Innovation in Online Communities – Towards Community-Centric Design

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Abstract. Online communities are changing how companies and non-profits innovate, lower costs, tap talent, and realize new socio-economic opportunities. In this paper, online communities are predicted to be an important resource in open innovation processes, based on the emerging online community trend of sharing and collaboration among non-professional users. However, in order to take full advantage of online communities for innovation purposes, challenges to community interaction, commitment and co-creation have to be overcome. The paper describes these challenges and discusses how future developments in community-centric design can facilitate innovation. Different community-centric methods are suggested with the aim to provide a research direction for redesigning community collaboration and a new approach to innovation in the Future Media Internet.

Keywords: Online communities, innovation, community-centric design.

1 Introduction

According to Clay Shirky, group action gives human society its particular character, "and anything that changes the way groups get things done will affect society as a whole" (p. 23) [1]. One important factor for such change is the proliferation of online communities as they encourage people to find, contact, interact and co-create with an extended web of employees, customers, and stakeholders [2]. Online communities are changing how companies and non-profits innovate [3], lower costs, tap talent, and realize new opportunities [4]. Innovation is no longer necessarily conducted only within a company, but also through co-creation involving non-professional users and external enterprises [5]. Facebook, MySpace, and Twitter are all successful examples of how online communities facilitate innovation and idea generation among groups. Moreover, large companies are increasingly turning to online communities for innovation. Innovation initiatives that used to take months to coordinate and launch can often be started on a very short notice and include groups around the globe.

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Co-creation, the practice of product or service development that is collaboratively executed by developers and stakeholders together [11], changes how knowledge, services and applications are created. Co-creation in online communities has the potential to lower the costs and time of doing research and innovation, with a greater disruptive potential. Online community is therefore predicted to be a key enabler of novel innovation chains and networks, to emerge both in the industry [3] and in non-profit organizations and e-Government [6]. Despite these predictions, important challenges exist in (a) how we can change innovation processes to involve non-professionals into efficient and systematic innovation processes and (b) how we can design systems that lower the threshold for commitment, contribution and co-creation within an online community.

The overall objective of this paper is to present and discuss (a) the challenges and opportunities to innovation involving online communities and (b) how user centric methods can be adapted to community-centric design methods supporting online community commitment, contribution and co-creation. We hope that the resulting insights may benefit future design and development of open innovation solutions for the Future Internet communities.

The paper is based on lessons learned from the European research project CITIZEN MEDIA (www.ist-citizenmedia.org) and RECORD, a Norwegian national project (www.recordproject.org). Both projects explore how people interact and create user-generated content in online communities. Taken together, these projects draw on experiences from the user involvement of more than 10.000 people.

The next sections describe online communities, their benefits for social innovation, key challenges and community-centric methods that can overcome these challenges.

2 Background: Innovation in Online Communities

2.1 Online Communities

Online communities are groups of people with a purposeful interaction supported by technology, guided by norms and policies [7]. Online communities are distinguished by e.g. frequency of interaction, links within or outside the community, enabling technology, and the community member characteristics [8]. Like traditional communities, online communities have their own identities, norms, and goals, and several community objectives may be shared with one or more related communities.

An online community will not survive without lasting user motivation and user participation [2], and the outcome of the innovation is dependent upon characteristics related to the community or communities involved [5]. The characteristics shared by successful online communities are often poorly understood; yet, this is critical knowledge for designers and human factor engineers developing online communities for co-creation and innovation. For example, why individuals or groups help and co-create with strangers in online communities is not very well understood [9], and why this happens more or less in different types of communities is key to know more about this process. An efficient online community platform for co-creation will also be dependent upon ease of use [2].

2.2 Open Innovation, Co-creation, and User Innovation

In a globalised economy and networked world, the way innovation is conceived is changing. Both non-profit organisations and businesses are opening up their innovation processes, involving larger parts of the value chain in the innovation activities, and turning towards the users for inspiration. In particular, three theoretical perspectives seem to be dominating the way we think of innovation: Open innovation [10] co-creation [11], and user innovation [12]. The theory of open innovation target businesses' needs to elicit and use both external and internal input in their innovation processes and technology development. The theories of co-creation and user innovation seem to suggest approaches to how innovation processes may be opened up by targeting the vendor and customers' co-creation of experiences through dialogue, access and transparency [11], and by looking at lead users for innovative ideas and product modifications [10].

The value creation potential of online communities has been clearly demonstrated by consumer market successes such as MySpace and YouTube [1]. The novelty of utilizing communities as an arena for co-creation to be utilized in open innovation processes is that users are not only asked about their opinions, wants and needs; they are invited to contribute with their creativity and problem solving skills. As an example, Peugeot initiated an online design contest where nearly 2800 design enthusiasts from 90 countries proposed car designs on the theme of "Retrofuturism" (www.peugeot-avenue.com) [3]. Other examples, in addition to those mentioned in the introduction, include how enterprises and NPOs such as IBM, Adidas, Reebok, Mazda, Sun, Reef Ball Foundation, Creative Commons and the American Cancer Society use SecondLife to gain benefit from networked innovations [13]. Most of these companies involve users to contribute with ideas, but some even give away some of their control (e.g. source code, professional content) and enable others (individuals and communities) to further improve their product and extend their services. In addition social networking accelerator allows business professionals to monitor and analyze customers' conversations on social networking sites, and as a result, provides real-time status updates about their products and services.

Taken together, online communities have the potential to improve the ability for people to co-create with others for the purpose of innovation. This gives high expectations as to how we can involve these communities, and how they can achieve innovations in public organizations, enterprises and governments.

3 Challenges to Innovation in Online Communities

The development and introduction of online communities for innovation still face important challenges in how non-professional users and communities can be involved more effectively to enhance collaboration and creativity between people. According to Daras and Alvarez [14] the key for the Future Internet is to bring together professional and amateur media creators, which still are two separate worlds: the amateurs collaborate in the consumer oriented communities and the professionals

compete in the commercial media world. The challenge will be to create a culture of sharing, in which information and knowledge is distributed without losing important content or trust in the process. On a general level it might be easier than ever to get *low commitment* from people and communities, but harder than ever to get *high commitment*. Therefore, designers should strive to make users participate with little effort by making their contributions a side-effect of something else they are already doing. Finally, organisations and companies must see the potential of transparency and openness to both trust and the promotion of collaboration between industry, governments and citizens.

Another major challenge is that the greater part of the European population is either not using online communities [18] or not being skilled in ICT, and is thus excluded to participate in such online innovation processes. This is an important gap, because community-driven innovations can lead to new solutions that create more benefits for non-professional users and wider uptake of services and applications. This gap is also important since the advancement of the ICT society is characterized by more complexity and rapid communication, which is an opportunity that will speed up group actions [1] as well as innovation, but might in addition increase the *digital divide*. ICT-competent people will more easily adapt to this fragmentation and speed, and even customize technology to their own personalised needs, while others don't. Furthermore, the social dynamics on the Internet put a greater demand upon the user to be productive in terms of a "do-it-yourself" movement [5], resulting in a divide between those who consume and those who produce: a *digital production divide* [15].

4 Possible Solutions: Community-Centric Design

As more and more people get involved in experimentation and community based innovation online, companies and researchers will also need to change their focus in education and training efforts for innovation. Instead of just interpret large volumes of data using a user-centric approach, companies will need to help to develop the skills to rapidly design provocative community-based experiments. Passive analysis will change towards active experimentation and *conversation*, using a community-centric design [16]. Therefore, this section recommends and discusses some applicable community-centric methods experienced in the projects CITIZEN MEDIA and RECORD that can enable co-creation and open innovation in communities, and tackles these challenges.

So far, media developments have been focusing on single users and user-centric design, while the design for co-creation and community interaction is still weak. However, collective action is different from individual action [1], and passive consumption is different from co-creation and collaboration. Light [17] explains that a traditional media perspective is a one-producer-to-many-recipients model, with little focus on user participation and co-creation. By contrast, a range of collaborative activities is open to users in online communities, which can stimulate non-professionals from being passive consumers to be the producers themselves of new services and new applications. A key question is how these models of behaviour can

be combined to design systems, including trust, privacy, security and commitment to encourage co-creation and co-activity.

4.1 From User-Centric Design to Community-Centric Design

Evaluation and design of online communities requires sensitivity to utility and user experience issues rather than just usability, while at the same time user feedback methods should not overburden participants in community applications. The nature of these applications makes it important to focus on continuous evaluation of running services (a) in order to gain knowledge regarding the users' motivation over time, and (b) because community applications are dynamic entities that are subject to continuous change. This can be supported by introducing new ways to keep existing users involved as well as new members that are joining the community. Finally, different types of communities need different tools for very particular needs. These tools might not meet most previous criteria of successful design, but nevertheless function well because they are situated in the community that uses them [1].

Table 1. Comparison of user-centric and community-centric goals

	User-centric design	**Community-centric design**
Who are the users/community	Individual users, contributor	Community members, networks, groups, collaborators
Users/community goals	Specific tasks and task completion	Social exchange, co-creation, creativity in collaboration.
Users/community needs	Efficiency, satisfaction, experience, searching	Community interaction, co-experience, privacy, social belonging

Table 1 shows some key differences between a user-centric approach and a community-centric approach, and how communities should be analyzed based on type and characteristics. Analyzing requirements is not only needed for the individual community members, but also for the broader community needs and characteristics, which are not always visible or apparent to individual members. This will give more insight in the dynamics of the selected community and what tools and components can be created that support collaboration and co-creation within this community.

As user-centric design and community-centric design are asking the same questions but have a different focus, existing user-centric design methods need to be adapted in order to fit this new paradigm.

Table 2 below shows how user-centric design methods can be adapted for a community-centric approach, and which future research directions still need to be explored. Some of the methods in Table 2 should also in future research be combined with social network analysis to identify a social structure made of nodes referring to individuals and communities that are tied by one or more specific types of interdependency, such as values, visions, ideas, financial exchange, friendship etc.

Table 2. A selection and examples of user-centric vs. community-centric methods

Goals	User-centric	Community-centric	Research direction
In-depth knowledge of user experience and user requirements	Interviews. One interviewer speaking to one participant at a time, getting individual requirements	Blogs or wikis to extend the scope of an interview from a mere study of user requirements to a study of collaboration with participants via e.g. online apps such as blog, YouTube, Picasa, and Blogger	Explore: a) the use of community-centric methods in existing communities, where the participants are familiar, b) involvement of diverse stakeholders and communities e.g. in co-creative activities.
Large scale user analysis and system evaluations	Survey questionnaires, by e-mail or ordinary mail, often with questions targeting individual user analysis	Online surveys including measures of community requirements, community usage, social capital, sociability issues, group relationships, etc. Extend text based surveys by visualization tools – pictures, sketches or videos to test ideas in collaboration	Explore a) how online community survey can be more effective, easy and interesting to use from the perspective of community members, b) the use and efficiency of visualisation tools in questionnaire surveys
Information on user motivation and ideas	Focus groups and single in-depth interviews	Instead of physically present focus groups, online focus groups can be used to facilitates participation among geographically distributed participants	Explore a) the potential of online discussion rounds, and how different form of structured or unstructured processes is doing, b) how different tools and contexts could be more or less useful for different innovations.
Observing users context and social interaction	Often lab, but also field studies and ethnographic studies are also used, measuring individual tasks	Online ethnography is emerging and adapts ethnography to the study of online communities and cultures	Explore a) how researchers can be immersed in the life of an online community or be engaged in the culture as a member, b) ethical and privacy concerns
Exploring users' contextualized experiences, needs, ideas	Cultural probes. Explorative contexts through tools in a probe package	Online probes are getting popular and can make use of various social networking tools and the participants' audiovisual equipment	Explore a) the right combination of social probing tools for each community interaction, b) innovation in real time

4.2 Living Labs as a New Approach to Community-Centric Design

In addition to community related adaptations of user-centric methods, new approaches to community-centric design are emerging: Living Labs, and in particular online Living Labs, where the users are actively involved in the innovation process, are assumed to enable the industry to meet innovation challenges, has generated a great deal of interest within the field of information and communication technology (ICT). This is in particular seen in the explosive growth in the European Network of Living Labs (ENOLL), now counting more than one hundred Living Labs across Europe.

According to Følstad [18], Living Labs are defined as "environments for innovation and development where users are exposed to new ICT solutions in (semi)realistic contexts, as part of medium- or long-term studies targeting evaluation of new ICT solutions and discovery of innovation opportunities". But, the concept of Living Labs is still evolving. An important emerging trend is to see Living Labs as a way to tap into the creative potential of communities [18]. Instead of being recipients of the outcome of innovation and development, users may be engaged in co-creative innovation processes of a Living Lab, which is recognized by ENOLL as being a key aspect of Living Labs. An online Living lab has also the potential of running co-creative experiments with high speed and test ideas right away.

Within the RECORD project, an online Living Lab has been established on the basis of two main components: a participant panel of >3000 persons meant to be representative of Internet users of a given geographical area (Norway), and an online environment enabling presentation of ICT concepts or prototypes and feedback from the participants. Survey and social media functionality are combined in order to enable (a) discussions between the participants, designers, and developers, (b) uploading of the participants' own redesign suggestions, and (c) analysis of the participants' feedback based on the participants' characteristics. This online environment allows the establishment of project-oriented online communities to participate in product and service development and innovation. Early experiences with the RECORD Living Lab indicate that online Living Labs may represent a relevant approach to the involvement of online communities in innovation processes.

The use of Living Labs is an interesting approach to community-centric design and open innovation, but we are only at the beginning of exploring how Living Lab participants may be involved in targeted and beneficial co-creation processes.

5 Conclusion

Internet usage is shifting from passive consumption of information services to active and collaborative group actions in online communities, which offer new opportunities for innovation. This paper has discussed challenges related to innovation in online communities, and proposed possible solutions. Still, community-centric methods are immature, and existing user-centric design methods need to be adapted in order to fit a new paradigm for innovation. New approaches such as Living Labs are promising, but further development of associated methods and processes is needed.

The different approaches and related research directions described in this paper will contribute to enhancing open innovation in communities and giving them new tools to facilitate new forms of group actions, collaboration and innovation among

both different user groups and communities in the Future Media Internet. We hope that the need for a future focus on such a community-centric design approach is being recognized, as this will help companies and non-profit organizations to tap into the enormous potential co-creation with communities offer for creating new applications and services on the Future Media Internet. This approach can also promote the development of services with social benefits and thus closing the digital divide.

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