

## **MASTERING THE POLITICAL PROCESS OF BUILDING INNOVATION NETWORKS – A CASE FROM THE DANISH CONSTRUCTION INDUSTRY**

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Drawing on network of innovation and organizational politics perspectives this paper analyzes the role of an innovation broker organization in developing and supporting an inter-organizational innovation process in the Danish construction industry. The aim is to implement an ICT-based product configuration tool to support the production, sale, and installation of balconies. It is suggested that the innovation broker was successful in stabilizing the innovation process by supplying minimal structures which provided a template which facilitated a combination of individual flexibility and overall synchronization. These minimal structures were both conceptual and processual. In the development phase these structures facilitated a processes of experimentation in which the utilization of the configurator were utilized to organize the development of several aspects and activities such as branding, product structure, production- and communication processes, and client approach into a coherent vision of change. This rendered the idea political strong in the implementation phase where former core business activities, such as exterior refurbishment, which did not fit into the new practices, were excluded from the network. The innovation thus grew strong enough to replace existing practices and identities and to embed new ones into new organizational structures and a new business-concept.

*Keywords:* innovation brokering, political process, minimal structures, innovation networks

### **Introduction**

For several decades the Danish construction industry has been widely accused of underperforming when it comes to innovation. Thus, formal R&D and growth in productivity has been consistently low compared to the industry as a whole (EBST 2002). A variety of arguments has been mobilized to explain these phenomena. These arguments have typically focused on the fragmentation of the production process (EBST 2002) or the difficulties of innovating in a project based production environment (Winch 1998, Bresnen et al. 2004). These explanations have often been advanced with a structural bias leaving little room for individual change agency. A typical example of this structural heuristic is the idea of a lock-in-situation, suggesting that the structure of coordination and cooperation at the sector-level hinders single actor strategies (EBST 2002).

Without ruling out the structural conditions for agency this paper argues that successful change agency is indeed possible in the construction industry. The paper argues that successful innovation is critically dependent on the ability to master the political process of forging inter-organizational innovation networks. It is further suggested that such political processes may be managed through the application of minimal structures (Kamoche & Cunha 2001) which defines templates upon which different actor may develop their political identity and interests.

These arguments are applied to the analysis of an inter-organizational innovation network in the Danish construction industry aiming to develop a configurable balcony solution supported by the innovation broker organization Building Lab DK. The aim of Building Lab DK is to catalyze inter-organizational innovation networks in the construction industry. It is an organization which is dedicated to the development of managerial competencies in relation to innovation processes.

### **Method**

The theoretical orientation of this paper is inspired by political process theory (Pettigrew 1977) meaning that the direction to the innovation process is seen as emerging rather than established through rational planning. This political approach is complemented by improvisational theory and the concept of minimal structure which is suggested as a managerial strategy to cope with emergent processes (Kamoche Cunha 2001, Barrett 1998).

The paper takes a case study approach (Flyvbjerg 2006) in appreciation of the highly idiosyncratic nature of innovation processes. The empirical material consists of three semi-structured interviews (Kvale 1997) with the staff of Building Lab DK and one with a business manager from the key company in the innovation network conducted during spring 2007 and written documentation produced during the innovation process.

One of the authors is currently working in Building Lab DK. While this may result in a slightly positive bias, he has also been a major resource of empirical material.

A limitation to the case-study is that the innovation process is still evolving. It thus remains to be seen for how long the network will continue to evolve and what the final shape will be. It also remains to be seen if the managerial strategies developed and provided by the innovation broker organization will diffuse and find a more general application within the Danish construction industry and thus have a wider impact in the industrial development. Also, to some extent the case findings are of course relative to the idiosyncrasies of the Danish construction industry. However, the challenges to innovation in construction are to a large extent generic, given the nature very of the product (location based, long life-span etc.) (Pries & Janszen 1994)

## **Managing Innovating in Inter-organizational Networks**

In line with the tradition of political process theory (Pettigrew 1977; McLoughlin et. al 2001), we shall suggest that inter-organizational innovation processes may be conceived as interest driven or political. Originally, the political process perspective was developed within an intra-organizational perspective. Change-processes were conceived as driven by political strategies and interests within the boundaries of a single organization.

To inter-organizational innovation change processes the political perspective is however also highly relevant as inter-organizational innovation networks consist of collaboration between independent organizations without any formal hierarchical leadership.

In order to bring the political characteristics of inter-organizational innovation networks more clearly into focus Dal Fiore (2007) has contrasted the activities of such networks with the institutionalized interaction between companies and organization. Thus, according to Dal Fiore such ongoing patterns of interaction are institutional rather than innovative. Institutional patterns of interaction are seen as embedded in communities, which serves the function of maximizing social control over individuality. Thus, communities are pictured as “closed entities” where agents feel the pressure to conform to social rules and norms.

On the contrary, the function of innovation network is to maximize individual control on sociality. Such networks are thus less bounded adhocracies, open to being exploited by individual agents. Thus:

“Inside communities, communication has a self-referential component; at every moment, boundaries and identities of community are reaffirmed through language and communication so that communication inside communities can be visualized as a centripetal force (...). On the other hand, communication inside networks develops along divergent lines and end up bridging different universes of meaning to generate new paths of meaning; it can be visualized as a centrifugal force (...) (Dal Fiore 2007:860)”

In line with this political conception of inter-organizational innovation networks McLoughlin *et al.* (2001) points to the “way in which the development of a new product can be seen as predicated on the building of a network of support through the enrolment of key supporters and interests (McLoughlin *et al.* 2001)”. As key areas of the political process they propose a three-fold focus on resources, the process of coalition building and the role of so-called “deeper structure” such as culture as sources for creating meaning. The process is seen as political to the extent that innovation networks are characterized by co-existence of both conflict and cooperation as actors form alliances in order to gain influence in the network. Empirical studies by Van de Ven *et al.* (1999:97) furthermore supports the political perspective, pointing to the fact that different positions within an organization do not reflect homogenous perspectives but often express opposing views during the innovation process.

Harrison and Laberge (2002) have developed a social-constructivist interpretation of the political process perspective. In their view phenomena such as “appropriateness” and “interests” are political constructs. Innovation-networks are pictured as composites of disparate elements which are disembedded from their original context in order to form a new universe. Innovation processes are conceptualized as processes where the structure of established norms, identities, and technological components are dissolved and brought into a political process in order to form a new socio-technological configuration. Innovation networks do thus often resemble a patchwork of fragments from existing networks pieced together in processes where actors try to advance or defend their position in the interpretive process of defining the network in a new way. The innovation process is pictured as a:

“(...) network between innovating actors who negotiate and come to an agreement, thus making up for the inadequacy of institutional and organizational forces which primarily serves the status quo. Innovation means dismantling existing associations and creating and stabilizing new ones for a while, even though there are often contradictions between innovation and the organization (Harrison and Laberge 2002:501)”

As innovation networks entail the “dismantling of existing associations” the political process becomes highly interpretive as the associations that normally define the identity and interest of the various actors are being dissolved.

With its emphasis on the centrifugal forces of individual interests the political process perspective poses a fundamental challenge to ideas of innovation management. The possibility of a coherent change agenda are however brought into view by conceiving identity and political interest as socially constructed. But how should the conditions for an innovative realignment of identities, capabilities, resources and technology be established?

Inspired by jazz improvisation the concept of minimal structures has been suggested as a way of managing innovative processes (Kamoche & Cunha 2001; Barrett 1998). The basic idea is that innovation management is about creating “minimal structures” to facilitate innovative improvisation in coordination between different specialists. Thus, according to Kamoche & Cunha (2001):

”A working definition of improvisation may be taken from jazz music, where it entails composing and performing contemporaneously”.

By emphasizing the relation between action and learning the approach points to the limitations of managerial strategies which suggests a too well defined relation between means and end early in the process. Managerial strategies should however not be discarded all together. It is rather argued that there is a creative and innovative pathway between chaos and rational

planning. Utilizing the image of jazz improvisation Barret (1998) identifies the following features of innovative improvisation:

- (i) Provocative competence: Deliberate efforts to interrupt habit patterns
- (ii) Embracing errors as a source of learning
- (iii) Shared orientation towards minimal structures that allows maximal flexibility
- (iv) Continual negotiation and dialog towards dynamic synchronization
- (v) Reliance on retrospective sense-making

According to Kamoche & Cunha (2001) management through minimal structure stands out as the fundamental prerequisite for improvisation:

“The minimal structure serves as a template upon which improvisation can take place – you cannot improvise on nothing. If there is agreement about the basic aspects of the process, e.g. behavioural norms, leadership, deadlines, product concept etc., product designers have unfettered scope for creativity (...)”

Although the concept of minimal structures has not been developed within the tradition of political process theory we find that it may be a fertile concept especially within a social-constructivist perspective on identity and interest as the basic idea is that the individual and common is co-constructed in the innovative process.

Minimal structures are also political in the sense that they are not all-inclusive. Like political process theory improvisation establish a center and periphery, where somebody gains in importance and come to perform the solo, while others may be forced to stand back or maybe leave the stage altogether. It is thus not a non-political managerial strategy but rather a strategy by which to cope with the political nature of creative processes.

### **The Program of Building Lab DK**

The innovation network of interest to this paper was supported by an innovation broker organization called Building Lab DK operating in the Danish construction industry. Building Lab DK is funded by the private foundation Realdania. It is running from 2005 until 2008 and has a total budget of 50 mio. Dkk (approx. 6.6 mio euros).

According to the program of Building Lab DK the barrier to innovation in the construction industry is not the lack of knowledge or ideas but rather the ability to manage the process of establishing inter-organizational innovation networks. Besides financial support (up to 50 pct.) the goal of the organization is to develop managerial competences in relation to innovation processes.

Building Lab DK provides as well conceptual as processual competences. The conceptual competences are based on the concept of mass-customization. The idea of this concept is that the current project and craft based production methods of the construction industry should be complemented by industrialized but flexible production methods. The industrialized production should thus allow for individual customization through the production of standard elements which may be combined into an individual expression. Mass-customization is seen as a solution to the challenge of creating stable and long-sighted production environments which make innovation efforts economically feasible without losing flexibility and the ability to respond to the highly volatile demands of the market.

The processual structures are composed of five steps

- (i) Trawl
- (ii) Framing
- (iii) Preject (pre-project)
- (iv) Proof-of-concept
- (v) Innovation Project

The initial process is a “trawl” through the companies of the construction industry in order to identify possible actors which are able and willing to participate in an inter-organizational innovation network. The “framing” consists of an initial coalition of companies in relation to a specific innovation idea. The preject-phase (pre-project) consists of a series of workshops in which the concept is further elaborated and developed. In the Proof-of-concept phase it is determined whether the network participant agrees to invest in the project. Finally, the innovation concept is implemented in the project-phase.

### **The Case of a Configurable Balcony Solution**

Since its launch in 2005 Building Lab DK has been engaged in the establishment of a project portfolio of nine innovation networks. This section looks into the process of developing an innovation network based on a configurable balcony solution. The process of network formation was initiated in February 2005 and in May 2007 the implementation was almost completed. This case has been chosen as it was the first innovation network to be supported by Building Lab DK and thus presently most rich in respect to empirical data.

#### **The establishment of the balcony network**

The innovation-network was initiated by a manager of a contractor specialized in exterior refurbishment called Ringsted Bygningsentreprise (RB). The manager of the contractor initially wanted to stream-line the somewhat troublesome process of installing new balconies

and furthermore wanted to improve the client approach. The idea of the manager was, however, only vaguely formulated. In order to crystallize this vague idea within the framework of mass-customization a university based consultancy agency specialized in product modularization and a spin-off company of this agency specialized in ICT configuration software were enrolled in the network. These companies brought competences in modularization and ICT-supported configuration to the network.

The crystallization process of the initial vague idea thus evolved around the utilization of the ICT configuration software allowing the balcony to be represented as a digital and configurable 3-d model.

In particular two perspectives were articulated, one which focused on client interaction and visualization and another which focused on optimizing the production and information flow between the contractor and the material supplier and between the contractor and the public planning authorities.

The innovation network was thus established as a merger between two existing networks. One of these was the network of RB. The network included two manufacturers; Weland Aluminium, a manufacturer of standard aluminium profiles and Kecon a medium size blacksmith company. The RB network also comprised Bascon a consulting engineering company. Taken as a whole this network represented the value-chain from design to production, sale and installation. As RB was an essential client to its suppliers the network was fairly robust.

The other network comprised IPU and 3D facto. Within this network 3D facto became the most central to the innovation consortium.

The fusion of these two networks was established by Building Lab DK. The concept of ICT configuration was accordingly foreign to the RB-network prior to the innovation project. The IPU/3D facto network had some prior experience within the construction industry and was eager to expanding their activities within the industry.

The initial innovation idea was formulated and agreed upon between RB and Building Lab DK within 3 weeks and the enrolment process lasted for another 2 months. The formal result of this process was a preject application.

### **Deepening the concept**

The preject application at the same time effectuated a closure and produced an opening. The preject application thus closed the entrance of new actors to the network while opening for a deeper formulation of the innovation idea.

The process of deepening the innovation concept took place during three two-days workshops. At the initial workshop a brainstorming was conducted in order to identify possible ways to utilise the configurator in the development of the network. Some 150 ideas were formulated. In the second workshop these were condensed to three scenarios, which were finally reduced to a client and production process perspective during the third workshop.

At the surface the project phase was characterized by relative little development. If one compares the core innovation idea in the project application and the project application they are actually very similar. The purposes outlined in both documents are (i) to offer the customer a configuration tool, which allows freedom to configure and visualize solutions; and (ii) to establish a production platform, which allows for better performance in relation to cost and quality.

Despite the fact that the core innovation ideas remained largely un-altered throughout the project phase it was a process which was politically important. Thus, during the project phase the configurator was used to organize a broader universe relevant to the different actors in the network. It was made politically strong.

To support this process Building Lab DK provided the overall framework and furthermore acted as facilitator of improvisational dynamics by introducing resources external to the network and by providing activities and methods to broaden the concept.

The strongest interests were those articulated by the company representatives themselves. The interests in developing the production process perspective were well represented within the network, and it thus became a politically very strong perspective. At the second workshop the IPU representative introduced the idea of modularization and configuration in an illustrative and tangible manner by presenting a detailed illustration of how an industrial product had been modularized and explained the pervasive effect it had had on the production flow.

Also the sales-dimension was represented. Thus, a meeting displaying a sale-situation had been tape recorded in which a salesman was selling a balcony solution to a cooperative housing association. This recording showed how the salesman illustrated the maybe-to-be balcony-solution by drawing on the asphalt outside the building and explaining the light-effects. In dialog with this salesman it was discussed how the configurator, as a visualization tool, could be used to improve the communication.

Other dimensions were less well-represented by company representatives and thus initially politically weaker. In relation to customer analysis and branding the use of external consultancy proved to be very efficient to disclose new perspectives. Accordingly, a customer and market investigation was conducted between the first and second workshop. A

very important result of the customer investigation was a change in perspective from outside in, i.e. a perspective where the balcony is conceived as an attribute to the exterior of the building, to inside-out, i.e. a perspective where the balcony is conceived as an extension to the private inner room. During the project phase this inside-out perspective became the dominant trajectory. This inside-out perspective became very strong and further developed into a branding strategy. It was accordingly decided that the balcony should be conceived as a life-style-project, in the same way as kitchens and bathrooms. In line with this reasoning, a long-sighted business model was formulated to turn the balcony solution into a life-style brand rather than merely a product solution. Providing instant visualization the configurator was seen as important to the realization of this vision.

This overall business approach has since been applied to shape the client approach. An example is that the main picture at the homepage shows a balcony solution from inside an apartment in line with the inside-out interpretation. Another example is that customer information has changed from being technical (e.g. explaining the difference between various mounting solutions) to focus on materials and style.

External sources were also used to raise the legitimacy of other elements in the universe. Different focus groups were invited to test and develop specific aspects. Thus, regulatory authorities from municipalities were invited to discuss how information could be extracted from the configurator in order to ease and standardize the process of obtaining permissions. Also lead-users in it-supported customer interaction were invited to discuss the utilization of the configurator to instant online visualization.

### **Testing the Concept**

In the project phase the innovation concept was lifted from a sheltered arena inhabited by dedicated actors into a potential hostile environment in which it had to compete with other interests, priorities and established routines in the network. This was the time when the commitment and flexibility of the concept was to be tested. In the balcony case the concept proved to be surprisingly strong and flexible and partly able to re-shape the network by initiating processes only partly anticipated in advance.

The innovation broker organization however continued to play an active role in the project phase. In order to strengthen the concept four mini-investigations were conducted to further deepen some of the trajectories which had been only vaguely sketched out in the project phase. Two of these investigations concerned branding and user involvement which had already been anchored in the concept during the project. The less developed topic was design. This investigation did not yield any immediate result. The most successful workshop was on how to penetrate into foreign markets. This became a dominating new trajectory to the

business strategy. Thus, the longsighted innovation strategy was complemented by yet another dimension.

The most pervasive and unanticipated development in the project phase was however a re-shaping of RB itself. By January 2007, the CEO and founder of RB chose to sell the refurbishment section of the company, which has hitherto been the core business area, in order to prioritize the development of the balcony section in a new company called Altan DK. A consequence was that the manager which initiated the project now became manager of the refurbishment company. This meant a weakening of the longsighted strategic perspective and downplayed the role of Building Lab DK as an active partner. Thus, the capacity to exploit external consultancy was considerably lowered. Furthermore the client perspective came under pressure. One reason was that the configuration software was not able to deliver the level of visualization which was envisioned in the project phase. While the software was able to deliver visualization of the individual balcony it could not as easily as initially anticipated integrate balconies into the visualization of an entire building. Instant prized calculation was also given up. Apart from the limitations in software the client perspective also lost ground as the manager of the new refurbishment company had been a central advocate of the client perspective.

A further consequence of the re-organization of RB was that the budget became heavily exceeded as the costs of establishing a new organization was not included in the initial budget. This was however turned in a political means which Altan DK utilized to consolidate its central position in the network.

More headway was made in relation to the production process perspective as an alignment process was initiated between the configurator and production process. The initial step in this process was the registration of the components at Weland, the supplier of aluminum profiles. A so-called product-family-master was created in order to define the modularization. A result of the systematic approach to the product was that the variety of components was reduced. Thus, during the alignment process the number of mounting fittings was reduced from 17 to 4.

It was, however, realized that the initial level of digital registration at Weland was lower than anticipated. Also the document handling system at Weland was inadequate to the integration process. However, the interests in favor of the innovation proved strong enough to overcome these barriers and a range of successive innovations were implemented at Weland. One of these is was a detailed 3D registration of the components. This registration was conducted in cooperation with RB who hired a student worker to perform the registration and also paid some of the costs. Also a new document handling system was implemented at Weland as a consequence of the balcony project.

A process which is currently under development is a possible change of the working division between Weland and Altan DK. Weland thus currently considers to hand over their balcony installation activities in the South-Swedish market to Altan DK.

### **Conclusion**

The innovation process described above is a case of how a combination of conceptual and processual minimal structures were utilized as a managerial strategy to cope with the emergent political process of building innovation networks. These minimal structures facilitated a combination of individual flexibility and overall synchronization in the development of the innovation idea.

The conceptual minimal structures, based on the concept of mass-customization, provided a template upon which to improvise. This template allowed for a coordinated development between many different actors. The processual minimal structures mainly consisted in keeping the innovation concept as broad as possible and thereby preventing it from being colonized by only one actor, as this would have limited the political support.

By applying these structures the technical artifact of the ICT configurator were utilized to organize a comprehensive re-organization of a broad range of aspects such as branding, product structure, production- and communication processes, and client approach.

The innovation was made politically strong as the minimal structures forced the actors to actively develop their interests and identity as these were not defined in advance. Thus different actors were made to develop ideas of how to take advantage of the configurator in line with the concept of mass-customization. The effect of these improvisational efforts was a high level of ownership, dedication, and political support in the implementation phase. The political strength of the innovation idea became evident as former core activities in general exterior refurbishment were excluded from the network.

A decisive circumstance in the case was that the innovation process was supported with both funding and managerial competences by the innovation broker organization. It is unlikely that such managerial competences would develop within the average SMEs of the construction industry. This point to the importance of pro-active innovation-broker initiatives in industries which are operational rather than strategic in their traditional managerial approach. The need for such proactive involvement however at the same time brings the difficult question of how to raise the general innovative capabilities of the sector to the fore.

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