The Power of Social Media for Global Knowledge Management

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ABSTRACT
Software is increasingly being developed by globally dispersed teams as companies strive by all means possible to release products and services at lower costs and a shorter time to market. Effective knowledge management and communication plays an important role in integrating these global teams so as to facilitate interaction and dissemination of knowledge to develop a product or service with optimal features. More recently, companies have been incorporating Web 2.0 tools to add to traditional Knowledge Management tools to provide synchronous communication for effective knowledge management. This paper draws from experiential learning, case studies, and established research to analyze the effectiveness of social media tools within both corporate and student contexts to conclude that using social media for knowledge management is a powerful technique to best capture value from existing knowledge – be it in documents and repositories or tacit knowledge and expertise within an organization.

Keywords: social media, knowledge management, global software development, Web 2.0, Cognizant C2

CREATING THE NEED FOR GLOBAL KNOWLEDGE MANAGEMENT
The last two decades have seen businesses take to the global playing field, supported by software-driven business processes (Conchuir, 2009) on more refined, intuitive, and streamlined platforms that enable businesses to perform across national and economic boundaries. At the onset of the 1990s, many companies took to offshoring key components of software development, leading to establishment of new collaboration techniques and processes that incorporate geographically distributed teams to design, implement, test, maintain, and release to customers various products and services. Offshoring allowed companies remote access to scarce resources from the global talent pool and the capability to capitalize on them competitively. Offshoring also alleviated the severe pressure of time-to-market because it allowed companies to experiment with and implement round-the-clock-development. Different market opportunities available to different global teams suddenly became accessible to the whole company and this facilitated better reach, enhancing the overall business. Furthermore, a refined understanding of each market’s socioeconomic and cultural background was provided by the respective local team (Tjia, 2005), therefore allowing the company better access to customer behavior and profiles in different parts of the world. Offshoring also meant that there was not much of a need for a brick and mortar office and that the entire company or parts of it could go virtual to better capture and create market value (Herbsleb & Moitra Deependra, 2001). This however, only led to a whole host of problems and situations (Tjia, 2005). Strategic issues came to light in which teams lost of control of the work flow. Teams also took a while to adjust to the new kind of division of work that was now highly granular to provide for flexibility in development (Herbsleb & Moitra Deependra, 2001). Coordination and collaboration became more important and frustrating as global teams struggled with miscommunications caused by geographical, temporal, and cultural differences (Fitzgerald B, 2006). Communications with global clients also imposed similar challenges. Solving these problems created by offshoring requires a three-pronged approach (Carmel & Agarwal, 2001).

Approach one: Reduce intensive collaboration for development
Collaboration will be required on a macro level as all unit tasks finally integrate to give a complete product or service, but micro tasks requiring cross-location collaboration for a single component of code should be avoided so as to save time and the attention of resources (Carmel & Agarwal, 2001).

Approach two: Reduce cultural and geographical distances between teams
Reduction of cultural distances within teams would need internal mechanisms such as a cultural liaison for each side (someone who is able to relate to the other team), along with a project manager whose responsibility would include communication and coordination with the different teams and scheduling and streamlining of tasks to ensure on-time product delivery (Vax & Michaud, 2008). Another way to alleviate that distance is to internalize the foreign entity (Carmel &
Agarwal, 2001), which means that all global teams get internalized into the company’s overarching corporate culture. Fostering a single global culture will unite components of the company and reduce distances caused by cultural or geographical location (Balasubramain R, 2009). The same strategy could also apply to the educational context with respect to student teams’ overarching project culture.

**Approach three: Reduce temporal distances with effective knowledge management**

Creation of formal channels or avenues for communication, code development, and project management is essentially a restructuring of knowledge management within a company. Temporal distances are caused by not finding the right resources at the right time during any work process (Agerfalk P, 2006). This resource can be an employee or a team leader or a member of senior management, and knowledge management coupled with effective means of synchronous communication can help teams contact the relevant resources and get answers much faster (Eccles & Davenport, 2010). Many companies are experimenting with social media tools to achieve synchronous communications on custom built platforms that are dedicated to knowledge management (Seebach, 2012).

**KNOWLEDGE MANAGEMENT EMPOWERED BY SOCIAL MEDIA**

A knowledge-based organization views knowledge as a scarce resource and its effective creation, distribution, and use are what determine an organization’s competitive advantage (Dingsøyr & Šmite, 2013). Although knowledge management primarily aims to reduce temporal distances, some of the techniques used by Earl’s (2001) different schools of knowledge management aim to reduce all three – geographical, sociocultural and temporal distances (Earl, 2001). Bjørnson and Dingsøyr reviewed Earl’s framework of knowledge management and indicated the focus area of every school with respect to the different distances between global teams (Dingsøyr & Šmite, 2013). An analysis of their research with an overlay of different classifications of social media tools leads to an observation that if used correctly, social media tools need not be isolated to informal or casual channels of communication and can be used in a corporate or formal context as well as to facilitate communication and collaboration. Table 1 reviews this overlay by listing relevant social media tools against each school of knowledge management with a view that these tools could further aid in achieving the school’s goals.

<table>
<thead>
<tr>
<th>School</th>
<th>Focus</th>
<th>Aim</th>
<th>Challenges Tackled</th>
<th>Description</th>
<th>Social Media Tool Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems</td>
<td>Technology</td>
<td>Knowledge bases</td>
<td>SC</td>
<td>Utilizing technology to create a repository of all design cycles</td>
<td>Collaborative content creation (wikis), blogs and microblogs</td>
</tr>
<tr>
<td>Cartographic</td>
<td>Maps</td>
<td>Knowledge directories</td>
<td>SC</td>
<td>Creating a map of resources for both individual learning and company references to assign task resources, upgrade skills, and search for competency</td>
<td>Content Communities (with social authority) Bookmarking platforms</td>
</tr>
<tr>
<td>Engineering</td>
<td>Processes</td>
<td>Knowledge flows</td>
<td>SC</td>
<td>Documenting work processes to implement for project retrospectives, mentoring programs and mapping knowledge</td>
<td>Collaborative content creation (wikis), content communities</td>
</tr>
<tr>
<td>Organizational</td>
<td>Networks</td>
<td>Knowledge pooling</td>
<td>G, T, SC</td>
<td>Creating Communities of Practitioners where people share explicit and implicit knowledge on common topics of interest. Knowledge Management literature typically distinguishes between two social groups – a Community of Practitioners (CoP) and a Network of Practitioners (NoP). While a CoP generally comprises of co-located team members, an NoP is an electronic subset of a CoP allowing for virtual global teams to be part of the knowledge creation and sharing process.</td>
<td>Social Networks, Content Communities</td>
</tr>
<tr>
<td>Spatial</td>
<td>Space</td>
<td>Knowledge exchange</td>
<td>G, T</td>
<td>How the design of an office can facilitate better communication among team members. (Dingsøyr &amp; Šmite, 2013) While this school concentrates only on co-located teams, virtual global teams can be privy to task boards in one team’s office where all project data, deadlines and progress is written out for effective sharing of progress at a glance.</td>
<td>Collaborative Content Creation (wikis)</td>
</tr>
</tbody>
</table>

T indicates challenges posed by temporal distances, G - geographical distances, SC - sociocultural distances

*Adapted from (Dingsøyr & Šmite, 2013)*

**Table 1: Schools of Knowledge Management**

Effective knowledge management aided by social media also adds to the social capital of the company, which is defined by the relationships between individuals and participants of a social network (Seebach, 2012). According to Nahapiet and
Ghoshal, social capital can be described as the “sum of the actual and potential resources embedded within, available through and derived from the network of relationships possessed by an individual or social unit” (Nahapiet & Ghoshal, 1998). Enterprise microblogging (as a form of knowledge management supported by social media) is a pervasive kind of technology with great promise of being effective in mining and exchanging knowledge within corporate Electronic Networks of Practitioners (ENoPs). Though many practitioners initially felt that data generated from microblogging would lead to information overload and therefore, a loss in productivity, research has shown quite the opposite. According to Christoph Seebach’s research, employees turn to the ENoP when they have exhausted all their known sources of knowledge, which is to say their colleagues whom they can contact directly to get information and solutions to their issues. Seebach’s analysis revealed that social media tools indeed helped in the bridging of otherwise “disconnected individuals” in an enterprise and that it helps in the usage of existing knowledge that might otherwise remain unused (Seebach, 2012).

CASE STUDIES

The following two case studies evaluate the role social media can play in corporate and noncorporate (student) collaborations across different global locations. Attention is also given to the ubiquity of issues faced by globally dispersed teams over both the corporate and student areas of analysis.

ANALYSIS: COGNIZANT’S C2 PLATFORM

Cognizant Technology Solutions was launched in 1994 out of a restructuring of Dun & Bradstreet Corporation and became a publicly listed company in 1998. Cognizant offers clients solutions and support in many areas of IT and infrastructure development and maintenance, in addition to consultancy services to industry verticals like financial services, health, retail, and consumer goods among others (Eccles & Davenport, 2010).

Global Knowledge Model at Cognizant: “Bringing the collective wisdom of the organization to the client”

Cognizant was managed with a global nearshore/offshore perspective from the start, with a US headquarters and major operations out of its global delivery center in Chennai, India. Virtually all client projects were divided into components and each component was handled by a different global team. Typically, 30% of the project would be handled by the onsite team and 70% of the components would be divided among nearshore (same time zone as onsite team) and offshore teams that were located at global delivery centers. To manage communication between teams, Cognizant first had a knowledge dissemination tool called the Knowledge Management Appliance that enabled employees to directly access various documents pertaining to past projects. This tool initially conformed to Earl’s Systems School of Knowledge Management. However, Cognizant was not satisfied with this one dimensional approach to knowledge. They wanted their employees to be routed intelligently to the relevant knowledge in terms of both documents and expertise based on their current work processes. As Web 2.0 tools emerged, Cognizant took to using those tools to create a knowledge network and platform. This meant the creation of a new tool – Cognizant C2, (Eccles & Davenport, 2010) and subscription to a new school of knowledge management thought – Organizational Knowledge Management, while incorporating Carmel and Agarwal’s approaches Two and Three to reduce distances between teams.

Cognizant C2

Cognizant’s Rajashree Natarajan came up with a breakthrough idea that brought project and process management together with knowledge management. C2 was intended to be a platform for collaboration between various global teams providing project and quality control at real-time atomic levels. This meant that for every ongoing task on a process, there were modules on the platform to contact relevant expertise across Cognizant’s resource pool, retrieve relevant documents that could aid in the task at hand, manage upcoming tasks, and schedule and complete tasks. Cognizant thought it necessary to provide predefined linkages between processes and relevant knowledge to provide for “just-in-time” knowledge on projects that could be accessed in a way that could ensure the effectiveness and productivity of Cognizant employees.

The client interface of C2 showed two key panels — the left panel had a series of tasks to be completed by the user in relation to his or her ongoing project and work process. The right panel listed potentially useful knowledge resources for the task at hand and also resources for the entire project context, including guides, templates, project data, artifacts, notes and checklists. The panel on top of both these panels was the Web 2.0 platform through which the user could Ctweet (an internal Cognizant Twitter), wikis, blogs, or contact resources retrieved by the platform that could potentially help with any aspect of the project. At the Cognizant Community 2009 meeting, Lakshmi Narayanan, Cognizant’s vice chairman, said “Using C2 we deliver projects 20% more efficiently (in terms of hours taken to complete specific tasks). It also allows us to increase productivity up to 70% in specific project management activities by effective usage of the C2 delivery management functionalities” (Eccles & Davenport, 2010).
EXPERIENTIAL LEARNING FOR STUDENTS

Singapore Management University (SMU) collaborates through its advanced elective Global Software Project Management with the Carnegie Mellon University (CMU-P) at Pittsburgh, Carnegie Mellon University (CMU-Q) at Qatar, and IT University of Copenhagen (ITU) to simulate for its students a global software development environment. Led by Prof. Benjamin Gan, SMU students are exposed to the various difficulties experienced by geographically distributed teams. Different teams handle separate tasks, and there is a high risk of miscommunication, unequal expectations, and task dependency mismatches. To mitigate these difficulties, the students use social media tools to help maintain the timeline of the project, disseminate goals and tasks and metrics and documentation to complete the project well within a deadline while factoring in time zones. Students are exposed to different expertise, work cultures, and social interactions, all of which lead to students adopting and styling the Organizational Knowledge Management model according to their needs to enable Follow the Sun agile development. SMU students participate in two different kinds of global projects – the first project with CMU revolves around collaborative content creation, whereas the second project with ITU concentrates on global software development. Both projects involve different levels and tools of collaboration to suit varying needs. Table 2 evaluates the different social media tools the teams commonly use with the goal of answering two main questions.

1) Which tool best helps improve synchronous communication between teams?
2) Comparing the different collaboration strategies adopted by both projects, which is the better strategy?

<table>
<thead>
<tr>
<th>Project</th>
<th>Tool</th>
<th>Purpose</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU-CMU</td>
<td>Facebook</td>
<td>Schedule meetings, Share meeting minutes, Post deadlines &amp; updates, Break the Ice between teams</td>
<td>Facebook groups do not work on a notification basis so important updates are missed if team members don’t check periodically. Great platform to bridge gaps and provide for synchronous and asynchronous communication. Robust document creation and versioning platform which allows for sharing of documentation between teams.</td>
</tr>
<tr>
<td>SMU-ITU</td>
<td>Wikis</td>
<td>Project documentation, Sharing of API documentation, guides, tutorials</td>
<td>Collaborative content creation possible with version control. Time consuming with extra markups but not too much of a deterrent.</td>
</tr>
<tr>
<td>SMU-CMU</td>
<td>Google Docs</td>
<td>Build content collaboratively</td>
<td>Effective means of on-the-go content creation as it does not support version control and overwriting and or deletion of data is a major risk.</td>
</tr>
<tr>
<td>SMU-CMU</td>
<td>Google Hangouts</td>
<td>Video Conferencing</td>
<td>Seamless integration with Google Docs and Google Drive to provide real time communication and content creation simultaneously.</td>
</tr>
<tr>
<td>SMU-ITU</td>
<td>Skype</td>
<td>Interactions between Project Managers and cultural liaisons</td>
<td>Seamless integration with Facebook to provide synchronous and asynchronous communication channels.</td>
</tr>
</tbody>
</table>

Note:
[2] Observations and evaluations based on the author’s immediate interactions with the tools.

Table 2: Analysis of Different Social Media Tools Used By Student Project Groups

Between the two projects, the use of wikis and a few features of Facebook were common, and the difference in ease of collaboration arose from the usage of Facebook’s extended features, including Skype (used for the SMU-ITU project) versus tools provided by Google (used for the SMU-CMU project). Between the platforms provided by Facebook and Google, Facebook is a better choice with respect to ease of use, productivity, and features, which is fairly counter-intuitive because Facebook is perceived to be solely a social networking platform. Facebook integrates neatly with Skype for Facebook for video and real-time communication and for document creation and versioning features, both of which provide basic features for meetings between teams. It also provides effective synchronous communication channels that reduce barriers between teams because they feel that they get to know their teammates on a more personal note, making interaction easier. Upon completion of the projects it was safe to conclude that the strategy to unite wikis with Facebook and Skype provided a strong backbone for collaboration between teams, thereby improving teamwork, efficiency, and development metrics. Different
teams also had the ability to tap into their counterparts’ knowledge bases whenever they required it – whether it was in the form of guides, tutorials, project hacks and workarounds, or past project documentation. Sharing of this knowledge via social media was an empowering experience that resulted in an overall increase in the quality of work produced.

CONCLUSION

Social media in both corporate and noncorporate (student) contexts aid in the dissemination of knowledge, creation of content communities, and establishment of networks of experts across different fields. This could lead to the reduction of different distances between globally distributed teams (Agerfalk P, 2006) that strive to jointly gain a competitive edge in the market. Both corporate and student contexts share the same issues of possible miscommunication. Bringing teams closer psychologically, socially, and culturally via social media tools could greatly aid in improving the qualitative attributes of performance, efficiency, and productivity of the global teams. This improvement could be a contributing factor to the overall improvement of the quantitative metrics of the teams beyond shorter time to market and lower costs, ultimately achieving different organizational goals.

REFERENCES