

INTERNATIONAL COLLABORATION AND PARTNERING IN THE SUPPLY CHAIN AS BUSINESS OPPORTUNITIES FOR ARCHITECTURAL FIRMS

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Due to a shift towards market driven concepts, a risk allocation from the demand side to the supply side and the increasing competition with other skilled actors in the value chain, architectural firms have to adapt quickly to stay competitive. They need to innovate not only their products and services, but also make more fundamental changes in the way they create and appropriate value, thereby replacing or innovating their business models. This research addresses business model design of architectural firms from an activity system perspective. It aims to identify activity systems that are used within the architectural service sector to create and capture value. By analysing the possibilities and restrictions of the activity systems in relation to both firm and supply chain, business opportunities for architectural firms are explored. Archival data and 20 explorative interviews with different architects, clients and contractors, contribute in the identification of two emergent activity systems: international collaboration and partnering in the supply chain. Since the activity systems include new activities, linkages and actors, they require managerial attention in order to 1) enhance value creation and capture by the firm and 2) guarantee optimal collaboration within the supply chain. By applying the concept of activity systems on the field of architecture, the importance of business model design for the value chain of architectural services is showed.

Keywords: architectural services, business model design, collaboration, supply chain integration.

INTRODUCTION

Fuelled by our fast changing society and increasingly unpredictable economy, organizations ability to adapt has become more important to survive. Firms need to develop new business models or alter their existing ones to create and capture value when markets, technologies and legal structures are changing (Teece 2010). Thus, constant innovation of the business model is essential to maintain a healthy business. Together with the financial crisis, global societal changes forced the architecture, engineering and construction (AEC) industry to undergo significant changes during the last decennium. In the Netherlands, a shift towards more integrated project delivery and a risk allocation from the demand to the supply side have resulted in new forms of collaboration, new roles and new responsibilities for all actors in the value

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chain (Volker and Klein 2010). Driven by their decreasing performance, architectural firms pursue new activities and even take over roles of other actors. Competition has become widespread and extremely high. Since the end of 2008 the turnover of architectural firms decreased tremendously. While the total turnover of the Dutch architectural service sector was estimated at approximately € 1.7 billion in 2008, in 2012 it was only € 0.7 billion. Employment within architectural firms decreased with 58% in that same period (BNA 2013). Although recent studies show stabilizing trends, firms expect further shrinkage of their turnover and workforce (Holtackers 2013).

As a result of the difficult market situation, the demand for new business models in the architectural service sector is high. But, especially when working in the public sector, firms tend to focus on the architectural quality of the service they provide and largely neglect the entrepreneurial side of their business (Cohen *et al.* 2005). Insights into business model design of architectural firms might improve managerial thinking by architects and could subsequently increase business opportunities within the sector. Zott and Amit (2010) present an activity system perspective on business model design. The activity system enables the firm, together with its partners, to create value and to appropriate a portion of that value. In this empirical research we use the activity system perspective on business model design to analyse value creation and appropriation of architectural firms. So far, research on value creation by architectural firms has been mainly explorative (BNA 2011, RIBA 2012). These studies provide insight in activities that might be of importance for architects to secure their current and future workloads. However, interdependencies with the firm's business model - other activities, actors and revenue models - remain underexposed.

Hence, our study addresses value creation in the field of architecture by using a systematic approach from business model literature. The research aims to identify and analyse current trends in value creation of architectural firms in order to recognize business opportunities. This shows the importance of business model design for the AEC industry and demonstrates that business model theory is able to contribute to an analysis of value creation by architectural firms. In addition, this research provides practitioners with an understanding of business model design and a detailed description of activity systems. The activity system perspective helps firms to rethink and redesign their business model based on current and new activities.

This paper is organized as follows. First, the theoretical background is presented, starting with a discussion of value creation in the AEC industry and by architectural firms in particular. Then business model design is introduced from an activity system perspective. Next, the paper focusses on our research methods, including research strategy, selection of respondents, data collection and data analysis. Then the findings of the explorative study are presented and analysed. Finally, concluding remarks and directions for future research will be offered.

VALUE CREATION IN THE AEC INDUSTRY

The AEC industry involves complex activities and many actors. Although different models can be used to understand the value creation and appropriation in the AEC process, none of them seems able to capture the totality (Bygballe *et al.* 2013). Architectural firms, as part of the supply chain, create and appropriate value together with their business model partners. Following Winch and Schneider (1993), several factors distinguish architectural practices from other types of firms. Architectural organizations deliver services, are professional, creative and purely knowledge-based. Value creation within architectural firms highly depends on the people involved, since

the expertise of the staff is indispensable for the service that is delivered. Within the scope of Dutch AEC activities, the traditional selection of architectural activities is very broad. This comprehensive amount of architectural activities originates from the time that only client, architect and builder were involved in the building process (Duffy and Rabeneck 2013). As complexity and fragmentation of AEC projects grew over time, the number of actors in the value chain of architectural services increased. Architectural firms, however, were still used to deliver a range of ‘full services’ in architecture, engineering and construction stages. The ‘Standard Job Description’ (BNA and ONRI 2009), which is used by Dutch clients and architects to define their working arrangements, mentions ten stages in which architectural services can be delivered. The activities include programming activities prior to the design in the first two stages, architectural design activities in stage three until five, engineering activities in stage six to seven and engineering, supervision and aftercare activities in the last three stages. Due to scarcity of financial resources, integrated contracts and an increasing competition among actors in the value chain, the scope of architectural activities has declined and become less defined in the last couple of years. However, the business model and revenue structure of most architectural firms is still based on the delivery of ‘full services’ in architecture, engineering and construction stages.

BUSINESS MODEL DESIGN

Although the concept of the business model is very popular among scholars and business strategists, there is no general agreement on what the business model is and how it can be used (e.g. Shafer *et al.* 2005). Starting from different conceptualizations of the business model, certain common themes emerge in literature (e.g. Morris *et al.* 2005, Zott *et al.* 2011). The business model can be viewed as a template of analysis on how firms conduct their businesses on a system level. Business models try to explain how value is created and delivered to all stakeholders (e.g., the firm, clients, partners, etc.), and how value is appropriated by the firm (Zott *et al.* 2011). The emerging consensus is that a business model may be defined as the rationale of how an organization creates, delivers, and captures value in relationship with a network of exchange partners (Afuah and Tucci 2001, Osterwalder and Pigneur 2010). The business model is a conceptual, rather than a financial model of a business. It outlines the logic to create and capture value, by making implicit the expectations of (changing) customer needs, associated revenues and costs, and competitor responses (Teece 2010). The overall objective of a firm’s business model is to exploit a business opportunity by creating value for parties involved, while generating a profit for the firm and its partners. The objective is reflected in the customer value proposition and explains why clients choose for a certain firm (Zott and Amit 2010). A good business model presents value propositions that are attractive to customers, is specifically designed to deliver that value, and has a profitable revenue model that enables the firm to capture a share of the value that is created (Teece 2010).

Teece (2010) notes that without a well-developed business model, firms will either fail to deliver or to capture value. To stay competitive, firms should re-evaluate their business model design frequently. They need to consider not only how to address changing market demands, but also how to capture value from providing new products and services. Hence, an understanding of business model design may help firms to establish competitive advantage (Teece 2010). The business model design captures how the firm is embedded in its networks and defines who are the firm’s potential partners, customers, suppliers and competitors. Zott and Amit (2010: 216) present an activity system perspective on the design of the business model. They conceptualize a

business model “*as a system of interdependent activities that transcends the focal firm and spans its boundaries*”. An activity can be viewed as the engagement of resources of any party to the business model to create and deliver specific value. Focusing on activities allows concentration on the firm, while considering the social aspects and transactional dimensions of relationships with business model participants. It provides a natural perspective for entrepreneurs and encourages the firm to think about the fundamental and integral aspects of the business model (Zott and Amit 2010). The activity system helps to create value and to appropriate a share of that value in an understandable and well thought out way (Zott and Amit 2010).

Zott and Amit (2010) suggest two sets of parameters that should be considered in the design of an activity system: design elements and design themes. The design elements describe the architecture of an activity system. These are content, structure and governance. The content of an activity system refers to the selection of activities. For example, a secondary market influences the selection of activities and is therefore a content issue. The activity system structure describes the linkage between activities and their importance for the business model. By building on existing knowledge and experience, for instance, new services delivery can be developed. The linkage between established methods and new services is a structure issue. Finally, governance refers to who performs the activities within an activity system. Whether an architectural firm, client or contractor is performing a set of activities is a governance issue. The design themes describe the sources of the activity’s system value creation. They detail the main value creation drivers and are configurations of the design elements. Zott and Amit (2010) distinguish four common design themes that are used by firms to create value. In novelty-centered business model design the economic exchange between partners is focussed on the involvement of new activities, new connections between activities or new governance mechanisms for activities. Efficiency-centered business models aim to maximize the efficiency of firm’s transactions and to reduce the costs of all the partners. When activity systems are designed for lock-in, they are able to retain third parties as evident participants of the business model. Complementarities are present when more value is generated by bundling activities (Zott and Amit 2010).

RESEARCH METHOD

In this research we use Zott and Amit’s (2010) activity system perspective on business model design to identify and analyse emerging activity systems in the architectural service sector. Since service delivery by architectural firms is highly complex and depending on the collaboration with other actors, a qualitative research strategy with exploratory interviews was used to gather a wide range of empirical data from the perspectives of different actors. In the presentation of our findings, we identify emergent activity systems firms use to maintain or improve their performance in the field. After a short introduction, the activity systems are analysed using the three design elements – content, structure, governance – as defined by Zott and Amit (2010). Due to the short time-span of this study we chose to limit this research to the identification and analysis of design elements, the core ingredients and architecture of the activity system. But, as design elements and design themes of activity systems could be highly interdependent (Zott and Amit 2010), some tentative links with design themes will be made as well in the discussion of our findings.

Research sample

In order to gather in-depth information on current and future business model design of architectural firms, we used the purposeful sampling technique of maximum variation

to capture a wide range of perspectives. We selected architects, clients and contractors from different areas in the Netherlands to allow various perspectives to arise on architectural value creation and delivery and to address collaboration within the supply chain. Respondents were selected from different types of established project collaborations (e.g. traditional-, team-, integrated collaboration), to explore typical ways of working, and from different types of innovative project collaborations (e.g. bottom-up initiatives, strategic alliances, network collaboration), to include more extreme ways of working. To ensure a good representation of the architectural field in the Netherlands, the sample consists of firms with different characteristics and different firm size. We included design firms, that are characterized by their emphasis on the delivery of design services, and firms that focus on the delivery of integral services, which for instance may comprise design, engineering and management services. With regard to firm size, three sizes are distinguished: micro-sized firms that employ fewer than 10 persons, small-sized firms with fewer than 50 persons and medium-sized firms with fewer than 250 persons (European Commission 2005). We refer to the respondents as architect A to O, client A to B and contractor A to C. Table 1 presents an overview of the selected respondents.

Table 1: Overview of respondents

Respondent	Firm characteristics	Firm size
Architect A - B	design	micro
Architect C - D	design	small
Architect E	design	medium
Architect F - G	integral	micro
Architect H - L	integral	small
Architect M - O	integral	medium
Client A - B	not relevant	not relevant
Contractor A - C	not relevant	not relevant

Data collection

We used 20 exploratory face-to-face interviews to collect data on value creation, delivery and capture by architectural firms. Archival materials and informal discussions were used to prepare for the interviews, to expand the understanding of each firm's context, and to strengthen or question the findings of the interviews. All interviews were approximately 1,5 hour in length. For the interviews a semi-structured protocol with open-ended questions was used. To ensure reliability of the data, the interviews were audiotaped, fully transcribed and checked by the respondent. The following topics were addressed in the interviews: roles and activities of the architect, collaboration with partners, client and suppliers and future business directions. The respondents were asked what activities they perform to enhance their value creation, what processes are used to organize the output and what actors are relevant in the delivery and capture of value. In order to identify activity systems that are important for the entire field of architecture, we looked for activities that were mentioned by multiple respondents or had a strong relationship with aspects mentioned by another respondent.

Data analysis

The data from the interviews were analysed by the authors and two other researchers using the technique of context mapping (Sleeswijk Visser *et al.* 2005). Statement

cards with paraphrases and relevant quotes have been derived from each interview transcript by one of the researchers. Then, the statement cards were discussed in a group meeting and categorized by themes. Disagreements that occurred were discussed until consensus was achieved. The relations between the themes were visualized and a codebook was created. Different key themes were identified as activity systems for value creation. The research findings were consolidated and validated in a workshop with practitioners to ensure reliability of the data. After this validation, data were reexamined and the key themes were further analysed and extended by looking for similarities and differences in the data. The codebook went through several iterations.

FINDINGS

Two activity systems that were identified in the content analysis are international collaboration and partnering in the supply chain. Each activity system is introduced shortly. Then the activity systems are analysed from a firm perspective using Zott and Amit's (2010) design elements – content, structure and governance. As Zott and Amit stress, the activity systems remain firm-centric. However, since our data suggest that other actors are of major importance to the architectural firm's business model, we choose to discuss the activity systems from a more structural point of view.

International collaboration

While some respondents believe that international markets provide opportunities to create and appropriate value, others deliberately don't work outside the Netherlands. Eight of the fifteen architectural firms are currently working abroad. They include design and integral firms of small or medium firm size. Reasons to work abroad include a higher building activity, available resources and lack of international competition. Some of the firms, like the firm of architect M, are asked by international parties because of their specific knowledge in a field that is less evolved in the country in question. Also Dutch architects are chosen because of other design approaches or working methods. The architectural firms that do not work outside of the Netherlands only include small or micro-sized firms. The firms of architect B and G still have a big workload in the Netherlands. Other firms, like the firm of architect D, simply do not have enough resources available to focus on international markets.

Content

Regarding the content of the activity system, working in international markets focusses on design or consultancy services in the first stages of the AEC process. Engineering and construction related tasks are executed by a local partner because these activities require knowledge of the local legal context and construction methods. Hence, all respondents believe that the collaboration with local partners is vital for the delivery of value to international clients. This means that 'full service delivery' is not applicable for architectural firms when working in international markets. However, activities in the first stages of the AEC process might become more comprehensive.

Structure

The internationally active respondents expect their international workloads to grow in the future. However, for some firms the revenues are currently still lagging behind expectations. The firm of architect O, for instance, is only able to participate in smaller one-on-one activities in Poland, because of the local price-based procurement tradition. But a good relationship with the embassy leads to multiple lecturing activities at the University and might eventually improve the firm's position. Although the linkage of different activities is highly project specific and varies per country, the

example of architect O illustrates that regarding the structure of the activity system, contacts with local authorities or institutes might be beneficial to the acquiring or performance of activities. As new connections play a vital role in the process of value creation, the activity system's structure relates strongly to the design theme novelty.

Governance

In order to gain more international projects and to maximize mutual benefits, Dutch architectural firms engage in partnerships with other firms. Regarding the governance of the activity system, three types of actors are mentioned to contribute in international value creation and appropriation. First, as explained earlier, international partners are crucial to understand the market situation, culture and customer needs. Secondly, partnerships with other Dutch architectural firms are initiated to compete with (bigger) international companies and to expand the scope of service delivery. These firms include architectural firms of same size and characteristics (architect M) and firms with different expertise (architect L). Finally, other Dutch firms from the supply chain, such as engineering firms, contractors or product suppliers, can contribute in a broader and more integrated service delivery. *"We note that the Netherlands is the world top right now in new, innovative work environments. (...) we really have a Dutch export product. Therefore, we have (a collaboration with) a furniture supplier and a concept developer. With those three, we want to create a kind of total project delivery"* (architect K). In this way, value creation can be enhanced on both firm level and supply chain level. Since new actors are involved, the activity system's governance closely relates to the design theme novelty.

Partnering in the supply chain

As architect H articulates, the design process and involved actors, activities and responsibilities are becoming more and more fragmented. *"The design is no longer an entity that requires one party to be involved, it has become a cluster where various parties each have their own input. It has become much more complex"* (architect H). Collaboration with other actors is not only important to deliver adequate services to the client, it also enables the firm to capture more value (architect K). The empirical data showed that partnering in the supply chain is done by six of the firms in order to stimulate value creation and appropriation. In addition, five of the firms work together with other architects to improve their value creation and appropriation in the field. Partnering with organizations outside the AEC industry is done by some architectural practices (architect C), but was only scarcely mentioned by the respondents.

Content

Partnering in the supply chain involves new activities that are not directly linked to the traditional AEC work of the architect. Networking activities and the investment in relationships have become very important. Partner selection, although this is often executed last-minute (architect E), or in contradiction with the established ways of working (contractor C) is also a new activity that requires attention. The selection of partners can be of major importance to acquire a project and also highly influences the total value that can be created and captured. Finally, with the identification and development of common strategies firms are able to improve value creation among all partners. The new activities involved in the content of the activity system point once again towards the importance of the novelty-centered business model design.

Structure

When analysing the structure of the activity system, it stands out that activities of partnering are mainly linked on the basis of trust and common ground. Trust can be

established by developing and working towards a shared goal or by discussing each partners priorities from the start (e.g. architect N and contractor B). Incentives, like a success fee, are used to create high involvement of all partners and to make sure that all partners maximize their input (contractor C). Since every project is highly unique, most of the respondents are currently working with different partners on each project. Several firms, however, are looking for possibilities to engage in long-term partnerships, as a way to stimulate efficiency and increase revenues. At this moment long-term partnerships are still scarce and in development. Although the structure of the activity system is currently characterized by a high degree of novelty, the aim of many firms is to move on towards an efficiency-centered activity system.

Governance

Regarding governance of the activity system, the interviews show that the actors involved in partnering include all kinds of firms from the supply chain. The firm of architect N pushed off some of their divisions to keep focus on their own core business: to conceptualize and visualize an idea based on the requirements of the client. Since these requirements are becoming more complex and comprehensive, partnerships with other actors are used by architectural firms to keep a focus on the core business (architect L). The partnerships generate a more integrated service delivery and increase the scope of the service. Suppliers have become important partners to deliver an integrated process and product to the client. These actors are involved in early stages of the AEC process to improve integration, efficiency and reduce costs (architect O). Partnering with other actors from the field can also stimulate innovation, which is illustrated by architect I, who develops strategic alliances with contractors, construction engineers and research institutes to further innovate their shared BIM expertise. The activity system's governance contains elements of the design themes novelty and efficiency.

CONCLUSION

This research aims to identify and analyse current trends in value creation of architectural firms. It also discusses their implications on firm level and supply chain level. Empirical results of 20 explorative interviews with different architectural firms, clients and contractors show two emergent activity systems that are used by architectural firms to create and capture value: international collaboration and partnering in the supply chain. Since these activity systems involve new activities, linkages and governance mechanisms, they point out that business model design of architectural firms should change concurrently. A re-design of current or design of new business models is necessary to 1) successfully create and capture value on firm level and 2) optimise collaboration on supply chain level. The design elements of Zott and Amit's (2010) activity system perspective on business model design – content, structure and governance – are used to systematically analyse the two activity systems and discuss their implications. The activity system international collaboration contains elements of the design theme novelty, while the activity system of partnering in the supply chain includes both novelty- and efficiency-centered aspects.

Regarding the content of the activity systems our study confirms that the traditional selection of architectural activities is currently changing. International collaboration results in a narrowing down of activities to the first stages of the AEC process.

Partnering in the supply chain helps firms to provide a joint 'full service delivery' to the client. Partnerships can help to secure activities and revenues for the firm, but

require attention to new activities like partner selection and a shared goal definition to optimise collaboration among all actors.

Although the linkage of activities is highly project related, certain common topics can be identified regarding the structure of the activity system. For international collaboration the involvement of high level parties can help to generate a stable basis for settlement. Partnering in the supply chain requires arrangements for collaboration. These arrangements can be based on trust or formalized in contracts. In both cases the development of a common ground and use of incentives can be fruitful.

Regarding the governance of the activity system, other actors are of importance to the business model of the architectural firm. In international collaboration, actors include local partners, other Dutch architectural offices or Dutch firms from the supply chain. For partnering in the supply chain, firms with different kinds of expertise are important to provide a 'full service delivery'. When collaborating with contractors or product suppliers for instance, value creation and appropriation can be enlarged for the architectural firm as well as for the partners involved.

LIMITATIONS AND FUTURE RESEARCH

The theoretical framework of the activity system offers opportunities to gain insight in the aspects that contribute to the design of business models. This research emphasizes the importance of business model design for architectural service firms, but has certain limitations that deserve to be mentioned. First, as mentioned in literature (Cohen *et al.* 2005) and confirmed by our respondents, the majority of architectural firms is not particularly concerned with their business model. To understand why this is and how this can be improved requires further research. Secondly, as pointed out in the section on our research method, this paper focusses on the identification and analysis of design elements in architectural activity systems. Further research and analysis will be necessary to study design themes in architectural service delivery more thoroughly and to provide a broader discussion on the interrelation of design elements and design themes.

As noted by Zott and Amit (2010), the activity system perspective could help to improve empirical understanding of past and current business models, to develop predictive theory on business model design, and to design new business models for the future. Future research could explore the relationship between the firm, the business model stakeholders and the value creation processes further. For this purpose, a larger sample of firms and combination of empirical research techniques is desirable.

Other AEC firms, for instance engineering firms or consultants, could also benefit from the activity system perspective on business model design. When applying the concept on several sectors of the industry, new sustainable models for collaboration within the supply chain could emerge. Hence, when customized to the characteristics of the industry, the activity system perspective on business model design could present a framework to address strategic issues on different industry levels.

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