Information, Ideas and Input:
The Value of Enterprise Social Networks

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Abstract

Enterprise social networks (ESN) make fast inroads into organisations. They are said to improve communication across silos and the capacity to collaborate and innovate. Yet, despite increasing academic interest, there is limited empirical research on what uses of ESN create value for individual users. To fill this void, we first report on results of a cross-case analysis into ESN communication patterns. We identify five prevalent activities of ESN users, which we use to derive constructs measuring ESN usage. We place these constructs as determinants of perceived value. We test our research model with survey data from active ESN users using partial least squares (PLS). The results show that the primary source of value derives from generating and obtaining ideas and new information as input for one's work. The study contributes to theorising ESN value and the nature of ESN systems.

Keywords

Enterprise Social Network, Social Media, Usage, Perceived Value, Multi-method research.

INTRODUCTION

Social media makes fast inroads into organisational workplaces (e.g. Riemer et al. 2010). Enterprise Social Networking (ESN) denotes online services that allow corporate users to display personal profiles, establish new relationships and communicate with each other using short messages in enterprise-wide messaging stream (Boyd and Ellison 2007). ESN is said to improve communication across silos, increase inclusion and engagement of employees, as well as the capacity to collaborate and innovate (McAfee 2009). At the same time the value of ESN has been hotly debated in public media and the blogosphere (e.g. Hessendahl 2013) with proponents pointing to the benefits and sceptics outlining the negative effects of non-work-related chatter labelling ESN as time-wasting technology impeding on individual productivity. Many companies have taken up the technology and experimented with its use, and anecdotal evidence suggests that ESN can be a valuable resource, but it is as yet unclear which activities drive the value that users might get from ESN.

Moreover, ESN has not been developed as a workplace technology to address specific needs or enable execution of well-understood tasks. Rather, ESN present as malleable software platforms that afford a multitude of potential uses (Richter and Riemer 2013b). Hence, ESN will over time be defined by its usage and by the value it presents to its users. Research will thus have to elicit the emerging forms of usage and investigate what exactly drives value in order to derive an understanding for the nature and potential role of ESN.

Against this backdrop, this study seeks to answer the following research question: What drives the value of ESN for its users? More specifically, given the different ways in which ESN can potentially be used: Which forms of usage drive the perceived value of ESN?

We adopt a bottom-up approach and develop our research model by drawing on prior qualitative empirical research carried out by members of the research team (Richter and Riemer 2013a). Based on the results of a cross-case analysis involving systematic qualitative coding of large samples of ESN messages, we derived five core activities that encapsulate how people use ESN. That way our research model and measurement of ESN usage are empirically grounded in actual observed ESN forms of usage. We hypothesize the relationships

between ESN usage and perceived value and use partial least squares (PLS) to test our model with data collected from 193 ESN users.

We find that using ESN to share information and ideas as input for users' work processes is the primary source of value, followed by problem solving and receiving and posting awareness updates. As a result, our data shows that the value of ESN lies in its ability to provide diverse input for people's work and the ability to crowdsource solutions to problems. ESN can thus be seen as a collective resource that acts as a social sharing space that can feed new information and ideas into innovation processes and everyday work.

Our study contributes to uncovering in a systematic and empirically grounded way the potential role, use activities and value of ESN. In doing so, it contributes to a better understanding of the nature of ESN, and the ways in which it creates value productively for business.

BACKGROUND: ENTERPRISE SOCIAL NETWORKING

Enterprise Social Networking is part of a larger phenomenon that originated on the public Internet, subsumed under the labels of social media, social software and Web 2.0 (o'Reilly 2009). Common to all social media is that they facilitate user participation, interaction, and the generation of content by users (Boyd and Ellison 2007). Enterprise 2.0 (McAfee 2009) then refers to the application of social media technologies, such as social networking, blogs, wikis, or microblogging services (Razmerita et al. 2014) in an organisational context.

In this paper, we focus on Enterprise Social Networking (ESN), a set of technologies derived from social networking sites (SNS) such as Facebook. SNS connect users by way of the creation of relationships and facilitate interactions between them through the exchange of short messages (Boyd & Ellison, 2007). Dedicated technologies have emerged that fulfil the above functions but are exclusively targeted at corporate users, such as Yammer, Tibbr, Sitrion or IBM Lotus Connections. An important reason for organisations to adopt dedicated workplace ESN services is to mitigate the risk related to confidentiality and information security of using public SNS such as Facebook for workplace communication (e.g. DiMicco et al. 2008).

Following Leonardi et al. (2013) ESN can be defined as web-based platforms that allow workers to (1) communicate messages with specific co-workers or broadcast messages to everyone in the organisation; (2) explicitly indicate or implicitly reveal particular co-workers as communication partners; (3) post, edit, and sort text and files linked to themselves or others; and (4) view the messages, connections, text, and files communicated, posted, edited and sorted by anyone else in the organisation at any time of their choosing. In essence, the affordances of ESN revolve around short message communication and relationship building.

Existing research on ESN generally falls into two streams. The first stream captures mostly conceptual research outlining the characteristics and associated high-level benefits of ESN. The second stream investigates the usage and associated organisational benefits using single case study research approaches.

The first stream of ESN research focuses on describing its fundamental characteristics, affordances (Leonardi et al. 2013) and presumed benefits, such as new ways of connecting and interacting with other people in the workplace (DiMicco et al. 2008; Zhang et al. 2010). For example, Treem and Leonardi (2012) propose four unique characteristics of social media in organisations: visibility and association (of content and people), persistence and editability (of content). Majchrzak et al. (2013) argue that the use of social media creates the opportunity to transform knowledge sharing in the workplace from an intermittent, centralised knowledge management process to a continuous online knowledge conversation of strangers, unexpected interpretations and dynamic emergence. Fulk and Yuan (2013) discuss how the affordances of ESN can help to overcome the challenges related to locating expertise, motivation to share knowledge and developing and maintaining the social ties with knowledge providers.

The second stream of research presents a number of interesting and revealing case studies investigating a diverse range of applications of ESN. In their study of the engineering division of a distributed high tech start-up Gibbs et al. (2013) find that the use of social media not only increases open communication and knowledge sharing, but also promotes covert behaviour, creating dialectical tensions for distributed workers that must be communicatively managed. Zhao and Rosson (2009) find that people share information with the social network thus laying the foundation for serendipitous discovery of useful information by other users. Zhang et al. (2010) find that employees use ESN to publish news about their business units and engage in long conversations and discussions. Riemer and Scifleet (2012) report on benefits of ESN in a professional service firm regarding knowledge sharing and knowledge creation through joint problem-solving via multi-user conversations.

In sum, research on ESN so far is either conceptual or investigates particular organisational activities and benefits using case studies. Yet, there is limited understanding of the value of ESN for individual users. Moreover, many studies rely on the analysis of communication data. While this provides insight into the kinds of activities that ESN enables in a certain case, it leaves out user perceptions of the associated value. More

importantly, it marginalises those users that merely read and benefit passively from the information distributed via ESN. To this end, we investigate the perceived value of ESN for users by employing a survey approach.

QUALITATIVE PRE-STUDY

Given the novelty and nature of ESN we base our study on prior qualitative research, the detailed results of which were published elsewhere (Richter and Riemer 2013a). In total three case studies where carried out investigating the forms of usage of the ESN platform Yammer in three organisations. Yammer is a leader in the ESN market in terms of number of users. We treat these studies as a pre-study phase for the main survey study presented in this paper. Using this data allows us to develop our constructs based on actual, observed ESN forms of usage. In the following we briefly report on the underlying methodology of the qualitative pre-study, before we introduce the results that were taken as the basis for construct development.

Method: qualitative coding of Yammer communication data using genre analysis

In three case studies we investigated the usage of Yammer by analysing the actual communication messages exchanged by users. The same research design and analysis method was applied in all three cases in order to ensure comparability of results. We applied what is termed "genre analysis" as the method to analyse a sample ESN messages in each case. Genre analysis is an instrument for eliciting the communication practices of a social group: "in identifying and labelling genres we try to capture the gestalt of the various components of the communicative act." (Kwasnik and Crowston 2005, p. 80). Communication genres are "socially recognized types of communicative actions […] that are habitually enacted by members of a community to realize particular social purposes." (Yates et al. 1999, p. 84) In coding messages, communicative purpose is the primary criterion by which to identify communication genres (Askehave and Swales 2001). Each message is coded regarding the purpose it serves for the group or organisation. This allows identifying distinct forms of ESN use.

The data for the analysis was extracted from Yammer and made available in Microsoft Excel by each of the organisations. In each case, the analysis was carried out by two researchers, whereby one worked across all three cases to ensure continuity. Data coding was done bottom-up: Starting with a small set of messages, each message was interpreted in the context of its conversation by assigning genres codes that label various purposes for posting the message into the ESN. Hence, genre codes emerged through constant iteration. An initial set of genres was first discussed and agreed upon and further messages successively coded. Whenever a new genre candidate emerged it was compared with the existing genres and kept as a new code if it was indeed different. Consequently, all previously coded messages were reviewed using the new set of genres. Frequently, genre codes were merged or split. The result of this analysis was a set of around 20 single genres that were then grouped to form distinct use cases. In total 5,906 messages were coded and 7,053 genre codes assigned (Richter and Riemer 2013a).

Results: Five distinct forms of Yammer usage

From the data analyses five distinct use cases emerged. Due to space restrictions we do not report on the detailed results in terms of single genre codes that were grouped to make up the five use cases. Instead we describe the five use cases that formed the basis for construct, item and questionnaire development:

1. *Discussions and informal talk:* People use ESN to discuss and voice their opinions on general corporate matters, current affairs, politics, industry-related news, but also on informal, non-work related topics (such as sports events, hobbies and other general interests). Discussions and informal talk often leads to long conversational message exchanges.

2. *Status updates and notifications:* People use ESN to notify other users about what they are working on, what is happening in their work environment and also about upcoming events that they know about. In this way users create awareness in others for what is going on and at the same time present themselves and their projects and activities to the wider user group.

3. *Idea and input generation:* Users share various forms of external input with the wider group, such as URLs to information they found on the Internet, newspaper articles, research studies or various files. This is mainly done via unsolicited messages posted to no one in particular. Yet, sometimes users post requests for input and ideas regarding a product or project specified by the message sender. This solicits input and ideas from others and can result in brief message exchanges, or in more extensive brainstorming discussion.

4. *Problem-solving:* Users frequently draw on the ESN to ask others for help such as by outlining a specific problem or by asking others to find a resource or expert able to solve a problem. These problems are very specific and directly associated with the sender's day-to-day work. In turn, other users provide a solution,

ask for more background information, discuss the problem, provide access to a resource (such as a document), and offer their experiences, best practices, or the contact details of experts.

5. *Social Feedback:* Users share success stories or acknowledge the achievements of people to the wider group. Users also use the ESN to thank others for doing something (e.g. providing information, or finishing a project successfully).

RESEARCH MODEL AND HYPOTHESES

Our dependent variable is value as perceived by ESN users. A core premise in human psychology is that human agents tend to act towards outcomes that they value (Lawler and Porter 1967; Porter 1961). From a psychological perspective, value can stem from the satisfaction of needs and from the pleasurable stimuli experienced when engaged in performing an activity (see Higgins 2007). By drawing on Zeithaml (1988), we further conceptualise value as one's evaluation of the perceived benefits compared to the associated costs. As a result, we define perceived value of ESN as the evaluation of the benefits of using an ESN for obtaining, processing and distributing work-related information against the respective costs involved in using it.

A key ingredient of all knowledge work is new information input. The key difference between traditional corporate intranets and ESN is that the latter naturally afford posting of information in an unsolicited way by any user, as well as the commenting on documents and other users' contributions. The ensuing user narratives amend the existing content and documents and help to contextualise the information. This in turn may help to make the information more intelligible. As a result, ESN can play the role as an organisation's collective transactional memory and afford the serendipitous discovery of new information (Zhao and Rosson 2009). We put forward the following hypothesis:

H1: The degree of using the ESN to obtain and generate input and information has a positive effect on perceived value of the ESN.

The pre-study further revealed that people use ESN to solve immediate work-related problems. Specifically, they post a concrete problem outline and ask for replies and solutions from other users, which help them solving the problem. This practice amounts to a form of ad-hoc crowdsourcing. Crowdsourcing is generally described as a "web-based activity that harnesses the creative contributions of a diverse large network of individuals (the crowd) through an open call requesting for their participation and contributions" (Stewart et al. 2010).

H2: The degree of using the ESN to obtain solutions for work problems has a positive effect on perceived value of the ESN.

People further use ESN to update other users in the network about what is going on in their environment. In doing so users actively engage in the creation of what has been termed awareness, "an understanding of the activities of others, which provides a context for your own activity" (Dourish and Bellotti 1992, p. 107). While awareness is usually taken for granted in co-located, face-to-face contexts (Gutwin and Greenberg 2002) in technologically mediated environments, information about others, their activities, context, etc. is not readily available (Scupelli et al. 2005). Users signalling awareness information is thus associated with immediate benefits for work practices and theorised to be valuable for users.

H3: The degree of using the ESN to post and read updates has a positive effect on perceived value of the ESN.

ESN have been described as conversational systems, as they afford engagement in interactive, multi-user conversations (Riemer and Scifleet 2012). Such conversations help the users to get to know other users. ESN can help employees in identifying topics of mutual interest that can create a common basis for communication between distant co-workers (DiMicco and Millen 2007). Consequently, people can draw on ESN as a way to manage, interact, and keep track of their social relationships for personal and professional purposes (Razmerita et al 2014), thereby forming valuable weak tie social capital within the organisation (DiMicco et al. 2008). Accordingly, Leidner et al. (2010) found greater sense of belonging to the organisation by recently hired employees who participated in organisational social networking. Informal interactions help to further build common ground (Clark and Brennan 1991) and mutual knowledge (Cramton 2001) between users, which in turn may reinforce cognitive social capital (Nahapiet and Ghoshal 1998) within the organisation.

H4: The degree of using the ESN for informal discussion has a positive effect on perceived value of the ESN.

People give and receive public feedback via the ESN. The processes of giving and receiving feedback and recognition to others can contribute to the positive relationships between the ESN users and thus foster the social capital within the organisation. Moreover, considering that communication is a reciprocal process (Kankanhalli et al. 2005), positive feedback one receives likely leads to increased positive feedback given to other people. Since building one's professional profile within an organisation has been reported to be a driver of knowledge

contributions to information repositories (Kankanhalli et al. 2005), the process of giving and receiving positive feedback will have a positive influence on the value of an ESN for individuals.

H5: The degree of using the ESN for giving public feedback has a positive effect on perceived value of the ESN.

EMPIRICAL RESEARCH

Instrument development

We followed Moore and Benbasat's (1991) and Davis' (1989) suggestions for new scale instrument development and conducted the scale development in three stages, namely item creation, scale development and testing:

(1) At the item creation stage, we developed the list of constructs and preliminary items based on the results from the qualitative pre-study. Thereafter, the list was presented to a group of active Yammer users and Yammer employees for feedback. Finally, we presented the list of constructs with their definitions and measurement items to a group of three senior IS and marketing scholars for comments and revisions. Based on the comments some items were reworded and some removed.

(2) For scale development, we undertook a series of Q-sorting exercises, the purpose of which was to ensure construct validity in that the items measure their intended construct and do not overlap with other constructs. We recruited a group of active Yammer users and a group of IS scholars to sort the items into categories based on the similarities and differences among them. In the first stage of sorting, the sorters were asked to group the items in the most appropriate way. Then we asked the sorters to name the groups they had created and elaborate any challenges they had with grouping items. Based on the results and the feedback from the sorters, items were refined and a few clearly overlapping ones removed. This approach allowed us to obtain the construct names and meanings from several individuals, which reinforces construct validity. In the second stage of the sorting exercise, we presented the sorters the constructs and their definitions and asked them to group the items. The lowest value for Cohen's kappa was 0.841, which afforded proceeding into instrument testing stage.

(3) As the final step in the instrument development process, we conducted a pilot test among 51 Yammer users to check the internal consistency of the newly developed constructs. The items were measured on a five-point scale anchored from Never to Very Often (Schriesheim and Schriesheim 1978). The Cronbach's alphas for the newly developed constructs exceeded 0.8 and thus exhibited good internal consistency.

Finally, we conceptualized the dependent variable, perceived value, following Zeithaml (1988) and Sirdesmukh et al. (2002) as the perceived benefit against the associated costs and adopted the measurement from Fulk et al. (2004). Yet, instead of using only one item, we employed multi-item measurement to cover different aspects of value and to enhance measurement reliability and validity. The items measuring value were measured on a 10-point scale anchored from Not at all to Totally. The items used in the measurement are presented in table 1.

Data Collection and Analysis

Data was collected with an online questionnaire from three Australian organisations that have adopted, and actively use Yammer as part of their day-to-day work practices. One organisation was a global professional services company, one a national telecommunications company and one a medium-sized company operating on business-to-business markets. Altogether 197 respondents completed the survey. After having screened the data, 193 usable responses were retained for further analysis. The average age of the respondents was 32 years. 46 per cent of the respondents were female.

We analysed the model using partial least squares (PLS) structural equation modelling. We adopted PLS due to its advantages over covariance-based methods (e.g., LISREL): (1) PLS maximises the explained variance of endogenous variables in the structural model (Chin 1998) which enables us to understand the amount of variance explained in the constructs, (2) PLS does not make distributional assumptions of the data (Ahuja and Thatcher 2005; Chin 1998) and (3) is particularly suitable for earlier stages of theory development (Hair et al. 2011).

We used three criteria to evaluate convergent validity: 1) all indicator factor loadings should be significant and exceed 0.70 (Chin 1998); 2) composite reliabilities should exceed 0.70 (Fornell and Larcker 1981); and 3) the average variance extracted (AVE) by each construct should be greater than the variance due to measurement error (AVE > 0.50) (Fornell and Larcker 1981). Item loadings and cross loadings with means and standard deviations are presented in Table 2. As can be seen, all item loadings exceeded 0.7 and were significant at .001 level. Furthermore, the AVEs, composite reliabilities and Cronbach's alphas presented in table 3 show that the constructs exhibit good composite reliability.

Table 1. The Survey instrument

Item	Measurement
DISCUSS1	I use Yammer to discuss matters of general interest such as politics, economy, society or sports.
DISCUSS2	I use Yammer to discuss matters related to the company.
DISCUSS3	I use Yammer to post things I found funny or entertaining.
DISCUSS4	I use Yammer to read amusing things posted by my colleagues.
DISCUSS5	I use Yammer to see my colleagues' opinions on topical work-related matters.
I&I1	I participate in brainstorming discussions on Yammer.
I&I2	I post files that I think might be relevant for my colleagues' work.
I&I3	I read my colleagues' postings to find pieces of information useful for my work.
I&I4	I read the information posted on Yammer to get new ideas for my work.
I&I5	I use Yammer to ask my colleagues to suggest ideas for the tasks I am involved in.
I&I6	I use Yammer to inform my colleagues about interesting pieces of work-related information (websites, news etc.) I have found.
PS1	When I encounter a problem in my work, I use Yammer to ask for help from my colleagues.
PS2	When I encounter a problem in my work, I use Yammer to outline my problem.
FB1	I use Yammer to give positive feedback in public.
FB2	I use Yammer to praise my colleagues for their good work.
UPDATE1	I use Yammer to inform my colleagues about forthcoming events, such as trainings, workshops
UPDATE2	I use Yammer to notify my colleagues about what is happening in my work environment.
UPDATE3	I use Yammer to give my colleagues updates on the things I am working on.
UPDATE4	I use Yammer to receive information about forthcoming events, such as trainings, workshops etc.
UPDATE5	I use Yammer to see what my colleagues are currently working on.
VALUE1	Think about how valuable Yammer has been in helping to discuss work-related information. Given the time and effort you invested using it, to what extent do you think Yammer is worth it?
VALUE2	Think about how valuable Yammer has been in helping to obtain work-related information. Given the time and effort you invested using it, to what extent do you think Yammer is worth it?
VALUE3	Think about how valuable Yammer has been in helping to share work-related information. Given the time and effort you invested using it, to what extent do you think Yammer is worth it?

Table 2. Item loadings and cross-loadings

	Mean	S.D	Discuss	Input & Ideas	Prob. solving	Feed-back	Updates & Events	Value
DISCUSS1	2.020	1.106	**0.803**	0.506	0.470	0.380	0.397	0.407
DISCUSS2	2.711	1.133	**0.844**	0.700	0.575	0.576	0.569	0.597
DISCUSS3	1.893	1.032	**0.794**	0.535	0.424	0.474	0.487	0.449
DISCUSS4	2.279	1.133	**0.754**	0.408	0.319	0.421	0.363	0.415
DISCUSS5	2.853	1.299	**0.818**	0.722	0.506	0.546	0.578	0.590
I&I1	2.538	1.167	0.637	**0.798**	0.552	0.524	0.586	0.605
I&I2	2.706	1.223	0.582	**0.795**	0.584	0.522	0.571	0.532
I&I3	3.264	1.065	0.556	**0.791**	0.503	0.424	0.490	0.618
I&I4	2.761	1.164	0.507	**0.767**	0.447	0.461	0.451	0.556
I&I5	2.340	1.143	0.605	**0.815**	0.711	0.481	0.576	0.598
I&I6	2.893	1.259	0.655	**0.851**	0.628	0.527	0.510	0.599
PS1	2.431	1.046	0.577	0.722	**0.970**	0.444	0.474	0.628
PS2	2.274	1.018	0.550	0.651	**0.963**	0.402	0.469	0.569
FB1	2.558	1.275	0.627	0.628	0.448	**0.978**	0.612	0.524
FB2	2.599	1.207	0.554	0.553	0.402	**0.969**	0.591	0.445
UPDATE1	2.213	1.167	0.504	0.550	0.388	0.578	**0.864**	0.469
UPDATE2	2.284	1.161	0.535	0.621	0.500	0.529	**0.889**	0.543
UPDATE3	2.208	1.166	0.504	0.561	0.464	0.503	**0.855**	0.495
UPDATE4	2.345	1.196	0.514	0.551	0.383	0.507	**0.795**	0.467
UPDATE5	2.330	1.186	0.533	0.512	0.324	0.511	**0.834**	0.496
VALUE1	5.640	2.984	0.608	0.685	0.596	0.489	0.577	**0.970**
VALUE1	5.614	2.813	0.623	0.722	0.609	0.485	0.560	**0.974**
VALUE3	5.777	2.863	0.600	0.723	0.605	0.488	0.567	**0.974**

Table 3. Construct level statistics for convergent validity

Construct	AVE	Composite Reliability	Cronbach's Alpha
DISCUSSION	0.645	0.901	0.865
IDEAS & INPUT	0.645	0.916	0.890
PROBLEM-SOLVING	0.934	0.966	0.930
FEEDBACK	0.947	0.973	0.944
UPDATES & EVENTS	0.719	0.927	0.902
VALUE	0.946	0.981	0.971

We examined the discriminant validity at both item and construct level. For the item-level discriminant validity, we examined the item cross-loadings. As can be seen from table 2, all items load higher on their intended construct than on any other construct. With respect to discriminant validity at construct level, we examined whether AVE for each construct was higher than the squared correlation between it and all other constructs (Fornell and Larcker 1981). As can be seen from table 4, all construct pairs met this requirement. Hence, we concluded that our measures exhibit good discriminant validity at both item and construct level.

To further ensure the reliability of the measurement, we addressed the potential concern for common method bias. To this end, we applied a marker variable approach. We selected a theoretically unrelated variable, qualitative overload from Ahuja and Thatcher (2005) to serve as a marker variable. The highest correlation between the marker variable and our constructs was 0.074 (problem solving) and hence the shared variance between the marker variable and problem solving 0.055, respectively. Thus, we concluded that common method bias is unlikely to distort the interpretations.

Table 4. Squared correlations between the constructs (AVEs bolded in the main diagonal)

	Discussion	Ideas & Input	Problem solving	Feed-back	Updates & Events	Value
DISCUSSION	**0.645**					
IDEAS & INPUT	0.542	**0.645**				
PROBLEM-SOLVING	0.340	0.507	**0.934**			
FEEDBACK	0.372	0.371	0.192	**0.947**		
UPDATES & EVENTS	0.373	0.436	0.238	0.383	**0.719**	
VALUE	0.394	0.533	0.385	0.251	0.341	**0.946**

RESULTS

We analysed the structural model to examine the significance and strength of hypothesised relationships. Bootstrapping with 5,000 subsamples was employed to obtain t-values for the standardised path coefficients. The results of the PLS analysis are presented in figure 1.
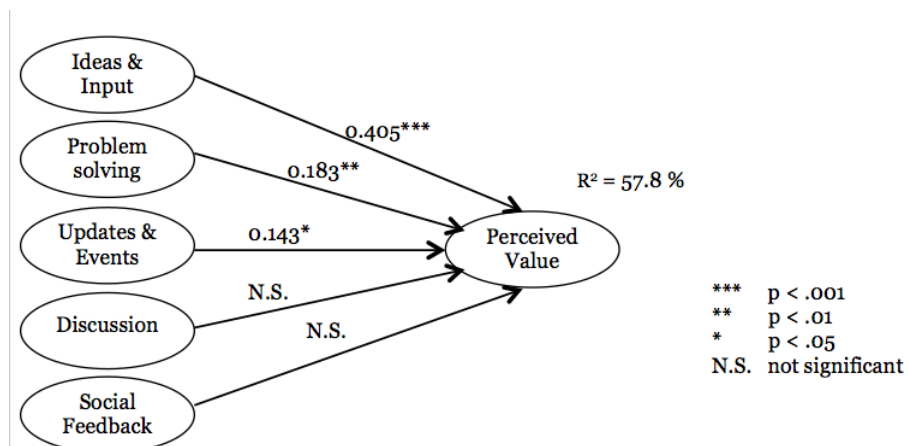

Figure 1. Results of the PLS analysis

Altogether, the model yielded an explanatory power of 57.8 per cent for the dependent variable, perceived value. Out of the five hypothesised relationships, three were statistically significant. *Ideas & Input* was clearly the principal predictor of perceived value thus supported H1. In addition, aligned with H2 and H3, the influence of *Problem solving* and *Updates & Events* on perceived value was statistically significant. However, in terms of statistical power, their effect was much weaker (Chin, 1998). Finally, neither *Discussion* nor *Feedback* did have any significant effects and thus H4 and H5 were not supported. The results are summarized in table 5.

Table 5. Summary of the hypotheses testing

Hypothesis	Support	Comment
H1 Ideas and Input has a positive effect on perceived value of an ESN.	Supported	Strong effect
H2 Problem solving has a positive effect on perceived value of an ESN.	Supported	Moderate effect
H3: Updates & Events has a positive effect on perceived value of an ESN.	Supported	Weak effect
H4: Discussion has a positive effect on perceived value of an ESN.	Not Supported	
H5: Social Feedback has a positive effect on perceived value of an ESN.	Not Supported	

Since neither Discussion nor Social Feedback had any *direct* effect on value, we conducted a post-hoc analysis to investigate their potential indirect effect. This post-hoc analysis revealed that Discussion had a positive effect

on Ideas and Input (β=0.585***), Problem Solving (β=0.507***), and Updates and Events (β=0.373***). Social feedback had a positive effect on Updates and Events (β=0.393***).

DISCUSSION

Our results show that exchanging and obtaining ideas and information is by far the most important source of value for ESN users. It follows that users see value in ESN as a space for sharing information with other users, for discussing ideas and for reading and obtaining information that feed into the users' work processes. As such, ESN have obvious advantages over traditional information supply approaches that are based on information needs analysis and planning approaches (e.g. Dorner et al. 2014). In today's changing markets and generally in the context of innovation, information needs of users are less and less predictable. This is where the self-organising nature of social sharing spaces such as ESN is highly valuable as users post unsolicited information for each other and dedicated management intervention is not required.

Moreover, it becomes obvious that users derive value not only from actively using ESN to ask for input or ideas, but also by consuming information posted by others, as is captured in the items for our Ideas & Input construct. By following the messages of other users and searching for relevant content, ESN is valuable for generating new ideas and input even without the user actively contributing to the discussion. Thus, what has often quite negatively been labelled as lurking (Muller 2012) can create considerable value for an individual. We assert that the rather negative connotation of passive lurking behaviour might have to been re-considered, not as lack of engagement, but as 'active lurking' (Zhang et al. 2010) or simply information consumption, which creates direct value for the individual. Importantly, at an aggregate level such forms of consumption might enhance the innovation capabilities of the organisation through increased utilisation of shared ideas and information.

Finally we want to expound upon the fact that the social aspects of ESN use, such as informal discussions and social feedback, did not have a direct effect on user value perceptions. We want to warn against the conclusion that the associated user activities are not valuable or useful and can thus be crowded out from the ESN platform. While a strictly rational reading might interpret them narrowly as the creation of 'noise' on the ESN, and thus as unwanted, our post-hoc analysis shows that they are valuable indirectly in creating and sustaining the user community. As pointed out by Jarrahi and Sawyer (2013), a key benefit of social technologies such as ESN is that they support establishing informal interactions and social connections across organisational boundaries. The social uses of ESN are thus needed to build and sustain the information space by creating shared cognition (Cannon-Bowers and Salas 2001), common background and interpersonal relationships. Together these reinforce the social capital (Nahapiet and Ghoshal 1998; Wasko and Faraj 2005) that in turn is needed as the basis for sharing information and ideas. These social behaviours are thus essential to the creation of the public good that is the ESN, without which the primary value-creating practice would not emerge in the first place.

CONCLUSION

Considering the dearth of research on ESN use, our study advances the understanding of the field. It contributes to the as yet limited empirical research on the business value of ESN by narrowing the gap of knowledge between individual-level uses of ESN and higher-level affordances (Fulk and Yuan 2013; Majchrzak et al. 2013). Our results imply that the unique value of ESN relates to its ability to facilitate information generation and knowledge creation conversations (Majchrzak et al. 2013), which in turn can contribute to the building of organisational knowledge. As such, our study contributes indirectly to a better understanding of knowledge-creation practices. According to Bhatt (2002) a key building block of organisational knowledge is interactions. When interactions are kept to a minimum, most of the knowledge remains in control of the individuals rather than becoming a collective resource and public good. By supporting interactions in a way that is not possible with traditional knowledge repositories, ESN contributes to transforming individuals' knowledge into a public good. Finally, our study contributes to a better understanding of the nature of ESN as an IT artefact or class of systems. ESN as malleable or open systems (Richter and Riemer, 2013b) do not lend themselves to immediate forms of usage prescribed or constraint by their features. Consequently, ESN will over time be defined through the value that they provide for their users, vis-à-vis other systems classes such as group support systems (Fjermestad and Hiltz 1998; Zigurs and Buckland 1998). Our study portrays ESN as self-organising information sharing and idea generation spaces.

Our study has practical implications for organisations considering adopting ESN as well as those aiming to maximize the return on their existing ESN investments. Supporting users' attempts to innovate (Ahuja and Thatcher 2005) with ESN through obtaining new input and ideas can help to materialize the returns on ESN investments. We further suggest that ESN developers could direct their efforts towards features that make obtaining and generating ideas more effective to further reinforce the usefulness of ESN in supporting innovating. Moreover, since establishing the network is clearly a prerequisite for materializing the value from ESN use, design features that make the social structures more transparent and approachable might further

accelerate establishing of a network. In turn, making it as easy as possible for users to get in contact with others can be particularly valuable for new employees (Koch et al. 2012; Leidner et al. 2010).

Our study is circumscribed by certain design choices. First of all, we focused only on one ESN system, namely Yammer and collected data from only three organisations. Second, we adopted a cross-sectional research design, which means the study offers only a snapshot of ESN use at a certain point in time. Third, our conceptualisation of value focused solely on using ESN to process information and thus emphasized quite heavily the utilitarian dimensions of value. We recognise that ESN use might also provide enjoyment and thus be associated with hedonic (Davis et al. 1992) or more social (Kankanhalli et al. 2005; Sheth et al. 1991) value. Fourth, we developed individual level usage constructs from qualitatively derived usage categories at the social level. While this provides benefits in that the constructs are empirically grounded in actual observed ESN activities, without having to revert to published and less valid categories derived from other technologies, it raises some questions regarding construct development that require further exploration. This is evident from the factor loadings for some of the measurement items that load on other items. Fifth, measuring behaviour through self-report instruments such as surveys is always inferior to using actual data traces capturing behaviours directly. It is our hope that ESN providers such as Yammer will begin capturing in their data model not only message creation activity, but also message consumption through reading or 'liking' of content. Finally, in our measurement model we examined only ESN uses that were positively related to value. We thus suggest future research examining the ESN uses that may have a negative effect on value.

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