UNCOVERING THE PHENOMENON OF EMPLOYEES’ ENTERPRISE SOCIAL SOFTWARE USE IN THE POST-ACCEPTANCE STAGE – PROPOSING A USE TYPOLOGY

Abstract

Social software applications – such as wikis, weblogs, and social networking sites – have in recent years attracted the attention of organizations. However, a better understanding of employees’ enterprise social software use behaviors would help organizations to make better informed decisions regarding enterprise social software implementations. As an important step toward addressing this need, this study – on the basis of (i) qualitative empirical data and (ii) existing literature – identifies four post-acceptance information system (IS) use behaviors related to how employees leverage implemented enterprise social software platforms (ESSPs): Consumptive use, contributive use, hedonic use, and social use. A conceptualization of these four distinct use behaviors is proposed and subsequently validated based on data from 233 employees using an ESSP in the post-acceptance stage at a communications and high-tech sector organization. By providing an enterprise social software use framework, developing and rigorously validating an according measurement instrument, this study provides researchers as well as practitioners with a proven instrument to assess employees’ post-acceptance enterprise social software use behaviors.

Keywords: Social software, Enterprise 2.0, Measurement models/methodologies/metrics, Social networks, Information systems use, Post-acceptance stage.

1 Introduction

Social software applications – such as wikis, weblogs, and social networking sites – have in recent years attracted the attention of organizations (e.g., Kane and Fichman, 2009; Majchrzak et al., 2006; Wagner and Majchrzak, 2006). The impressive growth of public social websites like Facebook and Twitter has put pressure on organizations to account for the changing communication behavior of their employees and, thus, organizations increasingly provide them with intra-organizational social software tools (Healey, 2012; Kiron et al., 2013). Today, a diverse mix of organizational social software applications is bundled and integrated within enterprise social software platforms (ESSPs), which organizations are increasingly adopting (Chan and Morgan, 2011; Chui et al., 2012; Kim et al., 2010; Majchrzak et al., 2009). However, as previous research on the introduction of new technologies demonstrates, even with the widespread adoption of an information system (IS) in an organization, its business impact might still be limited (Burton-Jones and Straub, 2006). In other words, the assumption
that increased use of a technology leads to a higher performance impact “is often false in practice” (Goodhue, 2007, p. 220). This is especially true for collaboration technology like social software, since the free form character and the large number of use contexts of ESSPs allow for a large variety of use scenarios (Kane et al., 2014; McAfee, 2009a). When studying the use-performance relationships, the plenitude of different measures of IS use is said to be one reason for the diverging conclusions about the relationship between IS use and performance measures (Petter et al., 2008), with the observed use-performance relationship ranging from strong positive relations (e.g., Rai et al., 2002) to no or only a weak relationship (e.g., Iivari, 2005). The core of the problem seems to be that relevant measures and dimensions of IS use will vary across study contexts (Burton-Jones and Straub, 2006). However, although research suggests that measures and dimensions of IS use should be adapted to the relevant field of study (Jasperson et al., 2005), current studies typically choose their use measures based on their appearance in past empirical research rather than for theoretical reasons (Petter and McLean, 2009). Our research endeavor sets forth to address this shortage of context-specific IS use measures in the field of enterprise social software use.

Prior research suggests that, when the ultimate goal is to study the use-performance relationship, a differentiated view of individuals’ IS use behaviors is necessary (e.g., Burton-Jones and Straub, 2006). The organizational diffusion of an IS can be regarded as a multistage process, consisting of pre-acceptance, acceptance, and post-acceptance behaviors (Cooper and Zmud, 1990). Whereas the pre-acceptance and acceptance stages have been shown to be of particular relevance to an IS’ initial adoption and success (e.g., Thong, 1999), the post-acceptance stage and its according use behaviors are critical to realize benefits on IS utilization (Bhattacherjee, 2001; Jasperson et al., 2005). IS research focusing on the post-acceptance stage has pointed out the relevance of IS use measures that offer a closer link to performance outcomes from IS use (e.g., Deng and Chi, 2012; Schwarz and Chin, 2007). Burton-Jones and Grange (2013) describe this kind of use behavior as “using a system in a way that helps to attain the goals for using the system” (p. 633). DeLone and McLean (2003) further suggest considering the nature and depth of use when studying the relationship between use and the realization of performance outcomes. We therefore follow the recommendations of Li et al. (2013) who “suggest that researchers carefully select contextual characteristics, including specific types of IS and user groups, to conceptualize the pertinent postacceptance usage behaviors” (p. 678) by focusing our investigation into employees’ ESSP use behaviors on the post-acceptance stage of organizational IS diffusion.

Our overall research endeavor aims to conceptualize relevant and robust ESSP use measures for empirical assessment of employees’ post-acceptance ESSP use behaviors. Therefore, we address the following two research questions in our paper:

- How do employees use enterprise social software platforms in the post-acceptance stage? (RQ1)
- How can these different ESSP use behaviors be conceptualized? (RQ2)

The next section describes our understanding of enterprise social software platforms and discusses prior work on the nature of IS use. Next, we present the design of the study and explicate its methodology. Subsequently, we synthesize our framework for enterprise social software use before going into details on the measurement instrument development and validation process. In the final section, we outline the next steps of our research endeavor and discuss this paper’s contributions.

2 Theoretical Background

Kim et al. (2010, p. 216) define social websites as “Web sites that make it possible for people to form online communities, and share user-created contents (UCCs).” We base our definition of enterprise social software platforms (ESSPs) on their definition by narrowing it down to the enterprise context, meaning people are represented by an organization’s employees, a network of co-workers represents
the community, and UCCs are represented by any kind of content (e.g., blogs, wikis, text messages, photos, videos, bookmarks, user profiles, and activity streams). In short, ESSPs are a mix of social networking sites (Boyd and Ellison, 2007; Richter et al., 2011) and social media sites with which various media types can be shared (Kim et al., 2010). We further agree with Leonardi et al. (2013) that “it makes less sense to distinguish between tools such as social networking, microblogging, and social tagging, and more sense to treat these individual tools as part of an integrated enterprise social media platform” (Leonardi et al., 2013, p. 2). Typical products in the ESSP segment are IBM’s social software platform IBM Connections, the Jive platform, and Microsoft’s SharePoint 2010 Communities (please refer to Drakos et al. (2013) or Koplowitz (2011) for recent market overviews on ESSPs). It is important to note that we focus on intra-organizational social software use and its impact in this research endeavor. Business benefits gained through the use of public social software platforms (e.g., Facebook use for human resources, marketing, or sales purposes) (e.g., Gallaugher and Ransbotham, 2010) are therefore outside the scope of this research.

Studies investigating individuals’ IS use define and operationalize the IS use construct in various ways. While some researchers focus on the behavioral intention to use a system (e.g., Agarwal and Prasad, 1997; Hsu et al., 2007; Karahanna et al., 1999), others base their research on actual system use by measuring system use in subjective (e.g., frequency, duration, intensity) or objective (e.g., system logs) terms (e.g., Igbaria et al., 1989; Limayem and Hirt, 2003). However – as IS research has pointed out – these rather lean conceptualizations have important shortcomings (e.g., DeLone and McLean, 2003; Straub et al., 1995). When studying the use-performance relationships, the plenitude of different measures of IS use is said to be one reason for the diverging conclusions about the relationship between IS use and performance measures (Petter et al., 2008), with the observed use-performance relationship ranging from strong positive relations (e.g., Rai et al., 2002) to no or only weak relationships (e.g., Iivari, 2005). Although research suggests that measures and dimensions of IS use should be adapted to the according study contexts (Burton-Jones and Straub, 2006), most studies still chose the measures based on their inclusion in past empirical studies rather than for theoretical reasons (Petter and McLean, 2009). In a recent study focusing on public social software platforms and individuals’ use behaviors during platform use, Ali-Hassan and Nevo (2009) identified three key dimensions of social software use in their explorative investigation: social use, hedonic use, and generative use. Scheepers et al. (2014) investigate use behaviors of public social software platform users and find four use behaviors of social software users: information seeking, hedonic activities, sustaining of strong ties, and extending weak ties. While also investigating a public social software platform (Facebook), Koroleva et al. (2011) exploratively examine users’ use behavior and identify the following use patterns among the study participants: active participation, passive following, social browsing, social searching, and private communication. Although it is expected that “SNS usage practices and benefits are likely to be very different in an enterprise context” (Richter et al., 2011, p. 97), we are aware of no published research that provides an enterprise social software use categorization including a measurement model focusing on employees’ post-acceptance use behaviors for ESSPs. In order to address this research gap, our study follows recent calls for further research into the nature of IS use (Grgecic and Rosenkranz, 2011; Jasperson et al., 2005; Petter et al., 2008) by conceptualizing ESSP use according to the specificities of enterprise social software.

3 Research Process and Methods

We focus our research on the individual level of investigation, i.e., we investigate individual ESSP users’ behaviors rather than the use behavior of a team or even an organization as a whole. Although an organization typically implements a particular ESSP, it is the individual users who decide on the extent of use, and it is they who should be able to report on the individual benefits achieved through ESSP use.
Data for this study has been collected in two phases (Figure 1). We adapted the paradigm proposed by Churchill Jr (1979), which is an approach that is widely accepted by IS researchers and has worked well in producing highly reliable measures in the past (Limayem et al., 2007). The first phase, which informed the researchers during the first two steps of the measurement instrument development process (Figure 1) and mainly addresses RQ1, consists of an exploratory investigation to look into practitioner perceptions toward employees’ social software use and its potential outcomes. Within this investigation, we a) conducted several workshops, each with participants from multiple professional services firms, and b) collected secondary qualitative data from an online discussion event for professionals. We narrow down our exploration to social software applications that are exclusively utilized for internal purposes, since the internal use of ESSPs is the focus of this study.

The workshops were conducted as part of an annual benchmarking project. This qualitative assessment is being carried out by the authors as a longitudinal investigation of professional service firms concerning their knowledge management (KM) and collaboration practices. One part of the interview-based benchmarking is aimed at the participants’ social software platforms, i.e. their respective use behaviors and use outcomes. The authors conducted several workshops (each lasting between four and eight hours) with the participant companies’ chief knowledge officers as well as project employees, to discuss which KM and collaboration instruments they deployed, how they are being used, and what kinds of outcomes they attain. Field notes and protocols gathered in the workshops, during which individuals shared their thoughts and emerging ideas on enterprise social software use, provided the researchers with anecdotes, informal observations, and valuable insights about relationships (Eisenhardt, 1989). In order to strengthen the generalizability and internal validity of our research, existing literature and theories were used to form a priori concepts (codes) for structuring field notes and workshop protocols (Hardgrave and Johnson, 2003). Workshop protocols were compiled and written by two researchers, face to face.

We further collected secondary qualitative data from an online discussion event called “The Social Business Jam”. On February 8-10, 2011, IBM hosted an online conversation (called a “Jam”) that brought together more than 2,700 participants – representing corporations, academic institutions, nonprofit organizations and government agencies – to discuss topics around the theme of
organizational social software and its business impacts (for further information on the event, see IBM Corporation (2011)). After the event, the host made the data files of all the discussions available, providing us with a data set of more than 2,100 single discussion posts related to enterprise social software use and its impacts. These statements by individual organizational members offer a rich data set that allows exploring the theme of enterprise social software with regard to the research questions in depth.

In the second data collection phase (see steps three to six in Figure 1), we collected survey-based data to assess the measurement properties of the developed constructs. We decided to apply the survey methodology as the data collection approach in order to enhance generalizability of the results (Dooley, 2001) and to be able to address RQ2 by means of second-generation statistical modeling techniques. Individuals’ ESSP use behaviors are potentially constrained by the type of ESSP available and the degree to which an organization’s culture encourages employees’ collaboration and knowledge sharing (Gray and Meister, 2004). In order to control for both possible sources of variation, we decided to collect data from a single organization during the second data collection phase. Since we are interested in employees’ post-acceptance use behaviors in this research endeavor, the ESSP should have reached a certain level of infusion within the organization under study. Prior research on organizational IT diffusion has shown that the technology implementation process, from the initial rollout of an IS all the way through final technology infusion, where the system is fully integrated and employees use it to the full extent of its possibilities (Cooper and Zmud, 1990), easily takes a period of eight to twelve months (see, e.g., Morris and Venkatesh (2010) for an example in the context of an enterprise resource planning (ERP) system implementation). Therefore, the time period since the ESSP’s implementation was an important criterion when searching for a research site for our data collection within our main empirical study. The survey-based data collection was conducted at an international communications and high-tech organization (referred to hereafter as “ComOrg”). At the time of data collection, ComOrg’s ESSP had been in place for more than five years already. The roughly 30,000 employees are distributed throughout the world. In exchange for the promise of a report describing our findings, the manager who is in charge of ComOrg’s social software initiative agreed to let us survey a subset of ComOrg’s employees with regard to their use of the organization’s ESSP.

4 Synthesizing the Enterprise Social Software Use Framework

Based on (i) the empirical material that we collected and analyzed during the first phase of data collection and (ii) existing literature on social software use, we developed a framework that addresses the question how employees use enterprise social software platforms (RQ1). Owing to ESSPs’ free form character and their large number of use contexts, ESSPs allow for a large variety of use scenarios (Kane et al., 2014; McAfee, 2009a), which is why literature as well as our empirical data suggest a differentiation between several social software use behaviors. On the basis of the collected qualitative data on practitioners’ social software use perceptions, we decided to structure the enterprise social software use framework (ESSUF) according to the type of employees’ interaction with an ESSP (Figure 2). Since knowledge consumption has repeatedly been named a major use behavior in the analyzed qualitative data on ESSP users (Table 1), and literature confirms this (e.g., Ali-Hassan et al., 2011; Durcikova et al., 2010; Koroleva et al., 2011), we included consumptive use as one of the use dimensions into the ESSUF. Consumptive use is defined as the extent to which employees use an ESSP to acquire knowledge from the platform (“passive use”).

Uncovering Enterprise Social Software Use
We’re slowly seeing results by connecting real life business scenarios to benefits and providing them with personalized and group action-based learning activities to help them connect, consume and contribute to their networks and communities.”

“There are tiers of contacts […] which we may want to treat differently (in terms of information consumed from and provided).”

“[…] make this community of evidence available for our clients to consume and contribute.”

“Individual employees are engaged, empowered, and enthusiastic about contributing their thoughts, ideas, and effort to achieving organizational outcomes.”

“The site simultaneously belongs to everybody, and also to a very engaged core group who contribute their own efforts so that all may benefit.”

“Front line contributors loved the idea because they felt better connected with the organization and senior management, and felt their expertise was now being recognized.”

“Others need to see active contributions from colleagues before jumping in – they’re not so much lurkers as they are potential active contributors who take a wait-and-see attitude.”

“For us, the social network has paved the way for new connections across the organization for learning, for teaming, for collaborating, and for fun.”

“Increasingly, I find that the lines between the social and the business blur as the organization becomes more active. For us, the Intranet is the hub and as more people fill out their profile and join interest-based groups the more I know about them as a person. That information only helps as we build business relationships. As you say, Isabelle, it isn’t a friendship, but our social connection helps make working together easier.”

Table 1. Excerpts of qualitative data on ESSP use behaviors.

Complementary, social software applications rely on user-created content (Parameswaran and Whinston, 2007), and research has shown that knowledge contribution behavior might well result in positive outcomes (e.g., Fulk and Yuan, 2013; Leidner et al., 2010; Treem and Leonardi, 2012). Knowledge consumption and knowledge contribution behaviors have already been identified as an important set of distinct, yet coexisting behaviors in the KM literature: “although they have unique motivational features, contribution and seeking are a pair of closely interrelated and inseparable behaviors – for the presumed benefits of KMS to occur, both must happen” (He and Wei, 2009, p. 828). Based on the evidence in literature as well as in the qualitative data (Table 1), we added contributive use as the second use dimension of the ESSUF. We define contributive use as the extent to which employees use an ESSP to contribute knowledge to the platform (“active use”). Given that ESSPs are closely related to the mostly hedonically driven public social software platforms from a theoretical standpoint (Rosen and Sherman, 2006; Thambusamy et al., 2010; Wu and Lu, 2013; Xu et al., 2012), and several workshop participants also found that hedonic use seems to be an important facet in ESSP use, we added this dimension to the ESSUF. We define hedonic use as the extent to which employees use an ESSP for entertainment purposes. Since expanding one’s personal network is one of the main motivations for using social software applications (e.g., Bock et al., 2005; Hsu and Lin, 2008; Krasnova et al., 2010), social use will be the fourth dimension of the ESSUF. Social use is
defined as the extent to which employees use an ESSP to establish and maintain social relations with their co-workers. Figure 2 illustrates the suggested enterprise social software use framework (ESSUF).

Figure 2. Enterprise social software use framework (ESSUF).

5 Survey-Based Data Analysis

5.1 Generation of initial item pools

For the purpose of enhancing the measurement instrument’s validity a priori, researchers suggest that measures should be adapted from tested and proven items of prior studies’ measures (e.g., Kankanhalli et al., 2005; Stone, 1978). Thus, we adopted items identified in previous studies and modified them for use in the ESSP context, where possible. While screening the literature for existing measures, we created initial item pools for each of the constructs (Straub, 1989). We extended the item pools with additional items where important aspects of the content domain of a construct have not been covered. We hereby followed the item-writing suggestions put forth by MacKenzie et al. (2011). All items are measured using seven-point Likert-type scales anchored from “strongly disagree” (1) to “strongly agree” (7). This process led to a total number of 110 items for the four proposed social software use constructs. In order to conceptually validate the proposed measures and to further reduce the number of items for the final questionnaire, the next step of instrument development involved a conceptual validation of the measurement instrument.

5.2 Conceptual validation

In order to reduce the number of items for the measurement instrument, two research workshops with three researchers were conducted. During these workshops, every candidate item was evaluated with regard to its relevance to the potential target construct. As a result of this step, a list of 16 candidate items took shape. Addressing the issue of construct validity of the proposed constructs, we subsequently conducted two rounds of a card sorting and item ranking similar to the ones proposed by Moore and Benbasat (1991) and Kankanhalli et al. (2005) with a group of IS researchers. This validation step was particularly necessary since the items for measuring the constructs were adapted from various sources or even newly developed for the purpose of this study. Instead of handing out cards to the judges physically, we decided to provide them with a computer-based spreadsheet tool that allowed the judges to assign the items to the available constructs and rank the items accordingly. The tool allowed the judges to either assign the items to one of the constructs or to indicate that they could not match the item with any of the available constructs, in order to ensure that the judges did not force fit any item into a particular construct (Moore and Benbasat, 1991). In order to assess the consistency of the item-to-construct-assignments, we calculated the item placement ratio (IPR) for each construct. The IPR is the percentage to which judges have correctly assigned all their items to the
intended target construct (Moore and Benbasat, 1991). Five IS researchers participated in the first round of the card sorting and item ranking exercise. Altogether, the five judges assigned 86% of the items to the targeted constructs, i.e., the first round brought forth an IPR of 86%. However, several changes in items were necessary after this round, since the judges felt that these items were ambiguous or unclear in their meaning. Therefore, one item each for the consumptive use construct, the contributive use construct, the hedonic use construct, and the social use construct needed to be modified. Table 2 shows the detailed results of the first round of card sorting and the IPRs of the first and second round of card sorting.

<table>
<thead>
<tr>
<th>Actual Category</th>
<th>Target Category</th>
<th>Total # of Items to Place</th>
<th>IPR 1st Round</th>
<th>IPR 2nd Round</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNSU</td>
<td>CTRU HU SU</td>
<td></td>
<td>20</td>
<td>85%</td>
</tr>
<tr>
<td>Consumptive Use (CNSU)</td>
<td>17</td>
<td></td>
<td>20</td>
<td>95%</td>
</tr>
<tr>
<td>Contributive Use (CTRU)</td>
<td>19</td>
<td></td>
<td>20</td>
<td>65%</td>
</tr>
<tr>
<td>Hedonic Use (HU)</td>
<td></td>
<td></td>
<td>13</td>
<td>85%</td>
</tr>
<tr>
<td>Social Use (SU)</td>
<td></td>
<td></td>
<td>6</td>
<td>100%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Overall IPR</td>
<td></td>
<td></td>
<td></td>
<td>86%</td>
</tr>
</tbody>
</table>

Table 2. Card sorting results (first round) and item placement ratios (first and second rounds).

The second round of card sorting was subsequently conducted by another five IS researchers. As a result of this card sorting round, one item of the consumptive use construct, one item of the contributive use construct, one item of the hedonic use construct as well as one item of the social use construct were removed from the item pool. This stage of card sorting yielded an IPR of 88%, showing further improvement in the IPRs of the constructs containing the modified items. All constructs could score an IPR of at least 85%, which can be considered a satisfactory item placement consistency. Thus, a high degree of construct validity and potential reliability had been achieved (Moore and Benbasat, 1991). Table 3 lists the item pool after the second round of the card sorting and item ranking exercise, including the respective sources.

5.3 Survey-based data collection

We provided our contact person at ComOrg with the hyperlink to our study’s online survey and asked him to distribute it to his colleagues. He then sent an e-mail with the hyperlink along with some encouraging words and the information that the results of the survey are beneficial to ComOrg to a subset of ComOrg’s employees. In this e-mail, as well as on the landing page of the online survey, the employees were informed that all collected data would be handled anonymously and in a strictly confidential manner. After two weeks, an e-mail reminder was sent out. We closed the online survey after an overall survey period of four weeks.
Uncovering Enterprise Social Software Use

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Question</th>
<th>Literature Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumptive Use (CNSU)</td>
<td>CNSU1</td>
<td>I use the system to obtain information provided by my colleagues.</td>
<td>Durcikova et al. (2010); Fulk et al. (2004)</td>
</tr>
<tr>
<td></td>
<td>CNSU2</td>
<td>I use the system as a way of acquiring knowledge.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CNSU3</td>
<td>I use the system to retrieve information made available on the platform.</td>
<td></td>
</tr>
<tr>
<td>Contributive Use (CTRU)</td>
<td>CTRU1</td>
<td>I use the system to contribute my knowledge to the platform.</td>
<td>Durcikova and Fadel (2012); Fulk et al. (2004); Kankanhalli et al. (2005)</td>
</tr>
<tr>
<td></td>
<td>CTRU2</td>
<td>I use the system to submit knowledge to it.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CTRU3</td>
<td>I use the system to provide my colleagues with information.</td>
<td></td>
</tr>
<tr>
<td>Hedonic Use (HU)</td>
<td>HU1</td>
<td>I use the system to exchange (i.e. consume and/or contribute) entertaining content through the platform.</td>
<td>Ali-Hassan and Nevo (2009)</td>
</tr>
<tr>
<td></td>
<td>HU2</td>
<td>I use the system to cheer me up when I am bored at work.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HU3</td>
<td>I use the system for entertainment purposes.</td>
<td></td>
</tr>
<tr>
<td>Social Use (SU)</td>
<td>SU1</td>
<td>I use the system to maintain social relationships with my colleagues.</td>
<td>Ali-Hassan and Nevo (2009); Ali-Hassan et al. (2011); Leidner et al. (2010)</td>
</tr>
<tr>
<td></td>
<td>SU2</td>
<td>I use the system to create social relations with my colleagues.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SU3</td>
<td>I use the system to get to know people in my organization.</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Item pool after second round of card sorting.

Since all questions of the online survey were mandatory in order to proceed to the next page of the survey, we did not have to deal with missing or incomplete responses. Owing to the focus of this investigation on employees’ post-acceptance use behaviors, we only analyzed the responses of those employees that had been using the platform for at least twelve months already. We therefore excluded all data sets from respondents who have been using the ESSP for less than twelve months at the time of the inquiry. Thus, this analysis is based on a final number of 233 usable data sets. The respondents’ demographic characteristics are shown in Table 4. The overall response rate was 6%. Whenever responses are obtained only from a subset of the overall population, non-response bias might be present (Baruch and Holtom, 2008). This is due to a potential difference between respondents and individuals who decided not to respond to the inquiry (non-respondents), which might limit a study’s external validity (Urbach et al., 2010). One way of assessing a potential non-response bias is the wave analysis technique, which suggests comparing the groups of early respondents and late respondents with each other (Rogelberg and Stanton, 2007). The rationale behind this technique is that persons who respond at a later stage (or ‘wave’) of an inquiry are expected to be similar to non-respondents (Armstrong and Overton, 1977).

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>46.2</td>
<td>9.7</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>14 % female</td>
</tr>
<tr>
<td>Organizational tenure [years]</td>
<td>14.6</td>
<td>9.8</td>
</tr>
<tr>
<td>Overall work experience [years]</td>
<td>23.7</td>
<td>9.9</td>
</tr>
<tr>
<td>Platform experience [months]</td>
<td>31.8</td>
<td>20.5</td>
</tr>
</tbody>
</table>

Table 4. Respondents’ demographic characteristics.

We defined respondents that finished the online survey within the first two weeks of the survey period as early respondents and those who responded in the latter two weeks of the survey period as late respondents. We assessed these two groups of respondents for differences by means of the non-parametric Mann-Whitney-U test (Mann and Whitney, 1947) as well as the Wilcoxon signed-rank test.
(Wilcoxon, 1945). No significant differences between the early and the late respondents could be identified. We therefore conclude that non-response bias is not an issue with our study’s data set.

### 5.4 Exploratory factor analysis

In a first step of exploring the collected survey data, we conducted an exploratory factor analysis (EFA) in order to examine whether the structure of the four suggested ESSP use behaviors identified in the qualitative investigation would also hold in the factor groups identified by the EFA. An EFA is able to extract the latent variables that explain the patterns of correlations within a data set (Gefen and Straub, 2005; Hair Jr et al., 1998). We conducted an EFA by means of a principal component analysis (PCA) with varimax rotation and Kaiser normalization on the collected data using SPSS 21.0 (IBM Corporation, 2012). We chose the varimax rotation because of its ability to render interpretable results. We validated these results using a direct oblimin rotation, yielding an equivalent factor structure. The EFA extracted four factors with eigenvalues higher than 1 (Table 5), together accounting for more than 85% of the variance in the data. The results (Table 9 in Appendix A) further show that all measurement items load highly on only one factor and that all loadings are well above the suggested threshold of 0.600 (Gefen and Straub, 2005).

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>1</td>
<td>4.981</td>
<td>41.505</td>
</tr>
<tr>
<td>2</td>
<td>2.465</td>
<td>20.545</td>
</tr>
<tr>
<td>3</td>
<td>1.584</td>
<td>13.200</td>
</tr>
<tr>
<td>4</td>
<td>1.196</td>
<td>9.963</td>
</tr>
<tr>
<td>5</td>
<td>.437</td>
<td>3.638</td>
</tr>
<tr>
<td>6</td>
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<tr>
<td>12</td>
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</tbody>
</table>

Table 5. Results of exploratory factor analysis.

### 5.5 Reliability and validity analysis

We further assessed the measurement model by the partial least squares (PLS) approach (Chin, 1998). We decided to utilize PLS for data analysis since it is the preferable approach – compared with covariance-based approaches – when it comes to measures that are not well established as it is the case in our study context (Chin and Newsted, 1999). Furthermore, the PLS approach is advantageous for management-oriented problems with decision relevance and a focus on prediction (Fornell and Bookstein, 1982). Following the validation guidelines of Straub et al. (2004) as well as Lewis et al. (2005), we tested the measurement model for indicator reliability, convergent validity, internal consistency, and discriminant validity. We used the software SmartPLS 2.0 M3 (Ringle et al., 2005) for the statistical analyses, such as assessing the psychometric properties of the proposed constructs.
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Table 6. Indicator reliability of constructs.

Indicator reliability describes the extent to which a variable or set of variables is consistent regarding what it intends to measure. We conducted a confirmatory factor analysis (CFA) in order to determine indicator reliability. Statistical significance of the parameter estimates was assessed by using a bootstrapping procedure with 1,000 resamples (sample size setting equal to sample size (n = 233)). With the lowest item loading being 0.82 (Table 6), all item loadings are well above the recommended threshold of 0.70 (Chin, 1998).

Convergent validity indicates the extent to which the items of a construct that are theoretically related are also related in practice. Convergent validity is given, since a) the average variance extracted (AVE) for each construct is well above the suggested threshold value of 0.50 (Fornell and Larcker, 1981), and b) all item loadings are above 0.80 (Table 6), well above the 0.70 threshold and statistically significant at the 0.001 level (Hair et al., 2010). Cronbach’s alpha (CA) (Cronbach, 1951) reliability estimates and composite reliability (CR) (Chin, 1998) were calculated to assess the internal consistency of the proposed constructs.

Table 7. Descriptive statistics and psychometric properties.

We found that the CA values of all constructs are greater than 0.82 (Table 7), which indicates strong reliability for all factors given the recommended threshold of 0.50 (Nunnally and Bernstein, 1994). We also followed the suggestion of Chin (1998) and calculated composite reliability (CR) as an
alternative to CA. The CR values for all factors are higher than 0.89 (Table 7), and therefore well above the recommended minimum of 0.70 (Nunnally and Bernstein 1994). Table 7 shows the descriptive statistics (minimum, maximum, mean, and standard deviation) as well as the CR, AVE, and CA values for the four identified use measures. There is evidence of discriminant validity, because i) the square root of all AVEs (bold diagonal in Table 7) are larger than inter-construct correlations (Fornell and Larcker, 1981), and ii) all factor indicators load on their corresponding factor stronger than on any other factor (Chin 1998). Hence, all cross-loading differences are much higher than the suggested threshold of 0.1 (Gefen and Straub, 2005). Table 8 shows the loadings and cross-loadings of the four use measures.

<table>
<thead>
<tr>
<th></th>
<th>Consumptive Use</th>
<th>Contributive Use</th>
<th>Hedonic Use</th>
<th>Social Use</th>
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<tr>
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<td>0.291</td>
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<td>0.907</td>
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</tbody>
</table>

Table 8. Loadings and cross-loadings.

Examining the mean values of the four use measures (Table 7), consumptive use obviously (and expectedly so) has the highest value (4.81), followed by contributive use (3.65), social use (2.73), and hedonic use, with a mean value of only 1.77.

6 Discussion and Next Steps

On the basis of (i) qualitative empirical data that we collected and analyzed during the first phase of data collection and (ii) existing literature, we developed a framework addressing the question of how employees use enterprise social software platforms in the post-acceptance stage and thereby addressed the first research question of this paper (RQ1). We further provided a conceptualization of the four distinct use behaviors identified. By means of the proposed measurement instrument and its subsequent rigorous validation (addressing RQ2), we enable researchers as well as practitioners to assess employees’ social software use behaviors in the post-acceptance stage through their different types of interactions with the ESSP. Our study thus contributes to IS research by (1) exploratively identifying a distinct set of IS use behaviors from a rich set of qualitative data, (2) developing a measurement instrument, guided by the recommendations of Churchill Jr (1979), Limayem et al. (2007), Moore and Benbasat (1991) as well as Straub (1989), and (3) rigorously assessing the distinctiveness as well as the psychometric properties of the suggested set of enterprise social software use measures.
The measurement instrument provides practitioners with an easily applicable way of measuring a distinct set of ESSP use behaviors. Consequently, it goes beyond the rather limited analysis functionality offered by many current ESSP solutions (e.g., Drakos et al., 2013). Allowing IT managers to assess the extent to which employees use ESSPs to consume, contribute, entertain, and socialize thus enables practitioners to dig deeper into employees’ ESSP use behaviors. The consumption-contribution ratio, for instance, might be a starting point to address the challenge that the vast majority of ESSP users typically only consumes content, while often only 10 percent or even less actively contribute content to the platform (also known as the 90-9-1 rule of thumb (Mattern et al., 2012)). It additionally draws practitioners’ attention towards the diverse nature of employees social software use (e.g., McAfee, 2009b). Organizations’ social software initiatives may benefit by taking into consideration the multifaceted nature of use during the post-acceptance stage of organizational ESSP implementation. Furthermore, such an assessment of the way social software tools are being used will allow IT managers a better alignment of the ESSP with the overall social software initiatives’ strategic goals (e.g., Haefliger et al., 2011).

The context-specific use conceptualization of employees’ post-acceptance ESSP use can be regarded as a major step towards “a mapping between system usage and performance” (Burton-Jones and Straub, 2006, p. 229). In a next step of our research endeavor, we will frame and conceptualize the individual benefit dimensions that employees experience by using ESSPs (e.g., Chui et al., 2012; da Cunha and Orlikowski, 2008; Denyer et al., 2011; Kügler and Smolnik, 2013; Raeth et al., 2011). Thereafter, we will bring together the identified post-acceptance ESSP use behaviors with the social software use benefits in a research model in order to assess the linkages between them.

### Appendix A

<table>
<thead>
<tr>
<th>Component 1</th>
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<th>Component 3</th>
<th>Component 4</th>
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**Notes:**
- Extraction method: principal component analysis.
- Rotation method: varimax with Kaiser normalization.

Table 9. Results of exploratory factor analysis (principal component analysis with Kaiser normalization).

### References


