STRATEGIES TO EMPLOY SOCIAL NETWORKS IN EARLY DESIGN PHASES (IDEA GENERATION)

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Abstract

For companies to be innovative, they need to look outside their boundaries and exchange knowledge, with crowdsourcing being an increasingly interesting idea given the potential of participation that can be reached. In this article, we summarize the arguments in favor and against the use of social networks for early design phases (idea generation), as well as the recommendations documented so far.
We explored the use of Facebook and Twitter in idea generation sessions, and documented the issues observed with the platforms and with the process followed by participants. We list the needs to consider in the next solutions, and finally provide some suggestions to be able to employ social networks within the process of an idea generation session.
The inclusion of crowds in the idea generation process can have a positive impact. The key to their successful application is to clearly define the objective beforehand, to select the right social network, and to use an adequate process.

Keywords: Early design phases, Participatory design, Idea generation, Social networks

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1 INTRODUCTION

New product and service creation and innovation are paramount for any organization that wants to compete in today's world. However, creativity is an increasingly cross-disciplinary task, user centered, and with shorter time-to-market than ever.

Organizations usually employ creative teams to develop concepts, but they can also open the early phases of design to different stakeholders. Eliciting wants and needs from the end user is not easy, organizations are always in search of ways to obtain this input more seamlessly, and less costly. For teams tasked with the mandate to generate new ideas, obtaining this input is paramount, ultimately risking the acceptance in the market. To achieve this, it is essential to exchange knowledge beyond organizational boundaries (Noteboom, 2000 in Vuori, 2012), therefore there is an increased interest in the use of online tools and communities to include the crowd for idea generation (Vuori, 2012).

Furthermore, the internet and new technologies are becoming the preferred mode of communication and information, making it easier for companies to reach their audiences (Niculescu & Thorsteinsson, 2011).

Some authors believe that more research is needed to find how to support idea generation using information and communication technologies (Ardaiz-Villanueva et al., 2011, Majchrzak & Malhotra, 2013), and while others point towards the potential benefits in using social media services for ideation (Wagner & Jiang, 2012), none have presented a method to this end. Our research team has been working with design teams and how to support knowledge exchange during idea generation sessions. With the mass adoption of social media, and particularly social networks, it was identified that there was an opportunity to harness these tools to enable the participation of communities in the early phases of design, the generation of a large quantity of ideas.

2 PREVIOUS WORK

There are different social media services with varying levels of communication, and they each can serve a different purpose for both the end user and the company itself. For example, they can be used to create, discuss and share new ideas, propose changes to current products, services and processes, and as an idea repository (Vuori, 2012). Vuori (2012) categorized the different social media services according to their application:

Table 1. Uses of Web 2.0 in companies (from Vuori, 2012)

	Internally focused applications	**Externally focused applications**
Communication	Blogs, discussion forums	Blogs, microblogging, social networking, online broadcasting
Collaboration	Internal idea crowdsourcing service	External idea crowdsourcing service
Connecting	Internal networking site, corporate wikis	Customer forums, online communities, virtual worlds

Wagner and Jiang (2012) have proposed the use of social media services to find ideas and needs, to develop innovative concepts and to evaluate those concepts. Majchrzak and Malhotra (2013) suggest that crowds can be used to generate ideas as part of a larger process where this ideas are used as input, while others authors (Ardaiz-Villanueva et al., 2011) suggest that different applications can be utilized at different phases of the creative process to respond to the particular needs in each phase.

3 RESEARCH QUESTION

It has been found that participants will not use technologies with steep learning curves during creative sessions because they rather focus on the creative process. Therefore, we propose the use of social networks which are already adopted by the end users in the early design phases to generate ideas. This will decrease the learning curve, and can potentially reach more participants.

3.1 Early Design Phases

In the early design phases, design teams search for information in order to understand the context of the new product or service. This information defines the design problem to conceptualize the new concept. At this early stage, information is dispersed mainly throughout users, communities and

experts. This kind of information capture key to product definition, but it is often not taken into account. (Jiménez-Narvaez et al., 2011).
In the early design phases, the information inputs can be captured by idea generation (ideation) sessions. In these sessions, companies have to generate ideas by bringing together participants from different domains or areas of expertise, and facilitate the exchange and creation of knowledge for a specific purpose.

3.2 Idea generation sessions

The purpose of idea generation sessions is to set an environment and implement creativity techniques that will help participants produce, express and combine ideas. They are an interesting example to explore support systems because of their unique characteristics: a defined purpose, limited time, multidisciplinary teams and willingness to create knowledge (Jiménez-Narvaez, Desrosiers and Gardoni, 2011). An advantage of idea generation sessions is that the ideas of others sometimes promote the creation of related ideas or new ideas.
While there is not one generally agreed process for idea generation sessions, Shneiderman et al. (2006) propose the following process, which is commonly accepted for new product development cycles:
1. Problem definition (need identification)
2. Information gathering
3. Idea generation
4. Modeling (description of potential solutions)
5. Feasibility analysis
6. Evaluation
7. Selection
8. Communication
9. Implementation

The scope of the ideation sessions performed within the research group is the idea generation, therefore we follow the process presented in Figure 1:

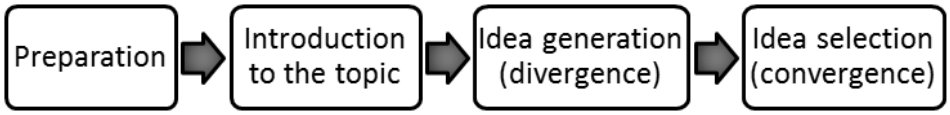

Figure 1. Process followed in idea generation sessions

During the idea generation and idea selection (divergence and convergence phases), a variety of creative techniques have been applied (brainstorming, SCAMPER[1], brainwriting, etc.). We have observed certain issues with the patterns of participation:
- Ideas are based on known solutions
- Popular ideas are recombined over and over
- Participants propose previously thought ideas
- Low variety in ideas (concepts resemble each other, even from one team to the next)

The use of social networks can potentially open the variety in the nature of ideas simply by reaching delocalized participants and concerned community members who cannot be physically there. The inclusion of a larger number of participants with diverse backgrounds will also contribute to the recombination of different ideas.

4 SOCIAL MEDIA AND THEIR POSSIBILITIES TO INVOLVE COMMUNITIES

Whenever a new technology is made available, it is worth finding possible uses in different domains. Based on the process for idea generation sessions by Shneiderman et al. (2006) and the examples

[1] SCAMPER is a problem-solving technique that motivates users to find solutions by Substituting, Combining, Adapting, Magnifying/Modifying, Putting to other uses, Eliminating or Rearranging the different elements in the problem. (Serrat, 2010)

found on extant literature, we identified that social networks could be used to help teams to identify areas of opportunity (need identification), or to obtain ideas from the crowd.
The advancement of information technologies, particularly the new venues of social networks, enables and makes it easier to digitally document these early design inputs, and later on be exploited and reused for further knowledge creation.

4.1 Arguments against the use of social networks for idea generation

From the reviewed literature, several arguments were identified to explain why companies have not adopted social networks to generate ideas; they can be summarized as follows:

4.1.1 Lack of information

Most companies that have not adopted social networks for idea generation do not have clear understanding of the benefits that can stem from their use. (Culnan, 2010, cited in Vuori, 2012)

4.1.2 Fear of the unknown

Some companies work "as they always have", and have trouble adopting technologies or processes outside their comfort zone. (Vuori, 2011, cited in Vuori, 2012)

4.1.3 Reliability

When using social networks and the "wisdom of the crowds", there is no guarantee of getting a result, there can be a shortage in participation or the original idea generator does not follow up with the implementation. (Wagner & Jiang, 2012)

4.1.4 Competition

By using an open social network or opening participation, contributions can be seen by everyone, which means competitors will have access to the same pool of ideas. (Wagner & Jiang, 2012; Schweitzer et al. 2012)

4.2 Arguments in favor of the use of social networks for idea generation

There are also arguments from authors to encourage the use of social networks to generate ideas both within the company and beyond, to include stakeholders and the crowd.

4.2.1 Number of Participants

By using social networks, organizations have access to a larger (unrestricted) amount of participants, regardless of their location. (Toubia, 2006; DeRosa, Smith & Hantula, 2007; Schweitzer et al., 2012; Jung, Schneider & Valacich, 2010; Wagner & Jiang, 2012)

4.2.2 Diversity

If participants are diverse, they will employ many different perspectives to approach the issue. (Clayton, 2002, cited in Wagner & Jiang, 2012)

4.2.3 Reach potential clients

Customers want to be taken into consideration in the design process. One of the factors that drive crowds to participate is to express their need for a product, service or improvement. (Awazu et al. 2009; Muhdi et al., 2011)

4.2.4 Idea quality

Several studies found that the use of crowds has resulted in higher quality ideas than those by individual participants.
Compared to the number of ideas generated in focus groups, an idea competition costs less to execute and can potentially produce four times as many usable ideas. Furthermore, it is easier and faster for crowds to detect weaknesses and mistakes in a concept, as well as the quality and originality. (Schweitzer et al., 2012; Wagner & Jiang, 2012; Majchrzak and Malhotra, 2013)

4.2.5 Record keeping

All ideas and communication exchanges in the social network are registered automatically, enabling participants to revisit the ideas of others. (Nemiro, 2002; Niculescu & Thorsteinsson, 2011; DeRosa, Smith & Hantula, 2007)

4.2.6 Satisfaction

Studies have demonstrated that participants are more satisfied with an idea generation session when using virtual communication, although some authors argue that this satisfaction can decrease over time because it is no longer a novelty (DeRosa, Smith & Hantula, 2007). Niculescu & Thorsteinsson, 2011

4.2.7 Implementation cost

No need for companies to purchase/install additional software, participants could utilize platforms open to all. (Jackson, 2010)

4.2.8 Eliminates the issues of face-to-face ideation

The use of a familiar platform will eliminate issues such as production blocking, evaluation apprehension and social loafing, which are known to occur in face-to-face brainstorming. (Diehl & Stroebe, 1987 cited in DeRosa, Smith & Hantula, 2007; Ardaiz-Villanueva et al., 2011; Wagner & Jiang, 2012)

5 EXPERIENCES USING SOCIAL MEDIA IN IDEA GENERATION SESSIONS

5.1 Creativity session on Facebook and Twitter

The first session was performed in the context of a resolving an institutional issue, to promote the use of the stairs at the École de technologie supérieure. An invitation to the event was sent to the community 1 week before. In total, 33 participants collaborated to generate ideas, 17 were co-located, 13 participated through Facebook and 3 over Twitter. The creativity methods applied in this session were brainstorming and SCAMPER.

5.2 Creativity session on Facebook

In the second session, the co-located event was attended by 20 participants, while the Facebook conversation included 9 participants, giving a total of 29 participants. In this case, the purpose of this session was to find ways to improve student life at the École de technologie supérieure, and it was proposed to open the online participation for those who were not able to attend the session. An invitation to the event was sent to the ÉTS community 2 weeks before.

5.3 Creativity session on multiple social networks with a large audience

The third session took place during the International Competition 24h of innovation. Social networks were used to inform the community of 700 participants that are on Facebook and also, the community that follows the 24 hours of innovation competition profile in LinkedIn, Flickr, YouTube or Twitter. Participants were informed about the event 2 months before.

The launch of 24h of innovation was diffused by WebEx and all the challenges of the competition directly on the website at http://24h-innovation.org/en/.

The use of social networks among the participants was observed to be related with communication, to be informed about details of the competition, but there was a scarce exchange of ideas.

6 EMPIRICAL FINDINGS

The preliminary findings observed in these experiments are presented in the following sections. Section 6.1 presents the issues related to the use of social networks, while Section 6.2 presents the issues related to the patterns of participation and idea exchange.

6.1 Issues found with the social media platforms

6.1.1 Establishing communication

The broadcast of information via a feed among participants, as Questions or Comments get lost easily, particularly the applications based on news "feeds" usually publish the newest information on the top, and it is refreshed each time the user accesses the application. Users with many "friends" and "interests" have difficulties locating relevant conversations.

6.1.2 Explaining complex ideas

Participants post videos and pictures to try to explain complex concepts, but can get discouraged if others don't understand the ideas they would normally explain with drawings or body language.

6.1.3 Attention retention

It is not always clear whether participants are following the exercise: Google Hangouts and Facebook make it possible for the moderator to see how many participants are connected at a given time, but it is not clear if the person is dedicated to the activity unless they interact actively. On Twitter, it is not possible to know how many participants are following the conversation.

6.1.4 Publication of contributions

Forgetting or misspelling the hashtag: Some users are savvier than others when it comes to social network usage, which can be an issue for those who for example, forget or misspell the hashtag on Twitter. When this happens contributions get lost because they are not part of the conversation, causing frustration for lack of response (and of course, a loss of information for the session or project).

6.1.5 Participation awareness

Contributions by participants are not automatically displayed to others: On Facebook, only the contributions made by the moderator are highlighted to the participants, to see the contributions made by others, they must click "View comments" (Figure 2). Users can follow a hashtag on Twitter, but if participants respond to a particular comment, this is not signaled.

6.2 Issues identified from the user's patterns of idea exchange

6.2.1 Lack of originality

Users contribute ideas they previously had: This issue has been already documented in previous literature as low novelty. It appears to be that users will contribute ideas that they have had in the past, and do not make an effort to come up with novel ideas to share.

6.2.2 Idea feedback

Users do not build on the ideas of others: Another previously documented issue is the low comments on ideas shared by the group. Once participants have shared their own thoughts, they are likely to agree or disagree with the ideas of others, but not to provide feedback for improving the concept or new ways to combine the ideas generated.

6.2.3 Rhythm of participation

Users expect to move forward immediately: One interesting finding was that users interact with the ideation session as they would a task to complete, namely they respond to the challenge provided and want to move on to the next one, whereas in face-to-face sessions the participants hold a discussion when a challenge is posed.

7 ADOPTING SOCIAL NETWORKS FOR IDEA GENERATION SESSIONS

Current social network solutions in corporate environments enable participants to "discuss, create and share content in the form of text and videos, comment, generate ideas and vote" (Vuori, 2012). Members of the community expect benefits from their participation, such as to be involved and appreciated, particularly in the process of creation. Users also need to be motivated to participate (Jung, Schneider & Valacich, 2010), as it has been found that internet users spend most of their time

on social networks in activities that are fun or entertaining (Nielsen, 2010 cited in Wagner & Jiang, 2012).
In the following sections, we revise some of the issues with current solutions and the needs to consider in the next solutions, the recommendations from different authors and finally some suggestions to apply in the current social networks to be able to implement them in an idea generation session.

7.1 Guidelines to employ social networks to support idea generation

To use social networks, as they are today, in idea generation sessions, moderators need to implement some of the following guidelines:

7.1.1 Establishing communication

Use social networks which allow having a dedicated space for the session (such as a Google Hangout, a Facebook Event or a Group).

7.1.2 Attention retention

Keep constant communication with participants, providing progress information, acknowledging contributions and promoting the exchange with other participants (your idea X can be combined with idea Y; how can we achieve idea K?).

7.1.3 Publication of contributions :

The use of social networks which allow having a dedicated space for the session (such as a Google Hangout, a Facebook Event or a Group) can help minimize the risk of participants forgetting a hashtag. All ideas will be located in the same space.

7.1.4 Lack of originality

Provide users with the ability to create an alter-ego to allow anonymity. Use moderators (human or automated) to guide and support the discussion. To stimulate non-redundant ideas and participation, some authors suggest the use of incentives, competition mechanisms (Jung, Schneider & Valacich, 2010) or cash rewards (DeRosa, Smith & Hantula, 2007).

7.1.5 Idea feedback

Clarify the voting criteria and improve the process to democratize the evaluation of ideas.

7.2 Ideal changes to social networks to support idea generation

The systems used to support distributed collaboration implemented currently need to improve the social aspects of virtual collaborations to promote the enrichment of idea descriptions, encourage commenting and the iterative development of ideas. Even small changes to the interface can influence the success of a collaboration environment (Jung, Schneider & Valacich, 2010). This can be made possible by the use of widely adopted social networks (Schweitzer et al., 2012).
In Table 2, we observe the comparison of difference between the current Group support systems and the Social Networks. This comparison clarifies the gap between the kind of information exchanged and the functionalities that could be improved in each type of system, which implies a pattern of communication is creative sessions:

Table 2. Comparison of group support systems and social networks to support ideation

	Current group support systems	Social networks
Participants	Usually work together / know each other	Usually do not know each other
User Registration	Can vary according to the system configuration	Yes
One on one conversations	Can vary according to the system configuration	Can vary according to the system configuration
Moderators	Can vary according to the organization	Varied
Real time publishing (submit ideas)	Yes	Yes

Voting	Yes	Only up-voting ("Likes")
Comments	Can vary according to the system configuration	Yes
Anonymity	Can vary according to the system configuration	Can vary according to the system configuration
Planning / modelling tools	Varies according to the system	No
Process structure / Guidelines	Yes	No
Rewards for participation	No (it is part of a job)	Can vary according to the organizer
Production of reports	Yes	No (although some providers are starting to look into this opportunity)

In light of what was found in the literature, and comparing the functionalities of social networks and current group support systems for idea generation, these modifications would be needed to be able to adapt social networks for idea generation sessions, based on the identified issues:

7.2.1 Explaining complex ideas

Inclusion of collaboration tools to sketch and share ideas graphically, providing users ways to draw or sketch and thus share their ideas in a graphical manner.

7.2.2 Attention retention

Manage the information load. Ardaiz-Villanueva et al. (2011) suggest limiting the number of ideas each user must revise in idea sharing systems, as to not overwhelm the participants. As they mention in their article, the graph algorithms used by social networks can support users having a personalized view, thus all (or most) ideas can be revised.

7.2.3 Participation awareness

Provide feedback in the form of performance indicators. Authors discussing current group idea management systems have proposed similar solutions (Jung, Schneider & Valacich, 2010; Chang, 2011; Glier et al., 2011).

8 DISCUSSION

Even if social networks provide the contact and the communication that a crowd needs, it is important to propose an action framework of to involve the crowd around a creative subject to be productive in early design phases.

The inclusion of crowds in the idea generation process can have a positive impact. The key to their successful application is to clearly define the objective beforehand, to select the right social network, and to use an adequate process.

Social networks are demonstrated to be a convenient space to connect people and ideas in a controlled manner. The ideas and comments can be shared easily, but for the idea exchange to be effective two key points should be established in advance: 1) Structure/Organization of the creative exchange among the participants and theirs ideas and 2) the definition of the kind of outputs that has to be expressed. Social networks are not a good place for ideas evaluation, because the ideas can be expressed but not conveniently analyzed or evaluated. Particularly, we noted that the ideas presented as a feed with the latest news could cause a contrary effect on idea feedback. Otherwise, to harness the use of Social networks for large creative session has more possibilities when the organization has a large community of interest that could be engaged to share or participate in co-ideation sessions.

In future exercises, it is expected to find ways to improve the use of social media for idea generation by testing different methods for distributed collaboration. The focus will be on three metrics:

- Number of ideas
- Ideas evaluated (ideas seen by other participants)
- Ideas shared (ideas shared by each participant)

The expectation is to be able to integrate improved idea generation methods for distant collaborations, which will be supported by technologies that the participants are already acquainted with.

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