Gaining a Competitive Edge through Action Design Research

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Abstract: The current business environment is characterized by increased competition and highly innovative approach, in order to create products and services to better respond to the costumers’ needs and expectations. In this specific context, the research approaches need to be more flexible and business oriented and so, throughout the paper we have used a research method that combines design research and action research, named Action Design Research which is a research method used for generating prescriptive design knowledge through building and evaluating IT artifacts in an organizational setting [1].

Following the Action Design Research stages and principles: problem identification, building, intervention and evaluation, reflection and learning and formalization of learning, the research team has developed an online instrument used to actively involve the consumer in the product development process, in order to generate a better consumers insight regarding their needs and desires and to design and/or adjust the product accordingly. The customer engagement IT tool created and tested by using Action Design Research, E-PICUS, has been developed within the framework of the research project “E-solutions for innovation through customer pro-active involvement in value creation to increase organisational competitiveness (E-PICUS)”, PN-II-PT-PCCA-2013-4-1811, currently undergoing.

1. Context of the study

In a business environment characterized by high complexity and dynamics, continuous innovation and the ability to generate knowledge during the innovation process [2], [3], [4] become major drivers for competitive advantage. And in today’s world, where the only constant is change, the task of managing innovation is vital for companies of any size in every industry [5].

In order to become more competitive and to expand their knowledge base, companies increasingly co-create knowledge with external stakeholders during the innovation process [6], [7] and there is a consistent stream of marketing and management literature presenting the way some firms managed to involve in the co-creation process one or more types of stakeholders, by using online technologies and developing co-creation communities.

The Internet can be a tremendously valuable instrument for companies, due to the fact that it can enhance the firms’ ability to actively engage costumers in collaborative innovation and to keep a constant two-way dialogue with its stakeholders and that is why companies are becoming increasingly interested in exploiting the open innovation opportunities offered by the new technologies.

The current paper seeks to present the process of constructing an online co-creation platform, aiming to support the new product development process undertaken by a Romanian manufacturing company, following the Action Design Research method.
The internet-based collaboration mechanisms can be mapped to the NPD process based on two important dimensions — the nature of customer involvement that is needed, and the stage of the NPD process at which the customer involvement is desired [8]. In our case the, the Internet-based collaboration mechanisms is focused on reach as opposed to richness and the interaction is applied to enhance the back-end stages of the process (product design and testing).

2. Action Research, Design Research and Action Design Research

Action Research is a type of field study in which “the researcher enters a real-world situation and aims both to improve it and to acquire knowledge” [9] and it combines theory generation with researcher intervention to solve immediate organizational problems [10] aiming to link theory with practice, and thinking with doing [11].

Design Research is the term used by the information systems community to describe a research method centered on developing innovative technologies intended to solve an identified class of problems [12]. The design research sequencing separates building from evaluating and has seven core guidelines: 1) produce an artifact; 2) address a relevant problem; 3) evaluate the artifact; 4) provide a clear and verifiable research contribution in the form of an artifact, a methodology, or design knowledge; 5) construct and evaluate the artifact rigorously; 6) design artifacts by searching for the best alternatives; 7) communicate the research in a manner understandable by both technical and managerial audiences [12].

Recognizing the fact that IT artifacts are often simultaneously shaped by researchers and use organizations and considering that organizational intervention is a key aspect, Sein et al. proposed Action Design Research (ADR), where artifact construction, organizational intervention and artifact evaluation occur concurrently [1].

The ADR method consists of four stages supported by seven principles. The stages include: problem formulation, which identifies and conceptualizes a research opportunity based on existing theories and technologies; “building, intervention and evaluation” (BIE), which refers to building the artifact, intervening in the organizational setup, and concurrently evaluating and shaping the artifact according to context; reflection and learning, which moves from developing a solution to a particular instance to applying that learning to a broader class of problems; and formalization of learning, which allows the situated learning from an ADR project to be further developed into a general solution for a class of field problems.

The ADR method also includes several guiding principles and “critical elements” such as: the importance of long-term commitment from the participating organization; defining the problem as an instance of a class of problems; practice-inspired research, which emphasizes viewing field problems as knowledge-creation opportunities; the theory-ingrained artifact, which emphasizes that the artifacts created and evaluated via ADR are informed by theories; reciprocal shaping, which highlights the inseparable influences mutually exerted by the two domains: the IT artifact and the organizational context; mutual influential roles, which points to the importance of mutual learning among the different project participants; authentic and concurrent evaluation, which emphasizes that evaluation is not a separate stage of the research process that follows building but a continuous process; guided emergence, which aims to capture interplay between structured external intervention and organic evolution; and generalized outcomes, which refers to the move from the specific-and-unique to generic-and-abstract.

3. E-PICUS app development through ADR

3.1. Problem Formulation

In the Problem formulation stage there are two critical elements to be considered: the ability to secure long-term commitment from the participating organization and the capacity to define the problem at hand as an instance of a class of problems.

Critical element 1: Securing long-term commitment from the participating organization
The online co-creation platform was developed within the framework of the research project, „E-solutions for innovation through customer pro-active involvement in value creation to increase organisational competitiveness (E-PICUS)”, PN-II-PT-PCCA-2013-4-1811, currently undergoing. The project was based on a consistent collaboration between researchers at the “Gheorghe Asachi” Technical University Iasi and Electra Group, which is a long-term partner of the University. The company has been actively involved in all stages of the project including the idea generation and the proposal writing phase, which lead to an improved team working setting. The IT artifact developed throughout the ADR process is being developed and tested for a product currently in production at ELECTRA.

Critical element 2: Defining the problem as an instance of a class of problems
Although at this stage, the IT artifact is created in partnership with a specific business for a particular product, this project aims at developing an online co-creation platform that could be adaptable in order to be further used by other types of businesses interested in actively involving their stakeholders in the co-creation process. This required an ability to conceptualize the co-creation process and putting it in context for the Romanian market as a class of problems from the beginning.

3.1.1. Principle 1: Practice-inspired research
This principle emphasizes viewing field problems (as opposed to theoretical puzzles) as knowledge-creation opportunities [1].

The project was jointly motivated by theoretical and applied academic studies in the co-creation and new product development area. The extensive research previously conducted revealed an abundant literature treating co-creation, online co-creation instruments and platforms, presenting both successful attempts and undergoing projects.

The research team discussions with the corporate partner disclosed the critical importance, in the new product development process, of having better insights from customers and other stakeholders in order to shape and adjust the product and its marketing strategy.

3.1.2. Principle 2: Theory-Ingrained Artifact
The theory-ingrained artifact emphasizes that the ensemble artifacts created and evaluated via ADR are informed by theories [1].

An extensive literature review was conducted in the design phase of the project in order to determine the state-of-the-art and to gain a better understanding of the co-creation area. The next phase consisted in a benchmarking analysis which included an extensive number of online co-creation platforms and instruments developed, among others by Dell [13], Heineken [14], BMW [15], Lego [16], Barilla [17], IBM [18], etc. the benchmarking analysis revealed the most common elements included in all platforms, the best practices and the overall process of inviting and engaging the stakeholders in the co-creation process.

The main tasks in the Problem Formulation Stage were to: identify and conceptualize the research opportunity, formulate initial research questions, cast the problem as an instance of a class of problems, identify contributing theoretical lenses and prior technology, secure long-term organizational commitment advances and set up roles and responsibilities.

The research team followed all the ADR stages and tasks as the initial research questions were established through a two-way approach: open discussions with the corporate partner to assess its needs and expectations and an extensive literature review to determine the state-of-the-art and further opportunities.

The long term goal was to develop an online co-creation platform that could be adapted and shaped to be further used by different companies in different contexts.

In order to make sure the project can be successfully developed the organizations commitment and the clear division of roles and responsibilities was essential.
3.2. Building, intervention and evaluation

The building, intervention and evaluation phase is guided by three principles: reciprocal shaping, mutually influential roles and authentic and concurrent evaluation [1].

3.2.1. Principle 3: Reciprocal shaping

This principle emphasizes the inseparable influences mutually exerted by the two domains: the IT artifact and the organizational context [1].

The project was jointly led by university marketing and management specialists and marketing and research & development representatives of the partner company engaged in an ongoing dialogue throughout the development of the platform. Neither one of the perspectives was privileged and the success of the project was dependent on the way the project team managed to communicate and to create the best scenarios to help achieve both the short term goal (the online co-creation platform for the specific product developed by ELECTRA) and the long term goal (an interactive, adaptive and contextual co-creation platform that can be further used by other businesses).

3.2.2. Principle 4: Mutually Influential Roles

The principle of mutually influential roles points to the importance of mutual learning among the different project participants and it was essential throughout the project because each partner has his own specific knowledge and expertise and in order to shape the User-friendly process and the Active Projects and online community section the research team needed constant and active input from the corporate partner.

3.2.3. Principle 5: Authentic and Concurrent Evaluation

Authentic and concurrent evaluation emphasizes a key characteristic of ADR, that evaluation is not a separate stage of the research process that follows building, but a continuous process [1].

The IT artifact was developed through an iterative process in 9 stages, modeled and adjusted through constant feed-back from the research team, the corporate partners and the external stakeholders testing.

The main tasks in the Building, Intervention, and Evaluation Stage were to: discover initial knowledge-creation target, select or customize BIE form, execute BIE cycle, assess need for additional cycles, repeat.

The online co-creation platform development largely followed software engineering web principles and the portal components were developed and adjusted in an environment of continuous testing, evaluation, improvement and market responsiveness.

3.3. Reflection and Learning

The reflection and learning phase is guided by one principle: guided emergence.

3.3.1. Principle 6: Guided emergence

The principle of guided emergence aims to capture a vital trait of ADR, the interplay between the two seemingly conflicting perspectives of structured external intervention and organic evolution. The artifact will reflect not only the preliminary design created by the researchers but also its ongoing shaping by organizational use, perspectives, and participants [1].

In order to make sure that the online platform can be further customized and used, the IT artifact was developed using ready to use templates and WordPress widgets and the website-flow was structured in a user-friendly and intuitive manner. The in-house testing and the focus-groups conducted revealed constructive flaws and technical errors that were fixed.

The main tasks in the Reflection and Learning Stage are to: reflect on the design and redesign during the project, evaluate adherence to principles and analyze intervention results according to stated goals. The project is at this moment in the reflection and learning stage and the research team is
constantly analyzing and evaluating the results obtained through internal and external testing according to the short term and long term goals of the project.

3.4. Formalization of Learning
3.4.1. Principle: 7. Generalized outcomes
The generalized outcomes principle refers to the move from the specific-and-unique to generic-and-abstract and there are three levels for this conceptual move (1) generalization of the problem instance, (2) generalization of the solution instance, and (3) derivation of design principles from the design research outcomes [1].

The main tasks in the Formalization of Learning Stage are to: abstract the learning onto concepts for a class of field problems, share outcomes and assessment with practitioners, articulate outcomes as design principles, articulate learning in light of theories selected and formalize results for dissemination.

The main goal of the project, from the start, was to develop a co-creation platform that can be further used and customized by other companies interested in involving their stakeholders in the NPD process and the research team is currently working on making further adjustments on the IT artifact while disseminating the results obtained throughout the project until this current phase.

4. Conclusions
There are some very important features of the ADR approach that we believe to be highly relevant for designing online co-creation platforms and instruments which led us to choosing this specific research methodology.

Firstly, it takes into consideration the dynamic between the planned design and the context of use which is an essential aspect when designing IT artefacts.

Secondly, ADR focuses on the constant interaction between the researchers, the practitioners and end-users throughout the design process and it is strongly oriented toward collaboration, thus leading to a more market oriented final product.

Thirdly, the fact that in ADR evaluation is not a separate stage of the research process that follows building, but a continuous process makes it appropriate for IT artefact development as they are continuously shaped and adjusted through an iterative process before being released to market.

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