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# **A Design Thinking Role Model Enables Creativity in IT: Case of the Financial Industry**

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## ***Abstract***

The challenge banks face to gain advantage over their competitors is being placed under pressure by the ever increasing speed of development which arises from the pace of innovation in computer technology, rapid changes in industry regulation and fast-changing customer needs. Banks have creative heads but the pursuing of efficient customer-centric creative work within an organization is often challenging. This paper presents a design thinking role model which was iteratively designed over nine projects within a period of four years and implemented in an IT department of two leading multinational banks. It analyzes the different roles of the design thinking role model and its multidisciplinary elements to enable creativity within these IT departments. It could be shown that creativity was enabled in this corporate IT context through the design thinking role model and thus a good base for the overall innovation process could be reached.

## ***Keywords***

Design thinking, creativity, role model, multidisciplinary

## **1. Introduction**

New technological advances in the 21st century have heightened customer expectations and increased competition (Alam & Perry 2002). The existing development processes were inefficient because there was too little consumer involvement. The importance of a systematic customer-oriented development process was acknowledged (Alam & Perry 2002). In the banking industry in particular there is a strong need for innovation due to the high level of commodities they offer. Pressures for increased speed of development arise from the pace of innovation in computer technology, rapid changes in industry regulations and fast-changing customer needs (Puschmann et al. 2012, Drew 1995). Enabling creativity in their IT departments is crucial for banks and their future development. Development of new solutions requires people and their creativity and hence research on creativity in particular has received strong attention in recent years (Amabile & Khaire 2008, Miron et al. 2004.). In terms of rapidly changing customer needs,

design thinking, as a human-centered innovation method, was accounted for being accurate of involving the targeted human being (Brenner & Witte 2011, Lockwood 2009, Plattner et al. 2009). The selection of personnel that can act in a creative environment increases the creativity of products and services (Sagiv et al. 2009, Amabile 1996). Research shows that separate units for innovation initiatives, using employee and customer suggestions and hiring new skills, can enable creativity with a high probability of innovation success (Drew 1995).

Design thinking was accredited for unleashing creativity (Skogstad 2009, Dym et al. 2005). Creativity can be seen as the first stage in the innovation process, where ideas are developed (West 2002). Research has given much attention to the rise of innovation processes but comparatively little research has addressed the different roles within design thinking projects in terms of enabling creativity. In summary, there is a general understanding of the method of design thinking (Brenner & Witte 2011, Plattner et al. 2009, Dym et al. 2005), but there is no clear understanding of which roles are needed in a corporate environment to support creativity. So far, no scientific study of implementing design thinking over a longer period of time within an IT context exists. The authors have led the implementation of design thinking in the IT departments of two leading banking institutions for nine projects over the course of five months each since 2008. This allowed analyzing the following research question: *How can a design thinking role model enable creativity in the IT environment of a banking institution?*

A role model that enables a sustainable way of implementing design thinking projects results from research on the one hand. On the other the design thinking role model enables creativity in this corporate context to establish a strong base of idea generation. In previous research the authors have described the role model as one corporate need for the implementation of design thinking (Vetterli et al. 2012b & Vetterli et al. 2011). In this specific research paper the design thinking role model is based on the previous findings to further evaluate the enabling of creativity in the IS environment. The element of multidisciplinary is strongly linked with creativity and therefore explicitly focused within this research.

## **2. Research Method**

The research efforts are part of an ongoing holistic research project which focuses on the question of how design thinking can be successfully embedded in an IT environment of a multinational financial institution. The role model was iteratively developed during nine projects and the embedding process was accompanied by 53 in-depth interviews with people from different hierarchical levels from business units and IT departments over four years. The overall paradigm was provided through design science research with its central goal to design an artifact that provides utility (Hevner et al. 2004). To reach this utility knowledge and understanding of a problem domain and its solution are achieved in the building and application of the designed artifact. The process of constructing and exercising innovative artifacts enable design-science researchers to understand the problem addressed by the artifact and the feasibility of their approach to its solution (Hevner et al. 2004). The artifact which was designed for this concrete research paper was the role model, implemented to assign tasks, competencies and responsibilities to specific parties in the IT and business departments. A previous literature review showed a gap in the literature which was addressing a suitable role constellation to provide creativity and finally innovation in a corporate environment. First ideas for this role

model has already been evaluated within academic settings and provided a suitable starting point for the design of the corporate context (Carleton & Leifer 2009). The final validation of this artifact in terms of design science was made during the implementation.

### **3. Creative Context for Implementation of the Role Model**

The context of appliance of the design thinking role model was on the one hand an IT innovation department of a multinational European leading bank and on the other hand a Swiss-based bank with international impact. Both banks had about one-third of their headcount positioned in the IT department. The headcount of the international bank is about 60,000 employees and the Swiss-based institution had about 5,000 employees in total. By reflecting on IT departments in banks there is a common pattern, that IT departments are service suppliers for business units. The business units are typically in direct contact with the bank's customers (Brocke et al. 2012). IT-driven innovation has become more and more part of people's everyday lives: Not only have the demands on usefulness and usability been growing continuously, but the IT departments take control to develop highly competitive consumer markets, for example retail banking, in which successful innovations are defined by the user's point of view rather than by technical perfection (Lindberg & Meinel 2010). The main challenge occurs when classically educated IT staff needs to deliver innovation for a customer-centric, highly dynamic environment. The educational background of hardware and software engineers has a strong influence on mindset building and decision-making and, as a result, IT development has the tendency to take place within an "exclusive" experts' world (Lindberg & Meinel 2010). Multidisciplinary IT teams can incorporate more than functional requirements to develop but capture non-functional requirements and therefore provide a more adequate and holistic customer-oriented view for creative processes. It helps to bridge gaps that result from disciplinary specialization, helps to integrate results from different disciplines, and allows issues to be addressed that lie beyond the disciplinary skills of individuals (Vissers & Dankbaar 2002)

#### **3.1 Creativity and Innovation**

Creativity is the production of novel and useful ideas in any domain (Amabile 1996). Organizations and IT departments have to rely on highly creative individuals for different types of innovation. Creativity can only be fostered indirectly, by influencing the working conditions of the creative individuals (Vissers & Dankbaar 2002). Creativity processes mostly take place in the so-called fuzzy front end of innovation (Koen et al. 2001, Reinertsen 1999, Amabile 1996). An innovation can only be called so if it reaches at least the stage of successful market introduction (Becker & Whisler 1967). The authors focus mainly on service innovation since the characteristics of the analyzed creativity context demanded services and only in a second step perhaps process innovations or even business model innovations. These differences pertain mainly to the specific characteristics of services, i.e. their intangibility, co-production with customers, simultaneity, heterogeneity and perishability (Fitzsimmons & Fitzsimmons 2000), which affect the development process of services and make them to a certain degree unique (Nijssen et al. 2006).

#### **3.2 Design Thinking in the Context of Information Systems**

Design thinking is especially promising and much recommended to support innovation and innovation teams in organizations (Sutton & Hargadon 1996). Also, in terms of service

innovations which typically are intangible, the tangible approach from design thinking improves the understanding and recognition of creative ideas (Vetterli et al. 2012a). Design thinking is a human-centered innovation method, based on central elements such as deep customer understanding, structured idea generation and rapid prototyping (Vetterli et al. 2011). This working definition can be integrated in the understanding of Leifer (1997), who shows that design thinking is the method that brings along the innovation itself as output. As applied in the context of this study, design thinking is the method which establishes an iterative design process of the creation, evaluation and selection of physical artifacts, so-called prototypes at the very beginning, creative front end of innovation.

In the field of software engineering, for example, prototypes are used as well, but mostly to converge on one specific idea and eliminate inconsistencies. Creative development in IT classically asks for clear development goals, milestones, along with considerable uncertainty regarding the process by which those goals are met (Cooper 2000). For design thinking prototypes are a tool to diverge and learn about the design space. Multidisciplinary and diversity in teams are positively associated with divergent thinking.

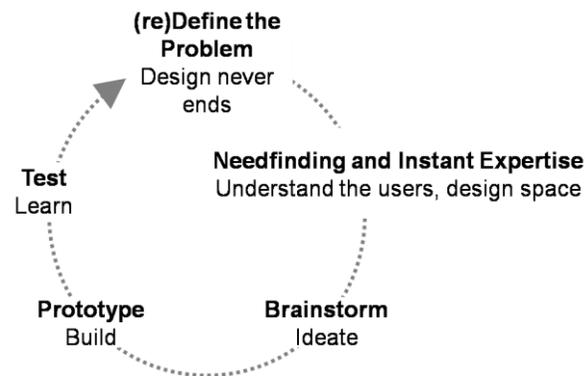
Design thinking projects, as they were embedded in the researched corporate environment, provided clear milestones, which stem from the different prototyping phases. These milestones provided several benefits in terms of frame of reference and structuring of the overall project (McDonough 2000). They were integrated in a diverging phase followed by a converging phase. The project integrates these two main phases for five months. The diverging phase targets the maximization of ambiguity through the amount of prototype created (all low-resolution prototypes). Flynn et al. (2003) showed that “the greater the number of ideas at the start of the new product development process, the greater the probability of successful products” (p. 416). Diverging activities are followed by the converging phase which reduces the amount of prototypes and at the same time raises the resolution of a small amount of final prototypes. These final prototypes should include the most successful elements of the diverging phase matching the identified human needs.

Organizationally, design thinking, as it has been implemented in the analyzed banks, was embedded as an incubator in the IT innovation departments. The goal was to provoke market-ready innovations as well as serve as a pool of creative ideas/artifacts for following projects. Of course, applying design thinking to IT development pursues the vision of setting up a complementary thinking style, which extends the problem-solving abilities of IT development teams with the purpose of making their outcomes more user-friendly and creative (Lindberg & Meinel 2010). To achieve this, roles around the design thinking projects acted strongly autonomously. Research has already shown decades ago that in the very early stages of innovation processes this autonomy, in terms of fluid job description, high communication and few rules, all incorporated in a loose organizational position, is needed (Burns & Stalker 1961).

### **3.3 Design Cycle to Foster Creativity**

Within the design thinking method the roles that will be introduced followed two main paths. The design team followed in their daily work a design cycle which had formerly proven to unleash creativity (Skogstad 2009, Dym et al. 2005). Additionally, the design cycle was integrated in the milestone path that should help the design teams to get a holistic view on their

problem involving different perspectives on their challenge that they had received from the company. Creativity is greater under conditions that restrict the scope of the problem in a way that leads individuals to focus on a manageable number of core elements (Sagiv et al. 2009).



**Figure 1:** Design cycle

Source: Stanford University 2012

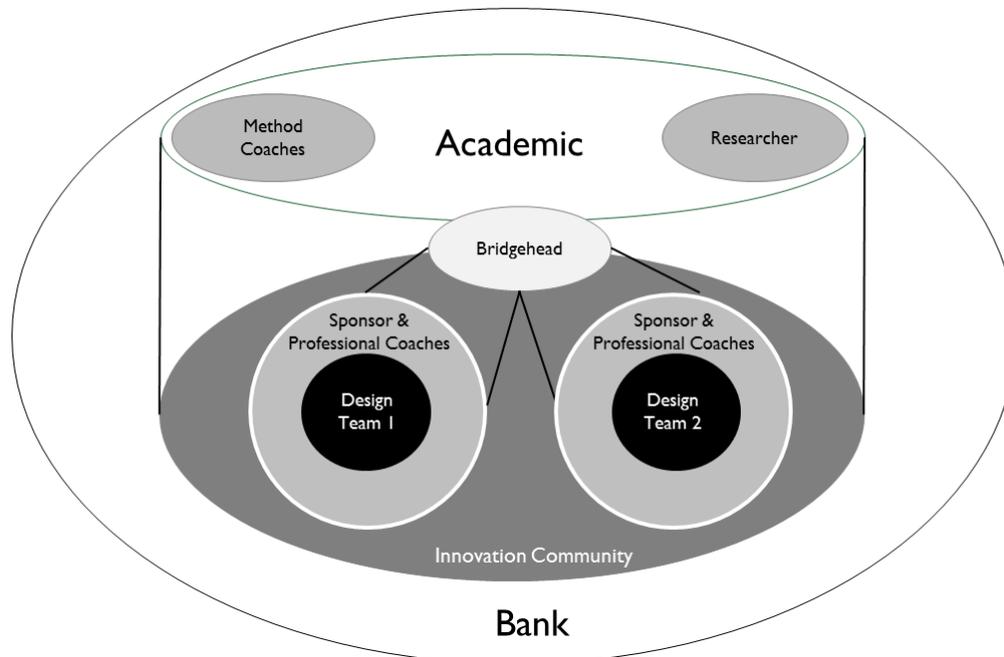
The design cycle fosters the consistent focus on human needs, on a number of iterations (see Figure 1). It results in an improved understanding of the problem from a customer perspective for solving the associated requirement that eventually has to be developed (Vetterli et al. 2012b). Brown & Eisenhardt (1995) have already shown that iteration is a success factor in terms of speed for innovation. Teams who iterate more frequently, do more testing, have frequent milestones and are supported by a powerful leadership in terms of procedure (coaching) develop more quickly (Brown & Eisenhardt 1995).

#### **4. The Design Thinking Role Model**

The authors understand role models as models that show the role formalization. Formalization refers to the “degree to which rules or standard operating procedures are used to govern the interaction between individuals” (Ruekert & Walker 1987). Formalized procedures can regulate the tasks people perform in the development process or the role responsibilities granted to specific persons in the creativity process. Facets of formalization, regulation and role specification may influence integration. Role formalization clarifies responsibilities and the dependencies between them (Ayers et al. 1997). The creation of an adequate role model should protect the design teams from being limited in their creativity within the corporate structures by politics or hierarchy and enable them to fully unleash the potential of design thinking. The role model should thus provide the creation of creative solutions and facilitate the innovation process. Nevertheless, the focus of this research was clearly on effects in terms of creativity at the beginning of the innovation process. The role model that served as the base was implemented in an academic surrounding and had just one connection point of the design teams with the corporate side (Carleton & Leifer 2009). Therefore in terms of recognition of innovation, heavy communication and enabling creativity within the IT department towards customer-oriented innovation, the original role model was modified for the corporate environment. The following explanation focuses on the description of the single roles. As it has already been shown that multidisciplinary teams enable creative processes, the description of the roles should incorporate the multidisciplinary at different levels related to the different roles. Multidisciplinary is

understood as setting environments that provide interesting frameworks to enhance fuzzy front-end creativity and thus generate opportunities for idiosyncratic innovation (Alves et al. 2007).

#### 4.1 Roles within the Design Thinking Role Model



**Figure 2:** Design Thinking Role Model

Figure 2 shows the complete role model and which roles are involved in design thinking projects.

The “**Design Teams**” acted as the heart of the project and especially as the main driver for the innovation. They worked on different predefined design challenges, autonomous from other operational tasks. The Design Teams had to initiate and fulfill the assignments for the solutions of the given design challenges and regularly presented their prototypes to the Innovation Community regarding the milestones in the milestone paths. The four Design Team members were mainly new in the organization (except one former employee), which was crucial to creativity, because it appeared that peripheral individuals may feel freer to develop unusual ideas gleaned from connections outside (Perry-Smith 2006). Using individuals who are newer to the company results in faster product or service development (McDonough 2000). The team members had a multidisciplinary background to foster the creative potential (Plattner et al. 2009). Groups composed of people with differing professional backgrounds, knowledge, skills and abilities will be more innovative than those whose members are similar, because they bring useful differing perspectives on issues to the group (Paulus 2000, West 2002). In addition to staffing the Design Team in terms of psychological preferences in how people perceive the world and make decisions, the candidates were assessed with the Myers-Briggs Type Indicator (MBTI)<sup>1</sup> (Wilde 2008).

<sup>1</sup> MBTI: For further information on the Myers-Briggs Type Indicator, consult the bibliography of Wilde (2008).

The following figure shows an example of how the different teams over the years were diverse. Figure 3 shows one team from year 2012:

		Sensors	Intuitors		
		ISTJ Inspector	ISFJ Protector	INFJ Counselor	INTJ Mastermind
Intravert		ISTP Operator	ISFP Composer	INFP Healer	INTP Architect
Extravert		ESTP Promoter	ESFP Performer	ENFP Champion	ENTP Inventor
		ESTJ Supervisor	ESFJ Provider	ENFJ Teacher	ENTJ Field Marshall
		Thinkers	Feelers	Feelers	Thinkers

**Figure 3:** Exemplary MBTI of one team from 2012

The **“Bridgehead”** is operationally assigned to the initiation and the implementation of the project and also creates physical as well as virtual space for creativity even before the project has started. Additionally, this role includes the coordination of the communication as well as the interlinking of the design teams with the organization. The communication included the definition of the milestone deadlines. Comparing this role with networks, it serves as a hub and gives the design teams a maximum of inputs through corporate stakeholders or even from external sources, which overall enriches the creativity potential (Amabile 1988). In particular, creative infrastructures (rooms and IT tools) helped the teams to leverage their creative potential throughout the different milestones (Plattner et al. 2009).

The **“Sponsor & Professional Coaches”** is the role that defines and frames the strategically relevant design challenge which is per se an important step for creativity (Dorst & Cross 2001). The Sponsor also consigns the Professional Coaches to share their expert knowledge with the teams. In the diverging phase in particular it was important to implement a pull effect from a design team perspective: the professional coaches could give relevant expert know-how if they were asked to do so by the design teams. This ensured that the Professional Coaches did not have a negative impact on the creativity of the teams as they were from the company itself (Perry-Smith 2006). The Sponsors served as innovation drivers and cultural change enablers (Vetterli et al. 2012b). In addition, they were informed regularly about the ongoing process and the milestones. These raised the recognition of the novelty and the creative ideas that were produced.

The **“Innovation Community”** consisted of a wide field of innovation-interested employees and built an outer circle around the design team and the professional coaches. They had a common interest that was connected through a common idea or the need to solve the same kinds of assignments; that’s why they were willing to share their knowledge, as stated in the numerous interviews. They acted as a diffusion partner for the innovation and gave the team unexpected

impulses for their tasks. In addition, they contributed the commercialization of the results and the promotion of the design thinking method. Interestingly, the Innovation Community members enjoyed being taken out of their daily work to experience a creative surrounding during the milestone presentations of the design teams and stated that it helped prepare organizational stakeholders to initiate first implementation steps for the upcoming solutions from the design thinking projects.

The “**Methods Coaches & Researcher**” were staffed from a university institute and this role fulfilled two different tasks: on the one hand they enabled the knowledge transfer and correct implementation of the method, and on the other hand they contributed to the project with their research. The role as enabler was crucial to the success of the project. This role, as the only external academic role, was responsible for giving the biggest possible scope for development to create diverging prototypes. Research has demonstrated that groups with members with diverse educational majors experience more difficulty defining how to proceed than groups in which members have similar educational backgrounds (Jehn et al. 1999), and therefore the method coach offered intensive weekly methodical coaching. Method coaches optimized the team through coaching of team dynamics based on the fact that diversity can threaten the group’s safety and thus creativity could start to suffer (West 2002). Diversity of knowledge and skills is a powerful predictor of innovation, but the method coaches needed to integrate the team dynamics in their daily work. In addition their competencies were needed to enable the harvesting of the fruits of diversity within the design team (West 2002). They could take the pressure away from the Design Team and foster their intrinsic motivation to be creative (Zhou 2003). Additionally, they had a strong position, as externals, as they could interrupt throughout the whole project phase if it seemed that creativity could be in danger through corporate influences.

## **5. Conclusion**

The following research question was addressed in this paper: *How can a design thinking role model enable creativity in an IT environment of a banking institution?* The authors developed a design thinking role model within the IT department of two leading banking institutions. The first part of the research question, *which concerns the design of such a role model for IT departments*, could be answered by the presented role model based on the design science research approach. The role model was successfully applied over the last four years in nine projects with duration of five months each and iteratively improved in practice until today. The second part of the research question concerns the enabling of creativity through the design thinking role model. Two findings could be derived: On the one hand, multidisciplinary which focuses only on the design team does not suffice alone to provide creativity, by means of new ideas being recognized, in a corporate environment. Multidisciplinary and diverse characteristics between all assigned roles were crucial as well to understand corporate processes and mechanisms and to unleash the full potential of design thinking in terms of creative solutions. Hence, on the other hand the assigned roles overall ensured the appliance of design thinking within the IT department in the two banks and led to the targeted creative environment. The role model consists in its core of Design Teams which are responsible for creating the ideas. They are surrounded by an Innovation Community that transports the creativity into the company. Additionally, the Bridgehead role provides the right environment for creativity by infrastructure and network in- and outside of the company. The Sponsors (and the Professional

Coaches) define the design challenge for the design teams in a suitable way to enable creative work within the defined design space. Finally, the Method Coaches, as only an external role, provide experience in creativity and the design thinking method to ensure the right appliance of design thinking and therefore generally to set up for creativity through design thinking in IT divisions.

The actual research of role models of design thinking in corporate environments, especially to enable creativity, has lacked in the literature. Hence, both practice and science can benefit from this research. For practice, it provides a role model which enables banks to unleash the creative potential of internal design thinking projects. For science, the theoretical considerations and the role model show different aspects of creativity in a corporate IT environment and provide a first step towards unleashing and protecting the central paradigm of design thinking in banks.

Further research could apply this design thinking role model to other industries. As for this paper, the role model as a whole was shown to enable a creative environment from an organizational and staff point of view. Additional research could distinguish the different impacts of the different roles and then probably reduce the amount of resources that need to be invested for such an implementation. The goal of appliance of this role model was not only to provide a creative environment but also to facilitate the overall innovation process. Nevertheless, the focus of this research was clearly on effects in terms of creativity at the beginning of the innovation process. Now research should focus on how the creative solutions that were developed at the beginning can be transported throughout the complete innovation process in order to offer a customer-oriented innovation.

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