
Evaluation of the Uses and Benefits of a Social Business Platform

Lester Holtzblatt

MITRE Corporation
202 Burlington Road
Bedford, MA 01730 USA
holtzblatt@mitre.org

Jill L. Drury

MITRE Corporation
202 Burlington Road
Bedford, MA 01730
jldrury@mitre.org

Daniel Weiss

MITRE Corporation
202 Burlington Road
Bedford, MA 01730
dweiss@mitre.org

Laurie E. Damianos

MITRE Corporation
202 Burlington Road
Bedford, MA 01730
laurie@mitre.org

Donna L. Cuomo

MITRE Corporation
202 Burlington Road
Bedford, MA 01730
dcuomo@mitre.org

Abstract

We evaluated an integrated social software platform, called Handshake, to determine individuals' usage patterns and characterize Handshake's business value. Our multi-step investigation included conducting 63 in-depth interviews, analyzing log data from 4600+ users, and administering an online survey. We found that both the level and type of participation affects whether users experience value. Active participants, for example, say that Handshake supports collaboration, strengthens social connections, fosters awareness of connections' activities, and facilitates knowledge management. This case study captures an early snapshot of behavior that we anticipate will change and grow over time.

Keywords

Social business software, enterprise 2.0, social software, social media

ACM Classification Keywords

H.5.3. Group and organization interfaces:
Asynchronous interaction, Collaborative computing,
Evaluation / methodology, Computer-supported
cooperative work, Web-based interaction

General Terms

Human Factors

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CHI 2012, May 5–10, 2012, Austin, TX, USA.

Introduction

During the past several years, a number of social business platforms have emerged. Several, cited by Forrester as leaders in this market, include: IBM Connections, Jive, Telligent, and Newsgator [14]. These platforms provide support for a wide range of social software capabilities in an integrated environment. The functions supported by these platforms include most, if not all of the following: blogs, wikis, profiles, microblogging, activity feeds, group support, tagging and tag clouds, RSS feeds, and discussion threads.

The MITRE Corporation, like many other enterprise organizations, is interested in leveraging social business tools effectively to provide business value to its staff and to the corporation as a whole. While a number of corporations have provided anecdotal reports of the success of these tools, it is difficult to measure objectively how individual staff and the organization, as a whole, benefit from their use, and how specific usage patterns impact their effectiveness.

These challenges in evaluation seem to be driven by several factors. First, adoption of new social software tools is often slow. The interactions among users, the changes in work practice, the relationship between how different tools are used, and the impact on business outcomes all take time to emerge. These "long-tail effects" are only realized when social communities reach critical mass and impacts are seen in a large population over an extended period of time [4]. In addition, in many cases, appropriate metrics for tying user behavior to business value do not exist.

Furthermore, studies on small, local pilots do not extrapolate well to the enterprise scale.

In order to address these issues, MITRE initiated a longitudinal evaluation to assess the business value of emerging social business tools, platforms, and models over an extended period of time. The goals of this evaluation are to assess the long-term impact in three areas:

- a) the benefit individual staff derive from long term tool usage, including how particular patterns of tool usage affect perceived user benefits,
- b) the impact tool usage has at an organizational level, including enabling and supporting new and emerging models for collaborating and sharing information across the corporation, and
- c) the impact tool usage has on facilitating external engagements with MITRE's partners, sponsors, and other experts from outside the company.

As the first piece in the larger longitudinal evaluation, this particular case study reports on research activities that address the first of these three goals, evaluating the impact that individual patterns of tool usage have on the value staff derive from using a social business platform. We view this case study as an early snapshot of behavior and anticipate that behaviors will change and grow as the social business platform reaches critical mass, users realize the benefits, work practices change over time, and new business models emerge.

Background

The MITRE Corporation is a not-for-profit organization chartered to work in the public interest. MITRE manages five Federally Funded Research and Development Centers in addition to fostering its own independent technology research and development. MITRE's 7000+ employees are distributed worldwide to support their sponsors' needs in systems engineering, information technology, operational concepts, and enterprise modernization. Most of MITRE's staff members are considered to be "knowledge workers": individuals who are valued for their ability to analyze and interpret information within a specific domain.

For solving problems, staff is expected to seek out and rely on the expertise and knowledge of technical and domain experts distributed across the company. As a result, the corporation places a high value on sharing knowledge across individuals, projects, and business units. Information is typically shared internally through the use of email and Listservs, face-to-face meetings, telephone, chat, internal wikis, and Microsoft SharePoint. For communicating and collaborating with *external partners*, MITRE employees have traditionally relied on email, telephone, face-to-face meetings, and an external Microsoft SharePoint site.

To improve this situation, MITRE embarked upon building a trusted environment for MITRE and its partners to connect, collaborate, and share new information in a more integrated fashion. The goals were to facilitate the ability to establish and maintain relationships across organizational boundaries, to form communities and facilitate multi-organizational collaboration around key topics, to leverage expertise across MITRE and MITRE's partners, and to bring

broader segments of the world to bear on important sponsor problems.

In August 2009, a research team at MITRE launched its social business platform called Handshake [6]. Based on the Elgg [10] open source platform, Handshake was designed so that employees could form connections, create their own profiles, establish groups, and facilitate multi-organizational collaboration around topics, projects, or communities of interest. Group tools include a discussion forum, basic file repository, wiki, blog, message board, and tag clouds. Handshake was also implemented to promote awareness of relationships, activities, topics, and communities through the use of email notifications and both group and individual activity streams.

Related Research

Research on social business applications highlights a variety of functions that these tools support, benefiting users in a number of different ways. Many of these tools support acquiring, organizing, and sharing knowledge within a corporate environment. For example, corporate wikis [2, 13, 15] and blogs [9] provide repositories of employee generated content. Social bookmarking tools [7, 17] and micro-blogs [23] provide employees new ways of disseminating links to useful information and other resources. Effimova et al. [9] report that the resulting "wealth of information" provided by employee-generated information often helps save staff time by reducing the effort required to learn about new technologies and tools, quickly getting answers to questions, and identifying experts both within and outside the company.

In addition to these information-centric functions, studies by IBM researchers on Beehive have demonstrated that social networking tools enhance staff's social capital by expanding social networks, strengthening existing ties, and enhancing staff's connection to the organization [8, 20]. Brzonowski [5] observed the potential business value of expanding and strengthening network ties within the enterprise, noting that these networks help both disseminate information throughout the organization and provide opportunities for collaboration. Furthermore, other studies document that staff with extensive networks of weak ties within a corporation are more productive [1] and generate greater revenue for the corporation [21].

Another major function highlighted in research on social software applications is the use of these tools to support collaboration. Matthews et al. [16] note that collections of people may work collaboratively to produce new knowledge in different contexts such as teams or communities of practice. Their research suggests that different tools may be better suited to support collaboration under these different contexts.

These studies have generally not assessed how broadly users experience these benefits or looked at how users' patterns of activity impact the value they experience from a social business platform. We are aware of only a single study that has looked at the relationship between tool usage and the benefits users experience. In their evaluation of IBM's social business platform, Beehive, Steinfeld et al. report a significant correlation between intensity of tool usage and measures of social capital [20]. However, their research did not distinguish how different types of users engaged with the platform. A number of researchers have contrasted "contributors"

from "lurkers" based on whether users contribute new content (e.g., file, wiki entry, blog post, discussion topic, bookmark, comment) in a particular social software application [11, 12, 18]. Others [22] have suggested that it is useful to further distinguish between occasional and frequent contributors. Preece and Shneiderman [19] proposed four distinct patterns of user activity: reader, contributor, collaborator, and leader. However, to date, researchers have not assessed how these distinct patterns of activity impact the benefits users gain from social business applications.

This case study provides an opportunity to empirically evaluate how knowledge workers within a corporation use and benefit from using a social business platform and how different patterns of activities (e.g., contributing content vs. lurking/reading) impact the benefits staff experience.

Method

Our investigation took place in multiple steps, which can be summarized as follows. First, we categorized Handshake groups because we wished to explore the patterns of activity in different types of groups or how each type of group contributed value to participants. Once we defined group types, we invited users from a representative sampling of groups to participate in in-depth interviews. To help ensure objectivity, none of the interviewers were members of the Handshake design or development team.

Analyzing the interviews enabled us to draw out some findings regarding the value of Handshake, but we wanted to estimate the generalizability of these findings to the Handshake population at large. To do so, we

constructed a survey based on the recurring themes that emerged from the interviews. The survey enabled us to determine which benefits mentioned by interviewees were, in fact, experienced more broadly.

Characterizing groups

Any MITRE employee can join Handshake and create a group on any topic. Handshake's 666 groups (as of October 2011) have thus been created on a wide variety of subjects, activities, relationships, organizations, and affiliations - with sizes ranging from a handful of members to over one thousand. We looked across all Handshake groups and identified five categories based on the primary purpose of the groups as our focus:

- **Project:** A team of individuals collaborating on a funded project or a work team for an assigned group project
- **Community of Practice:** a group of people who exchange information about a common domain, field, or profession
- **Peer Supported:** a self-forming group of people created to share tips, experiences, and Q&A
- **Application Support:** a group geared towards answering questions, accepting feedback, and taking input from users of a particular product or service; run by an application owner
- **MITRE Organization:** a group whose membership is restricted to a MITRE organizational unit; e.g., a department or division

While there were other categories of groups (such as those supporting academic or industry engagements), we focused on the above five categories because they covered a large number of very diverse groups that were likely to provide business value.

In-depth interviews

We arranged interviews with 63 people from 22 groups: seven Project groups, seven Community of Practice groups, three Peer Supported groups, two Application Support groups, and three MITRE Organization groups. We interviewed between two and four people in each group. While most of the interviewees participated regularly in Handshake activities, some of them logged into Handshake only occasionally.

We developed a set of interview questions designed to characterize the usage and value of Handshake. We included questions on the business goal of the group, how they were trying to accomplish that goal, and whether the goal was achieved. In addition, we probed on how the different ways staff use Handshake impact its perceived value. Additional questions examined whether (and why) users turned to Handshake instead of other collaboration tools provided by the corporation, such as Microsoft's SharePoint or an in-house Wikipedia-like tool called MITREpedia.

We also asked questions regarding how Handshake could be improved, particularly in helping users collaborate with external partners and what obstacles to Handshake use they experienced. Doing so was important for two reasons. First, it enabled us to provide feedback to the Handshake design team. Equally important, these questions signaled to interviewees our willingness to hear about Handshake's

negative – as well as positive – aspects. (We do not focus on areas for Handshake improvement in this paper; it is outside the scope of this analysis.)

Although we used the interview script in each case, we diverged from the prepared questions to probe for underlying reasons for answers to questions and also to capture stories that illustrated Handshake usage. We were guided by contextual interviewing techniques [3] in how we probed for rationale and detail. One team member would interview a person while the other captured notes. The interviews took between 30 and 60 minutes each.

Survey

We extracted recurring themes regarding Handshake's value from the interviews and used them to construct a survey. This web-based survey consisted of 18 Likert-scale questions, described in more detail in the results section below. All 4600+ MITRE Handshake members were invited via an email message to take the survey. The survey was not administered to the 1625 non-MITRE members of Handshake.

Interview Results

We analyzed our interview results by first identifying the major themes that emerged from these interviews for each of the five group types of our focus. We then synthesized these findings across groups. Based on this analysis, we identified six major themes that characterized the ways in which users perceived Handshake as a benefit. In the sections below, we illustrate how these benefits were manifest in some of the Handshake groups.

Supporting Team-based Collaboration

Besides Handshake, MITRE provides other enterprise tools to support team collaboration, such as: Microsoft SharePoint, ListSrvs, MITREpedia (a wiki), blogs, Microsoft Communicator instant messaging, Cisco MeetingPlace voice/web conferencing, video-teleconferencing rooms, and (of course) email. One of the questions we explored was: does Handshake's collaboration support offer anything that distinguishes it from all of the other collaboration tools? In fact, we found that many interviewees valued the *combination* of collaboration functionalities available in Handshake. MITRE employees often only use SharePoint as a shared document repository, for example; MITREpedia's wiki enables team members to aggregate information in a single document and/or work collaboratively on a document; our blogging software enables people to post or comment on ideas. Handshake users take advantage of all of these three functions (and more) in one tool, however, and this consolidation yielded benefits to interviewees.

One MITRE Project leader valued how Handshake's consolidation of different types of project material instilled confidence in his customers, whom he invited into his project's Handshake group. "They have instant access; the deliverables are there, they can look at the requirements and the whole audit trail, along with what has been said in discussions. I think they have better insight into the program itself" as a result.

A different Project group that consisted of MITRE software engineers, project managers, and student software developers working remotely at a university provided another example. Early in their collaboration (before using Handshake), the MITRE team members

had difficulty knowing when the students had finished a code update, and (once it was noticed) it was not easy for all members to keep track of everyone's comments on the updated software. In one case, the students used File Transfer Protocol (FTP) to upload a new build to a university server that could be accessed by the MITRE team members. Because there was no automated alerting ("we never knew when a new build was there"), the MITRE people did not know about the new build until the next day. By the time they got the build and installed it, another half-day had elapsed. Meanwhile, three students had stopped their work to wait for the comments, resulting in a loss of productive time that the project could ill-afford.

Our interviewee contrasted this situation to the process that Handshake enabled. "After deciding to use Handshake, they would throw the zipped build on Handshake...we knew down to the minute when there was a new build. All they had to do was post it... Using Handshake, it was two minutes from the time it was posted until the time we got it up and running. We did 30 builds over three months... It's a lot of work and Handshake enabled it all."

The interviewee went on to explain how the quality of their software improved because of another one of Handshake's embedded functions: the ability to comment on a file or other uploaded artifact. Testers would see the new build, install and execute it, then write up their findings, bug reports, or questions in the comment thread associated with the file. In this way, all material relevant to a build was automatically located together. Thus quality was improved because "there was less chance of a problem getting overlooked using this process."

It's important to note that Handshake facilitated smooth collaboration support between MITRE and non-MITRE team members. Very few of MITRE's other collaboration capabilities work well across the corporate firewall. "When you say to a partner, we want to invite you into our [Handshake] team site, they think, this is nice... This allows us to say 'we can' [collaborate electronically] instead of 'we can't do that.'" Handshake was critical to making cross-organizational collaboration work: "Without the tool [Handshake], we would not have been able to get our project done."

Enabling Collective Intelligence

Matthews et al. [16] have noted that individuals may also collaborate in an organization by producing knowledge through bottom-up, unscripted activities of collections of people who, through their aggregate activities, codify and share new knowledge. These activities are often referred to as collective intelligence.

We saw evidence of how Handshake supported collective intelligence activities particularly in Application Support groups. The most poignant example of collective intelligence in action was in a Handshake group created by the application support team for a gadget-based homepage on MITRE's intranet. Interaction from users of the homepage resulted in several benefits. First, Handshake provided an easy and quick method for collecting feedback compared to conducting time consuming interviews or focus groups. By posting design alternatives or ideas in the group, the application support team got both a broad diversity of ideas as well as a sense of which ideas had the greatest support. This allowed them to create a product that fulfilled the needs of the greatest number of group members. As one participant said,

"Having the members talk to each other has value to the team; we can see that an idea has bounced around this group and there's more than one person behind this opinion." In the same way, discussions about bugs in the current revision of the homepage allowed the product owners to see how widespread the issues were and how much they impacted users. This was noted by a product team member when he explained, "A Firefox upgrade was released overnight, and we didn't know about it. There were severe problems with what it did to the rendering of the gadgets, and this was a surprise to us. We found out about the problem from the users in this [Handshake] group. We wouldn't have found out about it so quickly if it wasn't for the group and wouldn't have known how widespread the problem was."

The second way that collective intelligence came into play was in using the "crowd" to generate new ideas and solutions. As one product team member put it, "Overall the big thing is that our designs get more iterative feedback... We're having users be participants in the design process, which helps to develop more polished software faster and better. There are things that come up in the Handshake group that we didn't think about." Similarly, in the case of the Firefox issue above, the combined intelligence of the group helped with determining a solution, as the team member continued, "The group helped in the solution and... the value to the team was that it improves the quality of the product. It helps us to deliver on our promise of creating software that works." Overall, these types of discussions in the group opened the team members' minds to alternative designs and solutions, improving the product and changing their thinking on important ideas. As one interviewee explained, "Some discussions

change the way that we thought about something. We have found innovative solutions – something we didn't anticipate – from the discussion."

Strengthening Social Connections

Members of Handshake groups spoke of how participation in these groups helped foster a greater sense of cohesiveness and community amongst members. A senior MITRE manager, for example, noted "there's something about seeing the photos [of group members] that makes you feel closer to the group... It motivates you...." This manager went on to highlight the impact these feelings had on team dynamics, noting "The Handshake group was part of what made the team feel cohesive." That sense of community extended to non-MITRE participants as well. One external member of a Community of Practice observed "for me, the relationship building that Handshake permits seems to be richer than what you find on the Listserv. On a Listserv, all you see is the name of a person. On Handshake it ... feels more like a community... I think it is the fact that you have a profile."

Both participants highlighted distinctive features of Handshake – the pictures and profiles – that created a feeling of connection to the members of the group. These features were particularly relevant in strengthening connections across organizational boundaries and geographic distances. The external member of the Community of Practice, for example, noted that participation in the group "helped solidify relationships" with MITRE staff. As result, he observed, "when we go to a conference or developer base, we recognize each other and can talk."

Similar experiences were observed by members who felt that participation in Handshake groups reduced geographic distances between staff at different locations. As one member of a Peer Support group observed "Since I'm at a site, I don't have an opportunity to engage in conversations in the hallway. This group lets me tap into what goes on in these areas of technology; it compensates for a lack of hallway discussion."

Facilitating Knowledge Management

According to interviewees, Handshake was an "essential repository for storing thoughts, discussions, and anything that would be valuable to record for a later date... Everything is consolidated." Because it was consolidated, the information would become easier to find: "otherwise it would get lost on my hard drive." In particular, Project group members said that Handshake was easier than email for managing information: "The advantage was, instead of having to subdivide your email and go back to a thread, all the discussion was in one place. Instead of having to open an old email to open an attachment, the files were all here [in Handshake] and it worked quite well." This knowledge capture is not just for final products but also for works-in-progress: "It is a group website/blog/file sharing mechanism to give us an informal persistent store for the things we're doing" and to maintain dynamically-changing status information.

Fostering Situation Awareness (SA)

Members described how Handshake's activity streams and alerts helped them maintain awareness of information that was pertinent to their work. Handshake groups provided SA for project members in varying degrees of detail based on their different roles:

non-manager staff members, project leaders, higher-level managers, and others on the periphery. Team members observed that they used Handshake alerts and activity streams to get immediate notification of version updates to team documents, reports of bugs found in software updates, and status updates on issues that needed immediate attention.

Handshake also helped project leaders respond quickly to issues arising on a project. For example, a project leader on a cross-organizational team noted that Handshake "... gives me better insight into ... anything [that] needs more attention or needs to be brought to attention of one of the customer program managers... I will do it via a phone call. But I learn whether I need to make that phone call via Handshake."

MITRE's customers also valued the insight they gained through monitoring project activity on Handshake. As a customer program manager noted, "(Handshake) saved me lots of time and effort because, at any given time, I knew what was going on in the project."

Enhancing Measurable Business Value

One recurring theme of Handshake users was that it made information easier to find and therefore saved users time. For Peer Supported groups this benefit was manifested by making the answers to questions and information easier to find. People did not tend to ask questions that had been asked before, and respondents did not need to answer questions that had already been addressed in the group. As one person put it, "Handshake is probably faster than other methods to get information ... because I can see historical content in a meaningful way. I could just go to a Listserv and ask the same question that people asked 20 times ...

On Handshake I am more inclined to look than to blurt out a question that people have asked before.”

In Project groups, Handshake helped streamline processes, particularly in teams that included external partners. As one group member of a cross-organizational team said, “Did Handshake produce better code? Probably not. But with regard to the number of iterations to get to the level of coding we got, Handshake definitely helped. It would have taken much longer, many more iterations without it.” Elaborating, he explained that all the build comments, bugs, etc. were associated in Handshake directly with the build file. As a result, team members could “see which build had which problems and when they were fixed. There was less chance of a problem getting overlooked because of the process.”

Handshake also helped increase quality by streamlining communication and creating shared understanding between project members and members of a customer team. A team lead, for example, noted “The customer has instant access to the deliverables there. They can look at requirements and the whole audit trail and what has been said in discussions. I think they have better insight into the program itself.” A customer team member similarly noted, “I think it has definitely improved the quality of products because you have instant feedback [about a design feature]...”

Survey Results

To assess the generality of our qualitative findings and to evaluate how different patterns of interaction with Handshake impact its perceived benefit, we analyzed data logs and conducted a survey of MITRE Handshake users.

Characterizing users

The interviews yielded many anecdotes that begged the question: was the experience of these 63 users typical of the entire Handshake population, and if not, what types of Handshake users were most likely to experience these benefits? To start answering that question, we characterized the Handshake population by collecting data from the Handshake database and logs and computing the following metrics for each user:

- **Length of time** since joining Handshake
- **% of days logged into Handshake**
- **Number of connections** established
- **Number of groups owned or co-owned**
- **Number of groups** a user is a member of
- **Number of items posted**

These metrics helped us to put the results of the survey into context.

Analysis of User Data Logs

Using the activity metrics described above, we first classified users into new and experienced Handshake users. Experienced Handshake users had been members of Handshake for at least 90 days. We then classified experienced users along two dimensions: a) based on the level of contributions they made to Handshake and b) the regularity with which they logged into Handshake. Users were classified by their level of contributions as:

- Active Contributors: Users that contributed at least 20 posts since they joined Handshake.
- Moderate Contributors: Users that contributed at least one post but fewer than 20 posts.
- Readers: Users that had never contributed any posts on Handshake.

Users were also classified based on the regularity with which they logged into Handshake as:

- Active Handshake Users: Users that logged into Handshake, on average, at least once a week.
- Occasional Handshake Users: Handshake members who logged in less than once a week on average. These Handshake members may have regularly tracked postings on Handshake via their email (since postings could be sent automatically to email), but we had no visibility into the level with which they followed group activity via email.

	Active Contrib.	Moderate Contrib.	Reader	Total
Active User	4%	7%	18%	29%
Occasional User	1%	7%	63%	71%
Total	5%	14%	81%	

Table 1. Percentage of Contributors and Readers Who Logged on Regularly and Occasionally

As of September 1, 2011, there were 4145 experienced Handshake users. As Table 1 illustrates, the level of

contributions users made on Handshake was related to the regularity with which they logged onto Handshake. Active Contributors were much more likely to log onto Handshake regularly than Moderate Contributors who, in turn, were more likely to log onto Handshake regularly than Readers.

	Connections	Gps. owned	Gps member	Posts	Months member
Active Contributor	17	1	11	49	20
Moderate Contributor	4	0	5	4	16
Reader	1	0	1	0	12

Table 2. Handshake Activity for Contributors & Readers

We then compared the activity of each of these types of Handshake users on several dimensions including the length of time they were members of Handshake, the number of connections they formed, the number of groups they owned and were a part of, and the number of posts they had made on Handshake. Table 2 indicates that Active Contributors were, on average, fairly early adopters of Handshake – with half of the Active Contributors having joined Handshake within the first four months after it was released. Active Contributors also had a much broader Handshake community and network than Moderate Contributors or Readers; belonging to nearly two times as many groups and having four times as many connections as Moderate Contributors. The average Reader had only one connection and belonged to only one group. Smaller, but still observable, differences were also

noted between the level of social connectedness of Active and Occasional Handshake Users (Table 3).

	Connections	Gps. owned	Gps member	Posts	Months member
Active User	3	0	4	0	13
Occasional User	1	0	2	0	13

Table 3. Handshake activity: Active & Occasional Users

Analysis of Survey Results

We received survey responses from 354 Handshake members – including 36% of the Active Contributors, 14% of the Moderate Contributors, and 6% of Readers. Results from the survey (Table 4) highlighted that the level of value users experienced in using Handshake was clearly related to patterns of users' activity. Active Contributors in all areas experienced greater value from the use of Handshake than both Moderate Contributors and Readers. The majority of Active Contributors experienced Handshake as valuable along four themes:

- **Supporting Collaboration:** Over 60% of Active Contributors felt that Handshake supported their collaboration activities in general and in particular by facilitating collaboration with staff in other locations. Over half of Active Contributors also felt that Handshake facilitated collaboration with external partners.
- **Strengthening Social Connection:** Over 80% of both Active and Moderate Contributors felt that Handshake fostered community around topics of

shared interest. Over half of Active Contributors felt that it helped them expand their social networks. There was no supporting evidence that Handshake strengthened existing ties for Active Contributors.

- **Fostering Situation Awareness:** Over 60% of both Active and Moderate Contributors felt that Handshake enabled them to track their connections' activities. However, Handshake did not foster awareness of the ongoing activities on most users' or others' projects.
- **Facilitating Knowledge Management:** Over half of Active Contributors felt that Handshake helped by consolidating information in a single place. However, most did not see Handshake as helpful in connecting them to other experts or in marketing their own expertise.

Readers did not experience Handshake as providing benefit in any of these areas. We examined whether the regularity with which Readers logged onto Handshake impacted the value Handshake users experienced. Although the majority of Readers who regularly logged onto Handshake did not perceive value on any of the dimensions we measured, a significantly higher percentage of Readers who logged on regularly did perceive Handshake as valuable ($p < .002$) than those who did not regularly log on. Our findings therefore were consistent with the conclusion that the regularity with which Handshake was accessed increased the level of benefit a user experienced.

Discussion

Although there are a variety of corporate applications deployed at MITRE that offer functions similar to those

	Active Contributor	Moderate Contributor	Readers	Readers (Active Reader)	Reader (Occasional Reader)
Business Value					
Saves time on job	35%	16%	6%	8%	5%
Helps improve quality of product	49%	21%	9%	10%	8%
Helps develop new business opportunities	28%	7%	3%	4%	2%
Knowledge Management					
Consolidates group information in one place	55%	26%	11%	19%	6%
Helps get new team members up to speed	42%	17%	7%	5%	8%
Helps keep abreast of new developments in domain	45%	47%	19%	23%	17%
Helps find experts	21%	12%	15%	23%	11%
Helps "market" knowledge and skills	13%	5%	8%	12%	5%
Situation Awareness					
Communicates progress on task to co-workers, managers, task or project leads	35%	15%	6%	10%	4%
Helps provide awareness of project status	31%	21%	9%	10%	8%
Helps provide awareness of connections' activities	63%	67%	28%	37%	23%
Keeps abreast of work in other projects	33%	44%	18%	25%	15%
Collaboration Support					
Aids collaboration with others at MITRE	65%	43%	19%	21%	16%
Aids collaboration with external partners	51%	14%	6%	10%	3%
Aids collaboration with MITRE staff who work in other locations	63%	47%	19%	25%	16%
Social Connections					
Helps expand social network	55%	35%	14%	22%	10%
Helps strengthen existing relationships	38%	25%	12%	12%	9%
Helps create a community around topics of interest	77%	77%	32%	41%	26%

Table 4. Results from the Handshake Value Survey

provided by Handshake, many of our interviewees highlighted that Handshake provided distinct value to them in contrast to other tools. Several characteristics of Handshake seemed to distinguish it from these other applications and contributed to the benefits we described in this paper including:

- Handshake's integration of multiple social business applications in a single platform enabled users to consolidate and access multiple types of information in one location.
- By providing users the ability to engage in lengthy discussion threads on posted files, wikis, or blogs, Handshake facilitated discourse around ideas.
- Users were able to maintain awareness of activities within their group through different information channels including alerts and activity streams.
- Handshake's profiles and pictures fostered a greater sense of personal connection between group members than would occur when individuals were simply known by names or email addresses.
- By reducing the barriers to entry for non-MITRE members, Handshake fostered greater cross-organizational collaboration.

However, in spite of the potential benefits of Handshake described by our interviewees, our survey results indicated that many Handshake users did not directly experience these benefits. Active Contributors were the one group of users who appeared to

experience many of Handshake's potential benefits consistently, particularly the support Handshake provided for collaboration and for broadening and strengthening social connections. This group of users differed from other users not only by contributing far more content on Handshake, but also by joining more groups and establishing more connections to others. These findings suggested that both the level of participation by a user and the type of participation by a user affected whether they experienced value from being a member of Handshake.

As long as a Handshake member participated in groups only by reading content, they were unlikely to experience benefits from being part of a group - even those benefits associated with acquiring information (e.g., staying abreast of developments in one's field or tracking progress in other MITRE projects). In contrast, users who contributed to Handshake groups were much more likely to experience benefits. Furthermore, the level of contribution a user made to groups appeared to affect the extent to which they experienced value in using Handshake. Moderate levels of contribution to groups appeared sufficient to foster members' sense of belonging and being part of a group. In addition, Moderate Contributors were as likely as Active Contributors to gain value from reading Handshake content. But only Active Contributors were likely to experience Handshake as providing support for collaborating and for helping expand their network of relationships. In other words, what a user got was proportional to what he/she gave.

Implications and Future Research

The results from our case study provide at least partial validation for Preece and Shneiderman's Reader-to-Leader framework for characterizing Social Media users [19]. Their description of readers, contributors, and collaborators maps well to our characterization of Readers, Moderate Contributors, and Active Contributors in Handshake. Their framework provides implications for motivating and supporting each of these different types of users and suggests how to expand users' level of participation beyond their current level of participation. Building on their ideas, MITRE's longitudinal evaluation offers opportunities to explore how to increase the regularity with which Readers use Handshake, how to transform Readers into Contributors, and how to increase the level of contributions by Moderate Contributors so they become Active Contributors.

Our interviews suggest that users may be characterized in other ways as well – for example, based on the type of groups they belong to and their motivations for joining a Handshake group. We plan additional analysis to identify distinctions between users based on this information.

Finally, as we noted in our introduction, this study is part of a larger longitudinal study that is focusing on understanding the impact of social business applications on both individual employees and on the organization over time. Towards that end, we are planning additional studies that will focus on evaluating the growth of participation by users, how work practices change as a result over time, and the effect of the platform on new and emerging business models within the corporation.

Acknowledgements

We thank Betty Fisher for her help in creating and analyzing results of the survey

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