# BOUNDARY SPANNING THROUGH ENTERPRISE SOCIAL SOFTWARE: AN EXTERNAL STAKEHOLDER PERSPECTIVE

*Completed Research Paper*

**Wietske van Osch**
Michigan State University
404 Wilson Rd, East Lansing, MI
VanOsch@msu.edu

**Charles W. Steinfield**
Michigan State University
404 Wilson Rd, East Lansing, MI
Steinfie@msu.edu

## Abstract

*Recent boundary spanning literature has recommended a shift toward assessing the role of virtual tools—such as social media. Simultaneously the proliferation of Enterprise Social Software (ESS) points to the need to theorize and investigate the supra-individual usage of these tools. This exploratory study responds to both mandates through a longitudinal, multi-method investigation of ESS' effects on boundary spanning by virtual research teams within a worldwide provider of workplace solutions. Combining survey, ESS log, and content data, this study complements the dominant internal focus of the boundary spanning literature with an external stakeholder perspective to analyze the types of boundary spanning activities enacted through ESS, the perceptions of these activities by external parties, as well as the effect of ESS hereon. Disentangling ESS' effects on boundary spanning not only extends our current understanding of the potential role of social media, but can further inform the design of supportive tools.*

**Keywords:** Boundary spanning, enterprise social software, social media, representation, coordination, information search, virtual teams, external stakeholder perspective

# Introduction

Virtual teams and organizations face significant opportunities and challenges for efficient and effective cross-boundary knowledge creation and management. While the use of virtual technologies enhances their ability to access external sources of information and knowledge, it simultaneously creates more fluid and transparent structures, potentially opening up teams and organizations to excess input that may have unanticipated consequences for performance (Marrone, 2010).

Today, the proliferation of social media technologies in organizational contexts has profound implications for such boundary spanning interactions and activities in virtual teams. Social media encompass a range of information and communication tools (ICTs) for supporting interaction, collaboration, and co-creation, such as blogs, content communities, and social network sites. Precise definitions are problematic giving the inherent evolving nature of these tools and their continuous integration into enterprise-wide platforms, social media scholars emphasize the importance of visibility of content and connections, as well as the system-generated associations between information and people as key distinguishing elements (Leonardi, Huysman, and Steinfield, 2013; Treem and Leonardi, 2012). Studies of organizational social media use suggest that these systems have the potential to enhance boundary spanning activities by enabling the identification of and interaction with relevant external individuals and information (cf., DiMicco et al. 2008; DiMicco et al., 2009; Steinfield et al., 2009; Shami et al., 2009).

Within the boundary spanning literature, recent papers have proposed the need for future research to move beyond traditional offline settings to study virtual contexts and in particular assess how the use of virtual tools, such as social media, affects engagement in and success of boundary spanning activities (Kirkman and Mathieu, 2005). An additional challenge for the boundary spanning literature has been its reliance on survey data from *internal* team members, despite the fact that boundary spanning is oriented toward *external stakeholders*—i.e., any group or individual who can affect or is affected by the achievement of the firm's objectives (Freeman, 1984). Hence, an external assessment by these outside stakeholders is warranted for further advancing our theoretical understanding of boundary spanning processes.

At the same time, recent studies of social media have suggested the need to move beyond the individual unit of analysis, to study how these technologies are used by and impact the performance of supra-individual entities, such as teams (Beer 2008; Van Osch and Coursaris 2012; 2013). This study responds to both of these mandates by investigating the relations between the use of enterprise social media and boundary spanning in virtual team settings.

Based on these motivations, the overall research question guiding this project is: **What types of boundary spanning activities are enacted through ESS and how are these activities perceived by external stakeholders?** To address this question, we propose to examine (i) three dimensions of boundary spanning, namely representation, coordination, and general information search (Marrone 2010; Ancona and Caldwell 1992); (ii) their representation in enterprise social media; and (iii) their perception and enactment by external stakeholders.

Hereto, we adopt a longitudinal, multi-method, multi-case approach combining results from behavioral social media log data, a content analysis of blog pages from two research units within a multi-national organization, as well as survey data from external stakeholders. Consequently, this study provides several novel contributions to theory and practice. First of all, by analyzing the role of ESS in multi-stakeholder networks, this study extends the dominant individual-level focus of existing social media literature and disentangles one dimension of its anticipated organizational impact. Second, shifting the focus to virtual settings, while involving external stakeholders in an assessment of boundary spanning, can help to advance the boundary spanning literature. Third, by adopting a longitudinal and mixed-method approach, encompassing behavioral and self-reported data from two organizational units within a global multinational company, we can further enrich our in-depth understanding of the co-evolution of boundary spanning with ESS. Finally, disentangling the effects of enterprise social media on boundary spanning is not only critical to industrial success and our theoretical knowledge of boundary spanning and ESS, but can also yield important insights for the design, development, and subsequent implementation of social media tools that are conducive to evoking and enhancing team performance by supporting effective boundary spanning.

The remainder of this paper is organized as follows. Following a review of the theoretical foundations on underpinning this study, we discuss the research design of this project, including the case selection, data collection, and data analysis process. Subsequently, we discuss the findings of our study and discuss important implications for theory, future research, practice, and ESS design.

# Theoretical Foundation

Based on the above research question and aims, in the following we review and synopsize a set of foundational conceptualizations about boundary spanning, product development and performance, enterprise social media, and virtual teams to provide the theoretical underpinnings for this project.

## *Boundary Spanning*

Boundary spanning–the extent to which communication links units to external sources of information (Tushman and Scanlon 1981)–is closely related to other popular concepts from social network theory, including bridging or weak ties (Granovetter 1973) and structural holes and information brokerage (Burt 1992). The common denominator across these concepts is the importance of establishing and managing external linkages as conduits to critical resources, coordination, and the creation of reputational benefits.

Within the literature of boundary spanning various research directions can be distinguished, including those focusing on identifying various dimensions of boundary spanning and measuring the effect of these boundary spanning activities (c.f., Ancona and Caldwell 1992); those disentangling role stress and role ambiguity experienced by boundary spanners (c.f., Singh and Rhoads 1991); and those drawing on Bourdieu's practice theory for understanding the emergence of joint fields and the role of boundary objects in the development of boundary spanning competence (c.f., Levina and Vaast 2005). Given our focus on the types of boundary spanning activities enacted through ESS and their perceptions by external stakeholders, we draw on the first research stream, as follows.

The literature on boundary spanning activities generally distinguishes three such activities, namely representation, coordination, and general information search (Grabher 2004; Ancona and Caldwell 1992)[1]. *Representation*, also referred to as ambassadorial or impression management (Ancona and Caldwell 1992), involves the lobbying for the team up the hierarchy in order to create favorable impressions and advocate amongst managers and senior managers, hence, is a largely vertical form of boundary spanning. Although representation can occur at all levels, the target actors typically hold greater power than the boundary-spanning actor (Ancona and Caldwell 1992). This process is crucial for team performance as the creation of a favorable impression among senior management is a prerequisite for obtaining access to key resources, including reputation, legitimization, higher-level commitment, and the financial support needed to facilitate successful product development (Grabher 2004). This boundary spanning process further benefits the target actors—management—as they stay informed of team progress that can support higher-level planning and resource allocation decisions, which in turn, can help the organization meet external client expectations (cf., Bettencourt, Brown, and MacKenzie 2005).

*Coordination,* also referred to as task coordination (Ancona and Caldwell 1992) or interteam process (Marks, Mathieu, and Zaccaro 2001), involves the facilitation of effective decision-making and design implementation through cross-boundary strategizing, planning, and evaluation; hence it is a horizontal form of boundary spanning. This process is crucial for team performance as it involves the aligning, negotiating, and monitoring of the efforts of individuals—within and outside the team—in order to accomplish individually and jointly determined project goals, for instance delivery deadlines. Hence, coordination is crucial for the efficiency, effectiveness, innovativeness, and flexibility of goal delivery (Mohrman, Tenkasi, Lawler, and Ledford 1995).

*General information search*, also referred to as scouting (Ancona and Caldwell 1992), involves the general scanning of the external team environment for gaining access to relevant information, knowledge, and expertise; hence, is a largely horizontal form of boundary spanning. Target actors of information search activities are often loosely coupled with the focal team (Marrone 2010). This boundary-spanning process is crucial for team performance as it enables them to gain project-specific expertise and an understanding

[1] Please note that the actual terms used to describe these three boundary-spanning activities by various authors differ

of trends, opportunities, and threats in the external environment (Hargadon 1998).

The majority of work on team boundary spanning has focused on representation or coordination behaviors; thus, few studies have addressed and compared all three processes simultaneously in order to disentangle their respective antecedents, evolution, and consequences (Marrone 2010). In this study, we address all three forms of boundary spanning simultaneously in order to reveal their respective enactment through the use of ESS.

Furthermore, because of the network perspective employed in this study, we wish to explore if the network structures as identified in our data are suggestive of or optimal for the boundary-spanning patterns of the studied teams. To illustrate, since representation is aimed at creation of favorable impressions among (senior) managers, a network structure of a team heavily engaging in representational activities should include many higher-ranked external stakeholders. Alternatively, a team engaged in coordination activities should reveal a restricted, but dense network structure characterized by a smaller size (less nodes), but recurrent ties (i.e., interactions) mainly with stakeholders at a peer level rather than senior managers. Finally, a team aimed at information search should represent a broad, but loose structure, characterized by a large number of one-off exchanges with external stakeholders.

### *Enterprise Social Software*

ESS usage by virtual teams can influence their ability to access a wide range of external resources. Yet, research on the use of enterprise social media for boundary spanning at the team and inter-team level remains largely unexplored due to the overemphasis on its role for marketing communications (Steinfield et al 2013; Van Osch and Coursaris 2013), and the preoccupation with the individual unit of analysis (Beer 2008; Van Osch and Coursaris 2012).

**Table 1. Potential Effects of Enterprise Social Media on Boundary Spanning**

| Reference | Social Media Platform | Boundary Spanning Opportunities | Related Boundary Spanning Activities |
|---|---|---|---|
| DiMicco et al. (2008, 2009) | Beehive | Support development/maintenance of internal relations; people sensemaking; networking/career goals; and social capital | Representation, coordination, information search |
| Steinfield et al. (2009) | Beehive | Supports locating information, larger networks of heterogeneous contacts, social interactions, and access to new people and expertise | Information search |
| Brzozowski (2009) | WaterCooler | Could help employees locate relevant information inside organization; enhance their feelings of being connected | Information search |
| Dai et al. (2011) | WaterCooler and Jive | Support decision-making by offering insights into prevalent sentiments in organization regarding important new ideas or products | Coordination |
| Guy et al. (2011) | Lotus Connections | Creates potential for novel connections with unknown individuals | Information search |
| Holtzblatt and Tierney (2011) | Internal R&D Idea Market | Impact participation breadth/depth by enhancing project transparency and awareness | Representation and information search |
| Von Krogh (2012) | n/a (conceptual) | Intuitive interface/ platform adaptability and openness enable better and more timely decision-making and economies of scale | Coordination |
| Jarvenpaa and Lang (2011) | Online communities | Enhance transactional efficiency by enabling resource sharing and efficient social production | Representation |
| Hienerth et al. (2011) | n/a (conceptual) | Open, engaging nature of ESS triggers ongoing communication/feedback and empowerment | Coordination |

As the growing body of evidence on the impact of social media in organizations suggests, such tools may help individual users locate and access remote sources of information as well as develop and maintain diverse networks of relationships in organizations that afford users social capital (see summary in Table 1).

Whereas the studies in Table 1 have identified general individual and organizational benefits associated with the ESS use, additional work is needed to further understand how the underlying features and materiality of social media systems contribute to successful boundary spanning by these virtual teams. One approach to this may be to examine how teams use ESS to accomplish the three broad functions of boundary spanning: representation, coordination, and information search (also see Table 3 below).

### *Boundary Spanning and ESS*

Because boundary spanning connects dispersed individuals, the requirements for and frequency of the use of virtual tools, such as social media, significantly increase (Marrone 2010). Social media, given its informational and social value—in terms of locating and accessing remote information and individuals—are particularly apt for affording the synchronicity required for effective boundary spanning (Kirkman and Mathieu 2005). Indeed, in a review of the potential influence of ESS on common organizational processes, Leonardi et al. (2013) emphasize the implications for boundary work, describing many ways that ESS can facilitate knowledge sharing across department, spatial, geographic and other types of boundaries. We offer a further integration of these two theoretical domains—boundary spanning and ESS—focusing on the relations between the common types of boundary spanning activities found in the literature and the potential ways that an ESS might be used to enact them in Table 2.

**Table 2. Integrating Perspectives on Boundary Spanning and ESS**

| *Boundary Spanning Activity:* | *Representation* | *Coordination* | *Information Search* |
|---|---|---|---|
| *Definition:* | Lobbying for favorable impressions | Inter-unit strategizing for effective decision making and implementation | General scanning of the environment for relevant information and expertise |
| *Direction:* | Vertical | Horizontal | Horizontal |
| *Target Actor:* | Managers | Peers in interdependent units | Loosely coupled experts |
| *Anticipated Performance Effect:* | Reputation, legitimization, managerial commitments, financial support | Efficiency, effectiveness, innovativeness, and flexibility of goal delivery | Project specific expertise and info on environmental trends, opportunities, and threats |
| *Potential Uses of ESS:* | Creating awareness and impressions | Enhancing communication and decision making | Locating information and individuals |

## Research Design

In what follows, a description of the case organization and the team selection process will be provided. Then we will discuss the mixed-method approach adopted in this study as well as the data collection and analysis process.

### *Case Organization*

Our case organization is a worldwide provider of workplace products, furnishings, and services. The company has approximately 10,000 employees around the world and is headquartered in the U.S. with offices and divisions in nearly 40 countries in North and South America, Europe, Africa, Asia, Oceania, and the Middle East.

In March 2012, the organization launched an ESS tool, which is based on the Jive Platform. Jive[2] is a provider of corporate social technologies that support business connections, communications, and collaborations among employees. Jive's customer base includes many multinational corporations and global institutions, including Nike, HP, T-Mobile, and the World Bank.

Product development and client consulting at the case organization (hereafter referred to as The Company) is provided through global teams that rely on a multiplicity of ICTs for collaboration, including Email, GoogleDocs, MSN, Sharepoint, and Skype. With the introduction of the ESS—which offers a large number of communication functionalities—the technology providers within The Company hope to offer an umbrella tool that can better support communication and collaboration processes inside virtual product development teams.

Following the ESS global launch in March 2012, the adoption and use has grown substantially, with a total user base of 6,926 users (with an account) as of November 19, 2012; out of which nearly 4,500 are active users (i.e., one viewing activity in previous 30 days), 1,000 users are participating users (i.e., active engagement in the form of commenting, liking, rating, or editing in previous 30 days), and 600 are contributing users (i.e., active creation of content in the previous 30 days). Currently, about 10% of users actively create content (i.e., contributing users) and an additional 10% actively engages in other ways with content (i.e., participating users).

Despite the focus on a single organization, the generalizability of our results are enhanced in two ways, namely by using (i) longitudinal and (ii) behavioral (i.e., exact and unobtrusive) data (Yin, 2011).

## *Unit Identification*

In this study, we selected two organizational units that conduct client-oriented research and consulting, one that focuses on more immediate client centered needs (hereafter referred to as Applied Research), while a second pursues research that informs more future product concepts (hereafter referred to as Futures Research). These units were selected for four reasons. First, both units are among the most proactive ESS adopters. Second, both units operate on the interface between external clients and various internal departments within the Company (including product development, marketing, sales, and procurement); hence, boundary spanning is at the heart of their daily activities and existence. Third, both units have a public blog page aimed at creating organizational awareness and cross-boundary communications with external stakeholders, making these blog pages an ideal case for an assessment of the effect of ESS on boundary spanning. Fourth, both units are similar in size and goal—client-oriented research—hence, allowing for effective cross-case comparisons.

Given the multi-case design of this study and the longitudinal log and content data available for each unit, confidence in the generalizability of our findings through within-case analyses as well as cross-case comparisons is further enhanced.

## *Data Collection*

Data was collected from a number of quantitative and qualitative sources, encompassing both behavioral data and self-reported data (see summary in Table 3), over the period of March 2012 to April 2013 (i.e., 14 months).

First, in order to understand what types of boundary spanning activities internal members enact using ESS; content data (i.e., posts by the units) from the public blog pages of both units were collected for a content analysis, which will be described in the next section. Second, ESS log data was collected in order to obtain a more in-depth understanding of the relation between the *position* of individual members—general member versus leader—and the *type* of boundary spanning activity they are most likely to enact.

Third, to disentangle the response and subsequent enactment of boundary spanning by external stakeholders within the same organization, including executives, directors, managers, and employees from other organizational units, we content analyzed comments in response to original blog posts by the two units. Fourth, to further assess external stakeholders' perceptions of boundary spanning activities by

[2] http://www.jivesoftware.com

these two organizational units, we distributed a survey to all external stakeholders who had visited or interacted with the blog pages of Futures Research and/or Applied Research, as evidenced by the ESS log data.

For this survey, we developed a mirror scale of the original Ancona and Caldwell (1992) scale in order to measure external stakeholder's perceptions of or response to each unit. Rather than measure boundary spanning per se, instead the scale measures an external stakeholder's possible response to a team's boundary spanning efforts. For example, if a team member engages in an information search, we might expect an external stakeholder to respond by being willing to provide information. Likewise, if a team member engages in a representation activity like "talking up" the team to enhance its reputation, we might expect an external stakeholder to perceive that team as being more visible (see Appendix 1 for the scale items). The results of the Exploratory Factor Analysis and reliability of emergent factors will be discussed in the next section.

**Table 3. Data Sources and Sample Sizes**

| | *FR (Futures Research)* | *AR (Applied Research)* |
|---|---|---|
| ESS Log Data | 1910 data points | 3773 data points[3] |
| External Surveys | 223 surveys (28% response rate) | 399 surveys (30% response rate) |
| ESS Content Data | 15 blogs posts, 63 comments | 13 blog posts, 47 comments |

Using this specific combination of research methods and data sources allows us to address the various components of our research question—what types of boundary spanning activities are enacted through ESS and how are these perceived by external stakeholders. The first part of our research question is addressed through the content analysis, which enables us to establish which types of boundary spanning activities are enacted through ESS in the context of FR and AR as well as the frequency of each of these activities. Not only does this allow us to see if ESS is used for boundary spanning but also if certain activities are more dominant, hence, may be better aligned with the ESS' affordances.

The second part of our research question is addressed through the use of survey data, which reveals the external stakeholder perspective of the boundary spanning activities enacted by internal members of FR and AR. Not only does this allow us to provide a two-way perspective of boundary spanning—both inside-out and outside-in—but also to disentangle if these two perspectives are aligned. In other words, do external stakeholders perceive and respond to boundary spanning activities in line with the underlying intentions of the two studied units.

Finally, in order to offer a systemic view of this two-way process, the network analysis enables us to assess if the network structure is in line with and optimal for the specific boundary spanning activities as enacted by members of FR and AR. This allows us to understand if the pattern of connections fits the boundary spanning theory in terms of anticipated target audiences for each of the three boundary spanning activities.

## *Data Analysis*

First, in order to analyze the content from the Futures Research and Applied Research blog pages, we developed a coding scheme to reflect each of the overarching boundary spanning processes—i.e., representation, coordination, and information search—as well as each of the underlying sub-processes. The coding scheme was developed deductively using the original definitions and denominators of the three boundary spanning processes (i.e., factors) as provided by Ancona and Caldwell. Furthermore, we used the individual items from Ancona and Caldwell's three-factor model to provide definitions of the underlying processes. The final coding scheme can be found in Appendix 2.

The two authors independently content analyzed all blog posts and their respective comments. An initial interrater reliability of 100% percentage agreement provided a strong assessment of the coding process

[3] I.e., the creation of a blog post or any interaction with the post (viewing, tagging, liking, modifying, or commenting)

reliability and the emergent coding scheme validity[4]. The coding process thus allowed for the classification of each original blog post into a particular type of boundary spanning activity as well as the classification of the comments for each blog post thread to determine whether the boundary spanning activity as perceived or enacted by external stakeholders was consistent with the original post.

Second, for further assessing the relation between position—general member or leader—and the type of boundary spanning activity enacted in these blog posts, a one-way ANOVA was used. While acknowledging the impact of small sample size on the statistical power of our analysis, mean differences from the one-way ANOVA can reveal patterns in the relation between an individual's organizational function—leader or general member—and the type of boundary-spanning activity performed.

Third, the survey data from external stakeholders was first analyzed using an exploratory factor analysis (EFA) to determine if the same three factors as proposed and empirically validated in the boundary spanning literature on internal team members holds for external stakeholders. Following the results of the EFA, regression analyses were conducted to assess the role of ESS usage in external stakeholders' perception of boundary spanning, while controlling for such likely antecedents as an employee's hierarchical level and tenure.

Finally, based on the ESS log data, a multimodal network visualization of the two blog pages was created using the Social Network Analysis package in R. *Multimodal* here refers to the examination of both users and technologies—in our case the blog pages—as equivalent nodes in a single social network (Kane and Borgatti, 2011). Not only does this approach allow for the direct visualization of the interaction patterns of external stakeholders with either or both blog pages as well as important traits of external stakeholders—specifically their hierarchical level in the organization—it further enables the visualization of the strength of stakeholder interactions—as defined by the sum of their activities—as well as the network overlap between the two organizational units. An effective interpretation of the content data warrants an understanding of the network of interactions, as will be further explained in the results section.

# Results

In what follows, we first present the content analysis results pertaining to original blog posts as well as the one-way ANOVA of the relation between position and activity type. Subsequently, we present the EFA of the survey data. Finally, we offer a network view for further interpretation of the content analysis results.

## *Boundary Spanning in Futures Research (FR) and Applied Research (AR)*

The content analysis of public blog posts from FR and AR reveal a consistent and uniform pattern across the two units. As Table 4 shows, 14 out of 15 FR posts (93%) and 10 out of 11 AR posts (91%) are primarily representational posts, with the majority aiming to inform external stakeholders. Both blogs only contained one information search post and no instances of coordination posts. Some posts though had multiple goals, which we have listed in the last "additional (sub)activity" column in Table 4.

Hence, when using ESS, internal members of the two units perform only a limited set of boundary spanning activities, primarily directed at representing their unit to external stakeholders through informing about or by "talking up" their activities.

[4] Because of the exploratory nature of this study, the content analysis was performed by members of the research team instead of external coders. The members of the research team independently coded the data to establish some measure of reliability.

| **Table 4. Classifying Boundary Spanning Activities on ESS Blogs** | | | | | |
|---|---|---|---|---|---|
| Post | # Comments | # Views | Activity | Subactivity | Additional (Sub)Activity: |
| *FR Blog Page* | | | | | |
| 1 | 4 | 141 | Representation | Informing | |
| 2 | 1 | 251 | Representation | Informing/ Talk Up | |
| 3 | 14 | 61 | Representation | Informing | Info Search: Tech Scan |
| 4 | 2 | 46 | Representation | Informing | |
| 5 | 1 | 129 | Representation | Informing | |
| 6 | 0 | 119 | Info Search | Tech Scan | |
| 7 | 2 | 39 | Representation | Informing | Rep: Progress |
| 8 | 4 | 39 | Representation | Informing | Rep: Progress/ Talk Up |
| 9 | 12 | 41 | Representation | Informing | |
| 10 | 2 | 29 | Representation | Informing | Rep: Progress; Info Search: Tech Scan |
| 11 | 5 | 217 | Representation | Informing | Rep: Progress |
| 12 | 4 | 152 | Representation | Informing | Rep: Progress |
| 13 | 1 | 148 | Representation | Informing | Rep: Progress / Talk Up |
| 14 | 14 | 35 | Representation | Informing | Rep: Progress/ Talk Up |
| 15 | 2 | 450 | Representation | Informing | Rep: Support |
| *AR Blog Page* | | | | | |
| 1 | 4 | 85 | Representation | Informing | Info Search: Tech Scan |
| 2 | 1 | 21 | Representation | Talk Up | |
| 3 | 14 | 199 | Info Search | Tech Scan | Rep: Support/ Resources |
| 4 | 2 | 167 | Representation | Talk Up | |
| 5 | 1 | 31 | Representation | Informing | |
| 6 | 0 | 18 | Representation | Talk Up | |
| 7 | 2 | 336 | Representation | Informing | Info Search: Tech Scan |
| 8 | 4 | 183 | Representation | Informing | Support |
| 9 | 12 | 193 | Representation | Informing | |
| 10 | 2 | 158 | Representation | Informing | |
| 11 | 5 | 125 | Representation | Informing | |

In addition to exploring the presence of each type of boundary spanning activity present in the blog posts, ANOVA results were used to identify any differences in the tendency for particular activities associated with hierarchical position within the unit. Due to the limited number of internal unit members (N = 12 per unit), we did not find a significant difference; however, a clear pattern emerged that revealed that members with a leadership position focused on representational activities (leaders (mean): 2.712; general members (mean): 2.423), whereas the relatively few information search activities tended to be performed by general members of the units (leaders (mean): 2.909; general members (mean): 3.205).

Contrary to the uniformity of activity types in blogs posts, the content analysis of comments reveals a much more diverse set of boundary spanning interactions in the comments. For the FR blog, from a total of 63 comments, 10 comments are about information provision (the mirror response to a technical scan),

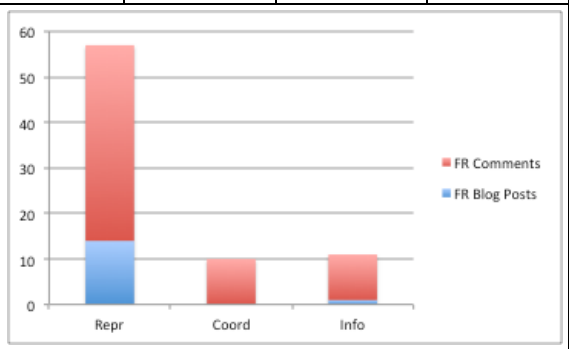
i.e., 16% of comments in contrast to only 7% of original blog posts being information search. Additionally, we identified 10 comments that are coordination-oriented; either in the form of coordinating activities or problem resolution, thus accounting for an additional 16% of comments compared to 0% coordination in the original blog posts. Finally, the majority of comments (N=43) on the FR blog is composed of responses to representation, primarily in the form of support (N=28), i.e., an acknowledgement or validation, and some additional talk up or persuasion by external stakeholders.

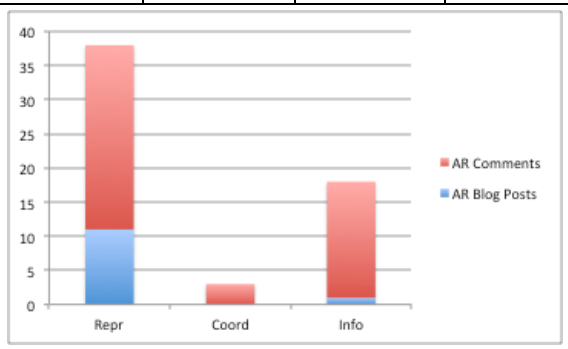
For AR, with a total of 47 comments, 17 comments provide information (technical scan), i.e., information provision accounts for 36% of comments in contrast to only 9% of original blog posts. Additionally, we identified 3 comments that are coordination-oriented; thus accounting for an additional 6% of comments compared to 0% of original blog posts. Finally, the majority of comments (N=27) on the AR blog is composed of responses to representation, primarily in the form of support (N=20), i.e., an acknowledgement or validation, and some additional talk up or persuasion by external stakeholders.

Furthermore, for both blogs we found that the majority of representational posts received some form of information sharing or provision in addition to expressions of support. So even when the purpose of a blog post is merely to inform others about or talk up a project, it will likely elicit the provision of relevant new information by external stakeholders.

**Table 5. Boundary Spanning Activities Blog Posts and Associated Comments**

| | *Blog Posts* | | | | *Comments* | | | |
|---|---|---|---|---|---|---|---|---|
| | **Total** | Repr | Coord | Info | **Total** | Repr | Coord | Info |
| *FR* | **15** | 14 (93%) | 0 (0%) | 1 (7%) | **63** | 43 (68%) | 10 (16%) | 10 (16%) |
| *AR* | **11** | 10 (91%) | 0 (0%) | 1 (9%) | **47** | 27 (57%) | 3 (6%) | 17 (36%) |




## *External Perceptions of Boundary Spanning*

The EFA pattern matrix following varimax rotation reveals that contrary to the three boundary spanning activities as identified by Ancona and Caldwell (1992), two factors with eigenvalues greater than 1.0 were identified in our study of external stakeholders perceptions of the boundary spanning activities for both datasets—i.e., external stakeholders of FR and AR. Interestingly, two boundary-spanning items from the original scale—importance and visibility—did not load on either of these factors. The remaining items and the two emergent factors are presented in Table 6 below.

Following the recommendation of Gaskin (2012), we assigned labels to these two factors after reviewing the items and identifying a common theme to the dimension being measured. Hence, based on the patterns of factors among the 9 items, the following two constructs emerged, namely: Support and Coordination. The coordination factor is a 3-item version of the original Ancona and Caldwell (1992) 5-item scale. The support factor is a compound factor that includes both items from representation and information search. Although for internal members, representational and information search activities are clearly distinct in purpose, for external people all these items appear to relate to some form of resource provision, whether monetary or informational.

Both factors for the two datasets—i.e., external stakeholders from FR and AR respectively—displayed adequate reliability, with high Cronbach's alpha values (Support: .855/.885 and Coordination: .826/.861).

| **Table 6. Pattern Matrix of EFA for External Stakeholders' Boundary Spanning Items*** | | |
|---|---|---|
| *Factors* | *Support* | *Coordination* |
| Eigenvalues | 4.2495 | 1.5023 |
| Variance Explained (R2) | 38.13 | 25.78 |
| *Items* | | |
| I would be willing to support FR/AR | 0.702 | |
| I would provide resources (e.g., money, equipment) to FR/AR | 0.714 | |
| I would provide FR/ARwith important information on the company's strategy or political situation. | 0.758 | |
| I would provide FR/ARwith important information on what competing firms or groups are doing | 0.795 | |
| I would provide FR/AR with information on marketing ideas/expertise | 0.785 | |
| I would provide FR/AR with information on technical ideas/expertise | 0.700 | |
| I or my unit coordinate(s) activities with FR/AR | | 0.858 |
| I or my unit negotiate(s) with FR/AR for delivery deadlines . | | 0.878 |
| I or my unit reviews FR's /AR's outcomes | | 0.790 |

All items had significant factor loadings (>0.5) to ensure construct validity (Shimp and Sharma, 1987

Given the exploratory nature of this study, we conducted basic regression analyses to assess the effect of ESS usage on perceptions of boundary spanning activities. That is, we explored whether external workers who were more active on the ESS sites of Futures Research and Applied were more likely to perceive these divisions as important and visible, and were more willing to provide support and to coordinate with them. We include a measure of each respondent's hierarchical level (position) and tenure (years with the company) as higher level and more senior respondents may not only be more likely to be the targets of boundary spanning activities like representation, but they are also in a position to offer more support. The results of our regression analyses are shown in Table 7.

As Table 7 shows, the findings for the two units, FR and AR, are dissimilar. Whereas recent ESS use (visits in the last 30 days) has no effect on Support and a significant negative on Coordination for FR, recent ESS use has a significant positive effect on Support and Coordination for AR. Thus, the number of recent blog visits did not emerge as a reliable predictor of enhanced boundary spanning support or coordination by external stakeholders for FR.

Furthermore, Log Activity—a variable reflecting the total number of activities (e.g., views, likes, comments, created posts etc.) performed on the ESS—has a positive effect for both Support and Coordination in FR and has a positive effect for Support in AR, but a negative effect on Coordination. It thus appears that Log Activity is a reliable predictor of boundary spanning for FR.

Other interesting findings pertain to location, position (i.e., hierarchy), and tenure (i.e., years in the firm). Location—a variable measuring distance from the U.S. headquarters—has a positive effect on Coordination for FR and on Support and Coordination for AR, thus implying that people further away are more likely to Support and/or Coordinate with the teams. Position has a positive effect on Support for FR and on both Support and Coordination for AR. Given that higher-level managers are more likely to be able to provide resources and other forms of support, the positive relation between position and boundary spanning seems plausible. Tenure has a significant negative effect on Support for both units, thereby implying that the longer people belong to the organization, the less likely they are to provide support to these units.

| Table 7. Regression Analyses of External Stakeholders | | | | | |
|---|---|---|---|---|---|
| Models | Independent Variables | Beta | Models | Independent Variables | Beta |
| FR | | | AR | | |
| Support<br><br>R2=.08<br>N=220 | ESS visits in last 30 days | 0.08 | Support<br><br>R2=.19<br>N=394 | ESS visits in last 30 days | 0.11*** |
| | ESS Activity | 0.14* | | ESS Activity | 0.02 |
| | Location | 0.10 | | Location | 0.20*** |
| | Position (Hierarchy) | 0.14* | | Position (Hierarchy) | 0.21*** |
| | Tenure | -0.07* | | Tenure | -0.22**** |
| Coordination<br><br>R2=.09<br>N= 220 | ESS visits in last 30 days | -0.19** | Coordination<br><br>R2=.09<br>N=394 | ESS visits in last 30 days | 0.11* |
| | ESS Activity | 0.18** | | ESS Activity | -0.02 |
| | Location | 0.14* | | Location | 0.25*** |
| | Position (Hierarchy) | 0.11 (n.s.) | | Position (Hierarchy) | 0.11* |
| | Tenure | 0.00 | | Tenure | -0.02 |

* = p < .05; ** = p < .01; *** = p < .001
We used the $\log_2$ of ESS Activity and Tenure in the regressions to make the range in values roughly equivalent to the ranges for the other variables in the equation.

## *A Multimodal Network View of External Stakeholders*

Our content analysis revealed the predominant boundary spanning activity enacted through the ESS is representation, which is essential in resource allocation decisions by higher-ranked external stakeholders (*larger nodes*). Therefore, in line with our proposed theory on the relation between boundary spanning and network structure, a team that predominantly engages in representational activity should reflect a network structure encompassing a large number of higher-ranked external stakeholders.

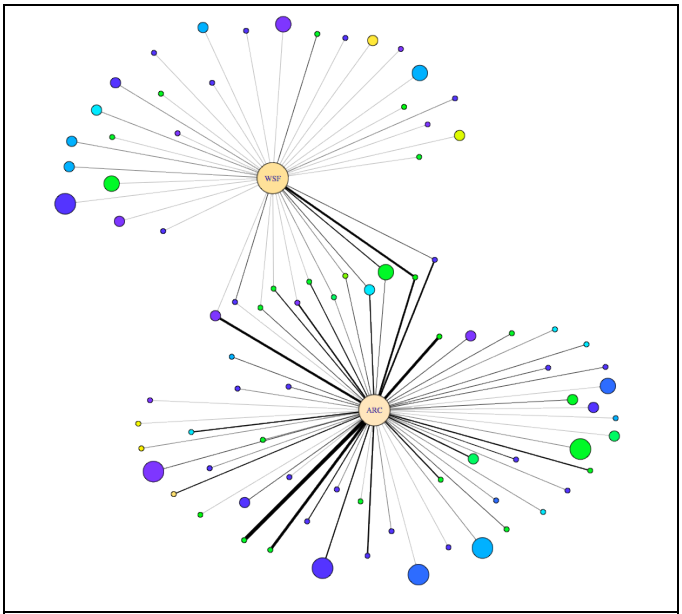



**Figure 1. Multimodal External Stakeholder Network**

Yet, as the network view in Figure 1 suggests, there is a predominance of blog interactions by lower-ranked external stakeholders (*smaller nodes*), who generally have informational or coordination motivations for boundary spanning interactions. Thus, considering the limited participation by these higher-ranked stakeholders, a lack of optimal content creation appears to exist.

Given that only a single blog post by the two organizational units focused on information search and no coordination posts existed, increasing the presence of informational and coordination posts could result in more strategic and value-adding interactions with lower-ranked external stakeholders and by extension enhance the value extraction for ESS and organizational investment in the tool. Alternatively, increasing the awareness for and interaction with the blogs from (senior) managers could also lead to a more optimal network structure if representation continues to be the dominant boundary spanning activity performed by FR and AR.

Furthermore, as aforementioned, the predominance of representational posts could be a consequent of the affordances of social media, which are primarily visibility oriented (Treem and Leonardi 2011), hence,

additional functionalities may need to be implemented for ESS to better support the other forms of boundary spanning which require enhanced communication and collaboration support.

# Discussion and Conclusion

Today, the proliferation of social media technologies in organizational contexts has profound implications for boundary spanning activities of virtual teams. While the use of such technologies enhances the ability of organizational teams and units to access external information, it may expose them to excess input that could have unanticipated consequences. Given the lack of research on the use of ESS for boundary spanning and the focus of boundary spanning literature on internal team members—despite the external orientation of such activities—this study set out to explore the type of boundary spanning activities that are enacted by teams through ESS as well as perceptions and responses hereto by external stakeholders.

Hereto data was collected and analyzed from surveys, ESS logs, and ESS content from two research units with a worldwide provider of workspace solutions. The findings from our content analysis show that internal members enact a uniform set of representational boundary spanning activities using ESS, but do not leverage the ESS tool for informational or coordination activities. This seems a direct consequent of the core affordance characterizing the organizational use of social media, namely *visibility* (Treem and Leonardi 2012). *Visibility* involves the ability to make behavior, knowledge, and connections visible to others, thereby lending strong support for representational activities.

Despite this lack of diversity in boundary spanning activities as performed by internal members of the two organizational units, FR and AR, the comments provided by external stakeholders in response to the representational posts span all three categories of boundary spanning activities, including representation, coordination, and information provision.

The findings from our survey with external stakeholders revealed that although internal boundary spanning can be distinguished into three activity categories—representation, coordination, and information provision—an external lens only reveals two activity categories—support and coordination—for external stakeholders. In other words, monetary or informational support—two discrete factors for internal members, namely representation and information search— are grouped for external stakeholders.

Regression analyses revealed an ambivalent and contextual role of ESS in the support and coordination extended by external stakeholders in response to boundary spanning from internal members of FR and AR. Although positive effects were found consistently with respect to support activities from external stakeholders, coordination activities revealed a negative relation with ESS usage.

Following the affordances as described by Treem and Leonardi (2012), representation-type activities (and their mirror support activities) are enabled through the enhanced visibility of the teams as a result of ESS. However, coordination—which requires more organized and perhaps private communications between various units in the organization—may represent a class of boundary-spanning activities that may not receive adequate support from ESS given their inherent fluid and open nature.

## *Theoretical and Practical Significance*

This study provides several novel contributions to theory and practice. First, it offers a coding scheme that can be used with high reliability for classifying the boundary spanning activity of ESS posts and could be applied to other types of content in order to provide an external assessment (i.e., by the researcher) of boundary spanning as opposed to survey self-reports from internal team members. Second, by adopting an external stakeholder perspective, this study revealed two important lessons regarding the role of ESS in boundary spanning. One, as the content analysis of comments revealed, external stakeholders have significant freedom in their responses to original boundary spanning posts by internal members; e.g., one can provide information or coordinate regardless of the original post being representational. Two, ESS appears to play an ambivalent role in boundary spanning by enhancing support for teams, however, undermining coordination. Finally, a network view of the interactions of external stakeholders with the public blog pages of FR and AR reveals that the dominance of representational posts may not be aligned with the audience of these blogs that is largely composed of lower-ranked stakeholders likely interested in informational or coordination posts. This misalignment of post content and stakeholder position could be a further consequent of the visibility affordance of ESS.

Through the development of the coding scheme as well as the analysis of the effects of ESS on external stakeholders' perceptions and responses to internal team members' boundary spanning activities, we offer two extensions to the existing boundary spanning literature: namely the focus on virtual settings and tools as well as an external stakeholder perspective. Additionally, by offering a team-level view and external stakeholder perspective, this study moves towards capturing the intricacies and complexities of cross-boundary communications, thereby extending the current individual-level focus in much of the social media literature. Furthermore, by triangulating findings from mixed data types—qualitative and quantitative—and sources—behavioral and self-reported—confidence in the reliability and validity of the findings presented in this paper is enhanced.

Finally, by offering a systemic view of boundary spanning, we complement the one-way, inside-out, perspective dominating the existing boundary spanning literature with an outside-in perspective and have proposed a scale that can be employed for measuring this external stakeholder perspective. By proposing a set of theoretical propositions regarding the relation between various boundary spanning activities and network structures

Furthermore, because of the network perspective employed in this study, we offer an approach to understanding how identified network structures may be suggestive of or optimal for the boundary-spanning patterns of the studied teams. We argue that for ESS to enable effective representation, network structures should reveal links between the boundary spanning team and higher level managers, while teams engaging in coordination should exhibit more frequent interactions to peer level external stakeholders in a smaller number of other units. Finally, we suggest that teams engaged information search, such as at the start of projects where teams aim to cast a wide net— the network should have a broad, but loose structure, characterized by a large number of one-off exchanges.

On a practical level, we hope this paper illustrates the importance of leading by example and thus the need for managers of the case organization to become active participants in ESS. Furthermore, to motivate members of FR and AR—as well as other units in the organization—to employ ESS in ways that enhance the efficiency and effectiveness of boundary spanning, it is important to develop adequate incentive structures. For instance, in its current format, the Company's ESS uses badges to signify how active users are based on any activity performed by the user. However, if the organization wants to actively encourage boundary spanning, such recognition schemes need to be adapted to reflect those sets of activities that represent actual moments of boundary spanning.

### *Challenges and Future Research*

Given the highly exploratory nature of this study, a number of limitations can be identified; namely: the analysis and comparison of only two organizational units, the small sample size within each of these cases, as well as the use of internal coders for the content analysis. In future iterations of this study, we wish to expand our multiple-case study to include more organizational units—including units belonging to other organizational departments (e.g., product development, marketing, procurement, etc.)—and to grow the number of cases studied within each unit. Furthermore, external coders will be trained to enhance the reliability of the coding process.

Although this paper represents an initial attempt to assess how ESS is used in boundary spanning activities by internal team members as well as how ESS affects perceptions of these boundary spanning activities by external stakeholders, more work remains to be done. Future research, by expanding the number and nature of teams under investigation, should aim to further disentangle which boundary spanning activities are best supported by these novel tools and why. Hereto, an important next step is the adoption of an affordance approach so as to identify the underlying mechanisms of ESS, as distinct from other forms of computer-mediated communication, through which teams engage in successful boundary spanning activities.

# Appendices

## *Appendix 1: Mirror Boundary Spanning Scale for External Stakeholders*

| External Stakeholder Items | Original Items (Ancona and Caldwell, 1992) |
|---|---|
| **Representation** | |
| FR's/AR's activities are important | Persuade other individuals that the team's activities are important |
| FR's/AR's activities are visible | "Talk up" the team to outsiders |
| I would be willing to support FR/AR | Persuade others to support the team's decisions; Find out whether others in the company support or oppose your team's activities |
| I would provide resources (e.g., money, new members, equipment) to FR/AR | Acquire resources (e.g., money, new members, equipment) for the team |
| I would provide FR/AR with important information on the company's strategy or political situation that may affect their activities | Find out information on your company's strategy or political situation that may affect your project |
| Coordination | |
| I or my unit coordinate(s) activities with FR/AR | Coordinate activities with external groups |
| I or my unit negotiate(s) with FR/AR for delivery deadlines | Negotiate with others for delivery deadlines |
| I or my unit reviews FR's/AR's outcomes | Review product design with outsiders |
| Information Search | |
| I would provide FR/AR with important information on what competing firms or groups are doing on similar projects | Find out what competing firms or groups are doing on similar projects |
| I would provide FR/AR with information on marketing ideas/expertise | Scan the environment inside or outside the organization for marketing ideas/expertise |
| I would provide FR/AR with information on technical ideas/expertise | Collect technical information/ideas from individuals outside of the team; Scan the environment inside or outside the organization for technical ideas/expertise |

It is important to note that whereas all original information search items were used to construct the mirror items for external stakeholder, some of the representation and coordination items were not adapted into mirror items, either due to substantial overlap with existing items or the lack of relevance to the context of this study. Ancona and Caldwell's (1992) original study focused on product development teams as reflected in items pertaining to product design and procurement, hence, these items are not appropriate in the applied research teams we studied. Excluded items include:

- Keep other groups in the company informed of your team's activities
- Scan the environment inside your organization for threats to your team
- Report the progress of the team to a higher organizational level
- Resolve design problems with external groups
- Procure things which the team needs from other groups or individuals in the company

## *Appendix 2: Coding Scheme*

| **BOUNDARY SPANNING** | **Sub-activity Label** | **Definition** |
|---|---|---|
| Representation | | Ambassadorial or impression management; involves the lobbying for the team up the hierarchy in order to create favorable impressions and advocate amongst managers and senior managers, hence, is a largely vertical form of boundary spanning. |
| | Talk Up | Persuade other individuals that the team's activities are important or otherwise "Talk up" the team to outsiders |
| | Persuasion | Persuade others to support the team's decisions |
| | Resources | Acquire resources (e.g., money, new members, equipment) for the team |
| | Progress | Report the progress of the team to a higher organizational level |
| | Support/Oppose | Find out whether others in the company support or oppose your team's activities |
| | Strategy/Politics | Find out information on your company's strategy or political situation that may affect your project |
| | Informing | Keep other groups in the company informed of your team's activities |
| Coordination | | Task coordination or interteam process; involves the facilitation of effective decision-making and design implementation through cross-boundary strategizing, planning, and evaluation; hence it is a horizontal form of boundary spanning. |
| | Resolution | Resolve design problems with external groups |
| | Coordination | Coordinate activities with external groups |
| | Procurement | Procure things which the team needs from other groups or individuals in the company |
| | Negotiation | Negotiate with others for delivery deadlines |
| | Review | Review product design with outsiders |
| Information Search | | Scouting; involves the general scanning of the external team environment for gaining access to relevant information, knowledge, and expertise; hence, is a largely horizontal form of boundary spanning. |
| | Competition | Find out what competing firms or groups are doing on similar projects |
| | Market Scan | Scan the environment inside or outside the organization for marketing ideas/expertise |
| | Technical Scan | Collect technical information/ideas from individuals outside of the team |

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