Innovating with Users Online? How Network Characteristics Affect Collaboration for Innovation

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ABSTRACT

This paper addresses how network characteristics affect collaboration in open innovation applications. Combining insights from open innovation and networked innovation, this paper applies an analytical framework addressing the innovation process from ideation to potential innovation, with a focus on relationships between involved parties and types of collective action. The analysis is based on the use of an open innovation application in three types of organisations: a hospital, an IT-company and three municipalities. The findings suggest that open innovation applications for gathering ideas facilitate a cross-cutting of vertical/hierarchical and horizontal/domain boundaries yet do little to alleviate challenges with innovation-management and cross-domain communication. Innovation-work beyond ideation, proceeding from an idea to an implemented innovation, is an example of high-level collaboration, requiring high levels of commitment, reciprocal trust, common purpose, mutual benefits and risks. The ideation-phase and the later phases of the innovation-process hence benefit from different constellations of networks.

KEYWORDS:

Open innovation; crowdsourcing; collaboration; user-involvement; networks.

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INTRODUCTION

Online and social applications make user-involvement and crowdsourcing modes of innovation technically easier, as exemplified by Dell's IdeaStorm, MyStarbucksIdea and Threadless. Such social and open innovation applications can be considered what Kaplan and Haenlein entitle a collaborative projects type of social media (Kaplan and Haenlein, 2010, p. 61). Efforts to involve customers and external stakeholders in innovation-processes build on a longstanding legacy of participatory design (see Sanders & Stappers, 2008 for a review), with key assumptions also reflected in the influential perspective of open innovation, pinpointing the benefits of enabling a flow of ideas and knowledge across networks (Chesbrough, 2003).

Innovation processes are situated within workplace cultures, where organisational practices and power relations might obstruct collaboration (Foss et al., 2011; Swan & Scarbrough, 2005). Research on open innovation has only paid limited attention to organisational dimensions, and not in a very systematic way (Hrastinski et al., 2010, Sieg et al., 2010, Sigala, 2012). Communication and collaboration across domains and networks is a precondition to meet the objective of open innovation

to leverage knowledge and experiences available from an extended network of stakeholders. Communication and collaboration moreover depend on the relationships between the nodes in a network being characterised by stronger or weaker ties. The present study therefore examines how networks and tie characteristics influence use of innovation applications in organisations. The following overall research question thus demarcates the study: *How do the relationships between involved actors in open innovation applications affect collaboration and the potential of innovating?*

This study provides an account of open innovation that does not suffer from survivor bias (c.f. Hopkins et al., 2011), nuancing the potentials of open innovation. The empirical evidence with regard to potentials as well as challenges of open innovation, offline and online, are growing. Yet there is still a need to study cases beyond the global and profiled examples such as MyStarbucksIdea and IdeaStorm.

The article begins with a review of literature on open and networked innovation, and the use of open innovation applications. Based on this review, we identify tie strength and different levels of complexity in collective action as two core constructs to understand the innovation process from ideation

to innovation. The article then investigates practices with open innovation applications through an analysis of how a hospital, an IT-company and three municipalities implemented an online open innovation application.

OPEN INNOVATION AND NETWORKED INNOVATION

Chesbrough's open innovation model, defined as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation respectively" (Chesbrough, 2006, p. 1) has gained considerable momentum in enterprises. The open model harnesses the flows of internal and external sources of ideas and knowledge that emerge as an opportunity when enterprises open up the boundaries between their organisation and the external environment. Open innovation is also considered valuable for public sector innovations, with benefits such as improved awareness of social problems and inclusion of citizen experiences (Bason, 2010; Mergel & Desouza, 2013).

Whereas open innovation has gained a strong popular position, a major deficit is its lack of attention to organisational practices within and between organisations. This is also reflected in how research on open innovation more often concern the initial phases of ideation, rather than the complex process of integrating knowledge (West & Bogers, 2014). Moreover, the concept of open innovation has been criticized for merely repackaging well-known find-

ings from the literature on innovation management, without giving sufficient credit to previous research and without building on previous research (Trott & Hartmann, 2009). Research building on the broader literature of innovation management and organisational practices nuance the simple and deterministic model of open innovation. Foss et al. (2011, p. 981) demonstrate how "there is no *direct* relation between customer involvement and innovation but that organisational practices prove a strong *mediating* effect." Organisational practices that enhance internal communication improve the capabilities of individuals in the organisation to access outside knowledge, and to share this knowledge within the organisation (Foss et al., 2011).

Given the decisive role of knowledge-sharing and communication within and across organisational boundaries to make use of external knowledge, this paper addresses communication between stakeholders involved in innovation processes. In doing so, this paper also acknowledges conditions, such as tie strength and trust, which ease communication and collaboration. This relates to the importance of mutual trust as an enabler of knowledge-sharing (Westergren & Holmström, 2012). More specific attention is needed for understanding the consequences of different relationships, as

open innovation seeks to harness knowledge from stakeholders with whom relationships cannot be characterised as strong.

The notion of networked innovation points to innovation that occurs through relationships and emphasizes the need to integrate knowledge from diverse networks; the critical part played by social networks; and the pervasive role of technology (Swan & Scarbrough, 2005; Valkokari et al., 2012). Firstly, there is a need to overcome boundaries based on differences in language, understanding and practice. The integration of knowledge across networks requires shared understanding and boundary spanning activities (see also Mørk et al. 2012). Secondly, networks of different kinds are implicated; this means that structural and processual aspects of networks must be considered. Strong and trust-based relationships play a different role than weak ties, and relate to tacit and explicit forms of knowledge respectively. These characteristics of networks are crucial, as networks have an important function with regard to transfer of knowledge (Burt, 2004; Granovetter, 1973; Gulati, 1998). Bridging ties have "early access to diverse, often contradictory, information and interpretations, which gives them a competitive advantage in seeing good ideas" (Burt, 2004, p. 356). Yet, networks

with weak ties and structural holes involve higher uncertainty, and are harder to manage (Valkokari et al., 2012). Bridging networks require the capability to understand specialized knowledge domains and presumes the ability to cross professional languages and sub-cultures (Möller & Rajala, 2007). Thirdly, “networks play a crucial role in communicating and negotiating which, and whose, understandings and interests (or ‘technological frames’) come to dominate innovation processes” (Swan & Scarbrough, 2005, p. 919).

Networked innovation and related perspectives consequently address the communicative aspects involved in innovation work to a larger extent than the open innovation model. This paper leans on both open innovation and networked innovation, attempting to detangle the intersections between new modes of innovation, new technologies for innovation and organisational structures and power dynamics shaping, facilitating and resisting change.

USER-INVOLVEMENT AND OPEN INNOVATION APPLICATIONS

Open and networked innovation should not be confused with the use of online websites for user-involvement, as these are merely tools for facilitating the process and for enabling collaboration. Online open innovation applications have become popular, as they provide technological support for tapping into end-users’ everyday experiences supporting collaborative modes of innovation (West & Bogers, 2014). The related notion of crowdsourcing is similarly a top-down initiated process with companies crowdsourcing innovation tasks to the general public (as with Threadless.com), or experts beyond the organisation’s boundaries (such as Innocentive.com) (Brabham, 2008).

Research on open innovation applications emphasize the crucial task of enabling and facilitating collaboration and dialogue between customers as well as between in-house employees, customers and external stakeholders (Di Gangi & Wasko, 2009; Mahr & Lievens, 2012; Ramaswamy & Gouillard, 2010; Sieg et al., 2010; Sigala, 2012). Mahr and Lievens (2012) emphasize the importance of dialogue among customers, as well as the need to grant users direct access to the development teams.

Users need to receive feedback from staff-members, which in turn will increase the feeling of reciprocity. Open innovation demands crossing domain-language boundaries, and companies struggle with formulating challenges in a way that enables external stakeholders and expertise to recognize these as challenges they would be able to solve (Sieg et al., 2010). From a networked innovation perspective, overcoming boundaries based on differences in domain-language and practices is difficult (Swan & Scarbrough, 2005), yet if communication is unsuccessful, knowledge is not integrated.

This emphasis on dialogue moreover points towards the importance of continuity of interaction between stakeholders beyond the first stage of proposing an idea or suggestion. Continuous interaction and dialogue is decisive for identifying the most promising ideas, and for refining and developing service ideas to implemented service innovations (Di Gangi & Wasko, 2009). These latter collective actions reflect more complex tasks compared to simply posting an idea or suggestion, and the complexity of different forms of collective tasks may be a crucial factor to consider. With regard to collective action online in general, Rheingold (2012) distinguishes between four different forms. *Networking* characterises e.g. information dissemination

and commenting, and is relatively simple with the least risk and commitment. *Coordination* requires that involved parties share information and agree to modify their activities for mutual benefit. *Cooperation* represents a shift from mutual benefit and self-interest to common purpose. And finally, *collaboration* is the most complex and purposeful means of collective action, requiring the highest levels of commitment, reciprocal trust, common purpose and mutual benefits and risks. Applied to online innovation applications, posting an idea is a form of low-level networking. Refining suggestions collaboratively through dialogue and completing the required work from idea to implemented innovation involve higher levels and increasingly complex forms of collective action.

ANALYTICAL FRAMEWORK

The literature review points to how innovation processes cannot be studied without considering the larger organisational context. External and internal as well as horizontal and hierarchical boundaries must be taken into account. Moreover the innovation management process from ideation to potential innovation should be studied. The analysis hence first addresses the ideation process. Secondly, we examine the innovation management process with attempts to integrate knowledge within relevant units and people in the organisations. Finally, we turn to whether and how contributors are recognized. In all three parts of the analysis, we consider the relations between involved parties, and the types of collective actions they take part in.

METHODOLOGY

Qualitative methods were applied to study the use of innovation applications in three types of organisations: a hospital, an IT-company and three municipalities. The cases represent polar types (Eisenhardt, 1989), with different organisational and management structures and practices. With this selection of cases, conclusions can be expected to be less idiosyncratic to the specific cases. An overview of the different methods applied is presented in Table 1.

In addition, strategic documents describing the innovation management processes in the case organisations were studied. For all organisations, the innovation applications served as an important background before meeting interviewees, guiding the conversations and serving to illustrate particular benefits and challenges.

The study protocols were designed to cover user experiences with the innovation applications in organisational contexts. Interviews with members of the project groups address how interviewees work with service innovations, and further how they work with motivating users to participate, how they manage the innovation process including responding to ideas and following

Table 1.

Overview of data gathered in the three case studies.

	<i>Case 1: The hospital Autumn 2010 and autumn 2011</i>	<i>Case 2: The IT-company Winter 2012</i>	<i>Case 3: Three municipalities Autumn 2012 and spring 2013</i>
<i>Data from project-groups</i>	Interviews with three employees responsible for administering the innovation platform, including the project-leader.	Interviews with two of the employees responsible for administering the platform, including the project leader.	Interviews with six employees responsible for administering the platform, including the project leaders in the municipalities.
<i>Data from end-users</i>	Interviews with 17 end-users. Six of these were employees in different units of the hospital, and 11 were patients/relatives. Three of the interviewed end-users have submitted ideas to the platform.	Interviews with eight end-users, all with management responsibilities in the company. Six of these have submitted ideas to the platform.	Interviews with one idea proposer in municipality 1. Open-ended survey with responses from 118 end-users in municipality 2. 20 of the respondents have submitted ideas to the platform. Two focus groups with nine employees in municipality 3. Five of these have submitted ideas to the platform.

Figure 1. Screenshot of the idea description page. Team members involved in developing ideas further get access to additional documents, tasks and information about the idea management process of the different ideas. Users who are not team members only access the Overview tab.

up on ideas, and how the innovation management process requires co-operation with appropriate units in the organisation. The interviews, focus groups and the open-ended survey with end-users address end-user experiences, with particular focus on how they experience being employees, patients and relatives at the hospital, employees of the company, and citizens and employees in the municipalities. End-users were also asked about their opinions and experiences with how ideas are followed up and managed, either based on their own experiences as idea-proposers or their opinions with how the innovation management process should be organized.

Individual interviews in the three case studies lasted approximately one hour. The focus-group interviews in case study 3 lasted two hours. All interviews were recorded and transcribed verbatim. Interviews were coded and analysed with NVivo 8. In analysing the data, similarities and differences in opinions and experiences between the cases were systematised. The answers from the open-ended survey were similarly studied and sorted according to the experiences and opinions of the respondents.

THE OPEN INNOVATION APPLICATION AND CASE SUMMARIES

The organisations implemented the same innovation system, and tailored the system to their own needs. The system provides a front-end ideation community, where users can submit ideas, as well as vote for and discuss ideas. The solution additionally provides a back-stage area with idea-management functionality available only to people involved in developing ideas into innovations. By joining the innovation teams responsible for developing ideas further, users can access and modify additional documents and tasks (see Figure 1).

An overview of the three case studies is presented in Table 2. The “Innovation process” in this table is based on strategic documents from the case organisations.

Table 2:

Presentation of case-organisations

	<i>Case 1: The hospital</i>	<i>Case 2: IT-company</i>	<i>Case 3: Municipalities</i>
<i>About</i>	The hospital is in charge of regional and local assignments and the provision of hospital services for the region.	The company has 10 000 employees in different business areas, and delivers IT services to public and private customers.	Three Norwegian municipalities (M1, M2, M3) with between 11 000 and 50 000 inhabitants.
<i>Purpose of innovation application</i>	To harness ideas for how to improve the hospital services, encouraging patients, relatives, employees and industry stakeholders to contribute their ideas.	Used by the employees for sparking innovations across business areas, as well as harnessing the competence, knowledge and creativity of their large employee basis.	M1 and M2 aimed to improve citizen involvement in public service innovation and to improve the opportunities of own employees in innovating municipal services. M3 involved employees in two units.
<i>Innovation process</i>	A project group of 3-4 employees conducts a first evaluation of the idea. Ideas that are considered to have the required use-value are moved to step 2. At this stage the idea proposer is welcomed and expected to take part. Ideas that become innovation projects are anchored at the appropriate management level. In step 3, the innovation project is elucidated and the required resources are allocated. In step 4 the innovation project is tested and evaluated. Based on the lessons learned in step 4, the innovation project is implemented full-scale in step 5.	An innovation board makes decisions on ideas that cross business areas (BAs) in the company. A management group from the relevant BA makes decisions on ideas that are BA-specific. The innovation potential of the ideas is assessed (decision point 1). Next, the ideas are elucidated and a business model for the idea is developed. Following a decision point 2, innovation-projects are then piloted in step 3. After a third decision point, ideas are implemented in step 4. Simpler ideas can leapfrog from decision point 1 to implementation.	In M1, one employee was involved in assessing the initial potential of the submitted ideas. In M2, a project group of five employees conducted the initial assessment of the submitted ideas. In M3, a project group of seven employees was involved in the initial assessment of ideas. The innovation process is divided into 4 and 5 steps. Submitted ideas are evaluated in step 1, elaborated in step 2 and forwarded to the appropriate unit in the municipalities, piloted in step 3, and implemented in step 4 or 5.

FINDINGS

This section provides a comparison of the experiences made in the different cases throughout the process; from ideation to innovation management and acting upon ideas and suggestions.

Ideation as individual and collective action

With the innovation applications the case organisations aim to crosscut hierarchical and domain-specific boundaries, and enable ideas and suggestions to flow freely. End-users are able to contribute ideas without knowing who the appropriate addressee of that idea is. This part of the process where individuals contribute ideas is a low-level networking type of action. It is simple and characterised by low levels of risk and commitment.

In the IT company, the application is expected to enable the company to gather ideas from employees regardless of their position in the company. The value of gathering ideas from employees who work with customers, operational tasks and technology is expected to be significant. Whereas the openness of the innovation application is limited, as it is used by company-internal people only, the application is an example of empowering employees with specific knowledge concerning customer experiences and

ideas (c.f. Foss et al., 2011). Employees no longer have to rely on their own chief of operation, and can easily access the top level of the organisation:

It's difficult for a small ant, you feel like a small piece in a very large organisation. (...) I have no idea who in the IT-department or any of the other BAs I should call to proceed with an idea. That is what I thought the Innovation system could support. You have a system so that the individual employee doesn't have to know what everybody else in the company works with (interviewee with end-user in the IT company).

Similarly to the IT company, the innovation applications in the hospital and municipalities are considered important for crosscutting hierarchical levels. The hospital aims for the innovation application to be a place where anyone can contribute their idea, regardless of their status and background. End-user participants in the municipalities, whether employees or citizens, emphasise that good service ideas appear in actual situations and contexts, and that the applications make experience-deduced ideas visible for the appropriate management level in the municipalities:

I don't know how you would otherwise be able to dis-

seminate a lot of ideas to the management level, and I think that's important with the platform, that managers see all the experience that is here (interviewee in municipality 3).

Project group and end-user interviewees in all three cases moreover express that the innovation applications should be a place where ideas can be proposed without thinking of constraints or the quality of the idea. This means users should not be required to consider whether their ideas are economically viable or possible to implement:

The big benefit is perhaps that ideas are unfiltered (...). [This system] forces the municipality to consider ideas seriously. Don't decline an idea before a real assessment has been made. Like previously, we have allowed ourselves to be locked in, we think economy first by default. And then we do not even come up with ideas (interviewee in the municipality 2 project-group).

This interviewee pinpoints a crucial aspect of brainstorming and ideation as typically split into two phases. In the first phase, users should not think of constraints. The first phase is intentionally designed to be diverging. Assessing ideas is part of

the second phase (Putman & Paulus, 2009; Wang et al., 2010). The innovation-system can be considered as online group-based brainstorming, where the first diverging phase welcomes all ideas.

The ideation-phase has the potential to take on a more complex form of collective action if involved parties develop a shared sense of responsibility and mutual benefit, by mutually improving ideas and suggestions. Yet, whereas the literature on the use of open innovation applications emphasises the importance of dialogue and interaction (Di Gangi & Wasko, 2009; Ramaswamy & Gouillard, 2010; Sieg et al., 2010; Sigala, 2012), the case organisations suggest that a vibrant community of contributing and communicating participants cannot be expected by default, and is not even desired by all organisations.

On the hospital's innovation platform, each idea has received 0.6 comments on average (min: 0, max: 8). The project group only occasionally comments to enquire about further details. Instead, this type of communication takes place with the idea-proposer directly via email, phone calls and meetings, and hence the interaction becomes invisible to other users of the platform. Some ideas are discussed and refined in the comments sections, and

in those cases, other employees have contributed their knowledge about similar projects or elaborated on the problems that the idea addresses. Yet, the project group in the hospital has not regarded the interaction that takes place through comments as important in the innovation management process.

On the IT company's platform, each idea has received 2.1 comments on average (min: 0, max: 17). The project-group and the end-users in the IT-company enquire about further details on the ideas, and also provide comprehensive feedback about the follow-up process. Other employees participate with comments that help refine the ideas. The interviewees emphasize that the company is a very large company where several people might be involved in developing ideas and suggestions through comments. In the interviews, one idea was discussed in more detail as this idea had sparked a large number of comments from other employees:

It's a good idea, it's a straightforward idea. It's more difficult to raise engagement around complex ideas. And then the person who posted the idea has made an effort and encouraged people to comment. But primarily, this is a good idea. And low hanging fruit, this is more about packaging services we already have (interviewee in IT-company).

[The idea proposer] is profiled in the company when it comes to innovation and business-development. And then the idea addresses Cloud Computing, which we have discussed broadly in the company. And the trend is of course towards more cloud computing. Hence the combination of the person suggesting the idea, and cloud as a highly relevant theme that's right in the middle of our business. (...) And in the comments, I see that employees from different business areas have commented (interviewee in IT-company).

These interviewees suggest that users will more easily comment and contribute in the innovation process if they understand what the idea is about. This appears self-evident, yet it is crucial, because it points towards the importance of how ideas are presented, and how complex, or domain-specific ideas, can be formulated in ways that communicates across domains. Different domains are characterized by idiosyncratic norms, and the use of jargon thwarts communication and knowledge sharing (Tiwana, 2008; Tushman, 1977). The fact that employees from different business areas contribute is particularly interesting as the users expect that the innovation-system should help facilitate innovation across business areas in the company.

In municipality 1, each idea has received 1.1 comments on average (min: 0, max: 4); in municipality 2, each idea has received 1.15 comments on average (min: 0, max: 6); and in municipality 3, each idea has received 2.5 comments on average (min: 0, max: 6). The employees responsible for the innovation-applications in municipality 1 and 2 do not consider the comments to be of any help. Quite the contrary, comments are considered as complicating as the project groups do not know how to deal with the comments, arguing that comments would then have to be archived in the filing of the case:

No, we're kind of happy that there isn't much discussion in the form of comments, because then we would've had a problem with how to deal with the comments. (...) Like, then the comments would have to be archived in the filing of the case. (...) We haven't thought about what to do with the comments. We just observe that there are comments to some of the ideas (interviewee in municipality 2 project-group).

Municipality 3 differs from the two other municipalities with regard to number of comments, and in having considered comments to be important from the beginning. On the front-page of the

innovation application, participants are encouraged to “comment and collaborate with others on their ideas to help improve the ideas”, and the project-group members additionally comment to enquire about further details. End-user employees similarly point to the comments as interesting and valuable. Employees who have not contributed ideas feel they have helped out by commenting, and employees who have contributed ideas appreciate receiving comments:

Yes, it's motivating to get comments, with other people contributing to your idea. It's a nice way to get other opinions and to develop the different ideas further (interviewee in municipality 3).

The interviewee here echoes points made in studies of customer involvement and open innovation applications; dialogue and interaction refine and improve innovative suggestions (Di Gangi & Wasko, 2009; Ramaswamy & Gouillard, 2010; Sigala, 2012). Whereas municipality 3 and the IT company to some degree succeeded with raising engagement through comments, the contrast between the importance of dialogue as emphasised in the literature and the overall low level of engagement and interaction in the innovation-applica-

tions of the case-organisations is stark: facilitating and succeeding with creating a vibrant and interactive online innovation community does not come easy.

Innovation management: Integrating networks, knowledge and interests

A well-functioning innovation management process requires that external knowledge is communicated to units and staff involved in the innovation process (Foss et al., 2011). Likewise in the case-organisations, proposed ideas are delegated to the appropriate people in the organisations. Cross-cutting organisational boundaries is relatively simple when it comes to gathering ideas, but much more difficult when it comes to the innovation management process. To succeed, interviewees in all three organisations emphasize the importance of the organisational system, arguing that the ability to complete projects, rather than merely acquiring ideas, represents the key condition for whether the innovation platforms can be considered successful. A cross-case comparison demonstrates the importance of innovation management and the ability to complete projects by allocating resources and by integrating people across networks and interests.

Turning to the hospital first, the project group

has two main tasks: evaluating the innovation potential of ideas, and being incubators for ideas that pass decision-points and become innovation projects. For ideas that become innovation projects, the innovation management process works well, and successful idea proposers commend the project group and the support they provide in the process. The required time and resources are allocated, and the innovation projects are situated within specific units of the hospital with employees who share relatively strong ties, have mutual trust in each other, and who experience ownership to the projects.

However, the process of acting upon ideas and suggestions does not always run smoothly. The project group explains how they often attempt to involve appropriate units at the hospital by forwarding suggestions, and then nothing happens:

We've had meetings with the person who is responsible for that, but nothing happens; we get in touch with one person, who contacts another person, who files a case, which is supposed to be discussed in a board. And then we try to keep updated, but it's no longer our responsibility, we've delegated the suggestions. And it kind of disappears. The same with this idea [points at an idea] where we're waiting for a reply. What's happening? Is there anything we can

do, or have they done anything with the idea? (interviewee in the hospital project-group).

The end-user employees who were interviewed emphasise challenges with internal competition between units and difficulties with collaboration. Their workplace identity is to their own profession and their own unit more than the hospital as such. The hospital is characterised by self-contained units working with operational tasks and little time to devote to external requests for how to improve hospital services.

Innovation management challenges are also experienced by the IT company. Interviewees who have responsibilities for development and innovation stress that the greatest challenge is finding available resources:

You need resource throughout the organisations, and these are people who are already fully occupied with their regular work tasks. Thus when I need to allocate people to develop these services, I need to take these people from their regular tasks. But of course, operating activities are prioritised, and then the innovation process will stop (interviewee in IT company project group).

Innovation work faces a reality where employees are already occupied with operating activities and delivering services to customers. There is little time left for development and innovation. According to one interviewee, even if a decision to allocate a number of hours to an innovation project comes from the top-management, "a chief of operation from some division might object and say 'no, you cannot do this in your work-time'". Other interviewees relatedly emphasise that employees might want to co-operate, but that cross-unit innovation faces the challenge of possibly benefiting only one unit, even if employees from several units are involved in the work.

In many cases, you will need to buy resources internally to help work across business areas, right? (...) So we need a system for facilitating such processes. It's not that people don't want to co-operate, but they need to prioritise their regular work. To be able to allocate people to innovation work, that perhaps in the end only will benefit another unit, you need to buy their time (interviewee in IT-company project-group).

Most interviewees therefore emphasise the significance of facilitating and structuring innovation.

Previously, innovation across business areas has been considered important on management level, but on specialist units on lower hierarchical levels, the attention and will to innovate has not been present. These challenges have been acknowledged from the start, and the innovation management process is designed to anchor ideas on the appropriate management-level and to ensure funding and resources for further elaboration of business-models. Different processes are designed for ideas that concern services within specific business areas and ideas that cross business-areas. In the latter case, the innovation management process defines how relevant resources from the business areas should be involved in the innovation-projects.

All three municipalities expected the open innovation system to spark off innovations across public service domains. Knowledge-sharing and collaboration across domains in the municipalities have traditionally been difficult to achieve. Service innovation often involves a number of different actors producing and delivering a service, and bringing them, and the citizens, together is regarded as productive:

We have an objective to become better at collaborating and working across organisational units in the municipality. Which we haven't been very good at before (interviewee in municipality 2).

The innovation applications are considered valuable exactly for improving collaboration and working across organisational units in the municipalities. However, the municipalities have had no real strategy for how to facilitate collaboration across units. Practices are instead ad-hoc, with ideas submitted to the innovation system being conveyed to the right "idea-owner" in the municipality. Simply put, the employees in the project groups hand over the idea to the right recipient: "Look at this, somebody came up with this great idea" (interviewee in the municipality 2 project-group). Involving the right people in the municipalities is not always straightforward, particularly if the right "idea-owner" cannot be easily identified:

So you have to identify where ideas belong. Like with ideas that concern public health, we haven't done much besides, reviewing the ideas, (...) and when the person who co-ordinates public health comes over, I

will hand these ideas over to her: "You need to take these ideas to your group and see what you can do with them". But with some ideas, like an idea that suggests we need more green parks, what can we do about it? It's just a wish. (...) Who owns that idea? I know our municipality, but this involves political decision-making, it is part of the municipal plan, so maybe the chief municipal executive should have it (interviewee in municipality 1 project group).

A similar challenge with identifying the right "idea-owner" is mentioned by one interviewee in municipality 2 with regard to ideas that fall between different areas of responsibilities: "The responsibility is distributed with the result that nobody takes responsibility. (...) Like is it culture, technical or somebody else?" Challenges with internal collaboration in the municipalities are not visible to external idea-proposers, who are disappointed when nothing appears to happen with proposed ideas. The amount of resources required for facilitating and following up on ideas and innovation projects is experienced as so significant that the municipalities have discontinued the initiatives with the innovation platforms.

Follow-up, feedback and impact

Services that are based on user-created content face the challenge of motivating users to participate (Brabham, 2010). Contributing must be experienced as worthwhile, and users need to be assured their participation is acknowledged (Mahr & Lievens, 2012). Demonstrating that submitted ideas are acknowledged and recognised seems particularly important:

You need to get the impression that your contribution is followed-up. (...) That something happens, and that you create something of value (interviewee in project group in municipality 2).

What I think is really positive is that it commits someone on the receiving end. When you contribute an idea, there is an expected commitment that it will be discussed on a management level, who should make some kind of conclusion and respond. We might have had openness for new suggestions before, but the commitment, that's novel (interviewee in municipality 3).

Idea proposers in all three cases stress that they want some kind of acknowledgements for con-

tributing ideas, and the project groups in all three cases in principle know providing feedback to idea proposers is required. There is hence agreement among project group participants and end-users that idea proposers should get feedback on their ideas after a short time, and that ideas that pass decision-points are continuously followed-up with information about progress. Ensuring a transparent decision process is a well-known principle of online modes of collaboration (Rheingold, 2012), and also emphasised as crucial in the studied organisations. End-users call for trust-related actions, concerning the benevolence, integrity and competence of the people in charge of these open innovation applications (Mayer et al., 1995): they want to know that the trustee wants what is best for the end-users; they want to know the evaluation principles used to evaluate the ideas; and they want to know that these often invisible and unknown trustees have the skills and ability to act appropriately:

If we see that some of the ideas are actually acted upon, then I believe people will contribute more. We're used to a lot of talking and not a lot of action. And we might think that the same will happen here. But if only one or two ideas are acted upon, I think

people will find contributing worthwhile (interviewee in municipality 3).

I would really like more information about ideas that are actually assessed, things that have been improved because of these ideas. Some kind of documentation that things I do here get consequences (Patient/relatives end-user at hospital).

Informing all users about progress is particularly important because of the two-layered functionality of the system, where additional information and documentation about the innovation-progress is available only to team-members of each particular innovation-project (see Figure 1).

In the hospital and the municipalities, end-users tend to criticise lack of follow-up and information about progress or lack of progress with regard to proposed ideas. Idea proposers stress that if ideas are not recognised, the innovation application turns from being an appreciated initiative to becoming an empty token of participation that does not empower them as employees and citizens: "It becomes a tool for the municipality for bragging about citizen participation" (end-user respondent in municipality 3 survey). In the IT company, in-

interviewees additionally point to the importance of making the value proposition of the innovation system plain for employees. The interviewees point to a number of monetary as well as experience-based individual incentives for participating, such as Key Performance Indicators, performance measurement and profiling top contributors.

DISCUSSION AND IMPLICATIONS

The findings reported in this paper suggest that open innovation applications facilitate crosscutting of vertical/hierarchical and horizontal/domain boundaries with regard to gathering ideas, yet that innovation management and facilitating communication across networks remain significant. Such applications may be useful for front-end ideation processes, but does little to alleviate the management of innovation processes, or the work and resources needed from all involved stakeholders beyond the ideation phase. The discussion will delineate how tie strength and relationships matter with regard to innovation management and with regard to facilitating continuous interaction and collaboration; and how the complexity of tasks in innovation work appears to demand different configurations of networks.

Network configurations and collaborative tasks

How then do the relationships between involved actors in open innovation applications affect collaboration and the potential of innovating? In the case-organisations, a tension persists between the benefits of weak ties for uncovering non-redundant and valuable information and knowledge (Burt,

2004; Granovetter, 1973) on the one hand and the challenges with weak ties on the other hand with regard to integrating knowledge and lack of mutual trust and obligation (Möller & Rajala, 2007; Swan & Scarbrough, 2005; Valkokari et al., 2012). It thus seems the innovation processes favour two different configurations of networks. In the front-end ideation process, the network should be loosely tied to reach out to people for ideas and knowledge not available in-house or among the management. The next phases benefit from a different configuration of relationships, as the complexity of tasks increases. Innovation work beyond ideation, proceeding from an idea to an implemented innovation, is an example of high-level collaboration, requiring high levels of commitment, reciprocal trust, common purpose, mutual benefits and risks.

Tie strength between actors and type of collective action might be depicted as a two-axis model, with the first dimension representing a continuum from weak ties to strong ties, and the second dimension representing a continuum from low-level networking to high-level collaboration (Rheingold, 2012). Low-level networking implies low risk and commitment, whereas high-level collaboration requires shared goals, mutual benefits, shared risks, resources and rewards. Figure 2 shows how

Figure 2: Collaborative systems depend on the relationships between nodes in the network and the purpose of collaboration.

network ties and networking tasks have different qualities with regard to knowledge diversity, trust and reciprocity, and mutual commitment.

Examples such as Wikipedia and Linux prove that complex and high-level collaboration among weak and even absent ties indeed is possible. However, Wikipedia and Linux are examples of bottom-up, mass collaboration initiatives, whereas open innovation such as crowd-sourcing practices are top-down, initiated by organisations hoping to involve a broader selection of stakeholders.

In the case-organisations, communication breakdowns and dead ends are common. The few examples of vibrant discussions with different stakeholders refining suggestions and knowledge collectively represent exceptions rather than the rule. Likewise, when suggestions and ideas are managed internally, involving employees across the organisations, low commitment and reciprocity across weaker ties thwart progress. Barriers to collaboration additionally include lack of dedicated time and resources with employees already being occupied with operating activities, pointing towards the importance of individual and collective incentives to contribute (Breunig et al., 2014; Foss et al., 2011). Incentives and allocation of the required time and resources appear as feasible remedies for enabling complex collaboration among

weaker ties.

Open innovation applications are gaining in popularity, yet they will fail to generate innovation unless ideas can be successfully acted upon. Popular discourse on user involvement and open innovation tend to downplay the efforts required for acting upon suggestions and ideas. Based on the experiences with open innovation in the case-organisations, we suggest the following research propositions:

Proposition 1: Ideation processes in open innovation benefit from heterogeneous and weakly tied networks given the knowledge and experience diversity of such networks without demanding requirements for mutual trust and reciprocity between involved participants.

Proposition 2: Innovation processes in open innovation, depicting the procedure from idea to innovation, require high-level collaboration with high risk and commitment. Heterogeneous and weakly tied networks encumber high-level collaboration as a consequence of low levels of trust and reciprocity.

Proposition 3: Mutual recognition of efforts, incentives and prolonged interaction beyond idea submission are required in order to ease and make possible high-level collaboration between weak ties in open innovation.

CONCLUSION AND LIMITATIONS

This paper has examined how networks, relationship characteristics and types of collective action have consequences for collaboration when organisations attempt to innovate with users online. The findings highlight how an online application, designed with the specific purpose to support online innovation processes from ideas to realized innovations, helps organisations reach beyond their existing knowledge- and experience-networks. Yet the findings also show how the higher-level collaborative tasks of instigating a more thorough dialogue across networks as well as integrating knowledge throughout the organisation require more than technology. The case organisations represent partly failed attempts at innovating with users online. Given the complexity of innovation work, with and without online applications, such failures are likely at least as common as the success stories.

This study has limitations. The case studies that were analysed represent different types of organisations, who all used the same open innovation application. This implies that the findings cannot be generalized to all types of organisations or for all types of open innovation or crowdsourcing ap-

plications. The limitations of this article encourage additional research at the intersections between technologies for innovations and organisational cultures within other organisations, and with the use of other methods and other open innovation applications.

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