

AIS Journals Joint Author Workshop in PACIS 2013

Working Title: Embedded Design Thinking as IT-driven innovation enabler at Deutsche Bank

Format: Abstract

Target Journal: MISQE

Authors: Christophe Vetterli (University of St.Gallen)*, Walter Brenner (University of St.Gallen), Falk Uebernickel (University of St.Gallen), Charles Petrie (University of St.Gallen), Dirk Stermann (Deutsche Bank)

1. INTRODUCTION

The banking sector is globally under intensive pressure to regain trust from its customers. Different perspectives from research and practice agree: trust is critical and can be provided by transparency and involvement in the applications for the banks' end customers. Thus the creation of customer-oriented services that provide these has been determined by banks to be major strategy. However, this creation process is complex and a deep understanding of potential customers as well as the adequate integration of technology is needed in order to deliver adequate customer-centered applications.

A related problem is that of fostering innovation, especially innovative customer-centric applications that would foster trust. CEO's in 2012 have clearly stated that innovation is one of the central competition drivers (IBM Global CEO Study, 2012; Lazonick, 2005). Friedmann (2005) arguments that the ability to innovate is decisive to survive in a world which becomes flatter and flatter. In addition to innovation, creativity, customer retention and employees are the most important elements for a long-lasting company success (IBM Global CEO Study 2010) and so must be a part of any solution. The human-driven aspects and customer-centricity are core for competition success (Lindberg et al., 2011).

IT is a critical enabler for such innovation (Kagermann et al., 2010) that is core to banks (Tallon and Lattanze, 2010) A related problem is that IT is struggling to achieve business/IT-alignment. This is one of the top three key challenges for CIOs for over 30 years (Luftman & Ben-Zvi, 2010) and it correlates directly with company success.

*Corresponding author

Design Thinking is a human-centered rapid-prototype-based innovation method that provides the tools to handle complex innovation processes with customer transparency and involvement. Design Thinking approaches managerial problems as designers approach design problems (Dunne & Martin, 2006) and can be integrated into the IT development process so as to address all of the problems above.

We study a demonstrated novel case of the success of such an application of Design Thinking. The case of Deutsche Bank, as the first of this kind, outlines how such customer-centric innovation was iteratively created according to the method Design Thinking and how IT worked with business as well as end-consumers in the creation process. A major result was that business/IT alignment could be reached on a project level. In terms of developing IT departmental customer-centric organisations, the case shows implications for cultural change, education of staff and organisational handling of high-resolution prototypes as well as resistance towards change and methods to overcome such resistance. These results have been derived from over 4 years lasting case of applying Design Thinking in form of a an incubator approach within Deutsche Bank's IT business application innovation processes as well as a decisive process step in the IT application development process. However, how to evaluate these results, and how to derive practical methods that can be used by other banks, is not yet clear and requires a deep analysis of the Deutsche Bank case.

2. LITERATURE REVIEW

Popular literature has given a view on how human-centered approaches were introduced in companies in a top down approach (Lafley & Charan, 2008; Brown, 2009; Martin, 2009). However, the literature has not yet studied how Design Thinking could be used in banking industry IT to create innovative applications that align IT and business and provide customer involvement and transparency. Certainly such a case study is novel within the extant literature. Design Thinking has not yet been researched in the context of financial institutions and over the period of time in the proposed study. Several papers are however relevant. The Embedded Design Thinking approach to alignment which is being described in the Deutsche Bank case integrates elements which are required to cope with the challenges of alignment (Teubner, 2006).

Design Thinking in general is one of the most promising and much recommended method to support innovation and innovation teams in organizations (Sutton & Hargadon, 1996). Design thinking, as applied in the Deutsche Bank context, has its roots in mechanical engineering at Stanford University (Dym et al., 2005), with a strong tangible creation focus. The main elements of design thinking are (compare Figure 2): Define the problem, Needfinding, Ideation, (rapid) Prototyping, Testing and Redefining. Design thinking innovation starts with an innovation task, or problem statement, such as "Improve the form finding process in branches", and is preferably already human-oriented. The authors understand human-centered as a consequent orientation of

the innovators on human needs, which often remain unarticulated (Terwiesch & Loch, 2004) and therefore automatically integrate business and IT divisions from an organisation. Design thinking teams learn novel ways to elicit real customer needs, as opposed to stated ones, and to iterate between the elements of the process and pursue these iterations through two different main phases: diverging and converging. The diverging phase is meant to foster divergent thinking in the team and result in as much ideas and prototypes as possible, whereas the convergent phase supports in converging thinking and raise the resolution of dominant designs. Both phases are linked by a transition phase, in which design thinking innovation teams change from a diverging working mode to a converging working mode (see figure 1).

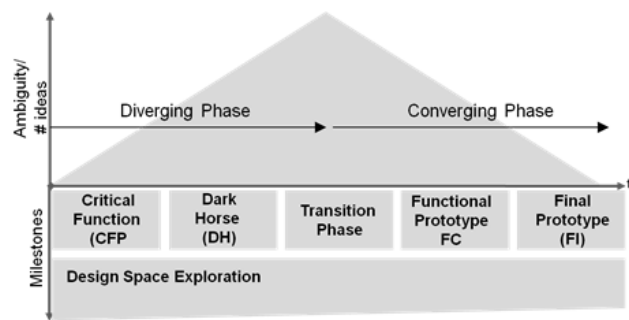


Figure 1: Milestones of Embedded Design Thinking Project

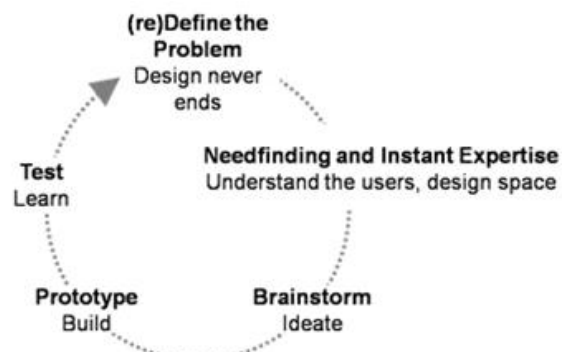


Figure 2: Design Cycle

The main outputs of design thinking are developed and tested prototypes. Prototypes are understood as tangible developed ideas, which gain more depth in the course of the process. Research defines prototypes broadly, as the approximations of the final product along one or several dimensions of interest (Ulrich & Eppinger, 1994). Furthermore prototype is the most commonly used learning mechanism in the case of customized design (Terwiesch & Loch, 2004). Additionally they make it possible for innovators to anticipate how the product will be received by their customers, without incurring the cost of an actual launch (Terwiesch & Loch, 2004).

The iterative approach and the pursuing of the described milestones has been researched from Stanford Design Group in the context of academia already (Carleton & Leifer 2009). The implementation of this concept in corporate world has just been partially analyzed so far (Vetterli et al., 2011; Vetterli et al., 2012). The proposed publication should give a detailed view for CIOs to position their IT adequately within the overall innovation process and create direct contact to end-consumers. From an implementation perspective it shows how Design Thinking can be incorporated into the CIO department of a financial institution and therefore provide implications for other CIOs either in the banking industry or other it-driven industries.

3. RESEARCH FRAMEWORK

The main problem from an IT perspective is that IT departments are typically suppliers to business units and do not have any contacts with end-consumer of the company. Even so, IT typically has a problem to align with real business requirements. In this situation, it is hardly possible to create customer-centric innovation. The business unit must capture all relevant needs of the end consumer and transmit all the relevant information completely to the IT supplier. The usual “throw it over the wall” approach is very unlikely to provide IT with the context needed to provide the real customer requirements.

The following figure shows the two sides of the design space for IT departments. On one hand the order-to-execution where the IT department has a clearly defined product portfolio to deliver for the business and on the other hand the collaboration oriented work which involves business in the product development.

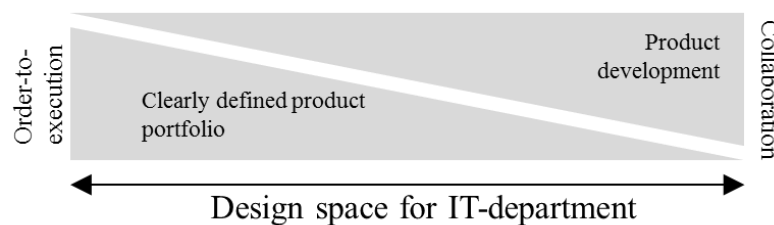


Figure 3: The design space of IT-departments

The research question is thus defined as how IT departments can enable the delivering of human-centered innovations? This question embeds several assumptions. One is that human-centered innovations in business services will produce the requisite customer transparency and involvement. Another is that the service applications will meet the bank’s business needs. A major assumption is that the process that results in such applications can be managed. And finally, embedded in this overall research question is the issue of whether there are practices that can be described for use and improvement by other financial institutions.

The hypothesis is that Embedded Design Thinking, as a human-centered innovation method within corporate environment can enable IT departments to capture the relevant information through methodological tools of Design Thinking and integrate the business adequately within the very early innovation stages to contrive that early innovation is delivering the right ideas and prototypes to deliver highly customer-oriented solutions. Moreover, our hypothesis is that within Deutsche Bank, there has been the creation of a kernel a new approach we call Embedded Design Thinking that incorporates the main paradigms of Design Thinking in a sustainable and manageable way for corporate environment, which can be explicated, reproduced, and improved upon by others.

4. RESEARCH METHOD

The research efforts for this publication 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 multinational financial institutions. The Framework of Embedded Design Thinking 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). Data has been gained through in depth interviews and observation over an application period of over four years and the presented result includes the implications that could be derived from the research efforts accompanying the application of Embedded Design Thinking. The data was analyzed through qualitative data analysis of the interview transcripts and three main components were identified: Business-/IT-Alignment, Customer-Orientation and Design Thinking.

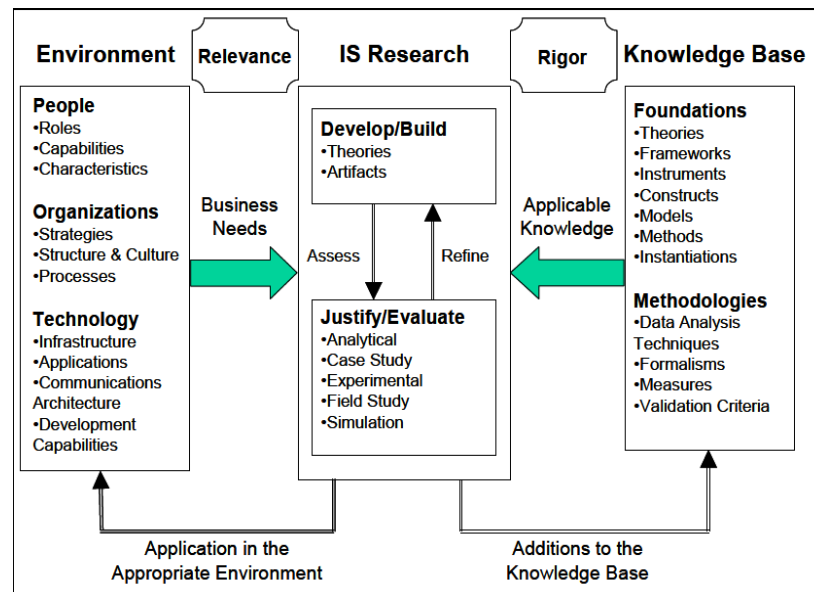


Figure 4: Design Science Research (Hevner et al. 2004)

The development of the knowledge and understanding of the problem domain and its solution was achieved in the building and application of the designed application services. This is what we study. 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 paper was the framework and its implication of Embedded Design Thinking, to implement Design Thinking in an IT environment and reach innovation from an overall organisational perspective integrating business as well IT perspective. The final validation of this artifact (Embedded Design Thinking) in terms of design science was made during iterations in the implementation.

5. EXPECTED CONTRIBUTION

The expected outcome from a theoretical perspective, the artifact of Embedded Design Thinking serves as a first approach in implementing Design Thinking in an IT environment of a financial institution. The approach of the ME310 Network (see also Carleton & Leifer, 2009) was a first step but is limited to academic context. The components of Embedded Design Thinking are being described and analyzed in the corporate context and significantly add value to the body of knowledge of implementing Design Thinking as methodology in a corporate environment. From a practical perspective the presented research shows how IT executives can enable their departments to create human-centered structures to enable the initiation of human-centered innovations whereas IT and business are both involved.

The different implication categories referring to the qualitative data analysis (Miles & Hubermann, 1994) and referring to the research framework are as followed:

Category	Implications
Business-/IT-Alignment	<ul style="list-style-type: none">• Definition where Business/IT-Alignment could be reached and why;• Alignment through organisational embedding of project constellation,• Alignment through process of Design thinking (method)• Alignment through involved business units and parts of the IT department,• Evaluation of role of the organisational IT within this project
Customer Orientation	<ul style="list-style-type: none">• Why the component of customer orientation as a mindset is so important in this environment and how the IT and Business side integrated it and digested this change<ul style="list-style-type: none">○ Why customer orientation is so central also in terms of IT○ What is the potential of customer orientation in IT

Design Thinking	<ul style="list-style-type: none"> ● Description of the main components of Embedded Design thinking <ul style="list-style-type: none"> ○ Design Cycle ○ Role Model ○ Communication Plan ○ Further Education Modules ● Methods/Tools which were used ● Prototypes that were delivered and in which form for hand-over ● Activities of the defined roles ● Resistance towards Design Thinking in this observed context ● How a transfer in knowledge could be reached for further development
-----------------	--

6. CURRENT PROGRESS

The current process of creating an MISQE article integrates following parts which have been achieved already (A-B) and the actually working on part (C-D):

A) Creation and evaluation of the artifact:

The creation of Embedded Design Thinking has been done and its implementation works since 2008/2009 in the IT innovation department of the Deutsche bank

B) Data gathering

The data over the last four years of appliance was accomplished and in total 53 in depth interviews were conducted on different hierarchy level.

C) Data analysis

The data was analyzed with codings in Nvivo and main statements in the style of the MISQE could be derived.

D) Article formulation

The actual status quo is the creation of the article and as a first step to receive feedback from the AIS Journals Joint Author Workshop PACIS 2013, which would represent a first very valuable discussion point to receive input and new perspectives to derive implications for the article.

References

- Brown, T. (2009). *Change by Design*. New York: HarperCollins.
- Carleton, T. & Leifer, L. (2009). Stanford's ME310 Course as an Evolution of Engineering Design. *Proceedings of the 19th CIRP Design Conference - Competitive Design* (p. 547ff). Cranfield University.
- Dunne, D. & Martin, R. (2006). Design Thinking and How It Will Change Management Education: An Interview and Discussion, in: *Academy of Management Learning & Education*, 5 (4), S. 512-523.
- Dym, Clive, Alice Agogino, Ozgur Eris, Daniel Frey, and Larry Leifer, 2005, "Engineering Design Thinking, Teaching, and Learning". *Journal of Engineering Education*, 34: 103-120.
- Friedmann, T.L.(2005). *The World Is Flat: A Brief History of the Globalized World in the Twenty-first Century*. London: Penguin.
- Hevner,A; March, S; Park, J.; & Ram, S. (2004). Design Science Research in Information Systems. *Management Information Systems Quarterly*, Vol. 28, No. 1, pp. 75-105.
- IBM Global CEO Study (2012). *Führen durch Vernetzen*. Ehningen: IBM Press.
- IBM Global CEO Study. (2010). *Unternehmensführung in einer komplexen Welt*. Ehningen: IBM Press.
- Kagermann, H.; Österle, H. & Jordan, J. (2010). *IT-Driven Business Models – Global Case Studies in Transformation*. Hoboken: John Wiley & Sons.Lafley Charan (2008). *The Game-Changer: How You Can Drive Revenue and Profit Growth with Innovation*. New York: Crown Business.
- Lazonick, W. (2005). *The innovative firm*. New York:Oxford University Press.
- Lindberg, T. et al. (2011). Design Thinking: A Fruitful Concept for IT Development? In H.Plattner, L. Leifer & C. Meinel, *Design Thinking: Understand – Improve – Apply* (S. 3-18). Heidelberg: Springer.
- Martin, R. (2009). *The Design of Business*. Boston: Harvard Business Press.
- Miles, M.B. & Hubermann, A.M. (1994). *Qualitative Data Analysis*. Thousand Oaks: Sage Publications Ltd.
- Sutton, R. & Hargadon, A. (1996). "Brainstorming Groups in Context: Effectiveness in a Product Design Firm". *Administrative Science Quarterly*, 41(4), 685-718.
- Tallon P.P. & Lattanze, D.D. (2010). A Service Science Perspective on Strategic Choice, IT, and Performance in U.S. Banking. *Journal of Management Information Systems*, 26 (4), 219-252.
- Terwiesch, Christian and Christoph Loch, 2004, "Collaborative Prototyping, Pricing of Custom-Designed Products". *Management Science*, 50: 145-115.
- Teubner, A. (2006). IT/Business Alignment. *Wirtschaftsinformatik* 48 (5), S. 368–371.
- Ulrich, Karl and Stephen Eppinger, 1994, *Product Design and Development*. New York: McGraw-Hill.
- Vetterli, C., Brenner, W.; Uebernickel, F. & Berger, K. (2011). Die Innovationsmethode Design Thinking. In: Lang, M. (Hrsg.), Amberg, M. (Hrsg.) (2011). *Dynamisches IT-Management - So steigern Sie die Agilität, Flexibilität und Innovationskraft Ihrer IT*. Symposion Publishing, Düsseldorf.
- Vetterli, C.,Hoffmann, F., Brenner, W., Eppler, M. & Uebernickel, F. (2012). *Assessing Prototypes and Team Performance in Design Thinking Innovation Projects*. EURAM 2012 – Conference Proceedings.