Design management of interaction design

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ABSTRACT

Traditional product and service industries have developed design management systems over a long period of time (Felber, 1984; Sebastian, 2005). Typically these assume a product development process where (re)production is separate from design. For the software and system development industries, where digital interaction design is the predominant design discipline (Löwgren & Stolterman, 2005) few studies have been done on design management. Studies concerning design management issues for digital interaction design have identified problems for interaction designers to find a stronghold in organizations (Carlshamre & Rantzer, 2000), or characteristics of the software development context that is distinct for management of interaction design (Holmlid, 2006). As their point of departure these studies have taken organizations that develop IT-systems as if they were products.

As a contrast, in this paper we expand the current literature by analyzing two studies of design management in an organization that uses software as part of their business process. We claim that for such organizations, design management of digital interaction design primarily is a concern for the operating core and the strategic apex, thus driving and directing the efforts made by support staff and technostructure.

INTRODUCTION

Traditional product and service industries have developed design management systems over a long period of time. Some of the effects of the work performed during the 80’s and 90’s can be seen in standards, such as the British Standards series, in classical texts (Gorb, 1990; Svengren, 1995; Ulrich & Eppinger, 2003), or in best-practice books (Bruce & Bessant, 2002; Bruce & Jevnaker, 1998). Typically these assume a product development process where (re)production is separate from design.

For the software and system development industries, where digital interaction design is the predominant design discipline (Löwgren & Stolterman, 2005) few studies have been done on design management. The focus has primarily been on design philosophies (Winograd, 1996; Ehn & Löwgren, 1997; Bannon Bødker, 1991), operative design methods (Löwgren & Stolterman, 2005), different design techniques and expressions (Arvola & Artman, 2007) or characteristics of the designed object (Löwgren & Stolterman, 2005; Edeholt & Löwgren, 2003). Studies on procuring usable systems have been made (Markensten & Artman, 2004; Holmlid & Artman, 2003; Markensten, 2005; Holmlid, 2005), as well as studies on designing for use as opposed to designing technology (Löwgren & Stolterman, 2005; Hallnäs & Redström, 2002).

Studies concerning design management issues for digital interaction design primarily have concentrated on design management in organizations developing software, such as software companies, consultancies etc. These studies have identified problems for
interaction designers to find a stronghold in organizations (Carlshamre & Rantzer, 2000), where a leading telecom software industry is used as the primary case. Another study identified characteristics of the software development context that is distinct for management of interaction design (Holmlid, 2006). The three cases in Holmlid (2006) are all taken from a software industry developing and selling systems as if they were products, in a business to business model.

In contrast to these, there is a large amount of organizations that uses software as part of their business process, either backstage, or as part of their service interface directly with clients. Some of the software is developed by other companies, and some of it can be developed by an IT-department. But, studies on design management of digital interaction design for such organizations are missing, and in this paper we provide one such study based on two cases.

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<thead>
<tr>
<th>Developing product/system</th>
<th>Product/system as business process component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product design</td>
<td></td>
</tr>
<tr>
<td>Gorb, 1987, 1990</td>
<td></td>
</tr>
<tr>
<td>Svengren, 1992, 1995</td>
<td></td>
</tr>
<tr>
<td>Bruce &amp; Jevnaker, 1998</td>
<td></td>
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<tr>
<td>Felber, 1984</td>
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<td>Lawrence 1987</td>
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<td>Jevnaker, 1998</td>
<td></td>
</tr>
<tr>
<td>Bruce &amp; Morris, 1998</td>
<td></td>
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<tr>
<td>Sebastian, 2005</td>
<td></td>
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<tr>
<td>Digital interaction design</td>
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<td>Carlshamre &amp; Rantzer, 2000</td>
<td>current paper</td>
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<td>Holmlid, 2006</td>
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Table 1. Distinction between studies primarily focusing in development versus usage.

**BACKGROUND**

For the benefit of the analysis of the cases we use two analytic tools for discussing the design management, Mintzberg’s configuration of organizations (Mintzberg, 1980) and Svengren’s two arenas (Svengren, 1995).

From Mintzberg’s configuration of organizations (Mintzberg, 1980) we identify five components of an organization: the strategic apex, the technostructure, an operational core, the supporting staff, and the middle line. Briefly these can be described as;

- **operating core**, the basic work of producing products and providing services;
- **strategic apex**, the top-management;
- **middle line**, managers who have a direct line relationship between the top-management and the operating core;
- **technostructure**, analysts who plan and control work processes and outputs in the organization;
- **support staff**, specialists who provide support to the organization as internal services.

Mintzberg claims that there are consistent designs of these components that can be referred to as configurations.
Dumas & Mintzberg (1989) points out a set of strategies to integrate design into an organization; design champion, design policy, design program, design function and infused design. This structure is well-known within, e.g., the usability engineering community (see e.g. Carlshamre & Rantzzer, 2000).

Svengren (1992, 1995) identifies two arenas on which design management operates; the strategic arena, comprising corporate identity and design policy, and the operational arena, comprising project management and design work. This view is supported by e.g. Felber (1984), and Lawrence (1987). Felber (1984) differentiates between business with uncoordinated areas of design work and strategically coordinated design work. In the uncoordinated case design work is typically the responsibility of its specific organizational function, such as product design being the responsibility of a research and development function, design of communication being the responsibility of the marketing function, etc. Lawrence (1987) identifies functional design management and strategic design management, which resembles Svengren’s two arenas. A similar way of describing design management is held forward by Gorb (1987, 1990), where he identifies several different meanings of design management, and one definition: “...the effective deployment by line managers of the design resources available to an organization in the pursuance of its corporate objectives. It is therefore directly concerned with the organizational place of design, with the identification of specific design disciplines which are relevant to the resolution of key management issues, and with the training of managers to use design effectively.” (Gorb, 1990, p2)

Sebastian (2005), not wholly unrelated, states that there are three design management approaches; managing the product, managing the process and managing the organization. In the same article, he is critical towards these, and suggest that design management should focus on “managing the creative cognition through the dynamics of a design team” (Sebastian, 2005, p92), and that perspectives from cognitive science should become central to design management. Other authors highlight design as an organizational capability (Jevnaker, 1998; Bruce & Morris, 1998)

Moreover, Svengren (1995) concludes that, for companies developing goods, three integrative processes are important to understand the drivers of the development of design as a strategic resource; functional integration, visual integration and conceptual integration.

CASE STUDIES
Two cases will be used to support our claims. They are collected from a government agency where the IT-department is the main actor developing software for the organization. In the first case the digital interaction designers were part of the IT-department, and in the second case the digital interaction designers were part of one of the operative departments. The case descriptions are held short and informative, and end on the borderline between system specification and system development.

CASE ONE
The agency is responsible for the population registration system, and there had been a decision to develop a new system. Top management decided, based on recommendations from earlier work together with another research team, that the system development
process should be set up as a role model of user-centered design for the organization. The interaction designers, being a part of the IT-department, were given an important role and were allowed to define how the system development process should be structured. Initially the results were a school example of user-centered design, with development of scenarios, prototypes, personas etc, to specify what the system should be capable of doing and how the users would like to interact with it. The digital interaction designers, as well as the user from the operating core participating in the development process, were satisfied and were anticipating a well-designed and usable system.

Before this work had been completed the Swedish government issued a policy stating that all government agencies should strive for delivering their services on a 24h basis, the so called 24h government directive. As this directive was issued, the top management of the agency sought advice from experts in the organization. The idea of providing services to clients on a 24 hour basis was closely connected to self-services with internet as the channel. Expert advice was sought from technology experts in the IT-department. The result was that there was issued an internal policy stating that in accordance with the 24-hour government directive, the agency should change technology base to web-based technology. The directive thus was understood to influence self-service systems as well as internal systems (such as the population registration system).

After the policy was issued by top-management, the technology developers of the IT-department dismissed the work by the interaction designers, stating that it was not possible to develop the system specified through the user-centered process. The technology experts were successful in their efforts, and the work performed by the interaction designers was dismissed and was ended prematurely.

CASE TWO

The agency is responsible for a social support process handling debt relief processes for citizens that cannot deal with it themselves. Due to a new government directive the agency were to take a wider responsibility for the process, adding some of the functions earlier performed by a court to the agency process. To be able to do this the business processes had to be changed and a new system developed, with e.g. more complex demands on privacy and security issues.

The line-manager responsible for reviewing and developing the business processes had an interaction designer employed, and together with the designer the manager decided to involve interaction designers in the business process development scheme. In the development of the business processes, professionals working with debt relief managed the development process and participated as experts on debt relief case handling.

Throughout the development of the revised business processes, the process developers and the interaction designers worked together with interviews, process mapping, scenarios, personas, prototypes, etc.

The main outcome, regarding the IT-system, of the process was a system acquisition specification following closely the suggestions made by Markensten (2005), comprising a section describing what the system should do, and a section on how the system should be used to do that. In short, this meant that the specification consisted of a tested prototype, a set of user-interface descriptions, a set of personas, scenarios, as well as a traditional text-based section.
When this specification was received by the IT-department, who were supposed to develop the system, the immediate response was that it did not conform to the standards for specifications that they had set up. This caused some friction, but the IT-department decided that they initially had to transform, or interpret, the specification into a format that they were accustomed to working with. This delayed the start of the actual system development. During this period the IT-department came to appreciate the initial specification that was given to them.

**DISCUSSION**

In the second case, the digital interaction designers were collaborating with the business process developers. This gave the process developers a possibility to, at an early stage, refrain from assuming how the technology support should act, and actually express how they wanted the technology support to behave for specific scenarios and personaes. It also provided the process developers with a powerful expression of their view of the technology support, as a link between the process descriptions and a more formal requirements specification. In that sense, the operating core took a tighter grip on its support structure, and required that technostructure was developed to support that. One opposite example comes from case one, where the digital interaction design and the technology requirements are seen as competitive descriptions, instead of complementary, or as in the second case, as sequential.

A traditional requirements specification is primarily a technical specification, used as a goal document, and as a means of tracking how the system development project performs. It works as a way of framing the operational arena for a system development project, in the cases here as a guiding document for the IT-department (part of the technostructure). Traditionally these documents are words, tables and diagrams only, written in a language of technology developers. Consequentially, the language of a business process developer is not used in these specifications. In the second case this is evident from the fact that the IT-department wanted to transform the specification into its own language. In the first case, on the other hand, there is a conflict between different ways of expressing the requirements.

So, in one sense, the work of the digital interaction designers provided a platform where the business process developers and the technology developers could discuss and act together towards a common vision, through the scenarios, prototypes and personaes. Based on these descriptions, requirement specification for usable and useful systems effectively can be produced, managed and monitored. In that sense the digital interaction design became part of the strategic arena, as part of a design policy of the organization. For the business developers it meant that they expressed their requirements clearly in terms of technology usage to the IT-department.

In the first case, the fact that the digital interaction designers were not part of the operating core or the strategic apex, seem to have made it easier for conflicting views within the technostructure to influence strategic decision making, without revealing the conflict, and in the end have impact on how the system would fit with business processes. Top management were handling several parallel strategic decisions, using the IT-competence from the IT-department as experts for one of these, not seeing that the parallel decision making were nullifying an earlier strategic decision, the one concerning
user-centered design. The fact that the technology decision seemed to be a mere technology decision, and the user-centered design decision seemed to be a non-technology issue, possibly occluded that they were inter-connected. Because both decisions concerned the IT-department, the issue of resolving the conflict between these became an internal affair for the IT-department. That is, the two areas of work were viewed as being issues concerning system development, thus being part of the operational arena of the IT-department. Furthermore, the interaction design work was defined as not specifically being part of the strategic arena, nor as being part of the operational arena of the core business process, registering the population.

In the second case, on the other hand, it seems to be precisely because the digital interaction designers are part of the operating core, that both the abilities of the technostructure and the strategic decisions are directed towards developing a system with a strategic alignment with the changes in the business process. It is important that the interaction designers receive confident and informed support by the middle-line, through the department manager. The interaction design work of the system is in this case construed as being an issue of corporate identity, and less an issue of technology.

If, in the first case, the user-centered design decision and the technology decision had been issues for separate components of the organization, the conflict between them would have had to be resolved in another way; either as a new top management decision, or as a consequence of defined structures and configurations of decision making between different components of the organization.

A fair amount of research on digital interaction design focuses on usage instead of technology, and when combined with organizational theory, such as Mintzberg’s, design of these interactions then becomes a matter of how business processes are carried out, and may therefore take its starting point as a part of developing the business processes.

CONCLUSION

In this paper we have expanded on current literature on design management of digital interaction design. Current literature mainly is concerned with organizations developing software for other organizations. We have focused on an organization that uses software as an integral part of its business process, by analyzing two interaction design studies from a design management perspective.

We conclude that for such organizations, design management of digital interaction design primarily is a concern for the operating core and the strategic apex, thus driving and directing the efforts made by support staff and technostructure.

> Process and business developers that work with interaction designers will benefit by having the imagined future business process also expressed in terms of technology usage, through scenarios, storyboards and prototypes. From these descriptions technology requirement specification for usable and useful systems effectively can be produced, managed and monitored.

> Such design-based specifications raises the lowest acceptable bound for interaction design work in the development organization, and increases the meaningful action space for the detailed digital interaction design in the development organization.

> Because usage of technology links the business process and its technology support, interaction design, in this type of organization, is a matter of how business processes are carried out, and not a matter of information technology engineering and design.
Consequently the management of digital interaction design has to emanate operatively from the process owners and the operating core, and strategically from the business development and from strategies on value creation/actualisation.

REFERENCES

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