control effects, “which are in turn a result of the assumptions inscribed into the technology as it is enacted in everyday work practices” (p. 235). Research by Morris et al. (2003) confirmed that the use of technology have coercive power effects over other organizations within the field, which eventually can lead to a change within the power relations between buyers and distributors. This is in line with the concept of negotiated order by Straus (1978), wherein attention is paid towards a situation where a change in for example technology can lead to an alteration of the social order and thus within the power relations between the involved actors. This process of alteration of the social order must be seen as an ongoing process which arises through everyday interactions among individuals within a continuous changing environment. These change in social order can also be seen as moments of possibility to influence the standard or to increase the power of an actor within the inter-organizational collaboration. According to the negotiated order theory by Strauss (1978) individual work practices are elaborated through consultation and negotiation with the involved actors. The theory of negotiated order is about the process of working things out. “Strauss’ notion of negotiated order highlights that the most important ordering processes of ongoing work practices are those that are agreed implicitly or explicitly through situated and ongoing relational interaction” (Strauss, 1978, as cited in Introna et al., 2019). Because inter-organizational collaboration is about accomplishing tasks in a social setting, involved actors negotiate with each other. Introna et al. (2019) discuss in their article also the concept of disrupting or renegotiating the negotiated or intra-actional order. By this, they mean that the established negotiated order at any point can be disrupted through daily work practices, to offer opportunities for renegotiation. This can be both, implicitly and explicitly. Additionally, Parhankangas et al. (2005) have researched negotiated order in relation to alliances and inter-organizational relationships. “Negotiated order is a robust means to govern process and results where all participants can continue to seek to improve their standing but can only find success in finding creative ways to act so as to demonstrably improve the standing of others” (Parhankangas et al., 2005, p.

438). This interaction between actors can lead to a change within the positions and power relations within the inter-organizational collaboration. Also, this theory of negotiated order shows the possibility of the actors to influence the process and outcome of determining the standard. As a continuously ongoing process where the power of the different actors on determining the standardized product is negotiated through interaction. Also research by Parhankangas et al. (2005) has shown the importance of flexibility and continuously reconsidering goals and processes, regarding a negotiation process. “The flexibility offered by a negotiation process encourages individuals to act openly in pursuit of their own interests, while learning what those interests actually are, and then allowing redefinitions of those interests, to account for the importance of larger and longer social and natural interests to which we are all intrinsically connected” (Parhankangas et al., 2005, p. 439). From this point of view, according to Parhankangas et al. (2005) collaborations can be seen as fluid, which lead to the importance of non-hierarchical relationships, experimentation and spontaneous responses. This is in line with the paper by Fleming and Spicer (2014) wherein they discussed the possibility of actors within a collaboration to increase their power relative to other organizations. Fleming and Spicer (2014) emphasize for example the power of an actor to shape preferences, attitudes and political outlook by for example implementing collective rules or standards.

In conclusion, this continuous change in social order can be seen as an opportunity for the involved actors to determine the standard and to strengthen their power and responsibility within the inter-organizational collaboration.

## 2.5 Standardizing products within construction

The above discussed theories are about standardization in general. However, this thesis is focused on the construction industry. As mentioned in the introduction of this research, the implementation of standardized products can be seen as the use of modularity in construction. According to Pero et al. (2015) modularity is gaining relevance within Engineer-to-Order (ETO) industries such as construction. Within Engineer-to-Order industries products are made that are of low volume and highly-customized. It is about engineering, manufacturing and assembling complex and unique products (Willner et al., 2016). Modularity in construction is achieved by standardizing components of the building creating a composite product:

“Modularity is an approach to product design based on standardization” (Pero et al., 2015, p. 602). By building with standardized products, the building time can be reduced and failure costs can be lowered. An advantage of modular building is that pursuing product variations

has only a limited impact on production and assembly processes (Voordijk, Meijboom & De Haan, 2006). A drawback of standardization is the restricted freedom of choice for the user of standardized products (Bongers, 1982). “While it is to the manufacturing division’s advantage if all products and components are standardized, marketing divisions are more interested in satisfying the diverse needs of customers with broad product lines and frequent product modifications” (Kotabe, 1998, as cited in Loyka & Powers, 2003). For example, in construction this can mean that the standardized measurements do not match the customer requirements which in the end leads to adaptation loss (Bongers, 1982). Madar and Neacsu (2010) also claim “that uniform products may not attract consumer on some markets and, often fail to satisfy local rules or product prescription” (p. 62). This also leads back to the constant dilemma between standardization and customization as discussed in a previous paragraph.

In addition to maximize the benefits from standardization, it is important to make key decisions early in the process, with as many actors as possible involved (Gibb & Isack, 2001). Also Lau et al. (2007) concluded in their research that managers should involve their suppliers, internal functional units and customers in early design stages of the product. Overall, modularization design principles must be actively embraced by all the actors involved in the design process of the product. This is not only the case when looking at forming the components of the standardized product, but also within the execution of the collaboration. As a final point Gibb and Isack (2001) claim that high quality, reasonable costs and effective product delivery is achieved with repeatable, predictable and measurable processes. Which are the goals of modular construction. “To maximize the benefits from standardization, key decisions must be made early in the construction process, largely before conceptual design [...]. At this stage, more than 60% of clients are still 'hands-on' and therefore have the opportunity to influence these decisions” (Gibb & Isack, 2001, p. 51). An important factor for determining the standardization of the product is the design phase in which the actors involved can mention their requirements and wishes. In this phase the standard is determined.

## 2.6 Conceptual model

Based on the theoretical background as described above a conceptual model is drafted. It shows the key concepts of the theory and the relationships related to applying a standardized product within an inter-organizational collaboration. The model is intended to formulate expectations, but not to determine hypotheses to be tested.

The starting point of the conceptual model is the standardized product. The application of a standardized product is impacted by the actor and organizational characteristics. These characteristics can be specified as market, industry and company factors (Powers and Loyka, 2007). But there is also expected to be a reversed relation. The standardized product has an impact on the actor and organizational characteristics.

As drawn in the conceptual model (Figure 1) the application of a standardized product has an impact on two different factors. As a first factor, the standardized product has an impact on the inter-organizational collaboration. The power relations between the actors within the inter-organizational collaboration will be redefined as a result of the use of the standardized product. Based on the theory by Seidl (2007) change within a collaboration will lead to a change in mutual relations. Also the alignment of interests, priorities and interaction goals has an impact on the inter-organizational collaboration. These are discussed in the theory by Öberg and Shih (2014) and Hughes et al. (2012). Besides, the barriers described by Eriksson et al. (2008) correspond to the different dimensions of proximity mentioned by Knoblen and Oerlemans (2006). Both concepts influence the collaboration between actors. These concepts are partially in line with the findings of research by Leonidou (1996) that the degree of standardization depends mostly on demographic and political-legal factors. This also shows the expected reversed relation. The inter-organizational collaboration and its characteristics influences the process and degree of product standardization.

The second factor that product standardization has an impact on is the individual actors' work practices. Work practices can be specified as tasks and responsibilities of the involved actors. It is expected that tasks and responsibilities of the actors will change. More precisely, following the reasoning of Petrakaki and Kornelakis (2016) it is expected that work autonomy and task discretion will be limited because of product standardization. In the research by Poksinska (2007), working conditions are specified as job demands, job control, social relations and development of competence. Also research by Sletten and Ellingson (2020) has shown that standardization has an impact on working practices: "standardized tools increase the social workers experienced professional competence but challenge their professional knowledge base, reflective practice, and professional accountability" (p. 714).

Another factor that impacts the application of a standardized product are the expectations regarding the inter-organizational collaboration and the output the standardized product delivers. Öberg and Shih (2014) and Hughes et al. (2012) describe in their studies the importance of paying attention to alignment of expectations between collaboration partners.

This factor has not only an impact on the standardized product, but also on the relationship between the individual actors' work practices and inter-organizational collaboration.

As indicated by the red lines in the conceptual model (Figure 1) the theory of negotiated order by Strauss (1978) is a continuous process within the application of a standardized product. When the standardized product is applied within a collaboration, the involved actors will negotiate to determine the specifications of the standardized product and the conditions under which it is applied (Seidl, 2007). The process of negotiated order has not only an effect on determining the standardized product. Negotiation also takes place when defining the individual work practices of actors. Because inter-organizational collaboration is about accomplishing tasks in social setting, involved actors negotiate with each other to determine the social order. The other way around, the individual work practices of actors can influence the negotiated order (Seidl, 2007). This negotiation process could also be linked to theory about power relations within inter-organizational collaboration. Fleming and Spicer (2014) claimed that "critical resources can aid the organization to either control other organizations within their sector, or conversely decrease the power which other institutions have over them" (p. 10). This shows the possibility of actors within the inter-organizational collaboration to increase their power by determining the standard. Morris et al. (2003) confirmed that the use of technology has coercive power effects over other organizations within the field, which eventually can lead to a change within the power relations. When a company has the knowledge and expertise about these technical aspects it means that, as other companies are in need of this knowledge and expertise, they have a certain power position. This is the case when one organization determines the standard and is called 'coercion' (Fleming and Spicer, 2014). Another face of power that could be expected based on the paper by Fleming and Spicer (2014) is 'domination', because standardization is based on certain decisions of an actor which become dominant.

As drawn in the conceptual model (Figure 1), all the factors are related with each other due to the continuous process of negotiated order. The application of a standardized product causes that the relationships within the inter-organizational collaboration and the work practices of the construction project actors are altered. Based on the above described literature it can be expected that the development and application of a standardized product within an inter-organizational collaboration will lead to different negotiation moments. During the designing and contracting phase of the construction project, the expectations regarding the output of the standardized product and collaboration are discussed. The negotiated outcomes of the inter-



organizational collaboration and individual actors' work practices both subsequently influence the final standardized product. During this negotiation process the power relations of the actors influence the outcome of the standardized product, because it determines the impact of an actor on determining the standard.

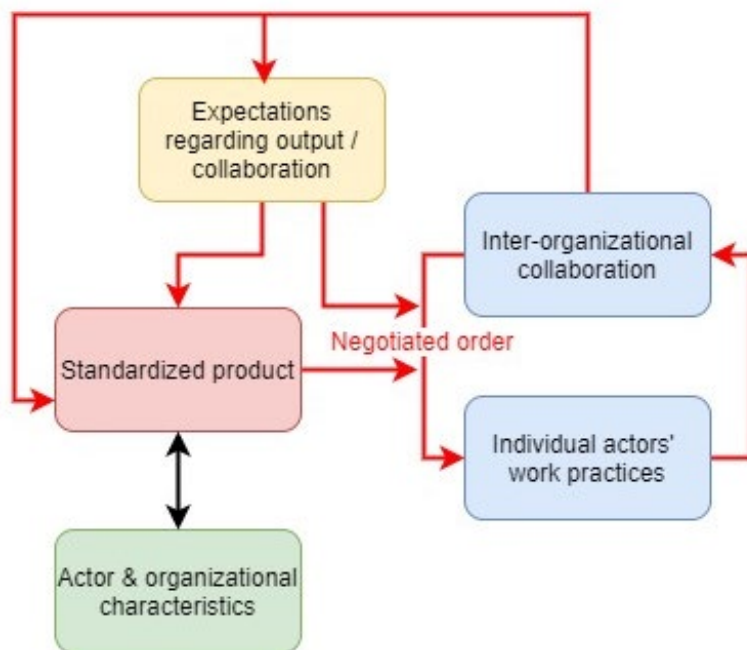


Figure 1: Conceptual model

### 3. Methodology

This chapter starts with the explanation of the chosen research method and a brief description of the organization and respondents of this research. After that, the methods of data collection and analysis of this data are described. This chapter concludes with a discussion of the research quality and research ethics.

#### 3.1 Method

As mentioned in the introduction the goal of this research is to gain insight into the impact of applying a standardized product on the individual work practices and inter-organizational collaboration of actors within a construction project and how the negotiated order is altered and (ideally) restored. Besides, the goal of this research is to provide the involved actors with a clear insight into the impacts of using the modular buildings on their individual work practices and collaboration, after which they perhaps can tackle some difficulties, to function optimally. By conducting interviews the researcher has the opportunity to ask further questions and can thereby gain a deeper understanding of underlying experiences and interests, which is the purpose of this research. Besides, through conducting interviews the researcher has the possibility to respond to non-verbal cues. Keeping both of these research goals in mind, qualitative research is the most suitable method (Bleijenbergh, 2015).

In addition, this research is based on deductive reasoning. The goal is to test existing theories. A bottom-up approach was used. According to Gioia et al. (2012) participants can explain their thoughts, intentions and actions. With this bottom-up approach the informants can speak up in the early stages of data gathering and analysis. Therefore a deductive reasoning is suitable for this explorative research.

To structure the interviews, the interview questions are partly based on the conceptual model as described in chapter two of this research. Besides, the sensitizing concepts formulated from the theoretical background serve as a base for the interview questions. These sensitizing concepts are for example power relations, possibilities of negotiation and standardization process (also mentioned in table 2).

#### 3.2 Case selection

As described in the introduction, this research is conducted at two different construction projects. For this research is chosen for two projects as research case, but they will not be compared with each other. There is chosen for these two projects because of their similarities. Both projects are largely completed and the same type of actors are involved with similar roles. Because of the number of interviews, it was necessary to involve two projects within

this study. In the opinion of the researcher it was not useful to interview more than one person from an actor that was involved at the same project, because the goal of this research is not to discover the experience of working with standardized products within the project team, but the impact of standardized products on the individual work practices and inter-organizational collaboration in a general sense within a construction project. Besides, it was not feasible to speak to several people from the project with the same function, because usually only one person from an actor was involved. It can be expected that this may lead to a one-sided and subjective view on the impact of a standardized product on the individual work practices of an actor and their inter-organizational collaboration. This risk is tackled by interviewing people with the same function, but at a different construction project. Besides, this is a qualitative research, the goal is not to generalize, but to be able to transfer the findings to other contexts or settings with other respondents (Lincoln & Guba, 1988).

The two cases are about the collaboration between different actors of a building project. As mentioned in the introduction of this thesis, the relevant actors are determined based on the involved actors within the designing phase of a building project. The interviewees are employees from contractors, architects, housing corporations and municipalities. Both building projects consist of modular buildings, the standardized product that is being investigated in this study. The first building project is located in Enschede, The Netherlands. On the so called Robsonterrein the contractor Hodes has built 20 studio's. They build these houses commissioned by housing corporation Domijn. Other important stakeholders are municipality Enschede, who is responsible for the building permit, and the involved architect LKSVD Architecten. The other construction project is located in Hengelo, The Netherlands. The contractor TBI Woonlab is building several new houses on the modular building manner. TBI Woonlab is a collaboration between three construction companies, namely, Era Contour, Hazenberg Bouw and Koopmans Bouwgroep. Within this collaboration the companies develop in collaboration with clients and consumers new processes and products with regards to new construction and energetic home improvement. Within this TBI Woonlab the partners developed some products, which are named modular buildings. These modular buildings come in three types, aimed at different types of customers. The involved architect, housing corporation and municipality Hengelo were interviewed for this research.

In order to be able to answer the research question, various actors were interviewed. In total nine people from different companies and with different functions participated in this research. More information about these interviews is given in the table 1 in the next section.

The researcher has come into contact with TBI Woonlab through a family member who works there. The contact with the contractor Hodes was made via the network Stichting Pioneering where the researcher is active. These (in)direct relationships have not impacted the criticism of the researcher. The danger of feeling part of the organization was out of question, because the researcher contacted both organizations specifically for this research and has no role within these companies.

### 3.3 Data collection

Before the interview questions could be formulated an operationalization of the main concepts from the theoretical background was made. In table 1 the main concepts are elaborated through dimensions and more precisely through indicators. Finally, in the last column the formulated interview questions (appendix 1) are linked to the corresponding concepts and dimensions. Within the semi-structured interviews space has been left for deviations from the format and possibilities to ask further questions.

Concepts	Dimensions	Indicators	Interview questions
Actor & organizational characteristics	Market, industry & company factors	<ul style="list-style-type: none"> <li>• Legal requirements, consumer preferences, product use conditions and competition</li> <li>• Market turbulence and technological turbulence</li> <li>• Sub-unit horizontal interdependence, sub-unit vertical dependence, headquarters – sub-unit trust,</li> </ul>	19, 22

		sub-unit acquiescence, sub-unit cooperation and centralization of decision-making authority	
Inter-organizational collaboration	Characteristics of collaboration	<ul style="list-style-type: none"> <li>• Collaboration process</li> <li>• Type of collaboration</li> </ul>	1, 8
	Involvement of actors	<ul style="list-style-type: none"> <li>• Deepness of the interaction between the partners</li> <li>• Number of actors involved</li> <li>• Duration of involvement Phase of involvement</li> </ul>	2, 3, 4, 5, 6, 7
	Barriers and proximity to collaboration	<ul style="list-style-type: none"> <li>• Cultural barriers / proximity</li> <li>• Technological barriers / proximity</li> <li>• Geographical barriers / proximity</li> </ul>	18, 19, 20
	Power relations	<ul style="list-style-type: none"> <li>• Process of setting standards</li> <li>• Change in power relations</li> </ul>	12, 13, 17

		through standardized product	
Individual actors' work practices	Work autonomy	<ul style="list-style-type: none"> <li>• Ability to exercise discretion</li> <li>• Change in choice of product options</li> </ul>	14, 16
	Tasks and responsibilities	<ul style="list-style-type: none"> <li>• Change in tasks and responsibilities</li> <li>• Task discretion</li> </ul>	15
Determining and applying the standards	Process of negotiated order	<ul style="list-style-type: none"> <li>• Process of setting the standards</li> </ul>	12, 13 (based on analysis of all interview questions)
	Logic of the firm	<ul style="list-style-type: none"> <li>• Alignment of interests</li> <li>• Alignment of priorities</li> <li>• Alignment of interaction goals</li> <li>• Alignment of expectations</li> </ul>	9, 10, 11

Table 2: Operationalization of variables

As mentioned above, interviews were conducted for this research. Therefore, primary data sources were used to collect the data. This research started with several exploratory interviews with the ICT-manager of Nijhuis Bouw.

The data collection of this research consisted of interviews and collecting relevant documents. As this study tries to identify the experience of actors, it is to be expected that some of these factors are hidden in the participants' experiences and that the participants might not be completely aware of them. Therefore has been chosen for semi-structured interviews with one

person at a time. In this way, respondents can speak as freely as possible, without a feeling that colleagues can judge. An exception is made for the interview with the housing corporation Domijn. This interview was held with two employees from Domijn who both are involved as developing managers at the construction project. Both respondents agreed with purchasing the interview together. More precisely, they requested it themselves, so they could complement each other during the interview.

All interviews were recorded and transcribed. The interview transcripts were used for data analysis. The interviewees were explicitly told that they stayed anonymous and that the data would be used confidential. The interview transcripts were only insightful for the researcher and the supervisor with fictitious names. All these aspects were conducted to ensure that the interviewees were as comfortable as possible to speak openly. During the interviews, the researcher asked for additional relevant information. The collected documents were limited to leaflets and public websites, that were only used as background information and were not analysed.

<b>Ref.</b>	<b>Data collection method</b>	<b>Date</b>	<b>Location</b>	<b>Company name</b>	<b>Type of actor</b>	<b>Function</b>
I1	Interview	June 11, 2021	Office Koopmans Enschede	TBI Woonlab	Contractor	Project developer
I2	Interview	June 23, 2021	Town Hall, Hengelo	Municipality Hengelo	Municipality	Project manager
I3	Interview	June 28, 2021	Teams (online)	SVP architects	Architect	Architect
I4	Interview	July 12, 2021	Town Hall, Hengelo	Municipality Hengelo	Municipality	Licensing authority
I5	Interview	June 28, 2021	Office Welbions, Hengelo	Welbions	Housing Corporation	Program developer
I6	Interview	May 28, 2021	Office Hodes, Goor	Hodes	Contractor	Director concepts

I7	Interview	June 2, 2021	Office LKSVDD, Enschede	LKSVDD Architects	Architect	Architect
I8	Interview	June 28, 2021	Teams (online)	Municipality Enschede	Municipality	Urban planner
I9	Interview	June 14, 2021	Office Domijn, Enschede	Domijn	Housing Corporation	Development managers

Table 3: Information data collection

### 3.4 Data analysis

As discussed in the previous paragraph, all the information from the interviews first needed to be captured by transcribing. The next step was to codify these transcripts. To analyse the data, a template analysis has been applied. “Template analysis is a style of thematic analysis that balances a relatively high degree of structure in the process of analysing textual data with the flexibility to adapt it to the needs of a particular study” (Symon and Cassell, 2012, p. 428). The research framework was used to constitute the codes. The secondary codes correspond with the dimensions and indicators as elaborated in the operationalization based on the theoretical background. Thereafter the secondary codes were clustered “within which hierarchical and lateral relations between themes can be defined” (King, 2012, p. 436). Which leads to an overview of each key concept and its relevant quotes. This coding process consists of several activities such as comparing, categorizing, interpreting and creatively deploying. Due to this sorting technique, patterns will become clear (Symon and Cassell, 2012). Within this master research this process has been executed by writing out the interviews and by coding the most important and striking concepts. Thereafter, the different codes have been compared and were the results formulated. An example of this coding process is the following. A quote from the interview with an architect was: “the builders have now all developed concept homes and in fact they only need the architect [...] for approval from the welfare committee” (designer, architect). This quote was assigned to the code ‘power relations’. Thereafter a second order code called ‘power position contractor’ was assigned and the third order code was called ‘dependence’.

This coding process is a fluid and exploratory process, whereby codes can switch in hierarchy (Fereday & Muir-Cochrane, 2006). In the end of the data analysis process, the most important findings were concluded based on the hierarchical relations between the codes. Not only the



relations found, but also the missing relationships that were relevant were mentioned. The expected relations were based on previous research, so when the data analysis led to findings that deviates from expectations, this could be seen as relevant new insights.

### 3.5 Research quality

As this study uses a qualitative research methodology, quality measures were considered that apply to this methodology. These quality measures are credibility, transferability, dependability, and confirmability.

Firstly, the credibility of a study is about the fit between constructed realities of respondents and reconstructions attributed to them (Guba and Lincoln, 1989). This is done by peer debriefing. Within this research process the researcher discussed her ideas and findings several times with a colleague and a family member. Both persons were critically and asked to elaborate on the statements and conclusions made by the researcher. Besides, through peer debriefing with other master students, a critical look from the outside was accomplished. Because of this peer debriefing the researcher has to made tacit understandings explicit and clear. Besides, this research process can be seen as an iterative process with many choices and minor adjustments. Especially in the phase of formulating the research question many topics have been considered. This process is partly recorded within the researcher's notes, so that the considerations and final choices can be easily traced.

Secondly, the transferability of the research results was considered. Transferability can be reached by providing enough detail about the specific research case. In this way “the reader can judge what other (similar) contexts might be informed by the findings” (Symon and Cassell, 2012, p. 207). This quality measure is met through an extensive description of the research context and the assumptions.

Thirdly, dependability is achieved by describing and explaining methodological changes which were made throughout this research. Dependability is about establishing the research findings as consistent and repeatable. By keeping a research diary where important tradeoffs were mentioned, “the reader is then able to judge why certain decisions were made and how the eventual understanding of the research situation was achieved” (Symon and Cassell, 2012, p. 207-208). Also, the discussions with other business administration students or people with different backgrounds lead to a coherent story.

Lastly, confirmability is about the degree to which others could confirm the findings of the research study. This is confirmed by providing extensive descriptions of the data collection

and analysis and the codebook which is added in the appendix. Also, substantiating the findings and conclusions with quotes of the interviews led to a higher degree of confirmability. This shows that the findings are based on the participants' narratives instead of potential researcher biases.

### 3.6 Research ethics

The research ethics were taken into account throughout this research process. Earlier in this chapter it was addressed how the researcher gained access to the involved organizations and interviewees. Also during the research process the research ethics were taken into account.

Firstly, informed consent rules have been followed. Before the start of an interview, the purpose of the data collection was told. In addition, the interviewees were asked whether the interview could be recorded. Also, the expectations were made clear.

Secondly, the researcher was constantly aware of her role as a researcher and not as a construction company employee. As mentioned before, the companies who participated were contacted for this research. However, my function at another construction company can lead to some background information. Mostly in a positive way, because of the basic information a researcher needs to understand the research case and to ask the right interview questions with sufficient substantive knowledge. On the other hand, the researcher's background can lead to prejudices and filling in potential answers. It must be mentioned that this can lead to the danger of subjectivity. To tackle this, the researcher talked with other people about the considerations and expectations to keep an open mind and to reflect during the process on the role of the researcher within this study.

Thirdly, during the research, there has been respect for the confidentiality and privacy of the data and people. Recordings and transcripts were only shared with the university supervisor. Besides, the interviewees remained anonymous in the transcripts and analysis of the research. In this way, it was the intention to let interviewees feel confident enough to tell their story as extensively as possible.

Lastly, the findings of the study were shared with the interviewees. This means that the cooperating actors can see how other actors within the collaboration experience the application of modular building and what the impact is on the individual work practices and inter-organizational collaboration of the involved actors. Even though interviewees were made anonymous within the results, it is possible that actors can link statements to specific actors. This has been taken into account by checking if the interviewees agreed with the

quotes within this research. Besides, that the involved parties were really interested in the findings of this research and the resulting recommendations. They participate in this study because they see it as a possibility to improve the application of modular building within construction projects.

## 4. Results

This chapter presents the findings of this qualitative research conducted in the construction industry. Every of the following paragraphs of this chapter are based on the factors described in the conceptual model (Figure 1). These factors are presented from the different perspectives of the actors distinguished in this study, which are contractors, architects, housing corporations and municipalities.

### 4.1 Motives and interests

The different involved actors are linked to various motives and interests regarding product standardization. During the interviews, it became clear that the contractors are particularly interested in applying a standardized product. The contractors are in charge of developing the standardized product. According to the employees of the contractors, product standardization provides lower production costs and therefore a lower market price, which leads to a better market position. The project developers of the housing corporations interviewed for this research mentioned that the biggest reason for them to invest in standardized products is affordability: *“The biggest reason is [...] affordability [...] for our tenants and for ourselves, so to speak, because we simply see that [...] [the affordability of housing] is under very great pressure”* (development manager, housing corporation). Besides the argument of cost reduction, can standardized building from the viewpoint of the housing corporation be interesting for the purpose of maintaining their housing stock: *“Yes and from our maintenance service. [...] In your total housing stock you also want something of a standard. Because our maintenance service and rental prefer that [...] not very luxurious in one neighborhood and very sober in another. You also want to have a sort of standard. That is easy for our maintenance, but also for the tenant. That you say nah oja if I have a rental home at Welbions for 600 euros this is what I get for it”* (program developer, housing corporation).

Another appealing reason to develop standardized products is the high quality. This appeared to be a reason for contractors, as well as for housing corporations and municipalities to develop standardized products, which are called modular buildings. The employee of the interviewed municipality indicated that the repeating process, because the product is used more often, and the better circumstances in which the elements of the building are made, lead to a higher quality of products.

A third aspect mentioned by the interviewees that advocates for product standardization is the possibility to certify products. Because of the high standardization of the products it is

possible to certify a product, which is a form of conformity assessment. When a product is certified, for example a lot of quality and safety checks are done, which makes it easier for the municipality to be able to grant the license. After all, it then already has been demonstrated that the product complies with the relevant laws, regulations and municipal plans: *“Give me that certificate [...]. It is agreed [...] if it has been tested in the right way, of course”* (licensing employee, municipality). The standardization of the product leads in this case also to standardization within the process of licensing. When the product is less variable and more repeatable, there is simply less to test.

### **Roles of actors within determining the standard**

In the previous paragraph it became clear that among the actors there is an understanding or acceptance of the shift towards modular building. In this paragraph the process of determining the standardized product is elaborated. It turns out, based on the data collected from the interviews, that the actor with the biggest interest in developing the standardized product also has the most impact in determining the standard. All interviewees describe the process of determining the standardized product similar. The interviewed CEO and project developer, which are both employees of a contractor, claimed that they determine the standardized products themselves, based on wishes and preferences of the client, the housing corporation. Other actors, have in their opinion, little influence on the outcome. This shows the power of the contractor within the inter-organizational collaboration, by determining standards to which other actors must also conform. With their power position within the collaboration, the contractor attempts to make the relationships with the housing corporation, municipality and architect appear inevitable.

The interviewed architects agree with this process description of the employees of the contractor, but also indicates that sometimes the developing process of the standardized product is done with an architect. However, the architect is mostly only asked for designing the flexible part of the product that needs to fit in with the building environment and specific requirements of the housing corporation or municipality, and has no further input. The interviewed architects indicated that their influence on determining the standard is limited. Only within the start phase of the construction project the architects can introduce their expertise. They can do this by making demands on the aesthetic characteristics of the buildings in consultation with the welfare committee of the municipality. The architects experience this as a limitation of the application of their knowledge and expertise. According to the interviewed architects they could also add value within the developing process of the

product: *“So my opinion is that we also have to think along with these types of products in order to do exactly that beauty and the integrality of the architectural design well”* (designer, architect).

The interviewed employees of the housing corporation and municipality as well have the feeling that their role in the developing process of the product is limited, as the contractor develops the product mostly himself. The opportunity to influence the standardized product is there when there is a repeated collaboration, because then a housing corporation is asked for some advice to improve the product and to match customer demand: *“We are still often asked to take a look at it or something. Once they have developed a concept we are asked to take a look at the maps”* (designer, architect). However, most of the time their role within determining the standard is limited, because they are simply not asked by the contractor. The same applies to the municipality. Their opportunity to influence the standardized product is limited to setting requirements for the buildings in their municipal plans.

Based on the findings as described above it can be concluded that the use of a standardized product leads to negotiation of the impact of the different actors on determining the standardized product. Which means that the power relations between the construction project actors change. As mentioned before, the power of the contractor to determine the product has increased, while the power of the other actors (architect, municipality and housing corporation) to influence the product has decreased. On the other hand is this negotiated order not fixed. During the interviews it became clear that different actors, for example the architects, are trying to find a way to increase their added value in the building process. *“So it is true that, certainly when still in the early stages of a concept, we are euh also euh of course also in their own interest, we are listened to”* (designer, architect). With network positioning the architect attempts to strengthen their position within the collaboration. By entering into partnerships with contractors, they ensure their position and influence in the development process of the standardized product.

From the above paragraph it can be concluded that the input of the architect, housing corporation and municipality in determining the standard is limited. However, the interviews with the involved actors also showed that the standards and agreements are not always and for every construction project binding. At the beginning of every construction project the involved actors have the possibility to indicate their wishes and requirements, by means of a contract between the involved actors. Within this phase the involved actors express their

expectations towards the outcome of the inter-organizational collaboration and the corresponding standardized product. This could be seen as a possibility for the architect, housing corporation and municipality to influence the standard as determined by the contractor. The drafting of the contract of the construction project is a negotiation phase, wherein actors have the best opportunity to influence the standard as determined by the contractor. This process shows the ability of the social order to change, because for every construction project new agreements are made around the standardized product. All the actors indicate the importance of clear agreements at the beginning of the collaboration. Employees of both architects and housing corporations claimed that this is the moment they can insert their requirements and wishes.

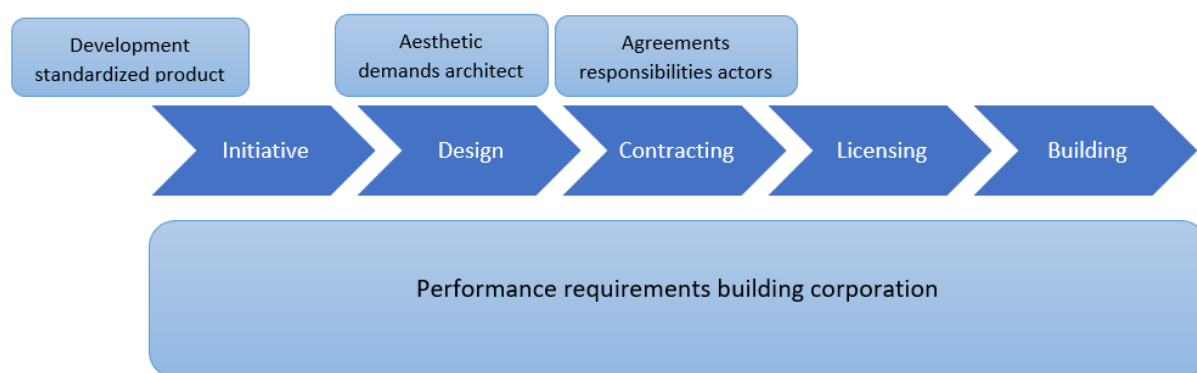


Figure 2: Building process

Overall, the data from the interviews showed that according to the interviewees the contractors mainly independently develop the product and therefore determine the standard. The architect, housing corporation and municipality assume that this product is based on wishes and expectations from the market, because otherwise the products would not be sold. But their influence on determining the standard is limited. Only within the contracting phase the actors (architect, housing corporation and municipality) have the possibility to indicate their specific wishes and requirements to adjust the standardized product.

#### 4.2 Alterations in individual actors' work practices

In this paragraph the potential alterations in individual actors' work practices will be outlined. Only the most prominent work practices will be discussed in this paragraph even though more are possibly influenced by applying a standardized product. The focus will be on alterations in tasks and work autonomy of the actors.

#### 4.2.1 Alterations in tasks and responsibilities

During the interviews with the involved actors the impact of product standardization was discussed. The interviews with the project developers of the housing corporations showed that there has been a switch in the work practices within their organizations: *“We want to leave the knowledge and expertise [with regard to developing the product] on the market and also give it back to the [contractors]”* (development manager, housing corporation). Firstly, the way housing corporation tenders’ projects are changed: *“We really want to purchase products. So also as few euh specific wishes, requirements as possible”* (development manager, housing corporation). According to both interviewed project developers from the housing corporations it is a conscious choice to choose a standardized product: *“Look if there are products that really don't fit the project. Then you should not choose that product. Then choose another product”* (development manager, housing corporation). By this they mean that with choosing a standardized product, the housing corporation must accept the additional consequences such as a decrease of adaptability of the product. The project developers of the housing corporations emphasize that the contractor has the knowledge and experience to develop a product, which automatically leads to less influence of the housing corporation on the final product. This is a form of power of the contractor because of possession of certain knowledge and resources. Therefore, the task of the project developers from the housing corporations is altered from delivering input within the process of developing the product, towards steering on performance indicators which are laid down in the contract. Standardization of products can change the work autonomy of involved actors. Work autonomy is the ability to exercise discretion and to provide input within the working process (Hackman and Oldham, 1975). With modular building the housing corporation only determines the frameworks in which the product must fit, but it is up to the contractors to develop the product and to determine how predetermined performance requirements will be met. According to the interviewees the work autonomy of the housing corporation is hereby decreased: *“We are very used to the fact that we can determine everything ourselves and that there is a lot of leeway there and that is still a bit, but to a certain extent. And that starts with which product you choose”* (development manager, housing corporation). As mentioned before, the housing corporation consciously choose a certain product and takes the limitation in adaptability of the product for granted. On the other hand a positive sidenote that the interviewees brought up was that this allows the housing corporation to return to their most important task, which is taking care of housing supply. This decrease in work autonomy does not always have to have negative consequences.



It could also be considered as a circumstance that increases effectivity of the housing corporation, because they can focus on their primary task.

According to the interviewed architects, their work practices also have been changed because of the application of a standardized product. Instead of being asked by the housing corporation to make a design, the product is already designed by the contractor and the architect only has a task to fit the design within the requirements of the municipality: “*the builders have now all developed concept homes and in fact they only need the architect [...] for approval from the welfare committee*” (designer, architect). The responsibility of an architect is therefore changed from being responsible for the whole design of the building towards being responsible for only the aesthetic exterior of the building: “*And if you look at the role you then have as an architect in conceptual building, that role is actually more limited than designing a house that is not yet known at all. So you could actually say that we only design the raincoat around the um around the shell of the building*” (designer, architect). According to the architects, their work autonomy has been decreased because of applying a standardized product. As discussed above, the architect only has to design the product's exterior. The most significant part of the product is determined before the architect gets involved, which leaves only the flexible part of the product for architects to be creative. However this is not always the case, as one of the architects that was interviewed was involved in developing the product: “*The role of the architect [should be] [...] thinking along in which products, which modular products there are to achieve that quality of life. [...] We help in this case with Hodes to develop the entire modular system. So we don't always succeed and that has mainly to do with economic aspects. Affordability in this case, but we prefer to add as much value as possible to the basic concept at the front*” (designer, architect). Whether the architect is involved in designing the standardized product depends on different factors, such as costs and time. Because of product standardization architects have to make more effort to exert influence on the final building. This shows the power of the contractor to determine if they want to involve the architect within the phase of determining the standardized product. It could even be argued that there is a risk that they lose their task of designing the building completely. One of the employees of the interviewed architects claimed: “*That sounds [...] if you would say it disrespectfully [...] that the builders have now all developed concept homes and in fact they only need the architect for the [...] approval from the welfare committee*” (designer, architect). In the past the main task of the architect was developing the product, while with modular building this already has been done. A way

for an architect to keep their work autonomy, is by making clear demands in the design approval phase: *“But if [those specific requirements] are not captured up front. [...] Then [the contractor] would probably have said yes, that does not fit within our building system, we are not going to do that. Then everything will be always the same”* (designer, architect).

The third actor distinguished in this research is the municipality. The task of the municipality is to grant a license to start the building process. According to the interviewees this task in itself does not change when a standardized product is applied, but the process of granting a license is often simplified. This because product standardization can lead to a simplification of the licensing task, due to the fact of the ability to certify a product. When the product is certified, the municipality assumes that the product meets the legal requirements and only checks whether the certification was done correctly and if the execution corresponds to what is promised: *“You give away more [...] trust to the [contractor]. And says ok you will develop a good product. Okay, let's trust that [instead of developing the product together]”* (licensing employee, municipality). Thus, because most of the checks about regulations and quality have already been deposited to the certifying parties, the task of municipalities has been simplified. Logically, this also means that the work autonomy of the municipalities is affected. It is their task to judge if a license can be granted. According to the interviewed employee of the municipality because of standardized product their task within the licensing process is simplified, as they only have to check whether the standardized product meets the requirements. Before granting the license, it has already been checked whether the product meets the legal requirements and the needed quality. On the other hand their main task also does not change that much, because in the end they still are in charge of granting the license for the construction project. Therewith they make a crucial contribution to the construction process, because the construction project will not continue without a license. It can be concluded that the municipality is mainly positive about the change in their work autonomy, because their task is simplified.

The last actor to discuss is the contractor. With modular building, the contractor is the initiating actor. As mentioned before, according to all interviewed actors, the contractor therefore has gotten more responsibility regarding developing the final product, compared to traditional building. The contractor is changed towards the initiator of the developing process of the product. Besides this change of responsibility, the task of the contractor does not change dramatically. After all the main task remains building. On the other hand, the work autonomy of contractors has been increased. Without much involvement of other actors,

contractors are able to develop the standardized product on their own. From this point of view, the contractor determines the standard mostly himself. The shift from project to product purchasing makes that there is less customization and therefore less deviation of the initial product, as developed by the contractor. It could even be argued that the contractor gets more freedom in developing the product, because the requirements that housing corporations set on the product are less specified. The contractor still must comply with the requirements set by housing corporations and municipalities. However these requirements are less detailed and more open to the contractors' interpretation. This development leads to an extension of the tasks of the contractor and an increase in work autonomy.

## **Summary**

The task of the project developers from the housing corporations is altered from delivering input within the process of developing the product, towards steering on performance indicators which are laid down in the contract.

This because the housing corporation wants to leave the responsibility of developing the product with the contractor, which is the case when product standardization is applied at a construction project. This also shows that the work practices of a contractor are altered towards a more leading role in which they develop the product mostly themselves. Because they are selling this standardized product instead of a customized product, the contractor has more freedom within performing their work practices. Another actors' work practices that is changed relatively much is that from the architect. Their task and duty remain the same, they design the product. However this task is (partly) shifted towards the contractor, whereby the work autonomy of the architect decreases, because of the limited influence on designing the standardized product. The last actors' work practices, that of the municipality, are hardly changed. Their task remains granting a license and is only simplified.

## **4.3 Alterations in inter-organizational collaboration**

### **4.3.1. Alterations in type of collaboration and power relations**

Besides the impact on individual work practices, applying a standardized product also influences inter-organizational collaboration between the actors within a construction project.

### **Redefined position of the architect and long-term relationships**

A specific consequence of working with standardized products according to the interviewed actors, is that it can lead to long-term relationships. For example, a contractor and an architect develop a product together and sell this product to different clients over the years. Another

reason actors keep working together after finishing a specific building project is product improvement. Instead of designing a specific product for each building project the contractor and architect develop a standardized product that is applied repeatedly. Through this repeated application, continuous optimization is necessary and because of this actors will continue to work together for a more extended period. Besides, because of the relatively high investment costs of developing the standardized product, actors need to offer the product for a longer period of time so that they can make a profit. For this reason the collaboration will also be maintained. *“We invested a lot in the [...] product development with [the contractor]. That [we] sometimes wondered, well, should we continue with this. We held on anyway and now we have a fantastic partnership”* (designer, architect). This quote also shows the fact that an architect is dependent of a contractor when entering a partnership, because they have to confirm with the standardized product. According to the interviewed architects, these types of collaborations are on the rise and are seen as a positive development: *“If we participate in the development of a product, I would rather be paid according to how many of those products are sold. Because then I remain involved as an architect with that product. But if I only participate in that development of that product and I get paid. What is in it for me when that product is put on the market? Then it is no use to me anymore. So I would prefer to have a revenue model based on how many of those products are put on the market”* (designer, architect). This quote shows the wish of architects to make a change in their revenue model, by earning money per quantity of products sold. Thus architects do not want to earn their money only after making the original design, but after every sold product. This adaptation of their revenue model to that of the contractor, can be seen as an expression of searching for a more prominent role within the collaboration. It can be concluded that with modular building, sometimes architects feel less involved in the designing and building process. Even though they believe that their knowledge and expertise is of great value. From the interviews with two architects it became clear that they are searching for a new position in the construction project. Therefore, they have to convince the contractor of their added value in the development phase of the standardized product. This also shows the power of a contractor, wherein they attempt to make relations of power appear inevitable and natural. With negotiation a new social order can be established. The architects confirm that the power relations have been changed because of the application of standardized products. They also mentioned that with modular building the contractor is their client, instead of the housing corporation, as was the case with traditional building. According to the interviewed architects, with traditional building the architect had a lot more contact with the municipality and the

housing corporation. In fact, with traditional building the housing corporation would select an architect to design the building after which a suitable contractor would be chosen for the technical finetuning of the design and executing the building process. *“Those power relations are indeed shifting because [...] if the contractor is our client, he has a completely different power than when the contractor [...] ultimately builds what the architect designs. Then it is not the case that we have the power, but [...] then the contractor has to follow much more. And now the contractor decides”* (designer, architect). This quote supports the conclusion that product standardization leads to a decrease in power of architects to influence the characteristics of the building. In contrast, this quote also shows the increase of the power of the contractor. Because of product standardization, the contractor has the power over the design process instead of this being determined by the architect. Besides, the interviewed contractors indicated that because of product standardization the need for housing corporations to customize seems to be decreased as well: *“Clients [have] less and less the need [...] to change our standards”* (CEO, contractor). Another reason for the increase in power regarding the contractor is the high demand for the products. The contractors have to take the specific wishes of the customer less into account. There is a favorable economy with a shortage of contractors. Because of this market forces it seems that contractors can afford a certain arrogance during the process of determining the standardized product. This means however, as also confirmed by the housing corporations, that the attitude of the contractor partially depends on the financial situation of the moment: *“But I think that is partly due to the financial situation we are in now. That there is a lot of demand. Look, of course there have also been years [...] that the contractors sat here begging for work. [At the moment] [they] have a lot of assignments they can also cancel something if it does not [fit them]”* (program developer, housing corporation).

### **Power of the client, the housing corporation**

In apposite of the increase of the power of the contractor, the power of the housing corporation within the process of determining the standard is decreased. The housing corporations simply have less possibilities to influence the characteristics of the buildings with modular building. The contractors determine the standard and offer the product on the market: *“You come to my showroom this is what I offer, do you like it buy it, you do not like it, go to the dealer next door but I will no longer live in that poverty that you have to constantly participate in tenders”* (CEO, contractor). This quote shows that the contractors have the power to determine which actors they want to make an offer. Leading to a situation wherein

the housing corporation has to look for a contractor that offers a standardized product that fits their requirements. This differs from traditional building, where a selection period was held wherein contractors needed to compete with one another. The interviewees of the housing corporation noted that they are looking for possible long-term collaboration with contractors. One of the ways they try to accomplish this is through a database. In this database the housing corporation inserts standardized products from contractors that fulfil their requirements. Through this database they can thus easily find suitable products, instead of having to request an offer from various contractors for every construction project. These products can be purchased for various construction projects on different locations. This is a change in tendering construction projects and therefore in type of collaboration (from project based to repeated purchase), because of product standardization. Because of the more controlling role of the housing corporation the importance of clear agreements in advance, within the inter-organizational collaboration, has increased. For example through performance indicators from the housing corporation: *“At the front you just have to realize how well I want to develop it. What are the performance indicators that we will aim for”* (program developer, housing corporation). Due to the fact that these performance indicators have been established in advance, it is possible for the housing corporation to control the building process. The contractor has to comply with these performance indicators during the further development of the product. This is a possibility for the housing corporation to increase their power within the inter-organizational collaboration. Nevertheless, the housing corporations are positive about the shift in power relations: *“It is important that we do as little as possible [...] at the wheel [in the development of a product]. Except for those performance requirements, of course. That are the points we think are important. And in the end how that is realized, yes we trust that the [contractor] has the best knowledge and expertise how to do this”* (development manager, housing corporation). This shows the impact of certain knowledge and expertise on the power position of an actor. The role of the project developers from the housing corporations is changed from manager of the designing phase towards a more passive and control focused role in the contracting phase, in which they deliver less input themselves, because the product has mainly been developed through the contractor.

### **Downsides of long-term relationships**

Besides the positive consequences regarding the development towards long-term relationships, there are also some downsides. According to an interviewed architect the long-term relationships between the involved actors can result in more monotonous product range.

When actors develop a standardized product together, they remain connected to each other and will therefore not enter into collaborations with other actors. The housing corporation as well experiences the similarity in products as a negative effect of standardization: *“Look, if a lot of architects all develop something together with a builder, then you also get a kind of tender, then you already know at the front, oh yes, then this architect will do something with this contractor. Sometimes that may be useful, but sometimes you may not want that. [Then you want to keep the] freedom to [choose]”* (program developer, housing corporation). A limited product range due to product standardization simply leads to having less products to choose from.

## Summary

It can be said that a shift has been made from tendering construction projects towards purchasing products. This development towards a product database, in which housing corporations insert standardized products from contractors that fulfil their requirements, could be seen as a possibility for the contractors to strengthen their position within the negotiated order. When the contractor matches the product with the housing corporation's wishes, their product will get purchased without major competition. For the architects the database could be an opportunity to indirectly influence the standard. This by submitting their comments regarding the product into the database. Therefore the architects could possibly lobby with the housing corporations to insert their knowledge and expertise within the assessment criteria of entering the standardized product database.

## 4.4 Analytical summary

The findings showed that the application of a standardized product has different consequences for the construction project actors. The application of a standardized product entails that certain actors have to take a different position within the inter-organizational collaboration which subsequently directly influences the individual actors' work practices. This is in line with the research by Petrakaki and Kornelakis (2016) in which they concluded that technology not only reduce autonomy, it also redistributes it. However it has to be said that for the contractor and architect a lot changes, while for the housing corporation and the municipality the tasks and positions relatively stay the same. During the interviews it became clear that the mutual relationships and the degree of power of an actor are a continuously changing process, which is in line with the theory of negotiated order by Strauss (1978). The results of this master thesis showed that standardization can lead to an alteration in power

relations. However, these power relations are not an established social order and can differ depending on the input of actors within the designing and contracting phase of the construction project. It can be concluded that the architect in particular has to fight for his position in the collaboration. They can achieve this throughout long-term collaborations between them and a contractor, as this gives architects the opportunity to strengthen their position in the process of determining the standardized product. The architect seems to strive for another revenue model, in which they make money after every sold product instead of after every sold product design. This ensures that their task of designing the building will be guaranteed.

This process of ensuring the impact of an actor within the collaboration can be explained by the theory of negotiated order by Straus (1978) wherein it became clear that actors have the possibility to change the social order by negotiating the terms and their input in the collaboration. The power within the inter-organizational collaboration is mostly shifted towards the contractor, because the contractor can determine the standard mostly himself. Therefore it is necessary that the housing corporation tenders' the construction project in a different way, which is confirmed by the interviewed contractors and housing corporations. It also requires a cultural change within the internal organization of the housing corporation, from an active to a more passive role. The power of the housing corporation to determine the product is (because of product standardization) altered from determining the specific requirements beforehand, towards steering on performance requirements during the contracting phase. The housing corporation remains the client, so they maintain a certain dominant position as in the end they still decide which product they want to purchase. Within the contracting phase, the housing corporation has the possibility to specify their wishes, whereby they indirectly influence the standardized product.

The impact of product standardization on the municipality is limited. This because it only simplifies the task of the municipality, but it does not further change their role within the inter-organizational collaboration.

The last actor that needs to be discussed is the contractor. Due to the fact that they have become the connector between the involved actors and are the initiator in the field of developing and offering the standardized product, the contractor experiences the most impact of the application of a standardized product. In relation to the discussed power dynamics by Fleming and Spicer (2014) it could be concluded that the contractor has a coercive site of power. After all, they have the control over the important resources within the inter-



organizational collaboration (namely the knowledge and expertise do design a standardized product). On the other hand, it could also be said that the architect features specific knowledge and expertise, enabling them to claim a certain role in the designing phase of the product. Thereby, the architect has the possibility to confirm their position within the inter-organizational collaboration. Besides, it could be concluded that the contractor also has a dominated site of power. The meaning of domination 'through' organizations is that an organization behaves as agents to ideologically dominate other actors to achieve desirable outcomes and goals (Fleming and Spicer, 2014). The contractor determines the standardized product based on their values and other actors have to comply with these values. The contractor determines the standardized product, which shapes the perceptions and preferences of the other actors. It even can lead to a situation in which actors cannot imagine an alternative, making them adapt to the standard as determined by the contractor.

Furthermore, it can be concluded that there are some possibilities to negotiate the social order during the inter-organizational collaboration between the construction project actors. The expectations of the inter-organizational collaboration and its output influence the standardized product. There are some ways to influence the standard. This could be done during the process of expectation management, which could be a possibility for the actors to negotiate the social order. During the preparation phase when the contract is drawn up, the different actors can express their demands. When these demands are taken into account the standard will be influenced as will be the inter-organizational collaboration as a whole. These findings are in line with the research of Elg and Johansson (1997) in which they underline the influence of moves that are made during the process to manipulate the outcome of the negotiation.

## 5. Discussion and conclusion

### 5.1 Discussion

#### 5.1.1 Theoretical discussion

The theoretical goal of this research was to develop and specify the information about the impact of standardization on individual work practices and inter-organizational collaboration, with the main focus on the negotiated order. Based on the theoretical background the expectation was that the process of negotiated order influences the impact of standardization and vice versa. This research provides several confirmations regarding the used theory and contributes to the current academic literature.

The findings of this research affirm the article of Petrakaki and Kornelakis (2016). They state that technology not only reduces autonomy, but it also redistributes it. This master thesis shows that standardizing products leads to a change in work autonomy for the different actors in the construction industry. In particular the work autonomy of the architect is restricted, because of the preconditions that are determined by developing a standardized product. Therefore architects have less freedom in designing the product. This is in line with the article of Petrakaki and Kornelakis (2016) in which they indicate that work autonomy of nurses and clinicians is limited because of standardized tools. These researchers explain this considering the fact that decisions about diagnoses and treatment are high-skill work, whereby professional judgment and jurisdiction is needed. According to Petrakaki and Kornelakis (2016) standardization causes a decrease within this work autonomy of health care professionals, which is also concluded in this master thesis regarding the architects. On the contrary, the findings of this research indicated that because of product standardization the work autonomy of contractors has been increased. It can be concluded that the work autonomy mostly is increased regarding the actor who determines the standard. This is the case for contractors in this research. This conclusion can be substantiated by the article of Fleming and Spicer (2014) in which they define a ‘coercive’ site of power, which means that an actor uses “resources [...] which they have at their disposal to get someone to do something that they otherwise would not do” (p. 8). This ‘coercive’ site of power can be recognized in this master thesis regarding the power increase of the contractor as a result of developing the standardized product. Also Alaimo and Kallinikos (2021) claim that standardization can lead to a certain dominant position of the actor that determines the standard, because of this indirect influence of standards on the perceptions of the other actors who also have to adhere to the standards. As a result of a change in the perceptions of the

involved actors, Alaimo and Kallinikos (2021) also conclude that standards lead to a shift in work practices.

Furthermore, this research shows that within the standardization process one actor can have relatively much power, when determining the standard. In the literature there has been written about how different actors are involved in the process of determining the standard, which is seen as a negotiation process. For example Seidl (2007) showed in his research that standardization is an evolving process based on the interaction of various actors. The findings as discussed in chapter four of this research are in line with this theory, because it shows that the housing corporation, architect and municipality mainly have to participate within the shift towards more standardization. In addition to the theory of Seidl (2007), the interviews of this thesis have shown that the extent to which this participation is voluntarily is doubtful. This shows the power of the contractor within the inter-organizational collaboration, by determining standards to which other actors must also conform. With their power position within the collaboration, the contractor attempts to shape the perceptions and preferences of the other actors, whereby they cannot imagine any alternative. Fleming and Spicer (2014) define this type of power as 'domination'. The contractor obliges the other actors more or less to go along with the standardized product. Another type of power that can be recognized is 'coercion'. After all, the contractor has the control over the important resources within the inter-organizational collaboration (namely the knowledge and expertise to design a standardized product). This leads to a situation wherein the architect depends on the contractor when they are asked for input on designing the standardized product. The architect is subject to the demands made upon them by the contractor, which means that the contractor has a strong power position over them. Also the housing corporation and municipality have to follow this development towards product standardization, which is initiated by the contractor. The degree of input during the development phase is very disproportionately distributed. The interviews with the construction project actors have indicated that particularly the contractor has a prominent role within the process of determining the standard. So, although all actors influence the standard, the degree in which they influence is not the same. For example the architect, who only can extent a certain degree of influence on the standardized product. The same can be said for the housing corporation and municipality. Product standardization is a development in which they have to participate. They do not have a choice to do so. So the degree in which the standard is determined through negotiation is limited. This finding is interesting, because Gibb and Isack (2001) conclude that to maximize the benefits from

standardization, the actors need to be involved in determining the standard. The limited extent of negotiation in the process of determining the standard can be explained by looking at previous literature. Research done by Mantzari, Sigalas & Hines (2017) shows that coercive and hegemonic pressures can lead to the application of a standard, without the actor being intrinsically motivated to use the standard. This is also in line with the previously named ‘coercive site of power’, defined by Fleming and Spicer (2014). Christensen (1982) showed with his research that there also could be economic reasons for participating within standardization. This is in line with the findings of the interviews done for this research, wherein it became clear that the most important reason for the housing corporation is to guarantee the affordability of the housing.

Lastly, the interviewees of this research confirm that their greatest opportunity to exert influence on the standardized product is before the construction project is in progress. However, the negotiation phase takes place after the standardized product is determined and is applied within a specific construction project. The other actors can influence the standard by adding requirements in a contract that underlies the collaboration between the construction actors. This finding corresponds to literature about developing standards between actors (Gibb & Isack, 2001; Lau et al. 2007). Because the contractor is the initiator of the standardization and offers a specific product, the other construction actors need to find a way during the negotiation about the contract in which they can influence the standardized product. This is done by claiming specific wishes in a contract that underlies the construction project. In this contract agreements can be made about the collaboration and actors can specify their roles and responsibilities. This is a way to renegotiate the social order. Keeping in mind the minimal influence of negotiation during the determination of the standard, this compensates the degree of influence that these other actors have on the standardized product. These findings are consistent with the results of the study by Poppo and Zenger (2002) about the relationship between formal contracts and relational governance: “Customized contracts narrow the domain around which parties can be opportunistic” (Poppo & Zenger, 2002, p. 721). This is in line with the statements of the interviewees about the opportunity to influence their tasks and the relations between the actors within the contracting phase of the construction project. This shows that within the contracting phase, actors have the opportunity to restructure the negotiated order.

### 5.1.2 Limitations and suggestions for further research

There are some methodological limitations in this research. These limitations are characteristics of design or methodology that impacted or influenced the interpretation of the findings.

The first limitation of this research is the limited number of interviews. Nine interviews were conducted within four different types of actors that were involved in two different construction projects. This limited number of respondents per actor can cause a distorted view of the total story. Because of the limited time and resources available, it was not possible to approach a bigger research group. For further research it could be a suggestion to focus on more cases with more of the same type of actors.

Another limitation of this research is related to the time span wherein this has been executed. Another way to learn more about the impact of product standardization on the negotiated order could be interviewing actors who work with a personalized product and actors who work with a standardized product. This to make a comparison.

Due to the short time span, it was impossible to investigate the before and after situation. The interviews were conducted on a certain moment in time. Respondents' opinions may have been distorted by a particular event. For example, one of the interviewed architects and contractors had delivered a successful joint construction project a few days before the interview. While another interviewed architect had a more negative evaluation about a recently completed construction project. This may have caused the answers to be more positive or negative than if the questions had been asked at a different moment in time.

It was not possible either to investigate all the contextual factors that influence the impact of and the process of determining the standardized product. Such as the economic situation and the amount of experience of the actors with product standardization. Therefore, longitudinal research could be recommended in further research.

### 5.1.3 Practical implications & recommendations

This research provides insights into the impact of product standardization on the involved actors within a construction project. The findings are based on interviews with employees of contractors, housing corporations, architects and municipalities. Besides the fact that this research shows the impact of product standardization, it also shows the process of determining the standards throughout the power relations within a construction project. The practical implications and recommendations that will be proposed in this paragraph are

mainly focused on these relationship changes between collaborative actors and on the interpretations and experiences of construction project actors.

The first recommendation is aimed at the architect and focused on the position of this actor in the negotiation process of determining the standard. This research showed that the role of architect, is compared to the other actors, affected the most by applying a standardized product. The architects finds that their knowledge and expertise are of added value in determining the standardized buildings. However, within the interviews with both contractors and architects, it became clear that the architect only has a prominent role in determining the standard when they are involved in the designing process of the standardized product. According to an interviewed architect, this could be done by changing the revenue model towards one wherein the architect also benefits from the number of products sold. To achieve this position the architect has to take initiative themselves. So that they can show the contractors the benefits of involving them in the development process of the standardized product. It could be recommended that the architect takes initiative themselves.

Besides the importance of involving the architect more in the development process of the standardized product, another practical recommendation sees on involving the housing corporation and also earlier. In this building process this actor is the client. The standard is determined when the product is developed. The interviews of this research show that the contractor mainly determines the standard himself. The employees of the housing corporations indicated that their input is occasionally requested as a client, but this is not standard procedure. In the end, the client needs to be willing to purchase the product. So to deviate as little as possible from the standard during the execution of the construction project, it could be efficient to involve the housing corporation more and earlier on in the process of determining the standard. This recommendation is aimed at the initiator of the development process of the standardized product, which is the contractor.

The last recommendation is addressed to all actors. This master thesis confirmed the theory by Strauss et al. (1978) that the negotiated order between actors is not fixed. This means that all actors have the possibility to strengthen their power position within the collaboration. For example, through networking or to focus on creating specific knowledge or expertise to cause some dependability of other actors.

#### 5.1.4 Methodological reflection

It is important that during the research you are aware of the role you have as a researcher. This is why I have evaluated my role as a researcher during the process of gathering data. After every interview I wrote down positive and negative points regarding my role within the interview. For example during the first interviews I noticed that I was tempted to do not ask any further questions, because I already thought I had all the information I needed. During the interviews that followed I however noticed that by doing this I could miss important information. Therefore, when I asked further I could understand the underlying dimensions better.

During the transcription process of the interviews I noticed another point of reflection. I noticed that I often asked closed questions with the aim to get a confirmation of the statement made by the interviewee. After I became aware of this, I tried to only formulate open questions. Even though, this sometimes made me feel like I was asking for the sake of asking.

Another point of reflection is related to my experience in the construction industry. In the first interviews I stated that I work for a contractor, but therefore interviewees had the tendency to speak in technical terms and had the tendency to lead information out, because they assumed that I already understood certain points. Such as how the building process is done and which actors are involved. For my research it was however important that these aspects were brought up by the interviewees themselves, because it is about their perspective.

#### 5.1.5 Reflexivity

In this paragraph I will reflect on my role as a researcher. According to Haynes (2012, as cited in Symon and Cassell, 2012) researcher reflexivity involves “thinking about how our thinking came to be, how a pre-existing understanding is constantly revised in the light of new understandings and how this in turn affects our research” (p. 73).

Reflexivity is about being aware of the assumptions I had before gathering the data. Looking back, the subject was chosen and eventually the main question of this research was formulated with some assumptions in mind. First of all, I expected that product standardization would have a big impact on the power relations within a construction project. I could best put myself in the position of the contractor, since I work for a contractor myself. Thereby I had some background information about the possibilities that a contractor has to determine the standard, without much involvement of other actors. I also had an assumption, when formulating the research question, about the alterations within work practices. Because of conversations I had

with employees of contractors and architects, I expected that product standardization would have the most impact on the position of the architect within the inter-organizational collaboration. Due to this expectation, I assumed that architects would be critical and pessimistic about the development towards product standardization. But in the end this was not entirely the case.

The same could be said for the interview questions, here was also a certain direction I expected to go into. For example, the choice of words: “Do you feel that you have gained more power because of the standardized product?” can push an interviewee in a certain direction. It can be proposed that this type of question could be formulated more openly, for example “Do you experience an alteration within the power of your organization because of product standardization?”. So that any expectations may have less influence on the opinion and experience of an interviewee.

This could perhaps also be the case with the data analyzing process. During the data analyzing process, when determining the open codes, the statement of interviewees have been labeled by codes formulated by myself. My expectations and assumptions as a researcher could have influenced the way I interpreted the quotes of the interviewees. For example the quote the following quote of an interviewed designer of an architect: “That sounds [...] if you would say it disrespectfully [...] that the builders have now all developed concept homes and in fact they only need the architect for the [...] approval from the welfare committee”. This quote is divided into a first order code ‘power’ and a second order code ‘decreased input’. However, these codes can be influenced by my assumption that an architects’ input within the process is decreased because of the partially shifted form the designing task from the architect towards the contractor.



## 5.2 Conclusion

The aim of this research is to gain insight into the impact of a standardized product (the modular buildings) on the individual work practices and inter-organizational collaboration of involved actors within a construction project. The outcome of this research can potentially optimize standardization within construction projects. In this paragraph the following research question will be answered: *How does product standardization impact negotiated order regarding individual work practices and inter-organizational collaboration of actors within a construction project?* Based on the findings as discussed in chapter four of this research it can be concluded that the distinguished actors (contractors, architects, housing corporations and municipalities) have different standpoints regarding the impact of standardization on their work practices and collaboration within a construction project. Therefore, the answers off the sub questions, that will be discussed below, consist of the different standpoints of the construction project actors.

To answer the main question of this research, three sub questions were formulated. The first one was: *“Which aspects lead to and what are the interests of the involved actors to develop a standardized product?”* As expected based on the literature, this research has confirmed that the involved actors within a construction project have different motives and interests for being involved in the product standardization process. This research has shown that the initiator of the standardization is the contractor. This actor seems to be most interested in less customization and a more standardized range of products, because of efficiency and cost advantages. From the viewpoint of the housing corporation standardized buildings can be interesting to help maintain their housing stock. Besides, as a client, the housing corporation wants to leave the responsibility of developing the product to the actor who has the right knowledge and expertise. According to the municipality standardization leads to simplification of their task, because the licensing process is made less complex due to the certificates that are awarded to the standardized products. This effect and the quality improve are the interests of the municipality for participating in the development towards product standardization. Product standardization is the least favourable for the architect. Their job is designing. Due to standardization designs are used multiple times, so there is simply less work for the architect. Their interest regarding product standardization is when it leads to long-term collaborations with contractors, so that the architect can also earn from the number of products sold.

Besides these motives and interests of developing a standardized product, this research also investigated the impact on the individual work practices of the actors of a construction project. The second sub question was: *“How is negotiated order regarding individual work practices of involved actors in the construction industry altered and (ideally) restored due to product standardization?”* Firstly it seems that due to standardization the individual work practices have been altered. The interviewed employees of the housing corporations claimed that their role within the building process is changed from active to more passive, as they do not have as much influence as they had on how the product should be build. This responsibility is allocated towards the contractor. With modular building the housing corporation only steers on performance requirements. The development process of the standardized product is mainly done by the contractor itself. Therefore, it can be concluded that the work autonomy of contractors has been increased because of the application of a standardized product. Instead of continuously adapting the product to the customers' wishes, the contractor develops a standardized product that can be used for different construction projects. Unlike the increase in work autonomy of the contractor, the development towards more standardization within the construction industry has decreased the work autonomy of the architect. Their impact on the final product is limited, in the first place because the product is applied repeatedly and therefore does not have to be redesigned every time. Secondly, because they are later in the process involved, then was the case with traditional building. There is simply less freedom of choice in the design process. According to the interviewees there has been a shift in involving architects by developing the standardized parts of the product, however according to the interviewed architects in practice this is more often not the case. The work practices of the last actor that has to be discussed, the municipality, are to a certain extent influenced by product standardization. Their task of granting the license is not altered, but only simplified.

Because of standardization the tasks of different actors have changed and have shifted among the different actors. Overall, the different actors negotiate about their work practices by clear agreements within the contracting phase. Besides, specifically the architect tries to keep their work autonomy by entering long-term collaborations with contractors to develop standardized products together. These activities could be seen as moments of negotiation in which the social order is restored. It also shows the power of the initiator of the product standardization, the contractor. Because of the favourable financial situation, the contractor can afford a certain arrogance in which they decide whether they are going into business with a customer.

The third and last sub question was: *“How is negotiated order regarding inter-organizational collaboration in the construction industry altered and (ideally) restored due to product standardization?”* Based on the research findings the conclusion can be made that the collaboration within a construction project has been impacted because of the application of a standardized product. The power relations between the actors within a construction project has changed. The housing corporation, which is the customer, simply has lower possibilities to influence the final product. The contractor determines the standard on their own and offers this product to housing corporations, as with traditional building the buildings were developed in association with the housing corporation, during the construction project. The contractors are in a prominent position, because of among other things the positive economic circumstances. Hereby they can refuse customers if their wishes do not suit the contractor's product. On the contrary, the power of the architect to influence the standard has been decreased. According to the interviewed architects, they often only play a role in the aesthetic part of the design of the building. Lastly, the position of the municipality has not been changed. They are still in charge of granting the license, whereby they can influence the final product. Through product standardization the negotiated order between the involved actors is altered, because the actors fulfil other positions within the collaborations. More precisely, the mutual relationships of the construction project actors are altered, because of product standardization. With the application of modular building the contractor is the leading actor and manages the contacts within the collaboration. As with traditional building the housing corporation took on this managing role. In particular the position of the architect in modular building differs from traditional building. Their contact is limited, their only communication point is the contractor, as with traditional building they also had to coordinate with the municipality and the housing corporation.

In conclusion, the negotiation between the tasks and positions of the different actors continuously takes place. However, the contractor can use his power to force the participation of the other construction project actors. The contractor determines the standard without much involvement of other actors, which gives the contractor a certain power position within the inter-organizational collaboration. Negotiation can be found in particular in the different knowledge and expertise of the actors, which makes them all necessary actors within the construction project. In particular the power position of determining the product is shifted from the housing corporation towards the contractor.

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## Appendix 1: Interview guideline

Interview number:
Date:
Time:
Location:
Name participant:
Company:
Function:

Introductie	
<ul style="list-style-type: none"> <li>- Toestemming vragen om het gesprek op te nemen.</li> <li>- Korte inleiding met toelichting op het onderzoek, de interviewer en de instantie waarvoor het onderzoek wordt uitgevoerd.</li> </ul> <p><i>Onderzoeksvraag: Wat is de impact van standaardisatie op het werken van actoren en de samenwerking binnen een bouwproject? (How does product standardization impact negotiated order regarding individual work practices and inter-organizational collaboration of actors within a construction project?)</i></p> <ul style="list-style-type: none"> <li>- Het interview zal maximaal één uur in beslag nemen en de gegevens zullen anoniem worden verwerkt.</li> </ul>	
Onderwerpen	Vragen
General	<ol style="list-style-type: none"> <li>1. Kunt u het bouwproces waarin u betrokken bent van idee naar opdracht omschrijven?</li> <li>2. Hoe zou u de rol van uw partij in het proces van idee naar opdracht omschrijven?</li> <li>3. Welke taken/verantwoordelijkheden heeft uw partij?</li> </ol>

	<p>4. Wat is uw functie en wat houdt dit in? Kunt u uw werkzaamheden in grote lijnen omschrijven?</p> <p>5. In welke fase van het bouwproces (idee tot opdracht) bent u precies betrokken?</p>
<b>Task, responsibilities and goals of actors within inter-organizational collaboration</b>	<p>6. Welke partijen zijn volgens u te onderscheiden in het bouwproces (idee naar opdracht)?</p> <p>7. Welke taken/verantwoordelijkheden ziet u voor deze verschillende partijen?</p> <p>8. Hoe zou u de samenwerking tussen de betrokken actoren omschrijven? Wat is het doel van de samenwerking? (Gaat het om het genereren en delen van kennis of heeft de samenwerking een strategisch doel?)</p>
<b>Characteristics application standardized product</b>	<p>In de bouwsector wordt steeds vaker gewerkt met een gestandaardiseerd product (conceptwoningen).</p> <p>9. Wat zijn volgens u de verschillen tussen het werken met een gestandaardiseerd product (conceptwoningen) en het werken met een variabel product (traditioneel bouwen)?</p> <p>10. Wat is volgens u de aanleiding voor het werken met een gestandaardiseerd product (conceptwoningen)?</p> <p>11. Wat is volgens u het doel van de toepassing van een gestandaardiseerd product (conceptwoningen)? Welke belangen ziet u voor uw partij?</p> <p>12. Hoe komt het bepalen wat de standaard is tot stand? Welke partijen zijn hierbij betrokken en op welke manier</p> <p>13. In hoeverre bent u (of uw partij) betrokken geweest bij de ontwikkeling van het gestandaardiseerde product (conceptwoningen)?</p>
<b>Impact of standardized product on actors' individual work practices</b>	<p>14. Hoe ervaart u de verandering in keuzemogelijkheden m.b.t. het ontwerp van het product (de woningen)?</p> <p>15. Wat is volgens u de impact van het werken met een gestandaardiseerd product (conceptwoningen) op de rol van uw partij in het bouwproces (samenwerking)? Wat is de impact op de taken en verantwoordelijkheden van uw partij?</p>

	<p>16. Wat is volgens u de impact van het werken met een gestandaardiseerd product (conceptwoningen) op uw vrijheid binnen uw rol in het bouwproces?</p> <p>17. Wat is volgens u de impact van het werken met een gestandaardiseerd product (conceptwoningen) op de samenwerking met andere partijen in de keten? (<i>Indirect doorvragen naar machtsrelaties</i>).</p>
<b>Proximity &amp; barriers</b>	<p>18. Welke culturele barrières/uitdagingen ziet u m.b.t. de toepassing van een gestandaardiseerd product in het bouwproces (samenwerking)?</p> <p>19. Welke organisatorische barrières/uitdagingen ziet u m.b.t. de toepassing van een gestandaardiseerd product in het bouwproces (samenwerking)?</p> <p>20. Welke barrières/uitdagingen ziet u nog meer m.b.t. de toepassing van een gestandaardiseerd product in het bouwproces (samenwerking)?</p>
<b>Expectations standardized product (loop)</b>	<p>21. Welke verwachtingen heeft u ten aanzien van de toekomstige toepassing van een gestandaardiseerd product?</p> <p>22. Wat moet volgens u nog gebeuren om de toepassing van een gestandaardiseerd product te verbeteren?</p> <p>23. Zijn er punten die volgens u in relevant zijn maar in dit interview nog niet aan de orde zijn geweest?</p>
<b>Afsluiting</b>	
<ul style="list-style-type: none"> <li>- Ter afsluiting vragen of de respondent nog opmerkingen of vragen heeft.</li> <li>- Vragen hoe de respondent het interview heeft ervaren.</li> <li>- Vragen naar eventuele informatie/documenten die nuttig kunnen zijn voor mijn onderzoek.</li> <li>- Aangeven dat aanvullingen nog gegeven kunnen worden per mail of telefoon.</li> <li>- Aangeven dat het transcript ter goedkeuring zal worden verstuurd.</li> <li>- Indien gewenst zal een terugkoppeling worden gegeven op het onderzoek.</li> <li>- Nogmaals dank voor uw medewerking aan het onderzoek.</li> </ul>	