

Abstract

Cultures vary across organizations and are not homogenous. An organization's deep seeded values and practices affects how they interact with collaborative software. Two organizations were observed, and two employees from each were interviewed. In addition, Hofstede's VSM08 survey was administered. As a result, both organizations scored differently using Hofstede's cultural dimensions as a framework and interviews described the differences in values and practices. This comparison study found that the organizations shaped collaborative software to fit their culture.

Introduction

In this paper, I will focus on how people collaborate with respect to information technology in the workplace - using tools that help individuals communicate and work toward a common goal. I compared groups from two different organizations. Each organization's culture was vastly different, and I wanted to see if Hofstede's cultural dimensions would explain any differences on the use of collaborative software between the groups. Although the structure and systems in-place were similar, the two groups adapted collaborative software to fit their culture.

Collaborative software can be traced back as far as the early 1990s where the first commercial products were being used by companies such as Boeing and IBM. Lotus Notes was among the first that allowed group collaboration when the internet was still in its infancy. The software – then coined “groupware” – helped companies such as Boeing to increase productivity by an average of 91% (Kirkpatrick & Losee, 1992).

Collaborative technology provides a means to augment the human intellect. According to Engelbart (1962), “by ‘augmenting human intellect’ we mean increasing the capability of a man to approach a complex problem situation, to gain comprehension to suit his particular needs, and to derive solutions to problems.” As the complexities of problems grow, the urgency of finding a solution increases as well. Collaboration software helps meet these needs by supporting the individuals of a team and interactions between them while making decisions.

Projects today are highly complex and may involve many teams from around the world. Collaborative software provides a means to support team membership, roles, responsibilities and other ancillary systems, such as budgets and resources. Kirkpatrick and Losee, state that, “in many meetings, 20% of the people do 80% of the talking. Those who are shy, junior,

intimidated, or just too polite typically shut up. Meeting software uses several techniques to loosen the lips of the silent majority. Everyone speaks at once, via the keyboard.”

With the proliferation of collaborative software, companies today implement web-based collaborative tools for employees to enable knowledge sharing. Employees are assumed to have used these pages, save documents, send messages and communicate. Although interesting, easy to use, there are times no one had used the software. The documents are empty, except for the basic documents saved by the creator. There is a problem with the “human-computer” relationship: the ability and willingness to use these technologies. It was not built into the culture (McDermott & O’Dell, 2001).

I hypothesized that culture has an impact on the use of technology in the workplace. The rate at which workers embrace or depend on technology in the workplace may depend on factors such as socioeconomic differences, gender, and racial differences (Mayhew, R., 2010). Hofstede provides a framework of cultural dimensions taken from research in a multinational organization. His work describes how individuals from different cultures compare along multiple dimensions. I will investigate two organizations and the way they use collaborative software using Hofstede’s cultural dimensions of power distance, uncertainty avoidance, and individualism vs. collectivism.

Power distance is the extent to which less powerful members of an organization accept or expect that power is distributed unequally (Hofstede, et al., 1997). High power distance societies, the relationship between boss and subordinate is dependence. A low power society relationship is interdependence. Australia, for example, is a low power distance country while Asian countries such as the Philippines are high power distance. Social hierarchy is prevalent in societies with inequality, Subordinates comply with a leader and leaders are expected to resolve disputes. On the other hand, in lower power distance countries subordinates will readily approach and contradict their bosses. Teams will work towards resolving disputes, and leaders encourage individual thinking.

Uncertainty avoidance, as defined by Hofstede, et al (1997), is “the extent to which members of a culture feel threatened by ambiguous or unknown situations.” The term is borrowed from sociology and is the tolerance for uncertainty and ambiguity. It is subjective to experience; unstructured situations create intolerable anxiety and ways of coping with it depends on the culture of the society. Uncertainty avoiding cultures minimize ambiguity by creating strict rules and laws. For example, Germany rates high in uncertainty avoidance (UAI: 65) compared to countries such as Denmark (UAI: 23). According to Peter Lawrence, a British sociologist, German’s are punctual and plan everything carefully. Germany reduced its risks to a minimum and proceeds with changes step by step to avoid the uncertainty.

Individualism stands for a society where everyone is expected to look after himself or herself and immediate family only. Collectivist societies are integrated in to strong cohesive in-groups that protect each other in exchange for unquestionable loyalty (Hofstede, et al. 1997). The United States, for instance, is very common to climb up the hierarchy ladder. Employees are expected to defend their interests and promote themselves. On the other hand, collectivist societies, like Asia, emphasize on groups. Confrontation is avoided and harmony and loyalty is very important.

I worked for a for-profit company, Millennial, Inc. (pseudo name), for four years. The company consisted of younger generation, “millennial” employees. At this company, I learned their core values, structure, tools and layout in which employees were arranged. Afterwards, I decided to diversify and joined a nonprofit, GenX (pseudo name). GenX was an older group of employees and the culture was very different from Millennial, Inc. Their values, behaviors, and the ways people acted were undocumented, hard to articulate and taken-for-granted. Seeing this disparity between the cultures, I wanted to use Hofstede’s cultural theory model to answer the following question:

- How do two culturally different organizations use collaborative software?

The utilization of technology in general has bounced between technological determinism and social constructivism. Technological determinism claims technology as the most important causal factor that is driving society. Social constructivism claims human, cultural, social economic and other factors are the most important factors driving technology. These two perspectives have answered many issues regarding innovation and the use of information technology in the past. However, when trying to explain research problems using these frameworks independently, the conclusions are debatable and still unanswered (Bimber, 1990). For example, social constructivists would view the use of a mobile innovation, such as the iPad, in the workplace as a tool to be used by employees and that the tool does not affect how employees perform their tasks. On the other hand, technological determinists see the effect that this tool will have on the employees and organizational structure.

With this in mind, I will incorporate these theories after following the methods and analyzing the results from my study. In addition to understanding how the two organizations cultures differ, I will compare whether the technology forced GenX or Millennial, Inc. to shape their culture or if they used their culture to shape the technology surrounding them.

The following section describes the participants, materials, procedures and measures taken in the study.

Methods

The study began with observations within GenX and Millennial, Inc. I recruited two participants from both organizations where semi-structured interviews were conducted with two users, respectively. In addition, a survey was administered to measure the six cultural dimensions according to Hofstede.

Participants

Two participants were interviewed from the nonprofit company, GenX. Both females were selected out of convenience - willingness to participate and availability in schedule. Female A was between age 40 and 49, an Education Administrator, and occasionally worked with external vendors. Female B was between 30 and, a Quality Improvement Analyst and worked internal teams.

The for-profit Millennial, Inc. had two participants – one male and one female. Both were recruited based on willingness to participate and availability. The male was between the ages of 24 and 29 and a Software Engineer. The female was between the ages of 30 and 34 and a Project Manager. They worked with external vendors.

Materials and Procedures

Observations were made while I was employed at Millennial, Inc. and GenX. First, I observed Millennial, Inc.'s use of collaboration software as it applied to their organization. Second, having made a career change to GenX, I observed their use of the same collaboration software. Differences in each organization's culture and use of the software were noted.

Semi-structured interviews were conducted with two users in each organization (See Table 1). A consent form was given to each participant in the study. After having read the form and agreed to consent, the participants were interviewed and their responses recorded for coding and analysis.

Question	Rationale
1. Tell me about the last project you were involved in at your company.	Get the participant to talk about his/her experience. Look for answers regarding what, where, when, why. (ice breaker)
2. What tools (if any) did you use to communicate and collaborate in the project? How frequently did you use these tools?	Find out what tools they use specifically to see if they differ from the other respondent and how frequently they are used.
3. How did you use each of these tools to make decisions? Were there reviews to any content? Can you tell me more	Learn more about how the respondent used the tools and whether or not they felt it was helpful. Is the culture hierarchical or flat?

about that?	
4. Do the tools remind you of any social networking site? Why or why not?	See if content/documents are put into context using social networking paradigms such as video, tweets, reviews, blogging, etc.
5. How were problems identified in the project? Was anyone in particular responsible for facilitating project goals and expectations?	Find out specific cultural behavior within the organization regarding PDI, UAI, etc.
6. In general, if you notice any issues in a project, how would you communicate that? Who would you contact? Why?	Find out specific cultural behavior within the organization regarding PDI, UAI, etc.
7. How thorough would you say documentation is for the projects you were involved?	Find out specific cultural behavior within the organization regarding PDI, UAI, etc.
8. When working on a project, how would you normally hear about any changes that may affect time or scope?	Find out specific cultural behavior within the organization regarding PDI, UAI, etc.
9. Is there anything else you would like to add?	

Table 1.

In addition, I used the Values Survey Module 2008 (VSM08) questionnaire developed by Geert, Gert Jan, Misho Minkov, and Henk Vinken to measure the six dimensions from Geert's culture study. The Values Survey Module was extended to include a question to help stratify by type of organization: for-profit or nonprofit. I invited survey respondents via email or word of mouth from GenX and Millennial, Inc. Also, I recruited respondents via online solicitation, through means such as Facebook and Google Chat status updates.

After receiving the survey responses, the data was stratified by type of organization, age, and gender. I measured the power distance (PDI), uncertainty avoidance (UAI) and individualism vs. collectivism (IDV) scales using the formulas provided in the VSM08 manual.

Measures

I collected both quantitative and qualitative measures to address the study's research questions: A) how do two very different work cultures use collaborative software, and B) does uncertainty avoidance, power distance, and individualism vs. collectivism play a role in how collaborative software is used within the organization?

The interview questions collected qualitative data from the participants. I created eight questions structured to elicit responses about power distance (PDI), uncertainty avoidance (UAI), and individualism vs. collectivism (IDV). In addition, the questions investigated practices

about communication, issue tracking, documentation, transparency and overall views on collaborative software. I was also interested in knowing what collaboration software were frequently used and why. To measure power distance (PDI), the goal was to identify who is responsible for making decisions when using collaborative tools in a team environment. If there was a leader, what conditions designated that person that role and why? In determining uncertainty avoidance (UAI), it was important to understand if and how the tools were being used to share, track and review documentation and other deliverables. The degree to how often they used tools as an interface to collaborate with internal or virtual teams was used to determine individualism vs. collectivism (IDV) in their current work culture.

From the survey results, I wanted to see how respondents from each organization rated on Hofstede's power distance (PDI), uncertainty avoidance (UAI), and individualism/collectivism (IDV) scale. Specifically, I wanted to see if there were significant differences among gender, age and organization types.

Results

I observed the two organizations and the differences in subcultures. Each organization had a different building and space layout for employees. The practices within each organization also differed – from standup meetings to impromptu, in-person visits. Although the structure and systems in place were closely identical, the practices in place were remarkably different.

Millennial, Inc. had a space layout that was team based. Employees were arranged according to project and in team areas, where members were from different departments in the company. The team members would sit in the area for the duration of the project. For example, one project consisted of a project manager, project lead, marketing liaison, software and hardware engineers who were all assigned a section to collaborate until the project end date. On the other hand, GenX had a department layout. Their employees were arranged according to departments and only collaborated amongst themselves. If there were team projects, the resources would come from within the department. If that resource was not available, they would fill that position externally.

The practices of Millennial, Inc. included “stand-ups” and regular department, or “town hall”, types of meetings. A “stand-up” is usually when team members meet daily, at the same time and place, to provide status updates and conflict resolution. Regular department meetings, or “town halls”, provided a status update about the department and company as a whole on a quarter or annual basis. GenX relied more on impromptu meetings. There were no “stand-ups” or scheduled department meetings. If there were conflicts, they were resolved in-person.

The structure at Millennial, Inc. was hierarchical and the systems included a suite of collaboration software, including MS Office, SharePoint, JIRA, an internal Wiki page, and a requirements management tool. These tools were used for transparency within the organization. GenX also had a hierarchical structure and similar tools in-place at the organization. However, the tools were not used for transparency as initially intended and were used infrequently. For instance, their use of SharePoint was not setup to email delegated tasks. Instead, it was used as a task-list for individual employees.

Interview results included qualitative data from the participants. In response to the interview questions, Millennial, Inc. and GenX participants expressed thoughts that could be associated with the three cultural dimensions: PDI, UAI, and IDV. Examples of participant's responses, classified by organization type, were joined with the three cultural dimensions in Table 2 and Table 3.

Millennial, Inc.

Cultural Dimension	Examples
PDI	<p>"I have very little power in what decisions to make. Management has more weight and decides where project goals and expectations lie." – <i>Software Engineer</i></p> <p>"I identify problems and put in an issues list in SharePoint where people can see it." – <i>Project Manager</i></p>
UAI	<p>"We use [collaborative software] to check if companies deliver or make requirement changes. It's nice that it tracks changes and keeps me in the loop." – <i>Software Engineer</i></p> <p>"We share everything on SharePoint" – <i>Project Manager</i></p>
IDV	<p>"I try to resolve with others on the team first." – <i>Software Engineer</i></p> <p>"SharePoint looks like MySpace with profiles, hierarchy in the company, and lots of comments and likes." – <i>Project Manager</i></p>

Table 2.

GenX

Cultural Dimension	Examples
PDI	<p>"Problems were generally identified by both myself and my boss in meetings, email or in-person." - <i>Education Administrator</i></p> <p>"If there are problems, they come to me first, then I go to [management] for final approval because I have no authority." – <i>Quality Improvement Analyst</i></p>
UAI	<p>"There is no documentation to recreate a given process again, if I were to move-up or get replaced." – <i>Education Administrator</i></p> <p>"We used JIRA for issue tracking at one point, but that stopped." - <i>Quality</i></p>

	<i>Improvement Analyst</i>
IDV	"We use SharePoint to check-in or checkout files, upload drafts. We tried using the blogs feature but that didn't work out." - <i>Quality Improvement Analyst</i>

Table 3.

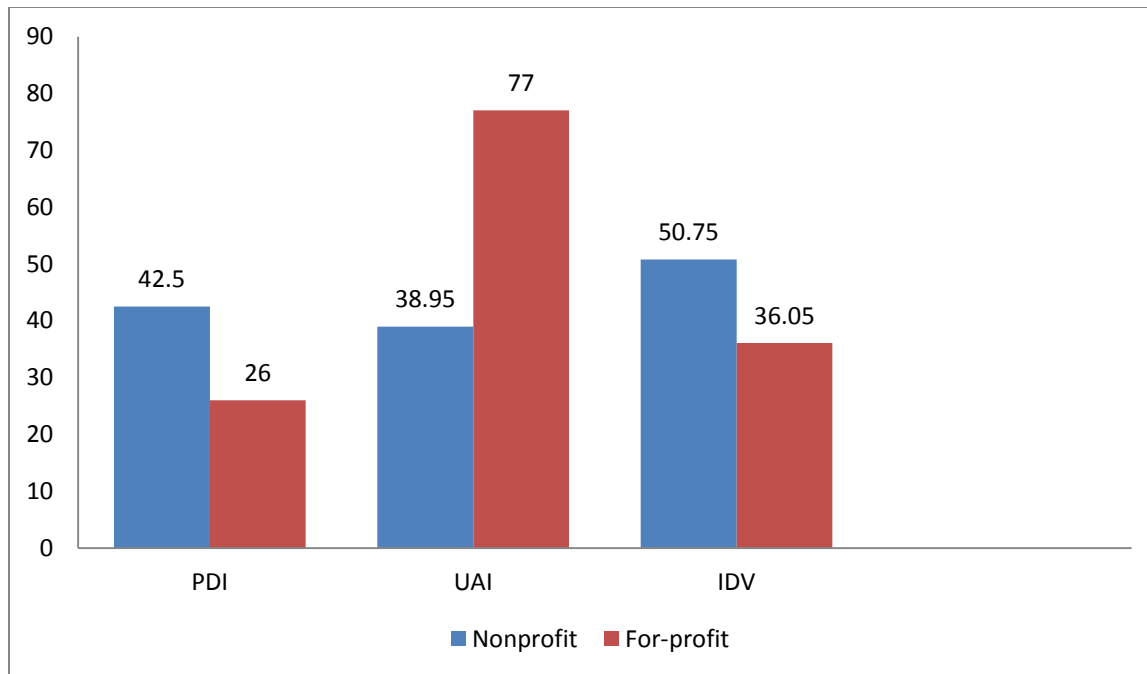
The categories analyzed were: preferred communication, groupware benefits, issue tracking, requirements management, and transparency (see Table 4). Millennial, Inc. communicated verbally through "stand-ups" or through group meetings. They used collaborative software to facilitate processes, perform peer reviews, and share documents. Issue tracking was through a software application called JIRA and "stand-ups". Requirements management was also through software called "Contour" or daily "stand-up" meetings. Transparency was achieved through software and triggered emails. In contrast, GenX communicated via email or phone. They used collaborative software mainly for document sharing. Issue tracking was in-person and sometimes JIRA, and requirements management was via an internal Wiki website or in-person. Transparency was achieved by email, in-person or SharePoint.

Categories	Practices	
	<i>Millennial, Inc.</i>	<i>GenX</i>
Communication	Meetings, "stand-ups"	Email, phone
"Groupware"	Facilitate processes, reviews, document sharing	Document sharing
Issue Tracking	JIRA, stand-ups	In-person, email, JIRA
Requirements Management	Contour, stand-ups	In-person, formal meetings, Wiki
Transparency	Software, triggered emails	Email, in-person, SharePoint

Table 4.

Survey

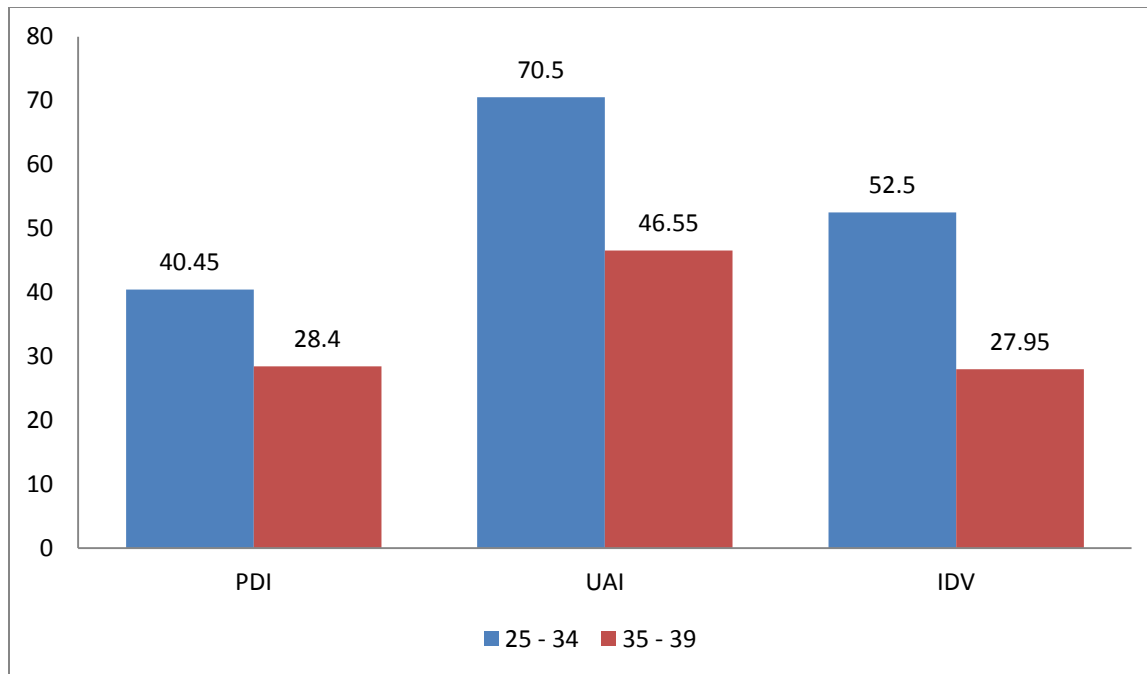
The survey had fourteen respondents. Stratified by organization type, there were nine nonprofit and five for-profit responses. The mean age for the nonprofit was 40 through 49 and the for-profit 25 through 29. The nonprofit PDI, UAI, and IDV scores were 42.50, 38.95 and 50.75, respectively. The for-profit PDI, UAI, and IDV scores were 26.00, 77.00 and 36.05 respectively (See Figure 1).



Organization Type	Total Responses	Mean Age	PDI	UAI	IDV
Nonprofit	9	40-49	42.50	38.95	50.75
For-profit	5	25-29	26.00	77.00	36.05

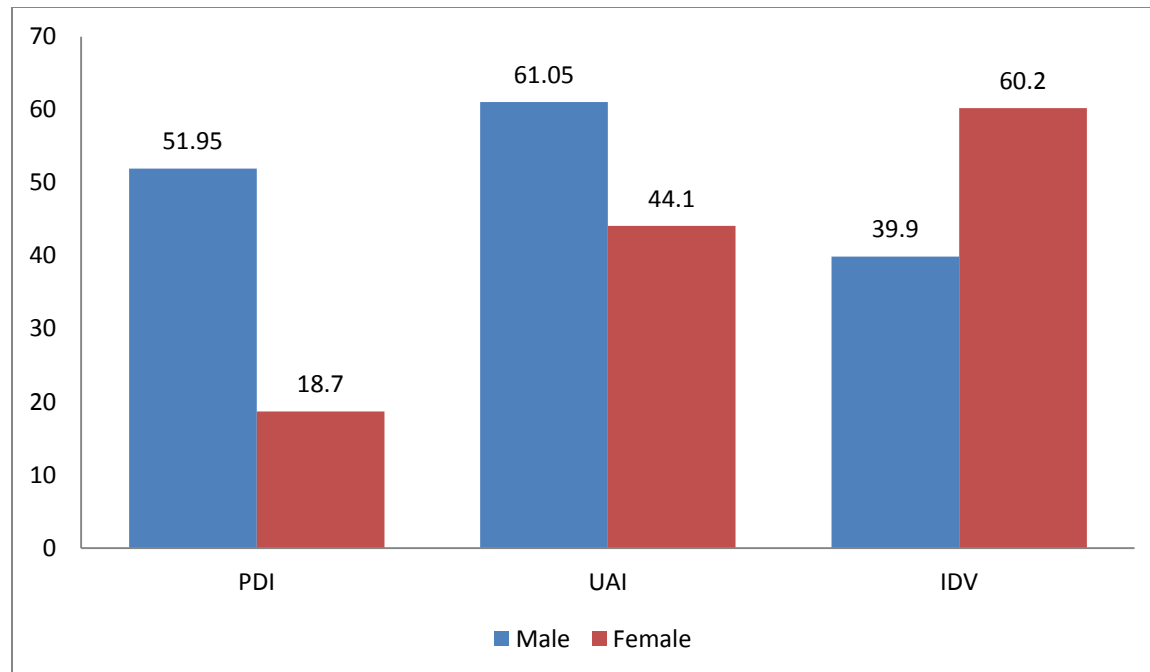
Figure 1.

Stratified by age group 25-34, the PDI, UAI and IDV scores are 40.45, 70.50 and 52.50, respectively. Looking at age group 35-39, the scores are 28.4, 46.55 and 27.95.



Age Group	PDI	UAI	IDV
25 - 34	40.45	70.5	52.50
35 - 59	28.4	46.55	27.95

When stratifying by gender, the PDI, UAI, and IDV scores for males were 51.95, 61.05, and 39.90, respectively. Scores for females were 18.70, 44.70 and 60.20 (See Figure 2).



Gender	PDI	UAI	IDV
Male	51.95	61.05	39.90
Female	18.70	44.10	60.20

Figure 2.

Discussion

Following McDermott and O'Dell (2001), there are examples where well designed collaborative software was used differently between the organizations Millennial, Inc. and GenX. Specifically, through observations and interviews, it was apparent that the organizations adapted software to their culture and not their culture to the software. Additionally, survey's showed where each organization rated on PDI, UAI, and IDV scales

In observations, Millennial, Inc. and GenX used similar tools and systems in place. Their collaborative tools were nearly identical, for the exception of a requirements management tool "Contour". However, their practices varied on the use of their software. Millennial, Inc., for example, shared ideas and insights because it felt natural. They were heavy with documentation, tracking issues so they were visible and controllable within the organization,

and had rituals like “daily standups”. However, GenX had different practices. GenX, traditionally shared documents through a network drive. Since collaborative software, such as JIRA and internal wiki applications were introduced into the organization, GenX employees had been using it primarily to store and share documents of their own work, sometimes even sharing with others, similarly to their use of network drives.

Surveys rated each organization on different scales according to Hofstede’s cultural dimensions. Observations concluded that Millennial, Inc. had lower scores in PDI, IDV and higher in UAI. GenX scored the opposite in comparison. The results of the survey, when stratifying by organization type, supported where I had rated Millennial, Inc. and GenX on these scales. In order to rule out age or generational differences, I stratified by age group and when comparing to organization type, this was not a factor. When stratified by gender, the analysis was inconclusive because there was no method to determine if an organization consisted more or less of either gender.

The two organizations shaped the collaborative technology to fit their culture. Millennial, Inc. had as much human intervention with their technology as GenX. Interview results showed how participants expected software to work for them in each organization, and in comparison their expectations were different. For example, one Gen X participant expressed how they used collaborative technology with this statement: “[w]e use SharePoint to check-in or checkout files, upload drafts. We tried using the blogs feature but that didn’t work out.” While a Millennial, Inc. participant mentioned, “[s]harePoint looks like MySpace with profiles, hierarchy in the company, and lots of comments and likes.” Each organization used the software in a way to solve problems in a manner they were collectively accustomed. The organizations were social constructivists.

Culture defines the way collaborative software is used. Organizations vary, and there are subcultures or even pockets of cultures within an organization (McDermot & O’Dell, 2001). Millennial, Inc. and GenX are two subcultures within a larger encompassing culture in the United States where their values and practices differ. Their use of collaborative software was tied to the way they, as an organization, traditionally shared knowledge and demonstrated processes.

There is no doubt that any of the two organizations may, or will, see that some potential technology does indeed offer a refined process and decide to adapt their culture to take advantage. Organizations are always seeking new ways to improve processes, save money, and reduce time to market. If there is collaborative software on the table that offers a better solution for accomplishing goals, there is nothing to stop them from introducing that product

into the organization. A little training to their employees and culture shift could very well lead them towards the definition of technological determinism.

Limitations

In this study, there were only two organizations analyzed within Chicago, IL. There were three cultural dimensions explored: PDI, UAI, and IDV. Comparisons in strata were among organization type, age group and gender. There were two participants from each organization for interviews. Fourteen responded in the survey, which would result in skewed data if there were any outliers. Future studies would involve comparisons among other organizations in various geographical locations, comparisons with all of Hofstede's cultural dimensions and additional strata, and a larger survey sample.

Two of the interviewers from GenX were from the same department. The organizations may have departments with differing cultures within the organization. Future studies should include more participants in various departments.

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