

# THE VALUE OF DESIGN RESEARCH

## NOT WITHOUT DESIGN – SYSTEMATICALLY LINKING RESEARCH, DESIGN AND PROJECT MANAGEMENT

11TH EUROPEAN ACADEMY OF  
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### ABSTRACT

*In this paper we advocate the use of design tools to support the management and progress of industry driven research projects. Moreover, we propose a neat collaboration between researchers and project managers allowing early and effective feedback. Our motivation is to inject research findings into projects early on so as to foster the absorption of knowledge and to leverage the learning process. Increasingly dealing with industry-driven research projects, we regard well aligned project management, research skills as well as out-of-the box thinking as crucial success factors. We therefore propose to use designers' work approaches as well as traditional research methods and to integrate them as an essential component into our projects. A design dedicated project that strives to embed designers' work approaches and problem-solving skills in start-up companies acts as a playground for our investigations. By setting up an early and collaborative relationship between designers and researchers we propose to develop an approach that may help accelerate an effective implementation of results. By doing this, we hope that the project partners (in our current project represented by designers and an effectuation specialist) and the involved researcher(s) benefit from this neat collaboration, the step-by-step research, as well as the application of design tools. Considering the goal of the given project, we deem it important that the integration of design and research is not restricted to one particular work package but that findings are transferred from one work package to the next one. Exploring the potential contributions of designers' work practices in the context of a research project we use the somewhat provocative slogan "Not without design" to discuss its potential relevance and areas of application.*

*Keywords: design-informed strategic management, project management support, research-driven knowledge transfer, management-design integration*

### 1 INTRODUCTION

As starting example we use a third-party research project called DOGA (Design Orientierte Gründungsarbeit = design oriented start-up work) whose goal is to integrate designers' work approaches and problem solving skills into start-up companies so that these practices become an integral part of entrepreneurial behavior. Supporting this agenda, two of our project partners (i.e. a designer and an effectuation specialist) developed a number of workshops aimed at changing the entrepreneurial behavior of participating companies through initiating, integrating and fostering a certain design orientation.

The goal of our work is to highlight this important relationship between design, research and project management, in which the latter has to aim at optimizing the collaboration between researchers and designers. Driven by this idea we advocate the need for an alternative approach to project management where ongoing research step-by-step contributes to and consequently supports the

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continuous progress of a project, and where design techniques act as incubators and problem solvers. In an academic setting we continuously face industry-driven research projects, which usually not only require strong project management and research skills but also out-of-the box thinking. Here is where we believe design tools and an early collaboration between project partners and researchers has to come into play. Similar to how design tools and techniques may be used to change entrepreneurial behavior referring to the goal of our third-party project, we see great potential for applying them in a general project management context in which researchers and practitioners/project partners have to collaborate.

## **2 THEORETICAL BACKGROUND**

Throughout the years research in the field of design management has led to the development of a variety of different design management concepts, frameworks and methodologies (Verganti 2011; Erichsen and Christensen 2013; Andreassen 2011). In the literature one finds several links between the organizational learning capability, design and the innovation performance, which represents the starting point for our considerations. For example, Fernandez-Mesa et al. (2013) showed a link between the design management capability, the organizational learning capability, as well as the product innovation performance of SMEs. Here design represents a mediating role and fosters the link between innovation and organizational learning, bringing ideas into material forms.

Representing a sort of comprehensive research laboratory (Dell’Era and Verganti 2009), leading Italian manufactures involve themselves in a continuous dialogue with their external environment (i.e. universities, raw material suppliers, designers and design schools). This learning process spans widely outside the firm’s boundaries and internalizes knowledge about meaning, sociocultural models as well as product languages (Verganti 2008). Many learning scientists presume that cognition and learning is rather a process than an individual’s thinking skill. This process spreads across the knowledge holder, the environment in which the knowing happens and the activities in which the learner takes part (Barab and Squire 2004).

Following this assumption, Acklin developed a model which describes the absorption of design knowledge (Acklin 2013) based on the absorptive capacity construct by Zahra and George (2002). This model proposes indicators that define the progress of absorption as well as those design management capabilities that facilitate the design absorption in SMEs with little or no prior design experience. Four organizational capabilities describe the absorptive capacity: acquisition, assimilation, transformation and exploitation. Acquisition describes the capability to identify and acquire external information. Assimilation is characterized by the routines and processes allowing a company to analyze, process, interpret as well as to understand information from external resources. Transformation is considered as the capability of creating and refining the processes and routines that allow for combining existing knowledge with new acquired knowledge. This includes the possibility to add or delete knowledge or its re-interpretation. Exploitation refers to the capability that enables a company to create new competencies or to leverage, refine and extend existing competencies. It also comprises the incorporation and transformation of knowledge into its operations (Zahra and George 2002; Acklin 2013).

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We consider the use of design as a strategic resource as well as a learning process (Acklin 2013), for the focus on capabilities and the way how they are realized requires the configuration of resources as well as the absorption of new knowledge (Acklin 2013). Therefore, we aim at applying these contributions to our projects and its management.

Many studies of design management describe its coordination with other divisions, such as for example with marketing (Moll et al., 2007; Lindahl and Nordin 2010; Venkatesh and Meamber 2006; Kristensen and Gronhaug 2007; Hsu 2011), its implementation in management strategy (Borja de Mozota 2003; Stevens 2009; Moultrie and Stevens 2011) or in the overall business process (Venkatesh et al., 2012; Borja de Mozota 2005; Borja de Mozota 2009; Volkova and Jacobsone 2013; Verganti 2008). Only few studies, however, explain the relationship between these factors so as to paint a more holistic picture of the impact design management may have on a cross-disciplinary field such as project management (Kanno and Shibata 2013).

### **3 DIFFERENT ONTOLOGICAL VIEWPOINTS AS A CHALLENGE**

Generally, design faces the challenge to create a useful object of art, either virtually or physically, and in doing so it is given the opportunity to build an environment which is fun, livable, sustainable and culturally inspiring (Esslinger 2011). Design problems are often complex problems and have usually no single right solution, but rather a range of different possibilities, making a cut-off necessary. Designers are confronted with wicked problems – meaning that tasks are ill-defined and based on complex, incomplete, contradicting or changing information. A prerequisite for this type of problem solving is therefore the ability to embrace a wide range of thoughts and knowledge in areas such as arts, technology and science (Rylander 2009). Thus, in design different strains of research can be identified; one of the most exhaustive explored issues being the thinking process of designers (Stempfle and Badke-Schaub 2002). Problem-solving in general and the solving of design problems in particular, requires an overlap between an envisioned goal space and a potential solution space. Only if both spaces are known and explored an optimal fit can be established, leading to the creation of well-designed products that meet all their requirements (Stempfle and Badke-Schaub 2002). An additional research perspective with its rather rigorous exploration and analysis methods may very well support this matching process.

Also, a better understanding of how designers solve problems and create value may help improve the problem-solving skills of today's knowledge economy (Rylander 2009). That is, managers and strategists increasingly discover the potential of design methods used in strategy activities, which have not been thought as relevant before (Stevens 2012). Showing a clear cross fertilization in the field of design management, Erichsen and Christensen found that the main challenge is to overcome the two different ontological viewpoints by which designers and managers approach this field (Erichsen and Christensen 2013). Here we believe that an additional research perspective may act as a mediating factor.

### **4 INTEGRATING DESIGN AND RESEARCH TO AUGMENT THE PROJECT PERSPECTIVE**

Our vision of future project management is based on the idea of a procedure that links research and design methodologies with an actual project in such a way that the envisioned target state is achieved, meaning solving the project-specific problem as well as creating value.

Starting with the literature we therefore explored a set of design tools and technique and developed an application sequence, which closely resembles a project process model. The resulting framework currently acts as the core structure of a third-party design research project our team is involved in. Findings from this first implementation will be used to improve future employments and furthermore ensure that the integration with new business methods and models fulfills the required quality standards. Selecting design tools and techniques we particularly aimed at methods which enable the representation of the complexity of projects and their tacit knowledge, as well as handle verbal and visual information (Hemetsberger and Godula 2007). Following Mahy and Zahedi (2010), we believe that design can act as a catalyst when collaboration in complex projects becomes necessary. The question that remains, however, is how project members are best organized and what tools and techniques may best support this process (Mahy and Zahedi 2010).

#### **4.1 FOSTERING THE COLLABORATION BETWEEN DESIGNERS AND RESEARCHERS**

As recent literature shows, the blurring of discipline boundaries is best achieved through the establishment of cross-functional teams (Chen and Venkatesh, 2013). This type of cooperation, i.e. the joint cross-disciplinary effort of developing an optimal solution, requires a high level of coordination, which also includes the social interaction of the relevant group members (Hemetsberger and Reinhardt 2009). It may therefore be argued that a well-knit, effective team compilation is crucial for the success of such teams and the problems they aim to solve. When it comes to integrating designers into a project environment Girard and Robin (2006) furthermore highlight that a team needs to be put together based on the project's overall design objectives. Consequently one should aim for creating an environment where designers and researchers, as well as other project team members, are able to efficiently collaborate. Collaboration, in this case, is defined as a process in which a group follows a sequence of steps leading to a shared goal (Kolfshoten and Vreede 2009). Integrating a design-research perspective into this process furthermore requires the existence of a naturalistic context and the support for iterating process steps (Barab and Squire 2004).

#### **4.2 THE DOGA PROJECT AS A TESTBED FOR JOINT DESIGN AND RESEARCH WORK**

The DOGA project is our first testbed to explore ideas with respect to this collaboration between project partners and researchers. We are particularly interested in understanding how the relationship between these participants can be designed. But we also want to find gaps that potentially endanger the envisioned target state. In the context of the DOGA project, the overall target state is defined as initiating, integrating and fostering a design orientation into start-up companies. It is thought to achieve this integration through a number

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of workshops, which should let entrepreneurs experience various work practices and problem solving approaches used by designers.

### **4.3 THE DOGA WORKSHOPS**

Aiming to integrate this design expertise into start-up companies our project partners, i.e. a designer and an effectuation specialist, developed a set of teaching modules ranging from so-called design jams to design workshops. The goal of these rather diverse modules is:

- to construct a framework of different design experiences so that workshop participants are able to see the different perspectives of design and their significance for the development of successful products and services;
- to convey design methodologies and competencies in order to extend and improve the entrepreneurial activities of participants;
- to enhance participants' awareness of design (thinking) as a strategic tool;
- to explain participants the integration of design orientation into company processes;

### **4.4 THE AIM OF DOGA**

Taking the DOGA project as a first application project for our combined research/design framework, the goal is to support the creation and evaluation of design workshops. The main challenge of this undertaking lies in locating and integrating information from different sources (i.e. feedback coming from workshop participants, workshop trainers and researchers), where the richness and diversity of fragments have to be seen and harnessed as strength rather than as weakness (Denyer et al. 2008). Following the mission of DOGA i.e. the integration of designer's work practices and problem solving approaches into the work processes of start-up companies so as to initiate and foster a design orientation, we particularly aim at the development, improvement and validation of these training workshops. Doing so, we want to tackle the question of how to provide input that can satisfy different requirements and preliminaries.

## **5 A PROPOSED RESEARCH METHODOLOGY**

Given the variety of projects and their distinct requirements, our goal is to develop a conceptual approach, which allows a reproducible procedure for (our) future industry-driven research projects.

We propose three different levels on which interactions may take place: (1) a project level, (2) a collaboration level and (3) a research level.

The procedure we follow is first to explore the problem space in which the project is anchored. Whereas designers usually work under the constraints of a complex environment we try to minimize these influencing affects by defining work packages. These work packages are in alignment with the overall goal of the project.

We ask the project partners to appoint a project manager who assists in two ways. On the one hand he/she represents the contact person for questions, which arise during the endurance of the project. On the other hand this person may serve as promoter and catalyzer for communication.

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Moving to the next level (2), we suggest the establishing of a fruitful collaboration between this project manager and the researcher. In the context of the DOGA project a designer represents the project manager and representatives of our group take on the research role. We are then particularly interested in the relationship between project manager and researcher. These interactions may point to certain dynamics useful for the improvement and stimulation of the overall problem-solving process. Improvements in this context means that feedback results derived from one work package create the foundation for the next work package. By doing this, we intertwine work packages in such a way that although they cover different aspects they act as feedback for each other, eventually leading to a better understanding of how researchers and designers may best collaborate. Here we believe that all happenings are important, since an evaluation of all work packages and their interrelation is required in order to generate reliable results.

For each of the work packages we elaborate an initial goal, i.e. a sub goal for each workshop of the DOGA project. A short interview conducted at the beginning of the work package (in this case with the workshop trainers and facilitators) is used to define this goal.

Next, we propose relevant design methods (Kumar 2013). We regard the implementation of these methods as useful, as the following recurring strategies have been empirically observed in the design process (Lindberg et al., 2008): (1) the illumination of the problem space: meaning that designers in the exploration space apply an intuitive (not fully verbalized) understanding, which is achieved through considering exemplary use cases or scenarios. An opposite approach is formulating general hypotheses as well as theories with respect to the problem; (2) the exploration of the solution space: various different ideas are explored by designers. This method represents the open and multidimensional character of the task; (3) the iterative alignment of the solution space: in an iterative way ideas are transferred into tangible representatives – prototypes. Those initiate and foster the communication not only among the design team but also with users and employers, considering that they are in touch with the problem-relevant environment.

According to these strategies we have selected the following design methods and techniques to study our workshop participants and other parties involved in the DOGA project. The first method we apply is the research participant map (Kumar 2013). This method maps people with respect to the project's topic and selects candidates for research. The aim is to get an overview of all people who are involved in the project. It is based on their activities and roles, so as to assure that the right people are part of the investigation.

Based on the findings we then move to the research level (3) and use a research plan specifically adapted to the goal of the project. The research plan is seen as a way to organize our research work (Kumar 2013). It involves details about the type of people to be studied, and when and how these analyses will take place. We define a budget as well as a timeline. Activities are shown and the plan is then shared and discussed for further actions. Following Denyer et al. (2008, p.395) this approach is described by:

- distinct research questions being driven by an interest in field problems,
- an emphasis on the production of prescriptive knowledge. This is connected to interventions and systems to produce outcomes which provides the key to solve field problems, and

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— a justification of research products largely based on pragmatic validity (i.e. dealing with the question whether the actions based on this knowledge produce the intended outcomes).

Based on the work of Hemetsberger and Godula (2007) we therefore suggest the following five general selection criteria for the methods used in our work packages: (1) the nature of knowledge transfer, (2) the interference of knowledge transfer, (3) the cost and feasibility of knowledge transfer, (4) the speed of knowledge transfer, and (5) the confidentiality of knowledge transfer.

In order to accelerate feedback loops we furthermore try to find methods that allow for an easy evaluation and analysis, and support an effective implementation of results. Also, effective and efficient communication is deemed important.

## **6 THE LONG-TERM PLAN**

Looking beyond our proposed research agenda the goal is to draw a bigger picture of how this approach can be used in project management. We particularly want to answer the question to what extent the management of projects can be leveraged for all stakeholders by enhancing the absorptive capacity. Hence, to arrive at more generic concept, additional analyses and validations through a number of different projects are necessary.

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