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HIGHER EDUCATION STUDENT'S MOTIVATION TO PARTICIPATE IN ONLINE MASS INNOVATION: CASE MASSIDEA.ORG

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Abstract: This case study is focusing on higher education student's motivation to participate in online mass innovation. To obtain this goal Massidea.org online social network (OSN) concept grounded on national open innovation system (NOIS) paradigm is introduced to eighteen students, while their initial perceptions, suggestions to concept enhancements and willingness to participate in development and content production were evaluated. As a result it was observed that the students were not equally willing to participate in content production and development. It is suggested that content production is the best start with less experienced students while giving them positive experiences relating to motivation factors such as presenting individual expertise to employers, sharing information and getting feedback from other users and rewarding/recognition. On the contrary development is suggested to execute with experienced lead users, but give them a strong support from teachers.

Keywords: innovation system, social media, online social networks, mass innovation, higher education, motivation

1 Introduction

Social media and online social networks (later OSNs) such as Wikipedia, Facebook, Twitter, YouTube and LinkedIn have revolutionized the way we create networks and collaborate among others. Communication and sharing insights has never been as easy as it is nowadays. OSNs generally refer to communities and hosted services facilitating collaboration and sharing between users (Cachia, et. al., 2007). In principal the OSNs facilitate the interaction among members by providing a dynamic platform which enables versatile services such as discussions, sharing of multimedia content and information. OSNs and the related open networks are also permanently changing how business life is operating. We expect that OSNs based innovation systems can enhance creativity through the unexpected linkage between insights and the different people behind these insights. This information and communication technology (ICT) supported collaboration of masses of people can be defined as mass innovation (Santonen, 2009). Some authors, including us, argue that later on the business success will depend more and more on the ability to utilize external resources to these open innovation processes (Chesbrough, 2003). As a result, also educational systems and strategies must evolve and provide tools to students effectively operate in this networked environment.

1.1 Objectives of this study

This case study is focusing on higher education student's motivation to participate in online mass innovation. To obtain this goal, a novel mass innovation OSN concept grounded on more comprehensive National Open Innovation System (NOIS) paradigm (Santonen et. al. 2007, 2008a, 2008b) is introduced to student's, while their initial perceptions, suggestions to concept enhancements and willingness to participate in development and content production are evaluated. In 2008 our case OSN currently named as *Massidea.org* was awarded as the best school related innovation in Finland. Finland is running one of the best innovation and educational systems in the world and therefore this case study could be regarded as an extreme sample (Yin, 1990).

Interestingly, the *Massidea.org* concept has gained a significant amount of attention in Finnish higher educational sector, yet the practical implementation process has confronted a number of challenges (Santonen, 2009). The biggest challenge seems to be the recruitment of human resources to content production and development, which is typically causing harm to OSNs (e.g. Nielsen 2006). Therefore in this study we are especially interested to evaluate higher education student's motivation to get involve with online mass innovation systems such as *Massidea.org*.

The paper is structured as follows: in the following section, we will define mass innovation term and present theoretical foundations relating to user's motivation participate in OSNs. We, then, present *Massidea.org* concept in more detail and introduce the methodological construct of this case study. Finally, we report our result and draw the conclusions from our findings.

2 Theoretical foundations

2.1 Defining mass innovation

Innovation literature has identified numerous definitions for innovation, yet something is common for most of them. The term innovation is typically used as a synonym for something new (Huiban and Boushina, 1998), which has been put into practice (Stähle et al., 2004) and is bringing added value to companies and customers (Haho, 2002). To simplify the difference between idea and innovation following summary can be made: idea is always the starting point, plan or intention for potential innovation. Idea changes to innovation during the successful execution process. Without the successful execution, the idea will not change to innovation (Santonen et. al. 2007).

When combining a wide range of people and their different but complementary insights and creative interaction, a novel thinking outside the box is possible and mass innovations can emerge (Santonen, 2009 adapted from Leadbeater, 2008). Some authors are calling this also as mass collaboration, which occurs when a large group of people work independently to achieve shared outcomes through communication technologies and loose voluntary networks (adapted from Tapscott and Williams, 2006). Without OSN and supporting ICT this kind of mass co-operation would be impossible.

2.2 Motivation to join and participate in OSNs

Based on the recent literature review Gaston-Breton et. al. (2009) summarized empirical studies on motivations to participate in virtual communities, which definition

(e.g. Pentina et. al. 2008) is somewhat similar to OSN definition. Since many typologies of motives to join or participate in OSN have been proposed, it is difficult to present a comprehensive picture in this short conference paper. As a result in the following we present our rather practical classification.

Functionality. Functionality has been identified as an important factor to explain motivation to participate in OSN (e.g. Wang and Fesenmaier, 2003, Gupta and Kim 2007). Good functionality supports user's creativity, productivity and creates a better image of the community (Preece, 2000). These findings among OSNs are also inline with Technology Acceptance model (later TAM) which is explaining the software application usage in general (Davis, 1989; Davis et al., 1989). In TAM model the perceived easy of use and usefulness are suggested to affect on the attitude towards using a particular software application. Further on, the attitude towards using application is suggested to affect on end-user's behavioural intention to use the application. Finally, behavioural intention on the other hand is argued to correlate with the actual software usage. Although the TAM model is not fully without critics (Legris et al., 2003), it is refereed and agreed to be a solid construct in the World Wide Web environment (e.g. Moon and Kim, 2001).

Social needs of users. Gupta and Kim (2004) study suggested that social benefit is a contributory factor when joining virtual communities. Dholakia et al. (2004) findings giving and receiving emotional support, meeting similar people, finding new friends, socializing and networking and discussing about similar interests as motivation factors are also inline with this suggestion. Furthermore Bishop (2006) claims that an individual has a desire to socialize and communicate through an online community by posting messages or participating discussions.

Recognition. Chan et al. (2004) proposed that recognition and affirmation have a positive impact when joining OSNs. Santonen et. al (2010) defined a solid reward model for National Open Innovation Systems and with the help of the social exchange literature summarized several incentive mechanisms including 1) the personal access to extra information or anticipated reciprocity, 2) the personal reputation, 3) social altruism and 4) tangible rewards and financial rewards. They also presented several classifications such as 1) individual vs. interpersonal, 2) hard vs. soft, 3) quantitative vs. qualitative gain and 4) intrinsic versus extrinsic to divide incentives.

Trust. Regarding to Ridings et al. (2002), trust has a significant role in joining virtual communities and exchanging information. According to Hsu et al. (2007) information-based trust leads to identification-based trust after members of virtual communities get familiar with each other. Furthermore Preece (2000) presents that the community must have a lucid policy of data protection to ensure members trust towards the community.

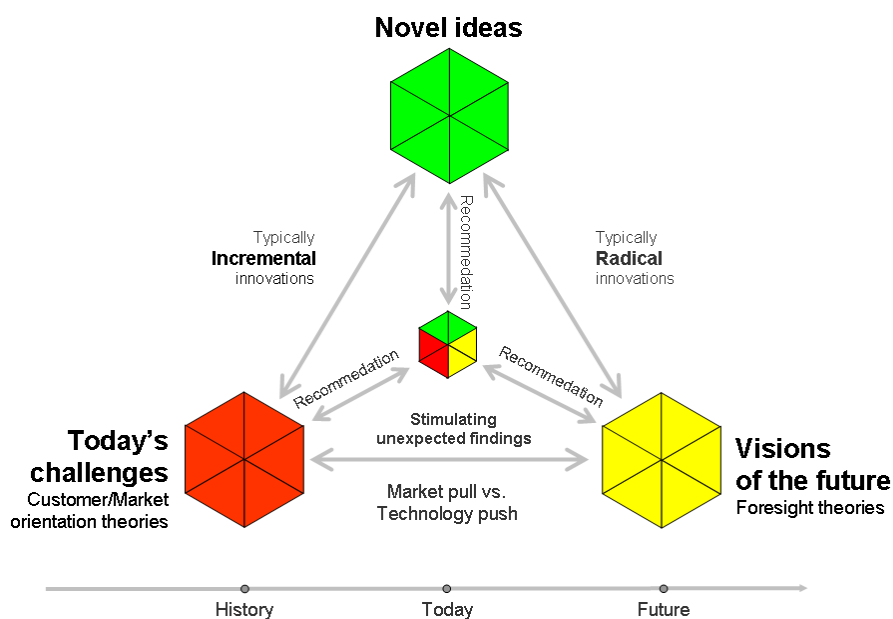
Reciprocity. Various researchers have emphasized also reciprocity and activeness as a motivation factor. According to Wasko and Faraj (2005) enjoying helping others and individual reputation are two strong motivation factors towards joining virtual communities. Dholakia et al. (2004) state that the community should have purposive value (desire to obtain information, negotiate, solve problems, etc.) and entertainment value (to play, relax, pass away the time, etc.). Interestingly these factors are very similar to extended TAM model by Moon and Kim (2001) which besides easy of use and usefulness emphasises also the importance of playfulness as a motivation factor. Furthermore, Preece (2000) presents that lively discussion, new ideas and constantly updated content makes the community interesting. Bishops (2006) study also claims that users have a desire of solving problems or creating content.

3. Introducing Massidea.org case

3.1 Defining the theoretical foundations

An open innovation (Chesbrough, 2003) online community Massidea.org – smashing ideas is founded on series innovation theories (Santonen et. al., 2007, 2008a and 2008b, Santonen 2009). Figure 1 presents an Innovation Triangle framework which can be implemented as an OSN such as Massidea.org.

Figure 1 The Innovation Triangle – Stimulating unexpected findings throughout content recommendation



With the aim of generating new ideas (i.e. the top cube) the framework includes two different yet complementary innovation sources: *first*, current market environment information, presenting today's challenges derived from history (i.e. the left cube) and *second*, future market environment information, presenting visions of the future (i.e. the right cube). Today's challenges based innovation process is producing novel ideas from practice, which typically generates small incremental improvements (i.e. incremental innovation) to current offering (Junarsin, 2009). This approach is certainly important, but it is not complete. Therefore mankind needs developers and researchers who are able to expand our current understanding and knowledge into new fields by following the vision of the future. On the contrary to challenges based incremental innovations this foresight driven approach is more likely leading to real novelties. These radical or disruptive innovations and technologies are innovations which eventually overturn the existing dominant technologies and innovations in the market (Clayton, 1995).

According to Herstatt and Lettl (2000) in *technology-push* theory, an emerging technology or a new combination of existing technologies provide the driving force for an innovative product and problem solution in the market place, while in the case of

“market pull” the product or process innovation has its origins in latent, unsatisfied customer needs in the market place. In practice ideas are transferring to innovations only if there is a balance between market pull and technology push. Even if idea is possible to construct and implement as a concrete entity, it does not necessarily mean that there is a market need for it.

3.2 Defining a common content format

When masses of people collaborate and share their insights, eventually a large cumulative database of contents will be created. In order to make the communication and interaction between contents and users easy, a common content format should be defined. In the internet and mobile communication era, the need for short and fast messaging has emerged. Novel thoughts might be triggered from very sort stimuli such as headline, yet in practice it is often very difficult to understand the whole meaning if the information is restricted only to headline.

In a fast-paced world readers do not want to spend more than few seconds in information-gathering process, yet they do want to collect all the required information. For this reason adjusted press release format is suggested as a good tool to share innovation related information. A press release is typically kept to one page or roughly 300 to 500 words. In press releases, the Five Ws concept (who, what, when, where and why) is a popular way to deliver the whole story in a compact format. Therefore, distributing innovation related information content one should give basic answers to the following questions depending on whether it is a challenge, a vision or an idea: 1) what is the thought, 2) why the thought is important and valuable, 3) who is the target group and who is working on the thought, 4) when (temporal dimension) the thought is topical and 5) where (geographical or physical location or circumstances) the thought is happening? By the following the above guidelines, easy to read and link cumulative content repository can be created.

3.3 Increasing the likelihood of unexpected findings

By integrating various content recommendation tools (Santonen, 2007) to innovation triangle (i.e. the arrows in the middle), we can increase the dynamics of the individual’s creativity and increase the likelihood of occurrence of unexpected findings from expected findings. In case of expected finding, the phenomenon fits with human expectations relating the future while in case of unexpected finding, phenomenon is not coherent with the individuals cognitive and belief system and it therefore breaks the conventional habit (Santonen et. al. 2007). Serendipity for example is a process by which one accidentally discovers something fortunate, especially while looking for something else entirely (Thagard and Croft, 1999). Obviously, the likelihood of unexpected findings naturally increases, when the number of interacting users and content increases. However, without advanced content recommendation systems, the unexpected findings potential might remain modest.

3.4 Defining the higher educational sector role in Massidea.org

Students spend thousands of hours while learning new competences. Significantly currently only small fragment these studying tasks are resulting insights, which an individual can directly use to promote him/herself to potential employers. An

information product involves high fixed cost, but low marginal costs, which basically mean that information is costly to produce but cheap to reproduce or copy (Shapiro and Varian, 1998). Therefore, learning new insights in an open innovation network and expanding contact network can be done with no, or only a little extra effort to studies if teachers are setting studying task which outcome fits into Massidea.org's innovation triangle framework.

In order to fully integrate something new such as Massidea.org to educational processes, there should also be an integration to school specific curriculum (Santonen, 2009). If OSN based learning is not a part of objectives of the curriculum, it must be implemented by one teacher and one course at the time. Only if these teachers are defining studying tasks which outcomes are shared to OSN, the critical mass of students is able to achieve.

Teacher's and student's contribution evidently requires changes to the current studying model. Necessarily these changes are not big in workload point of view, but are demanding from the state of mind viewpoint. The old habits – e.g. studying individually or with a small team, not openly sharing the outcomes to masses of people as soon as possible – have been printed hard in education. Therefore we must understand in more detail what motivates especially the higher education student to participate in online mass innovation.

3. Research methodology

3.1 Sample selection

The data collection for this case study was carried out in Finland. According to the Global Competitiveness Report 2008-2009 Finland is not only ranked number one in higher education and training indicators but also ranked number two in innovation indicator. Moreover, in year 2008 Massidea.org – our online mass innovation case sample – was rewarded as the best school related innovation by the Finnish Inventor Support Association. At the time of the study, our respondents – a group of eighteen students – were studying in Laurea which is the most awarded University of Applied Sciences in Finland. Laurea's pedagogical strategy and activities are based on the Learning by Developing (LbD) model that brings together students, lecturers, working life representatives and experts of R&D activities in various cooperation projects. As result, we argue that our case could be regarded as an extreme sample (Yin, 1990). Extreme cases are able to reveal more information than so called average cases and therefore are important tools to understand a novel phenomenon such as online mass innovation, which is integrated as a part of higher education studies.

3.2 Data collection

In order to increase interpretation of our results, the eighteen students were categorized with the help of following criteria. *The first criteria*, “student majoring degree” included 1) nursing and social services, 2) business management and 3) business information technology dimensions. *The second criteria*, “studying year” included 1) first, 2) second and 3) third year (or longer) student dimensions. *Finally, the third criteria*, “student's activity to produce content to OSN services in general” included 1)

producing content to OSNs less than 3 times in month and 2) producing content at least once in a week dimensions. A simple questionnaire asking above variables and some additional background information was send to Laurea's students via email. Based on the responses, the group of eighteen students meeting the defined framework were recruited. This three dimensional classification schema enabled the result comparison between different student groups and helped us to generate a better general understanding of the higher education student's motivation to participate in online mass innovation.

Open-ended, focused in-depth interviews were conducted with all eighteen respondents. Interviews were recorded with a permission of the interviewee and then transcribed as individual written reports (omitted). Interpretations of this study were grounded on these written reports and additional summary tables (omitted), which were constructed based on our three dimensional classification schema

Interviews had following structure. In the first phase, questions relating to respondents motivations to participate in ONSs in general were asked. Then in the second phase respondents read a description which explained the Massidea.org concept. During the interview there was also a possibility to ask additional information from interviewer. Finally in the third phase questions respondent's initial perceptions, suggestions to concept enhancements and willingness to participate in development and content production were evaluated.

4. Results

4.1 Initial perceptions

According to all respondent groups negative perceptions were associated to steeling ideas and getting student to join Massidea.org. However, an observation was also made that the opinions were more doubtful questions rather than straight negative feedback. In the following we will present the more detailed result with the help of our three dimensional classification schema defined in the methodology section.

Results by degree programmes. The most positive first impression was formed by nursing and social services degree programmes, whereas most skeptic attitude was perceived from information technology students. Business management students had doubtful questions towards Massidea.org such as is there enough demand in Finland and how will it work in practice.

Results by study year. First year students had the most positive react towards Massidea.org, whereas most skeptic thoughts came from second year students. Even though first year students had the most positive react towards Massidea.org they were able to enumerate most negative opinions about Massidea.org. Negative opinions however decreased as study years increased. Interestingly third year students were concerned on how to persuade companies to join.

Results by amount of content. Students producing generally little content to virtual communities regarded slightly more positively to Massidea.org. However majority in both groups had a positive first impression. In both groups the concept of Massidea.org was accepted but doubts towards the implementation was also noticed. They were also concerned on how the quality of content will be controlled. Students who produce little content into online communities had a notable number of questions related to Massidea.org.

4.2 Enhancement suggestions

Results by degree programmes. Most development proposals were given by business information technology programme. However, ideas were mainly related to technical implementation such as search engines. As for business management students, suggestions were related to improving communication for example by using Massidea.org through Facebook. Nursing and social services degrees emphasized on clear division of information.

Results by study year. Most suggested features to Massidea.org were related to clarity, easiness and functionality. Opportunities to chat or comment as well as a reward system were common proposals. Third year students had the most ideas and they were able look at the activity from company perspective.

Results by amount of content. Students in both groups requested Massidea.org to offer current information, logical clarity and possibility of linkage. Students producing a lot of content, suggested ideas which were more concrete and technical such as search engines and linkage possibility whereas the other group was more attracted to awards.

4.3 Motivation to participate in development

In all groups it was notable how students were insecure about their skills to develop a virtual community, even though the idea itself of developing was considerable.

Results by degree programmes. Willingness to develop Massidea.org was the highest among information technology students whereas the least interest within nursing and social services degrees.

Results by study year. First year students were most willing to develop Massidea.org.

Results by amount of content. Interest in developing Massidea.org was coextensive in both groups. The number was slightly below a half.

4.3 Motivation to produce content

Apart from nursing and social services degrees Massidea.org was seen as an opportunity to show expertise to companies. A monetary or nonmonetary award was also seen as a motivating feature.

Results by degree programmes. Students in information technology and business management appreciated the good image of companies involved. A strong motivator for nursing and social services degrees is a good complementarity inside the community.

Results by study year. Helping others and sharing experience was a quite highly ranked motivator for first and third year students. Third year students specified the most ideas on what would motivate to content producing.

Results by amount of content. Sharing experiences would encourage to produce content into Massidea.org in both groups. A lot of content producing students perceived practical use of Massidea.org whereas the other group appreciated an interesting topic.

4.4 Discussion

Initial perceptions and motivation to produce content. Based on our observations it appears that the respondents were not equally interested to join and produce content to Massidea.org. The first year and nursing and social service students had more positive initial impression about Massidea.org, while information technology and business management students and those producing a lot of content to OSNs were more doubtful.

The doubts were basically related getting students and other people to join Massidea.org and the data protection issues such as the possibility to steal ideas. In turn the motivation factors were presenting individual expertise to employers, sharing information and getting feedback from other users and the possibility of rewards/recognition. These observations are somewhat inline with the previous empirical motivation studies (Gaston-Breton et. al. 2009).

As a result it is suggested that the students having less experiences with OSNs are more open to online mass innovation then the experienced ones. Therefore, implementation of these kinds of systems to higher education should start from first year students, while giving them positive experiences from participation during their studies. These experiences should include not only recognizing and awarding, but also the feeling of safety and interaction with other users and especially with potential employers.

Suggesting enhancements and participating development. It is important to involve users in the OSN development. Especially in Finland a lot of attention has been given to user-driven innovation strategy, which emphasizes user's involvement in development. However, according to our results it seems that the respondents were not equally willing and capable to participate in development. It appears that respondents having more experiences on producing content to OSN and progressed further on their information technology studies were more into enhancement suggestions and participation on development in general.

Interestingly, this observation is inline with lead user method, which has proven to be very successful source of commercial attractive innovations (von Hippel 1986, Urban and von Hippel 1988). Lead users are defined by two characteristics; First, they experience needs ahead of the majority of a target market and second, they benefit greatly if they obtain a solution to these needs. Therefore, it is suggested that OSN development team should identify a group of experienced lead users and co-create the OSN with them. Significantly it was noted that a remarkable amount of our student respondents were interested in development, but were insecure about their skills and knowhow. Since the development of the Massidea.org is strongly grounded on the student work, teachers are playing a key role to encourage the students to trust on their skills. Observation relating the unwillingness to develop justified with lack of time or interest, is supporting also the importance of teachers. If teachers are able to integrate the development task as a part of their course activities, it does not require extra time, yet should be interesting because the students have selected the course.

5. Conclusions

This study was evaluating higher education student's motivation to participate in online mass innovation. To reach this goal we introduced OSN based Massidea.org concept to a group of eighteen students and conducted open-ended in-depth interviews with them. Massidea.org concept had gained positive attention, yet had also faced some troubles relating practical implementation. Since higher education students are one of the key users groups of Massidea.org, it was important to understand their motivation to join and participate in online mass innovation systems. As a result it was observed that the students were not equally willing to participate in content production and development. It was suggested that content production is the best start with less experiences students but development on the contrary with experienced lead users.

Finally, we must stress that the selected case research method is limiting our possibilities for generalization of our results. Therefore, this study should be considered as a preliminary study for more extensive empirical survey evaluating the student's motivation to participate and develop online mass innovation systems.

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