Towards a pattern based approach for designing virtual communities for innovations

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Abstract: In the field of Open Innovation, virtual communities set up by companies in order to integrate customers into their innovation process are a new and promising instrument. As there is actually a lack of systematic approaches for designing these communities, in this paper, we propose a pattern based two-step model, which enables non-intuitive design choices for virtual communities for innovations.

1 Introduction

In the past, companies' research and development departments were the only place of ideation and development of innovations. Innovative strength has been seen as one of the most valuable goods a company owns and thus, the innovation process has been a strictly internal issue, separated and isolated from the world outside the company. In the course of this isolation, innovations often were limited to enhancements of a company's existing products whereas only few radical innovations have been developed. The customer has thereby been seen primary as a source of need-information but not as source of solution-information.

In recent years, a paradigm shift has emerged, making efforts to open up companies' innovation processes in order to benefit from external sources in terms of various stakeholders as well as from synergies and the cooperation with other companies. This approach, often referred to as "Open Innovation" [Ch03, Hi06, HK02], becomes more and more important in product development. Literature describes the integration of customers as one of the biggest resources for innovations [TBP97, WP07]. Chesbrough [Ch03] illustrates this new paradigm of Open Innovation in the context of industrial research and development based on the following idea: The integration of stakeholders will open up the company's innovation funnel. Thus more potential ideas for creating innovations pour into the innovation process. The role of stakeholders thereby is not

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limited to the provider of need-information any more. They are rather seen as a source of new ideas, solutions and innovations. In other words: the amount of innovation potential that comes into the company's innovation funnel is rising because more actors are actively involved.

Besides core methods described in literature – namely the Lead-User-Method [UH88], Toolkits [HK02] and ideas competitions [WA07] – a relatively new phenomenon which takes advantage of the innovative strength of collaborating stakeholders are virtual communities which are induced by companies in order to access the creative capabilities of their members. Examples for these communities can be found in terms of "my Starbucks idea"[1] by Starbucks or "IdeaStorm"[2] by Dell. Both are platforms which enable virtual communities formed by customers and other stakeholders in order to develop innovative ideas during the first stages of the innovations process, where ideas are contributed, collaboratively discussed, rated and commented. In literature, an example for the concept of such a community for innovations which aims at covering the whole innovation process in the field of software related innovations can be found in [Br08] introducing the GENIE research project.

At present however, little is known about how to utilize the know-how of these communities [Fu06]. Existing attempts to leverage the innovative potential of virtual communities in terms of internet based community platforms mostly are developed by marketing or web development agencies. Having some experience concerning the implementation of virtual communities to a certain extent, they ideally follow best-practice or seat-of-the-pants approaches related to user interface design and community building. However, a systematic and well founded approach for designing and developing such communities in terms of an internet based platform is missing in practice. Neither does literature offer a suitable approach concerning the in-depth technical design of such a community. Nevertheless, plenty of literature can be found on topics like collaboration theory (e.g. [BVN03]), the support of creative tasks as they appear during idea generation (e.g. [Sh02]), the motivation of people joining and contributing to virtual communities (e.g. [Hu09, Le09]) and aspects concerning the establishment of virtual communities (e.g. [LK06]) which all influence the proper design of such communities. Furthermore, several resources can be found, offering design patterns for community websites[3]. Yet, these pattern libraries are mostly compilations of best practice solutions without further theoretical background.

2 Developing a pattern based approach

In order to establish a well founded approach on how to design virtual communities for innovations, here we propose a pattern based two-step approach for the design of functional units which can be combined in order to implement a comprehensive platform for virtual communities for innovations. Based on established theories and metho-

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[1] http://mystarbucksidea.force.com
[2] http://www.ideastorm.com
[3] E.g. the Yahoo Design Patterns library http://developer.yahoo.com/ypatterns

dologies, namely theory driven design and a pattern based approach out of the domain of collaboration engineering, our approach thus aims at improving phenomenons like the quality of developed ideas, the motivation of people to contribute or improved collaboration within these virtual communities.

2.1 Theory based identification of functionalities

If you want to implement a virtual community, one of the first questions you have to face is which functionalities you will implement on the community platform. Actually, a wide array of out-of-the box solutions in terms of content management or portal solutions exists, which offer an even wider array of functionalities by various components, tools or modules each. However, there is no approach which tells you which functionalities or what combination of functionalities you should choose (or implement from scratch if necessary) in order to design your community so that it produces a desired result.

In order to face this dilemma, in the first step of our approach we propose the identification of functionalities based on the theory driven design approach according to Briggs [Br06]. Theory driven design at a glance is based on considering theories in terms of models of cause and effect which are suitable to explain a certain phenomenon of interest. We illustrate the approach of theory driven design using a tangible example based on theories of motivation we developed in the course of a research project.

In [Le09], we derived functionalities for an internet based ideas competition whose participants are members of a virtual community for innovations. We started to apply theory driven design by identifying the phenomenon of interest we wanted to influence by functionalities in a first step: the participation of an individual in the competition. In a second step, we stated theories which serve as models of cause and effect explaining the desired effect – namely the participation in the competition. Therefore, we adapted an established theoretical model out of the field of motivation psychology which is shown in Fig. 1.
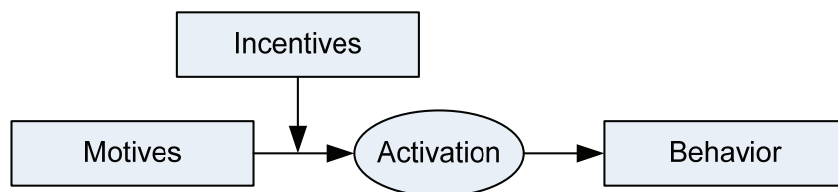

Figure 1: Example for theory driven design: the MIAB model according to [Le09]

The model shown in Fig. 1 states the following theory: in general, every person is bound to distinct (intrinsic and extrinsic) motivations. Examples for these motivations related to competitions are self-esteem, fun (each intrinsic) or winning prizes (extrinsic). The different motives of an individual can be activated by adequate incentives, which results in a distinct behavior of the individual (in our case participation). Using this theory (as a model of cause and effect), we identified functionalities which support incentives

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suitable to activate these different motives. Thus, we implemented for example a functionality called "Top-Idea" which exposes a high-class idea at a prominent position on the platform in order to honor the author's skills. This functionality intends to activate the motive "self-marketing" we identified in the area of ideas competitions.

Another example implementing the identification of functionalities based on theory driven design can be found in [Hu09]. This example deals with the derivement of functionalities based on established theories on creativity support. Amongst others, there we derived functionalities which enable browsing, filtering and searching capabilities regarding all the information produced by the community in terms of a knowledge base. These capabilities are an essential precondition for creative work according to a creativity support framework called "GENEX" by [Sh02] we took as a basis for theory driven design.

The application of the first step of our approach leads us to non-intuitive design choices which produce results beyond those possible with an intuitive approach. The outcome is a set of functionalities grounded on reasonable models of cause and effect and leading to predictable results. However, functionalities of virtual community platforms do not appear isolated but always in context. For example, the configurations of a chat room or the organizational conditions of a group-chat are important information in addition to the functionalities themselves. This implicates the need of a comprehensive functional unit consisting of the functionality itself and additional information on its configuration and application.

2.2 Building pattern based functional units

As a suitable way to combine functionalities with additional information on how to use them – which forms the second step of our approach – we identified a pattern based approach called ThinkLet approach, described by [Br01]. This approach stems from research on Group Support Systems (GSS). ThinkLets can be described at a glance as "the smallest unit of intellectual capital required to create one repeatable, predictable pattern of thinking among people working toward a goal" [Br01]. They are a combination of a distinct tool (which enables certain functionalities), its configuration and a so called script, which contains information on how to use the tool.

As an example for the second step of our approach we refer to the "Top-Idea" functionality mentioned above. In order to achieve a pattern based functional unit concerning this functionality, we add additional information about its configuration and a script on how to use it. The configuration includes for example information on how an idea in a virtual community for innovations becomes a top-idea. This could for example be based on a community rating or the decision of the platform's organizers. The scrip includes for example information on the wording to be used entitling the Top-Idea component. It could be called "Top-Idea", "Coolest Idea" or even "Hot stuff", depending for example on the target-audience of the virtual community. Another example for information a script provides is the maximum duration, an idea has the status of a "Top-Idea" in order to provide sufficient variation by changing the featured idea after a certain period of time. The combination of step one and two of our approach is shown in Fig. 2.
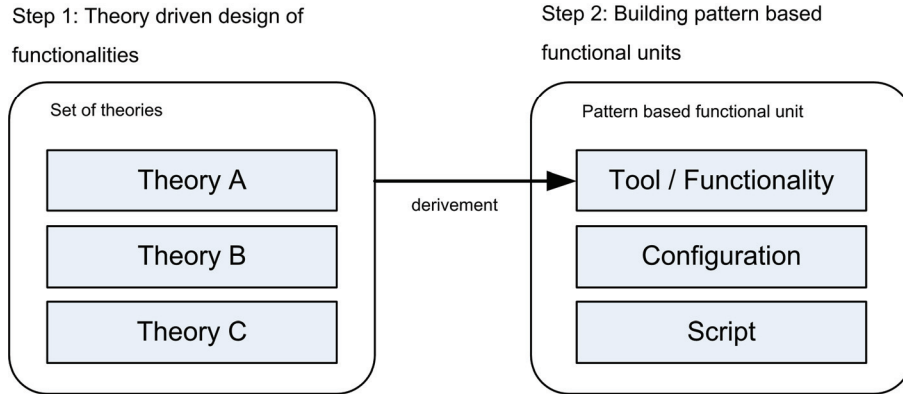
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Figure 2: Step two – building pattern based functional units

Although the origin of the ThinkLet approach is Group Support Systems, which usually concerns small groups of people working at the same time at the same place towards a group goal, we think this approach can be transferred to functionalities which are used for large groups working at different times at different places towards a group goal. This is because the definition of a ThinkLet does not contain any restrictions in terms of time, place and amount of collaborating people.

3 Conclusion & Outlook

In this paper, we introduced a two-step pattern based approach for identifying pattern based functional units for virtual communities for innovations. The first step proposes theory driven identification and design of functionalities. The second step enriches these functionalities with additional information on how to configure and use them resulting in pattern based functional units.

Our proposition can be used as an addition or an additional implementation related in-depth step in combination with established approaches for implementing a virtual community for innovations. As an example, our approach can be used in combination with the design science framework according to [He04]. As we want to implement a virtual community for innovations in the context of a current research project, in future work we will extend the design science framework, in order to include our approach as a way to derive design choices in a non-intuitive way. In [Le09] and [Hu09], we applied the proposed approach in a first run for communities for innovations. For future research, based on these results, we are planning to develop a comprehensive set of pattern based units according to our approach and implement a virtual community for innovations which furthermore will enable a detailed evaluation of our approach.

Concluding, even though we proposed our approach with the focus on developing virtual communities for innovations, we think it is adoptable for designing software artifacts of any other domain as well. This of course has to be evaluated by future research.

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