Management Through Digital Collaboration: An Exploration of Microsoft SharePoint Usage at the USPTO

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Abstract

To recommend alterations to the inconsistently used USPTO executive SharePoint communication system, our team: researched communication strategies, explored the preferences of the USPTO executives, and became expert users of the SharePoint software. We formulated recommendations focused on improving the efficiency, usability, and functionality of the SharePoint sites. By successfully developing and promoting a universal template, naming protocol, and useful instructional tools, our team provided the USPTO executives with a foundation on which to build an effective, dynamic, shared electronic workspace.

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WPI Community

Despite the time that these individuals contributed to help our IQP succeed, we would most sincerely like to thank our advisors, Professor Lauren "The Destroyer" Mathews and Professor James "The Hammer" Hanlan with the following tribute, a sonnet in (almost) iambic pentameter:

Ode to Our Advisors

I sincerely hope that you have enjoyed
Our project; a massive undertaking
To Washington DC we were deployed
To solve a problem: communicating
Toil and work, into paper we plunged
To fix, to create, and to synthesize
Till that with which we began was expunged
O'er the pages, readers were victimized
A report so voluminous was born
Page upon page of scripture, des belles-lettres
All who indulged were swept up: a windstorm
On crie aux Amis, aux sœurs ET frères

Our task complete, a great accomplishment
We release you now, kind-hearted docent

-James Davison

Executive Summary

Effective communication is critical to the success of any company or agency, regardless of size. With the advent of the digital age, commonplace methods for communication, such as paper reports and memos, have been translated into digital systems, such as shared workspaces and email. In recent years, the United States Patent and Trademark Office (USPTO) has moved much of its internal data infrastructure into a Microsoft Office SharePoint Server 2007 system. This system has been used successfully for: tracking meeting attendance and agendas; tracking the availability of executives; storing countless files and data; and providing instant access to crucial information. Inconsistent usage of individual SharePoint sites dedicated to projects within the Strategic Development Committees (SDCs) has resulted in inefficient communication among project members and directors. Consequently, it has become difficult to maintain reliable project information.

The Strategic Development Committee project sites were created as a part of the USPTO 2010-2015 Strategic Plan with the intention of providing accurate information regarding project status, goals, and progress. Pertinent information within these sites should be analyzed and linked to metrics on the Strategic Planning Balanced Scorecard, a separate SharePoint site used to monitor how well the USPTO is meeting the goals set by the Strategic Plan. However, the inconsistent usage of the SDC project sites has hindered progress. The goal of our project was to assess the current usage situation of the SDC project sites and to recommend a strategy for a more effective introduction to, and implementation of, the SharePoint sites.

Through our interviews with 14 of the 24 Patent Directors, the 4 Assistant Deputy Commissioners, and the Deputy Commissioner for Patents, we found that these executives were never given a formal introduction to the purpose and use of their project sites. The primary issue with using the sites, as reported by 86% of Patent Directors interviewed, was the lack of time

available for learning how to use the SharePoint system. Additionally, we collected data from the directors regarding currently utilized functions of SharePoint, issues with the current sites, and proposed solutions to improve the sites, which are summarized in Table 1:

Table 1: Aggregation of Top Recommendation Considerations from Patent Director Interviews.

Top Functions to Preserve	Top Issues to Consider	Top Proposed Solutions
Ability to coordinate schedules among multiple employees and monitor availability	The SharePoint lacks a universal naming system – executives and managers are often confused about how to name files	Develop a user-friendly notification to remind executives managers when to update, or to alert them to new developments on the project site
Simple File Storage on a centralized server to keep desktops clutter free	The search function is not intuitive and it is unconventional; it takes more time to use than it allows the user to retain	Implement a universal template that is used for all SDC sites, so SharePoint navigation is consistent
Community storage and access to past and future meeting agendas, minutes taken, and announcements	The executives do not have enough time to learn how to use the system effectively	Develop a nomenclature system that allows executives and managers to have a consistent naming pattern for documents

After reviewing the information collected during this project, our team produced a set of five feasible recommendations that would enhance and streamline usage of the SDC SharePoint project sites. While directed towards the SDC sites, these recommendations could potentially be applied to enhance other underdeveloped areas of the SharePoint system. The three primary recommendations produced through our analysis were:

1. *Enhanced site template*. Modifying the current template to display summary information on the home page of the project, as well as improving internal navigation of the site, would make the site more intuitive and appealing to use.

2. *Creation of instructional materials*. Providing an instructional protocol detailing how the sites should be operated and how to perform tasks within the sites would promote proper use of the system.
3. *Universal document name convention*. Creating a universal convention for document names hosted on the SharePoint server would both make files within sites easier to locate and enable the search function to be more fully utilized.

Along with each of these, our team produced prototypes that could be implemented and further developed to fulfill these recommendations. In addition to this, our team produced two secondary recommendations that would further increase the capabilities of the SharePoint system:

1. *Upgrading the Microsoft Office suite.* Upgrading the version of Microsoft Office used at the USPTO from 2003 to Office 2007 or 2010 would greatly increase the integration of the SharePoint with desktop applications (for example, importing tasks into Outlook).
2. *Appointing SharePoint project managers*. Appointing a small number of members to manage the SDC project sites would ensure that sites remain organized and functional.

By implementing these recommendations, our team believes that the Patent Office executives would see an increase in productivity and organization. These advantages produce a greater incentive to utilize the SharePoint as a primary workspace, eliminating the need for alternative means such as email and shared drives. We are confident that, by embracing the recommended modifications, the Microsoft SharePoint system at the USPTO could be an effective and reliable executive communication tool.

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1. Introduction

Communication is a vital component of any functional organization. Without a successful communication system, requisite tasks cannot be functionally assigned, necessary data cannot be transferred, and products cannot be advertised. Breakdowns in communications happen so predictably that an entire industry is built on the prospect of improving communications at a corporate level. Consequently, there are a myriad of technologies and strategies dedicated to maintaining stable personnel infrastructures. Regardless of the types of technologies employed, it can become exceedingly difficult for an organization to successfully transition to a new communication system, no matter how critical the adoption of a new system may be. Such difficulties can arise from a multitude of causes, including a lack of instruction on how to use the new system properly or a lack of time for members to use or familiarize themselves with the system. Should the members of an organization become divided in their use of new and old communication systems, significant breakdowns in communication can occur, resulting in impaired productivity. The development of effective communications strategies requires an exceptional understanding of the consequences of a dynamic organizational structure.

There are currently over nine thousand individuals employed by the United States Patent and Trademark Office (USPTO, 2010e). The executives of the USPTO have recognized that communications amongst themselves need to be refocused in order to keep pace with its growing and dynamic organization. In recent years, members of the agency have attempted to shift the bulk of communications concerning the purpose and progress of Strategic Development Committee (SDC) projects into a Microsoft SharePoint site system. Ideally, each project would be managed within its own site, but all project sites would be unified with a common template and set of information. Each site would contain the project charter, which details required information such as the status, resources, purpose, and priority of the project, as well as the

names of the project leader and other members. In addition, the site would also contain an up-to-date "action plan" for the project used to track milestones and progress. Finally, the SDC sites would host links, documents, and an organizational calendar relevant to the project, and these items would be accessible by all members.

Although the notion behind streamlined SharePoint usage at the USPTO exists, it was not fully recognized or understood by all project managers. The majority of the SDC projects are either out of date or vacant, although a number of sites are utilized to some degree. These inconsistencies suggested that some of the executives and managers in charge of these sites, as well as other members working on the projects, continued to use alternative means of communication and collaboration rather than the intended SharePoint sites. Concurrently, some individuals took the initiative to use the new project sites, further emphasizing the aforementioned disparity. This resulted in difficulties for executives attempting to communicate or transfer data between project sites. Such complications were even more detrimental to any external parties who desired up-to-date and readily accessible information concerning project status and progress.

In order to best understand the factors stymieing communication at the USPTO, one must understand the information relevant to the problem at hand. Corporate communication was defined by Cornelissen (2008) as the tactics and media that are used to relay information between members of a company, both internally (e.g., USPTO employees) and externally (e.g., applicants of patents, trademarks, and copyrights and various oversight and supervisory groups within the U.S. government). Given the context in which Cornelissen wrote, it is logical to apply that definition to the function of communications among executives of the USPTO. In addition, it is important to understand that executives work on the upper management level, far removed

from the day-to-day work of the patent examiners on actual applications. The productivity of the executives, who handle multiple groups and projects simultaneously, revolves around their ability to communicate with one another and those whom they supervise.

The USPTO has taken their management systems (both storage and communication) into the digital age. Currently, the agency uses a Microsoft SharePoint system, which is a client-server based workspace used to communicate relevant data between users. This system was implemented as a solution to optimize the different functions of the USPTO. Specifically, implementing SharePoint was an attempt to make the communication process more efficient among the executives of the USPTO. This "shared workspace" is a digital environment in which multiple users can work in tandem and access current updates on projects, assignments, and other important tasks, presumably facilitating collaboration among USPTO executives.

The executives at the USPTO are aware of the importance of accurate and efficient communication among project managers and the necessity of maintaining reliable data within projects. The integration of SDC project sites into the USPTO SharePoint system was an attempt to streamline the presentation of relevant project progress and data. The system was meant to provide easy access to external executives, as well as to allow members of the organization to complete projects in a digital workspace. Inconsistent usage of the SDC project sites was prevalent among the majority of the user base. Executives at the USPTO desired to know why the sites were not being used effectively, and sought recommendations methods to encourage and enhance site usage.

Through this project, our team aimed to highlight the problems related to inconsistent usage of SharePoint sites for managing projects among executives and managers at the USPTO. The specific causes for the inconsistent use of the SharePoint system were unknown before we

began this investigation. To understand reasons for underutilization of the project sites, our group interviewed executives and managers associated with the SDC project sites: the Deputy Commissioner for Patents, the four Associate Commissioners for Patents, and fourteen out of twenty-four selected Technology Center Patent Executives. These interviews were conducted to understand the obstacles that prevent the executives from using the system as intended. After identifying these problems and addressing potential solutions, we formulated recommendations for policies and procedures that should encourage use of the SharePoint project sites and convince both executives and managers to take advantage of the opportunities for effective collaboration provided by the system.

2. Background and Literature Review

Companies and government organizations are labyrinths of offices, employees, managers, executives, and information. Navigation through and comprehension of a large organization may seem nearly impossible, so it is important to understand the strategies, infrastructure, and tools that these large organizations utilize to help smooth out their operating procedures. By starting at the executive level, it is possible to examine the communications that drive a company forward and impact the organization as a whole. Communications strategies inherently take one of three forms: technologically based, through the organized interaction of the company's personnel, or some combination of the two. Finally, one can look at the effects of communication strategies on the company as a whole.

Executive communications at the United States Patent and Trademark Office are hindered by the inconsistent usage of a system based around a Microsoft SharePoint server, resulting in an underdeveloped shared workspace. In this chapter, we will analyze communications principles applicable to the USPTO in order to get both a general and specific understanding of the problems associated with executive communications in this agency.

2.1 Executive Communications

In the United States, large corporations and large governmental or nongovernmental organizations have powerful influences over the country's various economic, social, and political agendas. These organizations require special infrastructures for employees to harness and control that power. Often, these organizations are too large to be organized by a linear structure of administration. There are simply too many constituent parts of the organization to be overseen by a single managerial figurehead. This is remedied by appointing a group of executives to run the company. For example, General Electric, one of the largest companies in the world, is headed by Chief Operating Executive (CEO) Jeff Immelt (Forbes, 2010), who sits

on a board of directors who run the company. Executives of any large organization have a significant burden placed on their shoulders, both fiscally and socially. Usually, the shareholders and supporters of a company look to the executives and either praise or criticize their decision-making. For this reason, executives must develop strategies to communicate amongst themselves in order to stay organized and accomplish necessary tasks.

2.1.1 What are Executive Communications?

Cornelissen (2008), a professor of corporate communication at Leeds University Business School, defined corporate communication as "the tactics and media that are used to communicate with internal and external groups." Communications do not merely encompass methods of information relay, but also the media through which information is transferred. Cornelissen (2008) also claimed that corporate communications are essential to preserving the image and reputation of the company. For all intents and purposes associated with this project, the terms: corporate communications and executive communications are interchangeable.

Communication facilitation among leaders and their subordinates becomes increasingly complex as an organization grows in size, especially when one considers the size of an organization like the United States government. Cornelissen (2008) discussed the importance of an "integrated approach" to communication. An integrated approach involves coordinating communications within an organization so that it has one coherent "corporate identity." For example, when a new telecommunications company called "Orange" was launched, it was tasked with introducing, marketing, and effectively distributing digital networks for the up-and-coming mobile phone market in the United Kingdom (Cornelissen, 2008). The group of executives at France Telecom, the parent company sponsoring this ambitious venture decided that the company needed to be united under a singular cause, represented by the name: "Orange." Through this unique approach to executive communications, the company combined the multiple

executive branches under one overarching brand, and the company thrived and was (as of 2007) the 67th wealthiest brand in the world.

Linsky (2007) attempted to pinpoint the characteristics of "high-functioning" executive teams. The points made in the article reinforce the theory behind the "integrated" facets of executive communications. The two most important characteristics are the ability for the executive team to have difficult conversations efficiently and to share responsibility for what happens within their organization. In contrast, Linsky claimed that a lack of cohesion in an executive team stems from a lack of a sense of ownership of the final product, and a refusal to communicate with one's peers, whether stemming from competition or general inability to communicate effectively.

When considering the function of executive communications, Cornlissen's (2008) theories agreed with those written ten years prior by Goodman (1998). Goodman stated that communications could be described as "a wide variety of management functions related to an organization's internal and external communications." Though this book was written before much of the technology currently available was developed, Goodman understood the importance of both interpersonal and technological communications. He implied that executive communications must be structured to be effective, and that avenues through which to pursue this structure come from media such as computer networks, email, and forms of digital media.

Since the USPTO focuses on international relations as well as domestic, it was important to explore how foreign entities engineering the executive communications system. Van Ruler and de Lange (2003) offered a look at foreign executive communications, claiming that Europeans have begun to realize the growing importance of not only observing how executive communications are conducted, but also taking a more active role in managing them. Van Ruler

and de Lange (2003) determined that, of the three communication categories within a company (marketing communications, public relations, and internal communications), executive communications are primarily based on internal communications. The study included an examination of the organization of communications departments within different companies, finding that over 60% of the organizations involved in the study had only one department managing all communications at the organization.

Van Ruler and de Lange (2003) also discussed the dangers of unbalanced communication responsibilities, by claiming that encroachment, or the appointment of unqualified individuals to oversee communications, causes deterioration of a company's internal structure. Allowing such individuals to run one of the most important, vital systems within an organization without the proper training or understanding can be devastating to the efficient functioning of that organization.

2.1.2 The Responsibilities of an Executive

Those responsible for running large organizations fill a unique niche both in society and at their respective organizations. Goodman (1998) explains that executives have the responsibility of upholding the mission statement and philosophies of the corporation they oversee. The executives of an organization must communicate and coordinate both internally with employees and externally with customers, shareholders, or the public.

Internally, the executives are responsible for motivational or developmental programs for their employees (Goodman, 1998). They must uphold the culture of the organization and impart its mission statement to their subordinates by communicating examples either through actions or in words. Communication can be more than the flow of data or the exchange of words. Both the way these acts are accomplished and the tone through which they are accomplished say a lot about the executives, and about the company as a whole.

Broom (1982) defined the role of executive communications more fully by breaking down corporate communication responsibilities into four main categories. Executives can play the role of: communication technician, expert prescriber, communication facilitator, and problem-solving process facilitator. Broom saw the latter three to be largely similar. Those three roles in the workplace were not fully distinguishable, and therefore, tasks were difficult to delegate to executives assigned to each role. Dozier (1995) condensed these four major roles into two key roles that executives can fulfill: communication technician and communication manager. Dozier (1995) and Broom (1982) both agreed on the definition of a communication technician, claiming that such an executive role implies the implementation of decisions made that are not directly related to the management of the company- these may be more related to the actual processes within a company. The communication manager delegates the responsibilities of the managerial staff within the company. Although these are two radically different roles, it is important to remember that they are still the responsibility of the executives running the organization.

Nancherla (2010) moved away from the theoretical aspects of the executive mindset and focused on the real-world application of executive responsibilities. By analyzing the expectations placed on executives by their companies, Nancherla (2010) was able to synthesize a list of traits and responsibilities that are important to executives. More than half of the U.S. companies surveyed by ClearRock, an outplacement and executive coaching firm based in Boston, wished that their top-level executives were more capable strategists, while a majority of 67% agreed that their executives needed better leadership qualities. In the end, the article defines executive responsibilities to encompass everything from leadership, strategic thinking, communications, and company vision, to a provider of motivation, management, decisiveness,

and creativity. As such, it is logical to draw the conclusion that the majority of executives working for companies need to work on their communication skills in some way.

2.1.3 The Challenges of Executive Communications

While anyone trying to communicate ideas or information to others will encounter problems that may require unique or creative solutions, executives have additional concerns to attend to. A vast array of responsibilities allows executives access to information that most employees or civil servants would not have. Consequently, executives are allowed access to larger amounts of information, which can be difficult to deal with. Mr. James Dwyer (personal communication, 14 September 2010), Assistant Deputy Commissioner for Patent Operations at the USPTO, explained that there is a 13.5 to 1 ratio of patent examiners to supervisors and a 200 to 1 ratio of examiners to directors. As one climbs the ladder higher and higher, greater responsibilities are taken on while other specialized responsibilities are dropped, which can cause various challenges for the executive.

Generally speaking, when dealing with data, people, or money, the more there is, the more complicated the process of managing that quantity becomes. In 2009, the United States Patent Office (USPTO, 2010d) received more than 482,000 patent applications. This represents a massive amount of data that requires processing. With each patent application comes approximately $1500 in applications fees, which also needs to be processed appropriately. Logistically, receiving and moving large amounts of "product" increases the stress on the administrators of a system.

The same thing happens when one attempts to command a large workforce. Oracle Corporation (2010), one of the largest database companies in the world, employs over 105,000 people. Managing a workforce of that size requires expert strategies for communications. Their teams employ a multitude of communication systems, ranging from face-to-face interactions,

conference calls, and email correspondence to the implementation of databases and streamlined file transfer services. Each of these systems can be used in conjunction with the others to deal with complex situations.

An organization that offers a unique product or outcome that cannot be attained through other means within a country, such as the USPTO, may face public scrutiny, embarrassment, and distrust if it fails to operate effectively. James Brashear (2010), who is the Vice President, General Counsel and Corporate Secretary of the NASDAQ, categorized the day-to-day security challenges facing executives. Primarily, executives must be concerned with the type of material they are discussing. Brashear claimed that executives deal with far more sensitive information than the average employee working at a company. Paul Williams (2007), who is the chair of the strategic advisory group known as the Information Systems Audit and Control Association (ISACA), as well as the IT Governance Institute, agreed with Brashear (2010). He explained that "information security is paramount to global commerce." Executives deal with highly sensitive material, and loss of control of this material through unstable or unreliable communications can be disastrous.

Brashear (2010) and Williams (2007) also agreed that security based on information technology is not the correct solution; the authors disagreed about the direction that executive communication security should take. Brashear argued that each individual form of communication needs its own form of security. Physical delivery can be monitored, and only trusted couriers used, but this form of security is labor intensive and can present problems with time-sensitive issues. Emails and faxes are instant and easy to use. Email is considered the primary method of communication in an office environment. Unfortunately, computers are liable to tampering, and emails can be intercepted. Sensitive information cannot necessarily be

sent through email. Brashear's solution to this problem comes through encryption and password protection of documents.

Williams (2007) favored a committee-based approach to security. He suggested that organizations use a Chief Information Security Officer (CISO), an executive much like the CEO or the CFO, to oversee security at the company. The role of this executive is to inform and control the actions of other executives and members of the company regarding security. It is a highly dynamic position, requiring outside work by the CISO to stay up-to-date on the latest in technological security measures.

Finally, executives must be concerned with communications both internally and externally (Brashear, 2010). These two different venues offer individual challenges based on the circumstances during which they must be employed. Often, executives are constrained by the security of their companies. It is exceedingly difficult for them to communicate with and accommodate outside interests in the company.

In addition to security restrictions, executives must acquire and continuously develop a unique set of skills necessary for internal and external communication. Cornelissen (2008) provided a qualitative understanding of the skills necessary for executives to effectively represent their organization. A director or executive is continuously challenged to understand his or her shareholders, as well as the dynamic reputation and identity of his or her company. A director must be aware of the theories of communication for different types of businesses, as well as customs in different parts of the world. He or she must be able to adapt to changing environments, as well as develop an extensive knowledge for his or her organization's client base.

Goodman (1998) further emphasized the importance for executives to have positive public images by explaining the need for external communication. He used the example of how Macy's™ understands that its customer base wants to view it as a family business. The company promotes this image annually by holding the Macy's Thanksgiving Day Parade. If the executives working at Macy's broke with the image of a family business, they would be relinquishing important support of the company, tarnishing both their own reputations and the reputation of the company. From information organization to security concerns and the upholding of the reputation of their company, executives are continuously challenged with situations different from those facing the average employee. The ability of the executives to handle these types of situations makes them qualified for their job (Cornelissen, 2008).

2.1.4 Communication Strategies used by Executives

Ultimately, some experts believe that the strategic planning of an executive communication process can be broken down into three main points: the combination of planned and emerging communication processes, the general direction beyond individual communication tactics, and the overall organization and consideration of the environment in which the strategy will be introduced (Cornelissen, 2008). Executive communications can be carried out through various channels, the most efficient of which is a hotly debated subject. Kim and Prasad (2006) proclaimed in 2006 that 4G mobile servers were the way of the future for businesses. They argued that the coming dependence on mobile data transfer networks would dominate not only the executive domain, but also the public domain. They claimed that the speeds at which data is transferrable over a 4G system far exceed those available via any other mobile network. By allowing executives access to such a high-speed network, efficiency and effectiveness of communications could drastically increase.

Cornelissen (2008) argued that a communication strategy is about more than the technology or the software implemented rather than the network upon which it is built. He discussed the steps necessary to build a successful communication program, both internally and externally. Cornelissen (2008) discussed the necessity for a strategic "intent," that is, the executives in question must establish a goal for their communications program before planning. They must then define "communication objectives," by analyzing the problem areas within the processes or communications systems of their organization. After identifying these areas, they must proceed with a communication strategy, including everything from data transfer, message style and detail, and the budget (either time, or money) to implement the communication system.

A group of executives can also call upon an outside organization to provide them with a strategy. For example, the Harvard Management Update (2007) relays information about a communications and organization model known as "The Morning Meeting (TMM) Model." This specific model involves mandatory meetings of the same executives day after day to force communication about initiatives within the company. Each executive is given a chance to voice his or her concerns, allowing for a greater sense of community and inter-executive communication. Sometimes it is easier and more cost effective for an organization to bring in outside help to solve their problems. Recognizing when this is necessary is part of the strategizing process (Linsky, 2007).

Executives must have technological expertise. Before the executives enforce a communications system, they must make sure their employees can handle the hardware and the software involved. Shared workspaces occupy a unique niche in the software universe. They allow their users to communicate data changes, make announcements, upload documents, and perform a variety of other tasks in order to keep a project orderly and efficient.

2.2 Shared Workspaces

Shared workspaces are an integral part of today's business society. With so many data being transferred from person to person and company to company, a cohesive workstation is all but required to succeed. Researchers have conducted studies as far back as 1993 to determine the value of shared workspaces within the office environment (Geelhoed, 1993).

2.2.1 What is a Shared Workspace?

A shared workspace is a digital environment in which individuals who are granted access can communicate their ideas. These pragmatic storage stations allow for the relatively effortless transfer of information and can help prevent prodigal data storing practices. The correct application of shared workspaces is up for debate. Protopsaltou et al. (2006) argued for the use of digital shared workspaces when considering the mediation of an environment. The authors proposed the idea of a "fourth party" in a communications system. They saw shared workspaces as an opportunity for a "fourth party" arbiter (either within the company or an outside consultant) to monitor and evaluate the work that is being shared, completed, and compiled by an organization.

Other individuals believe that the shared workspaces are simply efficient ways for individuals to communicate information and data, and to track their changes to files or ideas. Kunzer et al. (2002) evaluated the benefits of Shared Workspace Open Framework (SWOF) at the Aachen University in Germany. The students assessed the importance of communicating information in research and development projects and commented on how much of the work for these projects was done in an offline format. The group performed an experiment in which they attempted to smoothly introduce different research organizations to a shared workspace.

In general, Kunzer et al. (2002) argued that the components of a typical shared workspace included: document sharing, group calendars, project management utilities, contact management

utilities, and discussion forums. Any member with sufficient access to the workspace can update these sections, and all members of the group can see the changes made. This becomes especially important as the number workspace members grows, thus permission levels for editing and viewing parts of a workspace are a major design and implementation concern.

Shared workspaces are beginning to move into the realm of mobile workspaces (Rodriguez-Covili et al., 2010). Though workspaces can technically be accessed from anywhere with an internet connection, it is a recent advance that workspace access is being developed for mobile devices. This evolution is supported by research done by Kim and Prasad (2006), who hypothesized that mobile networks were the way of the communication future.

2.2.2 Freeware versus Pay-to-Use

Most types of software on the market come in pay-to use and free-to-use media. Freeware is software that is distributed to the public at no charge. The idea of freeware has existed since the first instances of software distribution. Some of the first freeware distribution took place in 1982 (Goldsborough, 2009). Often, freeware programs are not as sophisticated as a piece of software one would pay for. Additionally, technical support for these programs is generally limited.

Despite the disadvantages, freeware is becoming increasingly prevalent in today's digital world. Marketwatch's annual evaluation journal (2006) published an article on corporate responses to open source software. Since open source databases and communication programs were becoming more widely used, even at a level above the individual user, larger organizations began to offer freeware to accompany this open source software. Pay-to-Use software licenses tend to be distributed by for-profit companies that fund their business through revenue generated by the software they develop instead of through donations, although in some cases pay-to-use software may be distributed by other companies in order to make up for the costs of producing

said software. Examples of premium pay-to-use workspaces include Groove and Microsoft SharePoint.

While pay-to-use software tends to offer stronger technical support, freeware can offer comparable functionality for virtually no cost. Drawbacks to the reduced cost and increased availability can be severe. Since freeware usually does not generate revenue for its distributor outside of donations and voluntary support, smaller systems can fall into disrepair or cease to be supported. In addition to this, widely used freeware, such as Google Docs, located on external servers can pose a greater security risk than pay-to-use software located on company run servers. An example of this, as described by Kincaid (2009), occurred when a bug in the Google Docs system caused some private documents to become publicly shared. Although this accounted for less than 0.05% of the documents hosted on Google's servers, it demonstrates the risk posed by using external freeware systems when hosting critical data.

2.3 Microsoft SharePoint

The United States Patent and Trademark Office currently employs a Microsoft Office SharePoint Server 2007 (MOSS) to manage the communication of project details and data among executive managers and project members. MOSS offers a centralized collaboration space in which users can create multiple workspaces for various projects within which they can communicate and share files and information with one another.

2.3.1 Local vs. Server – Groove vs. SharePoint

While both Microsoft Office Groove and SharePoint are used for similar purposes, SharePoint Server 2007 and Groove 2007 (now known as SharePoint Workspace 2010) are two fundamentally different programs (Freeman, 2010). Both programs feature collaborative workspaces and integration with various other Microsoft tools but handle the storage and transmission of data in completely different ways. The similarities in both function and name

often cause confusion when discussed by people who only have experience with one of the two; thus, it is necessary to describe the differences in use and function between them.

A Microsoft Groove workspace is built on a decentralized peer-to-peer framework, where copies of the workspace are hosted on each individual's desktop (Freeman, 2010). Whenever one individual makes a change to his or her local workspace or a file within that workspace, the software sends an automatic update out to all members of that workspace. It is notable that, rather than uploading the entire file to each other member whenever a change is made, the system only sends the data necessary to perform the modifications. This system is ideally used for smaller project groups who travel and spend much time offline or have slow internet connections, as they will always have access to every file in the workspace, and updating their files can be done with ease any time they find a connection.

Conversely, a Microsoft SharePoint Server workspace is built using a client-server foundation, where all files are hosted on a server to which users must connect in order to make changes (Gilster, 2008). Through centralizing all data on a server, it is much easier to include large numbers of personnel in a project workspace, both as collaborators as well as viewers, as there is a definitive source for the latest versions of data rather than having to rely on data being flung from member to member via peer-to-peer transitions. In addition to this, since the primary interface with the SharePoint Server system is through a web portal (Freeman, 2010), it provides much greater capability for interface customization and data presentation. Consequently, Microsoft SharePoint provides a much more effective medium for the display and communication of data among a large pool of members.

2.3.2 Uses as an Organizational Tool

Microsoft SharePoint offers a suite of tools available for collaboration among members, ranging from a group calendar, to task lists, to a document repository. A prominent

organizational feature of the site is the workspace calendar (Bates and Smith, 2007). Members can use the calendar to keep up-to-date on scheduling, including availability and leave of group members. Calendar items allow for the inclusion of information including: proposed location, start and end times, meeting descriptions, and future recurrence. In addition, if the user has the necessary privileges for creating new workspaces within the site (Sterling, 2007), specialized "Meeting Workspaces" can be created for organizing attendees, agendas, minutes, and other relevant information regarding the event. Another notable organizational component of the SharePoint site is the task list (Bates and Smith, 2007), which allows project members to create tasks, defining traits such as priority, due date, status, and descriptions, and then assign those tasks to the members who are working on them.

One of the potential organizational opportunities offered by SharePoint lies in its integration capabilities with Microsoft Outlook (Gilster, 2008). By accessing a shared calendar on the site and choosing "Connect to Client," one can synchronize their Outlook 2007 or 2010 software with the calendar, enabling them to view the latest workspace calendar on their local machine, as well as make adjustments to the calendar, should one possess the correct privileges. Using Outlook Scheduling Assistant in conjunction with synchronized calendars allows workspace members to easily determine what free hours each participant has and to maximize the available attendees when scheduling meetings. If the user in question has privileges within the SharePoint site (Reid, 2009), he or she can create synchronized meeting spaces through Outlook that create their own customizable workspaces within the site, complete with room for agendas and minutes as well as attendance responses from invited members.

2.3.3 Additional Features

There are many packaged features that come with SharePoint, such as integration with Outlook calendars and other Microsoft Office programs, as well as capabilities for developers to

construct their own features and programs (Gilster, 2008). The document repository is a crucial feature in any SharePoint workspace via which users may collaborate on documents of various types. Here users can upload and download documents for the project, as well as open documents within the repository and modify them online without having to download them to the file system, should they have the correct permissions. Sensitive documents can be "checked out," granting sole editing rights to the user that checked out the document until he or she completes his or her changes and checks it back into the system. Apart from uploading documents and revisions to the workspace manually, Microsoft Office programs, such as Word and Excel, offer the option to save a document directly to the workspace, provided that it is a new document or it has been checked out for revisions (Reid, 2009).

In addition to its smooth integration with Microsoft Office, the web platform of the SharePoint Server offers capabilities for the creation of web applications and solutions (Jansen, 2009). The creation of these solutions is done through using Microsoft SharePoint Designer, a specialized HTML editor intended for modifying SharePoint sites and code. Many solutions can be constructed through using this software to modify existing frameworks, such as setting up and customizing email notifications when tasks are complete or automatically creating documents necessary at points during a workflow.

2.4 USPTO and its Executive Communications

The United States Patent and Trademark Office (USPTO), like many other large organizations/agencies, changes its communication processes over time to keep up with the latest technologies. Certain communications are more important within the USPTO than are others. For example, an email between two examiners about where they want to go for lunch is not as important as the meeting time and place for a team of executives working on a certain project.

The USPTO could not function properly if the executive communications were misinterpreted or just simply did not exist. These executive communications affect the outcome of the overall patent process in a multitude of ways.

2.4.1. Chain of Command

Mr. James Dwyer (personal communication, September 14, 2010) explained that current communications at the USPTO are broken up into three primary levels. These tiers are based on the different operating positions of the USPTO, consisting of the patent examiners, the managers, and the executives. Each position has a different responsibility and level of authority. The patent examiners report to the manager level positions, while the managers report to the executive level positions. This "chain of command" is common among most businesses or agencies. The executives at the USPTO must have a unique mindset in order to accomplish their goals. They cannot spend their time focusing on small day-to-day problems or issues. They must be looking primarily at the "big picture" in order to keep projects and the employees whom they supervise functioning smoothly.

2.5 Implementing New Technologies in Corporate Settings

For technology to be incorporated into an organization, it must be widely accepted by all potential users. Upper level management and executives, as well as lower level workers, must be able to benefit from the changes. If the technology is not accepted, but is still implemented, it will not be utilized to its full potential. The immense variety of available solutions can either lead to progressive developments or create additional problems in any corporate setting.

2.5.1 Technology Implementation Process

The executives and managers of an organization must consider how technology affects the daily operations of their organization and how effectively employees can do their jobs. In order for a company to integrate technology into their working environment successfully, the

leaders must recognize the needs of the company. Along with decision-making, managing information technology (IT) and generating a plan for technology is crucial for an organization's ability to implement and adapt to new technologies.

The decision process that organizations undergo to determine which type of technology is needed can be described by the use of a decision model (Lawson-Body et al., 2010). This process can be observed when considering the development of wireless technology. According to Lawson-Body et al. (2010), the decision model consists of a number of steps. After identifying potentially useful technologies, the organization or its representative must identify the coverage needed by the technology, based on the needs and functions of those individuals who need to use it. This "coverage" describes the various groups of employees that the technology will affect when implemented. There are three different coverage areas that are broken down into small, medium, and large. The number of individuals who would be affected by the technology dictates the size of these coverage areas. Once the coverage area is chosen, the organization or representative can decide on the type of wireless technology that will most effectively meet the needs of the organization. While this decision model was applied specifically to wireless technology, similar decision models could be applied for any type of technology.

2.5.2 Resistance to Technological Change

Employee resistance is a critical variable when an organization is considering information technology implementation (Lapointe & Rivard, 2005). While resistance to new technology has many origins, it can be used as an indicator that indirectly communicates a user's discomfort with a new system that might be flawed. This contradicts a common assumption about resistance, that it should be regarded only as a critical obstacle that prevents organizations from utilizing the potential benefits of the technology being implemented. Lapointe and Rivard

(2005) analyzed two models created by Markus (1983) and Joshi (1991). Using the political variants of interaction theory and equity theory, they attempted to explain resistance to information technology implementation.

Markus's (1983) model dealt with a theory of resistance to management information systems (MIS). This model used the interaction theory, which holds that people or groups resist the implemented system because of individual characteristics relative to the person and to the system. Due to the difficulty of defining this theory, Markus instead used an example to describe the theory. This example described a system's ability to affect the authority hierarchy within an organization and the resistance met by the individuals using that system. The term "interaction" was applied to the individuals within the hierarchy of the organization and then the evaluation of the resistance was based on those specific interactions. It was concluded that, if the system alters the balance of power, the system would be resisted by those who lose power and accepted by those who gain it.

Lapointe and Rivard (2005) acknowledged Markus's model as a way to describe the resistance to implementing technology relative to the interactions between the system and the users, as well as the context in which the system is being used. Broken down, this model shows that the source of the resistance is conflict between the system being implemented and individuals' perceptions of what the system is being used for, or how the system is being applied.

Consistent with the model of Markus (1983), Joshi (1991) proposed that individuals evaluate technological changes and resist, whether or not those changes are in their favor. Contrary to Markus's model, Joshi used a model based upon equity theory, not interaction theory, in order to describe the resistances. Equity theory has been used extensively and is deeply rooted in the social sciences. John Stacey Adams, a 20th century behavioral psychologist

who developed the original theory, believed that employees working together strive to maintain equilibrium. He believed that each employee would vary their input and consequential outcomes based on their perception of their colleagues' respective inputs and outputs (Adams, 1966). Joshi simply applied this theory to technology in the workplace through a model that has three different levels that users employ in order to assess the change introduced by an implementation. First, a user would analyze the change in terms of a gain or loss in their equity status. At the second level, the user attempts to compare his or her outcome due to the change with that of the organization. The third and final level of analysis is where the user compares his or her outcome with that of other users in their group or organization.

Lapointe and Rivard (2005) drew conclusions from Joshi's model to explain that there are individual perceptions of the system along with benefits and drawbacks that the technological system will establish for that individual or group. Essentially, the system being implemented could be beneficial or harmful to an organization relative to the specific person viewing the outcomes.

These models did not consider resistance either good or bad; rather, Lapointe and Rivard (2005) illustrated that it can have positive and negative effects relative to the specific situation. In that it may generate conflict and take up valuable time, resistance is detrimental to the infrastructure of an organization. Alternatively, when resistance prevents the use of a system that has unfair results and undesirable effects, it can be useful for an organization. Lapointe and Rivard (2005) concluded that, if a technological system is perceived to represent a loss of power for individuals within an organization, then they are more likely to resist. More specifically, the magnitude of the power loss for individuals and the perceived importance of the technology would dictate the strength of the resistance.

2.6 Benefits and Drawbacks of New Technology in the Workplace

The prevalence of technology in today's businesses society is undeniable, but it is important to consider exactly why that is. Technology can accelerate growth, but it can also stunt it. Fear of the latter is often the reason why companies may be resistant to accepting new technologies. By focusing on computer-based technologies, mostly used for organization, data transfer, and communication (similar to Microsoft SharePoint), it is possible to appreciate the benefits and drawbacks that have been seen through past technological implementations.

2.6.1 The Internet and Productivity

The internet is an integral aspect of society that is here to stay. When dealing with the functions of any business, especially one that requires intense amounts of computer work and research, it is critical to observe how the internet can impact productivity. A quintessential part of the office environment is an email system. Email allows individuals to communicate almost instantaneously from all over the world. Kelly Services, a successful Fortune 500 company, conducted an international survey of approximately 70,000 workers across 28 countries to determine whether email and the internet were important, productivity-boosting aspects of work environments (Kelly Services, 2007). Using the survey results, the following diagram illustrates employees' opinions regarding the internet's impact on productivity in the workplace in various countries.

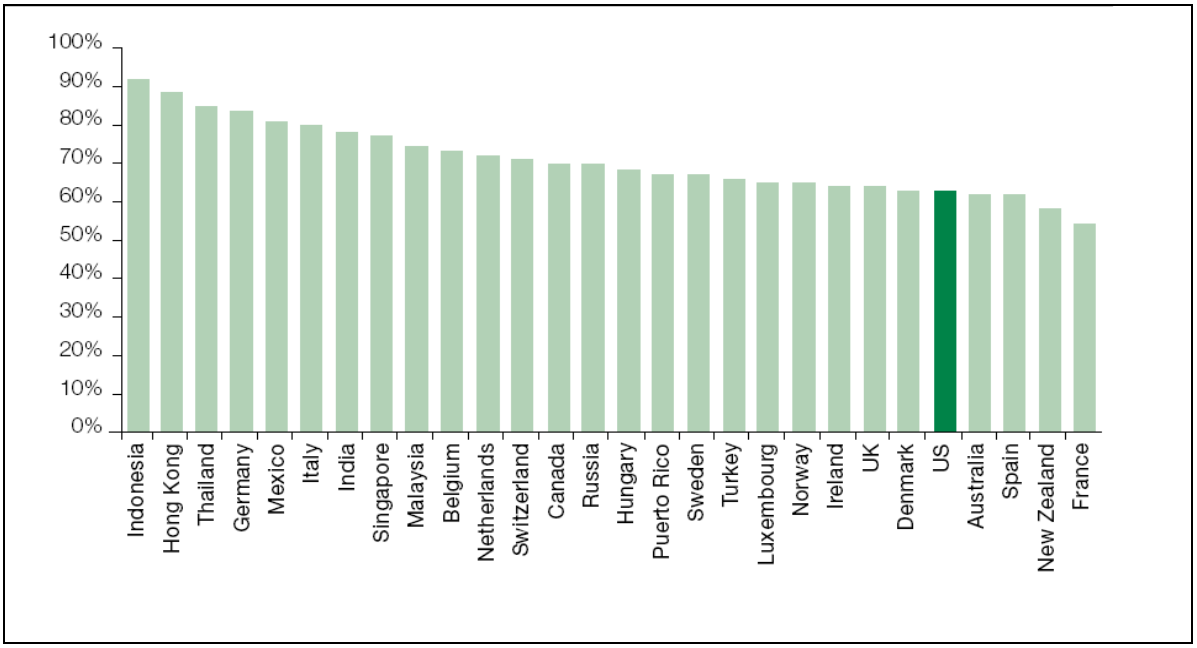

Figure 1: Results of Perceived Impact of Internet on Productivity Survey. Approximately 70,000 workers across 28 countries showed that, on average, 69% of the employees felt that the internet does increase productivity (Kelly Services, 2010).

In each of the countries represented in the survey, all of which are developed nations, more than half of the participants agreed that using the internet at the office benefited them. The global average resulted in 69% of employees believing that the internet did increase their productivity at work. Furthermore, the study also pointed out that additional attention needed to be dedicated to internet-based training. For example, the survey highlighted the need for readily accessible acceptable use policies and illustrated the extent to which the internet is used for personal reasons while at the office. While the Kelly Services (2007) survey shows that many employees believe that email and internet access increase their overall productivity, it is quite possible for the opposite to occur. For example, a study by India's Chamber of Commerce showed that social networking sites like Facebook have caused an office-based productivity loss of nearly 12.5% (BBC News, 2009).

It has also been shown that, as individuals learn more about technology and how to use it properly, negative aspects of the integration of the internet into the workplace can be alleviated. When internet and email usage in the office was still in a developmental stage, there were fears of losing electronic data, cases of information overload, and fears of "big brother" watching what employees were doing (Society of Financial Service Professionals, 2001). Between 1998 and 2001, as acceptance of technology began to settle in, these fears began to reduce. This is shown in the table below, which contains an excerpt of data from a survey of the perceived negative impact of information technology in the workplace.

Table 2: Change in Fear of Technology. Based on findings from 1,130 respondents who use technology for business purposes (Society of Financial Service Professionals, 2001). N = 1130.

Technological Issue Feared	Percent of Workers in 1998	Percent of Workers in 2001
Distinction between work and personal time	67%	48%
Fear of "Big Brother" watching	63%	46%
Fear of being displaced	68%	25%
Overload of data and information	66%	49%

The internet's impact on the business environment is disputed, but it stands as one of the most important inventions in the modern world. Therefore, it is a beneficial point to reference when concerned with the impact of large technological shifts in any working environment.

2.6.2 Using Technology to Extend Physical Work and Recruitment Environments

Technology not only influences how daily business is carried out within an organization, but also affects the ability of an organization to extend work environments beyond the bounds of the physical office. For example, writing at the peak integration time of new and rapidly changing technologies for businesses and agencies, Cohn (2000) explained that the expansion of technology has allowed individuals who may otherwise be considered disabled to work. This

benefits their livelihood, and allows the parent company a larger employee base from which to draw.

Organizations are also finding that, by adopting technological tools, they are able to expand the physical environment in which their employees are able to work. One of the most important phenomena in the modern business world has been the rise of telecommuting as an acceptable strategy for expanding the work environment. Telecommuting began more than half a century ago following the end of World War II, with the increased use of television and telephones in conducting business (Reymers, 1996). The actual term was coined in the 1970s, and, originally, the rise of telecommuting was attributable to the realization that fossil fuels would not last forever. Less transportation meant less fossil fuel consumption with the same capacity for work and productivity.

Nearly twenty years ago, John S. Niles (1991), President of Global Telematics, claimed that telecommuting was one of the most important developments of the end of the 20th century. He claimed that telecommuting would help to develop and reenergize the economy like nothing else, creating new job opportunities by greatly expanding possible employment locations. More recently, the 21st century "gas crisis" sparked by the consistent increase in gas prices has brought telecommuting into an even more prominent light (Cohen, 2008). Telecommuting allowed employees, as well as employers subsidizing transit costs, to save money by avoiding spending money on gas and transportation.

However, Cohen (2008) also warns about the dangers of telecommuting in relation to the security concerns associated with modern technology. He points out that, at a private residence, computer security is a major consideration when determining if telecommuting is a good idea

(Cohen, 2008). A company has no definitive control over the configuration of a telecommuting employee's phone lines, internet connection, or physical mail collection.

The security disadvantages are counteracted by the numerous advantages associated with telecommuting, both from an employee and employer perspective. From the perspective of a company considering the system, telecommuting was originally shown to reduce the rate of "job-hopping" amongst employees, as well as to improve productivity (Johnson, 1994). Those trends hold true today, improving retention rates by 37% over companies who do not use telecommuting, as well as decreasing employee stress by 25% (Levinson, 2008). In addition, if the job permits telecommuting, companies are able to hire the most qualified applicants for the job, regardless of the individual's location.

Employee benefits are also evident. Telecommuting has been associated with reduced stress, more employee freedom, and improved personal health (both physical and mental) (Johnson, 1994). However, employees also experienced challenges while telecommuting. One study conducted by CompTIA indicated that more than half of employees were concerned with the security of corporate information (Levinson, 2008). The most prevalent challenge was shown to be personal responsibility for the security of the work they are doing.

Telecommuting is quite popular in today's private and public business sectors among employees and managers who reside significant distances from their business offices, as well as employers who do not want to allow transit distance to prevent the hiring of qualified individuals. Leaders of the United States Patent and Trademark Office have been exploring "hoteling" options, by which the examiners are able to work from areas outside of Alexandria, VA (Marques et al., 2008). This allows the agency to hire more employees, not all of whom need to work on site.

More recently, companies embracing the growth of social networking sites are finding enormous employee bases, with individuals eager to work for them. Companies are finding ways to cut out the middleman to find qualified applicants through sites such as Twitter, Facebook, and LinkedIn (Jensen, 2010). Each site has its own merits and drawbacks, but the acceptance of such technologies as viable means of recruitments is essential for companies hoping to compete in today's industry.

2.7. Conclusion

The field of executive communications encompasses a wide range of topics, all of which are important for businesses to consider. As has been discussed, communications at a managerial level are concerned with security, volumes of data, communication pathways, and a myriad of other internal and external concerns. Corporations often look for help from outside of their company, be it a consultation, software program, management restructuring, or a combination thereof. One of the tools discussed to help streamline executive communications is Microsoft SharePoint, which is a powerful and influential piece of software if utilized correctly. In particular, an agency as important as the United States Patent and Trademark Office needs to be able to fully and consistently utilize the capabilities that SharePoint has to offer. As the organization moves forward with different initiatives such as "hoteling" and expanding employee hiring, it will be important to consider the correct way to implement such technologies.

3. Methodology

Although the executives of the United States Patent and Trademark Office have attempted to enhance the agency's internal communications through the implementation of a Microsoft SharePoint system, the implemented process is imperfect. Inconsistent usage of that SharePoint system hinders executive communications, resulting in an underdeveloped shared workspace. The goal of our project was to recommend a strategy for a more effective introduction and implementation of the Microsoft SharePoint communication system through software usage education and promotion to executives. To accomplish this goal, our team devised a series of attainable objectives to guide our progress. We compiled explanations of various investigation strategies including but not limited to: semi-structured interviews, focus groups, structured surveys, and experiments. The following explanations clarify how each step of our project was accomplished.

3.1 Objective 1: Determining the Current Advantages and Disadvantages of the Microsoft SharePoint System at the USPTO

Before recommending changes to the executive communication system at the USPTO, our team needed to understand the role of SharePoint at the USPTO. We explored what advantages and disadvantages Microsoft SharePoint would present to an organization that is not only large, but has varying layers of employee permissions and security restrictions. In this section of our project, we describe the steps we took to identify and document the problems that caused the communication and SharePoint management issues at the USPTO.

3.1.1 Exploration of and Familiarization with the USPTO SharePoint Server

To assist with on-site research, our team was granted owner-level access to one part of the Executive Microsoft SharePoint Suite, known as the Strategic Development Committee (SDC) site. Owner-level access entails full control over the site, meaning that we had the ability

to view, modify, create, and delete any information stored within the site and the structure of the site itself. Our first task was to determine the accuracy of our initial assumption that executives were using the SharePoint system, but that they were using it incorrectly due to an incomplete understanding of its capabilities. This assumption was founded on the interpretation of our team's initial contact with our liaisons, Amber Ostrup and James Dwyer. Initially, we believed that the system was in use, but executives were experiencing difficulty in maintaining project information, leading to the unauthorized duplication and disruption of essential data.

To test these assumptions, we performed an in-depth exploration of the system and its different capabilities. We did two different analyses of the system to become familiar with its proposed and actual working mechanisms. The first analysis of the system was meant to be an overview and learning experience. We determined the basic flow and structure of the SDC site. The site interface was a graphical user interface (GUI) organized in a large web with project site hyperlinks hidden behind their respective titles (Figure 2), with each project site following a generic template (Figure 3). In this web, each blue box across the top shows the overseeing committee for the projects beneath it, listing the Associate Deputy Commissioners for Patent Operations leading that committee.

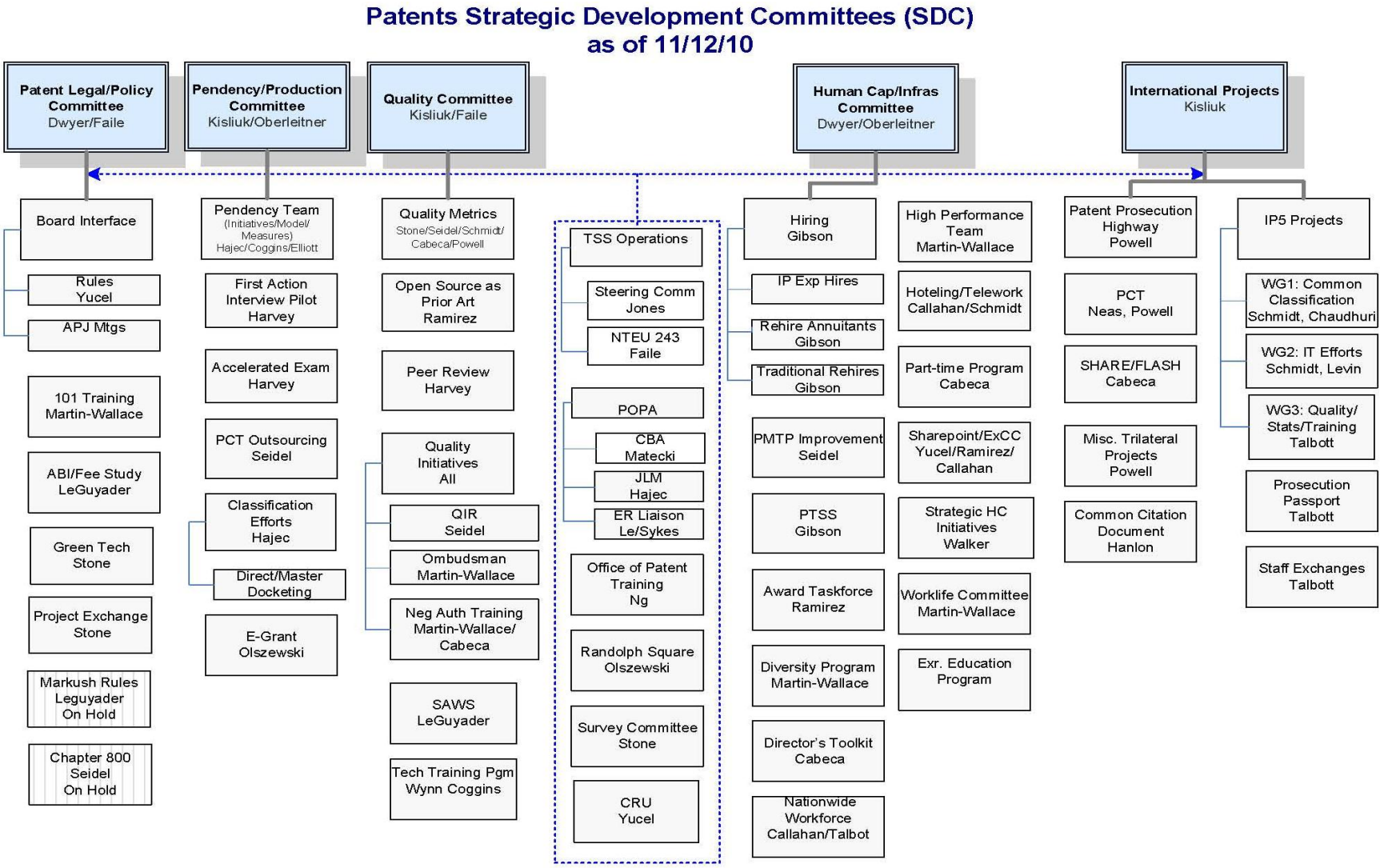

Figure 2: Web Diagram GUI of the Strategic Development Committee SharePoint Site.

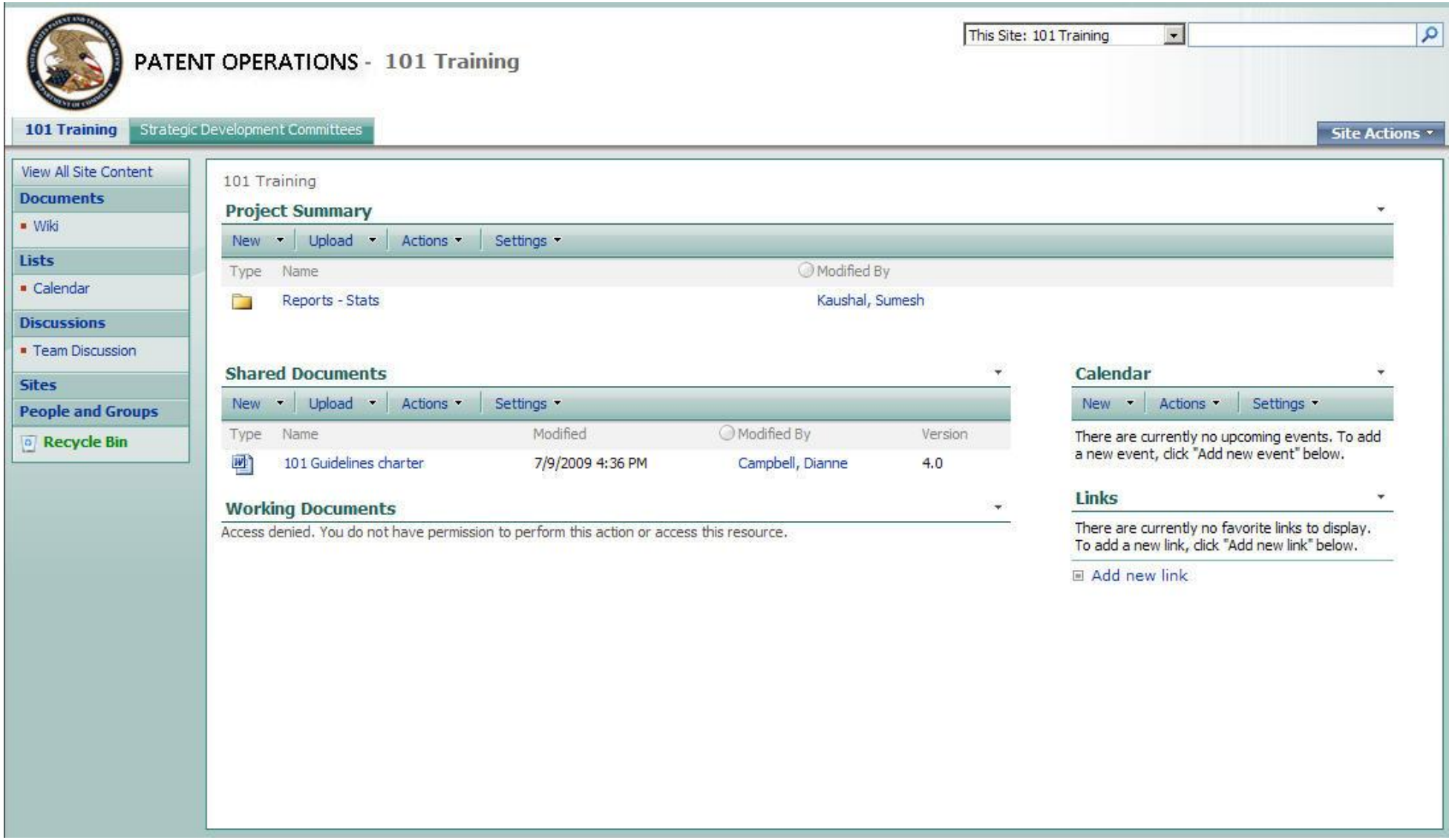

Figure 3: Original SDC Project Site Template.

Our exploration determined that the individual projects were meant to be easily located and accessed through this central hub. One should be able to determine a number of factors, including the manager of the project, the members of the project team, the priority of the project, the funding available, and an action plan for the completion of the project. Our team briefly examined each project site to determine whether the prescribed template was followed.

After completing our initial examination, a reexamination of the site was necessary, this time in greater detail. The analysis of each site was broken down into six different categories of how each project's workspace is used. We used the template shown in Table 3 to determine the degree to which the executive(s) in charge used the workspace: extensively, with a developed action plan and updates on project materials; moderately, with some sort of action plan or updated material; or not at all.

Table 3: Template for Qualitative SharePoint Project Site Analysis.

In-Depth Analysis Template for SDC Project Sites		
Project Name	**Managers Involved**	**Project Plan: Yes/No?**
IQP Example	Davison, Moore, Ruck	Yes
Describe the Plan	**When was it Last Updated?**	**Who has Updated the Site?**
IQP Proposal	December 2010	J.Davison, B.Moore, S.Ruck

It was our hope that by qualitatively identifying the strengths and weaknesses of the SDC SharePoint project sites, our group could piece together a quantitative, albeit preliminary, analysis of how effectively project managers were utilizing their sites.

These steps were carried out to gain an appreciation and an understanding of what the SharePoint server was supposed to accomplish. We were able to use the information gathered in this step of the project to amplify our impact during executive interviews by prioritizing which questions we would ask.

3.1.2 Interview with Sean Vincent: Site Collection Administrator of the SDC SharePoint Server

To understand the positive and negative impacts that SharePoint could potentially have on the USPTO if modified correctly, our next step was to speak with Sean Vincent. Mr. Vincent is a member of the USPTO Search and Information Resources Administration (SIRA) and is a site collection administrator for some parts of the SDC SharePoint server. He has complete control over the layout, permissions, and software upgrades, among other important aspects of the executive SharePoint suite we were dealing with. Our primary goal was to use this interview to determine what Mr. Vincent thought of the current implementation of the SharePoint system. He designed the system, but did not have much control over the actual layout of the project site template (Figure 3) or the introduction of the software, which was left up to the directors of individual projects for each SharePoint site. His opinions and knowledge were vital to the technical development of our project.

Our secondary goal while speaking with Mr. Vincent was to determine what type of resource limitations would affect potential modifications to the SharePoint structure. We knew that the available resources for SharePoint modifications were limited and needed to understand what resources would be available for any modifications we might suggest. It was important to determine what types of recommendations might be more or less feasible based on these confining factors. Should a recommendation require additional resources to be budgeted in order to ensure affective use, it would be critical to prove that following such a recommendation would prove cost-effective.

Finally, we asked Mr. Vincent what recommendations he would make to optimize the SharePoint system. Although he is not an executive at the USPTO, his expertise in the versatility and limitations of SharePoint was of great value to our analysis. We wanted to know what type of organizational structure for the SDC project sites would be most effective, and what type of

development time would go into a venture that involved modifying the software. A copy of the interview questions and the written answers provided can be found in Appendix C.

3.1.3 Development of Test-Sites via the WPI SharePoint Proxy Server

The final step in determining the strengths and weaknesses of the USPTO's Microsoft SharePoint program was to create a test site that mimicked the functionality and aesthetics of the project sites. These SharePoint test sites were created on the WPI SharePoint server to avoid potential security complications at the USPTO. This allowed our team the freedom we needed to modify and explore different aspects of the software without worrying about protecting USPTO information or accidentally damaging any USPTO SharePoint sites.

Our team initially developed two different test sites, one to directly mimic the format of an SDC project site, and one that we felt might solve some of the usage issues with the SDC project sites. This second site was not developed with the input of the executives. Our team developed the modified site based on our discussions with Sean Vincent and Amber Ostrup. Initially, we planned to use these sites to experiment with modifications that might increase the efficiency of site usage. However, following our preliminary analysis of site usage amongst project managers, we determined that these experimental sites would be more useful for creating modifications to the original template that might make project sites more accessible and easy to use for executives. Images of these prototypes were created for potential use in future interviews in order to better discern what modifications might enhance site usage for all active projects, meaning projects that are not designated as "On Hold," regardless of priority levels.

3.2 Objective 2: Identifying the Usage of and Objections to the Current USPTO SharePoint System

After receiving input from experts regarding the design and orchestration of the USPTO SharePoint server, it was essential for us to determine the actual usage of, benefits from, and

objections to the use of the SharePoint server. We planned and conducted interviews with specific levels of USPTO executives, ranging from the Deputy Commissioner for Patents to the Patent Directors. Each interview had to be approached with a different set of questions. We wanted different information from the different tiers of executives (Table 4) because we wanted to make recommendations that could be used for all parties involved in the SharePoint.

Table 4: Tiers of Executives Selected for Interviews.

Executive Position	Number of Executives	Role in SDC Projects
Deputy Commissioner for Patents	1	Oversees directors in charge of initiative committees.
Associate Commissioner for Patent Operations (ADC)	4	Oversee committees which are in charge of the individual SDC projects.
Technology Center Patent Director	24	Oversee individual SDC projects.

Our initial schedule planned for twenty-nine individual interviews, with target interview lengths of twenty minutes. The interviews were structured to be between five and seven questions long. While this limited our ability to ask broad questions, more in-depth interviews with a wide spectrum of subjects ultimately helped us make better recommendations than would have been allowed by a limited number of lengthy interviews. The schedule for our executive interviews can be found in Appendix D.

3.2.1 Interview with Margaret Focarino: Deputy Commissioner for Patents

It seemed logical to start with as broad of a view as possible concerning the goals of the usage of the USPTO's SharePoint server. By examining what could be analogous to a "blueprint" for the communications process, we were able to reconstruct a theoretical outline of the communications structure at the USPTO. Mrs. Focarino, Deputy Commissioner for Patents at the USPTO, was able to offer us some insight on how she believed the executives were supposed to communicate and ideally manage their projects.

Our questions focused less on the technical adaptability of SharePoint, and more on the managerial uses of the program. We used this interview to get a feel for what Mrs. Focarino thought was inefficient about the management process. By understanding what improvements were desired, it was much easier to recommend changes to be made to the SharePoint system.

This interview was conducted by James, Stephen, and Brian, as Mrs. Focarino requested the presence of all three group members at the meeting. For more extensive information on the questions asked and answers received, the interview questions can be found in Appendix E, along with notes taken during the interview.

3.2.2 Interviews with the Associate Commissioners for Patent Operations

Our team decided to interview the four Associate Commissioners for Patent Operations (ADCs): James Dwyer, Bruce Kisliuk, Andrew Faile, and Robert Oberleitner. Speaking with the ADCs allowed our team to consider the goals of the Strategic Development Committee from the viewpoint of an individual who might be overseeing multiple projects at the same time, ensuring that everything runs smoothly. Our questions for the ADCs focused on discovering exactly how much time they spent performing tasks that could potentially be automated within SharePoint. Through these interviews, we were attempting to discover the most important aspects of the individual projects, and exactly how they should be utilized to be most advantageous to the executives at the USPTO.

Mr. Dwyer requested that the ADCs be interviewed as a group so that they could talk amongst themselves as we asked the questions. He explained that the ADCs would like time to discuss the topics as a group because they had not previously set aside time to discuss our specific line of questioning. For more information regarding the questions asked and feedback received, the interview questions can be found in Appendix F, along with notes taken during the interview.

3.2.3 Interviews with the Patent Executives

During the third and final set of interviews, our team spoke directly with the Patent Directors overseeing the individual projects laid out by the Strategic Development Committee. These are the individuals listed as managers of projects listed on the SDC SharePoint site. We used these interviews to understand exactly what the executives wanted to gain by using the Microsoft SharePoint system; they were the most important component of our project.

Our questions focused on discovering which tasks executives might be able to eliminate from their daily schedule via SharePoint, such as the process of sending reminder emails for progress updates or searching for information on the current progress of a project, to free up valuable time in their busy schedules. Through previous research and use of the software, our team was aware of many of the automatic features available to help with management and scheduling available through Microsoft SharePoint. These interviews were conducted at the convenience of the individual; some were conducted as groups of Technology Center Directors, while others were conducted individually. The schedule used can be found in Appendix D. The interview questions and summarized notes pertaining to these interviews can be found in Appendix G and Appendix H.

3.3 Objective 3: Determining Current Executive Benefits Gained by Using the Microsoft SharePoint System

Following the interviews with the USPTO executives, it was necessary to compile our data and determine what benefits are attributed to the current Microsoft SharePoint configuration. By determining the current positive features of the Microsoft SharePoint system, we were able to isolate features within the software that could be implemented, repaired or improved.

3.3.1 Qualitative Analysis of Interviews

To conduct a qualitative analysis of our interviews, we divided the interviews into a series of categories: reasons for use, problem areas, current benefits, and proposed solutions. Table 5 demonstrates, the organization that we used: the right-hand column shows examples of some possible responses that are categorized into the criteria of the left-hand column, but is not meant to show all possible feedback.

Table 5: Template for Qualitative Analysis of Director Interview Feedback.

Feedback from Patent Director of Technology Center	
Reasons for Use	Scheduling, Meeting Agendas, Document Storage
Problem Areas	Poorly Structured Interface, No Easy Search Function
Current Benefits	Reference colleagues' calendars to determine availability for meetings
Proposed Solutions	Implementation of a notification system for project updates and modifications

This organization provided a structure to assist in analyzing each interview individually. By organizing the information as such, it was easier for us to examine the qualitative data tables after the fact and pull out the common themes. This allowed us to narrow the field of recommendation possibilities drastically, and provided an established reference point to keep us on track while devising various solutions.

3.4 Objective 4: Identifying How Shared Workspaces are Used in Work Environments

Since our preliminary assessment of the situation at the USPTO indicated that the SharePoint workspace was being used inconsistently, it was beneficial to our recommendations to determine what functions shared workspaces are used for outside of the USPTO. We used a combination of surveys and interviews to determine appropriate uses for the software. To be relevant to the operations at the Patent Office, the user-base had to be of above-average technical

ability. Our team chose to: survey the general population of WPI, conduct interviews with the head of WPI's Residential Services (currently using SharePoint), interview a Senior Director at Oracle Co., and interview a Director of RMD and billing operations at Dartmouth Hitchcock Medical Center.

We used this section of our project to garner input outside of the Patent Office on what changes might enhance the USPTO SharePoint system. It was important to gather additional information about potential changes and upgrades not suggested by employees at the USPTO.

3.4.1 Interview with Michael Hamilton: WPI Residential Service Director

During our preliminary background research, our team was informed by Thomas Collins, Director of SharePoint Services at WPI, that the managers of Residential Services were some of the most prominent users of Microsoft SharePoint on campus. Residential Services is a large and important department on the WPI campus, handling thousands of students' housing arrangements and employing dozens of residential advisors. Since we wanted to look at executive views of outside organizations, analyzing the Residential Services Director's use of Microsoft SharePoint was a good starting point.

The questions asked during his interview focused on the managerial uses of SharePoint in an environment with technically inclined users. The members of Residential Services involved with updating the SharePoint server are all either WPI engineering students or technological users. The interview protocol, as well as notes on the questions asked can be found in Appendix I.

3.4.2 Survey of the SharePoint Users within the WPI Community

Next, we wanted to get a broad sample of SharePoint users who are well versed in technological fields. The most readily available audience for this survey consisted of the WPI faculty, staff, juniors and seniors. We had ready access to contact lists for the student and faculty

bodies, and this population is sensitive to the importance of gathering data for an effective and successful IQP (and would be more willing to assist). Since WPI students are not encouraged to actively modify the initial setup of Microsoft SharePoint, the survey focused on the usability of SharePoint from an out-of-the-box perspective.

By using the data gathered through this survey, we planned to draw conclusions about the usefulness and different applications of SharePoint outside of the office environment. All of the interviews conducted at the Patent Office focused exclusively on the views of those who work with the information every day. We believed that it would be beneficial to examine the views of those dealing with uses of SharePoint independent of USPTO operations.

3.4.3 Interview with Jay Davison: Senior Director of Oracle Corporation

Following the survey of the WPI community, our team interviewed Jay Davison, a Senior Director at Oracle Corporation, a database company that relies on shared workspaces similar to Microsoft SharePoint. We used this interview opportunity to find out how other large organizations communicate at an executive level. Mr. Davison was able to provide us with insight into a company that operates on a scale ten times that of the patent office, employing 105,000 people. Nevertheless, Oracle still manages to produce effective and efficient products. Interview protocols and notes on the interview can be found in Appendix I.

3.4.4 Interview with Barbara Moore: Director of RMD at Dartmouth Hitchcock Medical Center

We also interviewed Barbara Moore, Director of RMD at Dartmouth Hitchcock Medical Center (DHMC). DHMC uses SharePoint as an organizational tool. Through our interview with Mrs. Moore, we were able to gain insight into the other potential uses of SharePoint from a management standpoint. It was important to hear the opinions of others who use SharePoint in a professional environment. Interview protocols and notes on the interview can be found in Appendix I.

3.5 Objective 5: Development of a Protocol for SharePoint Usage amongst Executives at the USPTO

Through our discussions with Amber Ostrup, and with various Patent Director, it became evident that an official protocol for the usage of SDC SharePoint project sites was never created or distributed to members of the sites. While finalizing our recommendations for future SDC project sites, we determined that it would be beneficial to create a prototype for such a protocol. To create this protocol, we broke down basic SharePoint site usage into six essential elements: the action plan, email alerts, project calendar, project charter, document repositories, and project tasks. We created a set of brief instructional pages that detail the purpose of various elements within the project site as well as an explanation of how to complete various tasks within the site properly. The methods used to complete these five objectives allowed us to obtain tangible and reliable results metrics, expanding the usability and accessibility of our final recommendations.

4. Results

The methodology detailed in Chapter 3 allowed our team to obtain a set of results pertaining to our investigation of the USPTO's Microsoft SharePoint system. This chapter is organized to best prove the completion of each of the objectives outlined in Chapter 3. The following descriptions contain raw results without extensive discussions regarding the impact of the results on our team's recommendations. The discussion, conclusion, and recommendation aspect of this project can be found in Chapters 5, 6, and 7 respectively.

4.1 Objective 1: Determining the Current Advantages and Disadvantages of the Microsoft SharePoint System at the USPTO

4.1.1 SharePoint Usage Exploration and Analysis

Our team's first set of results comes from an in-depth examination of the SDC project site, used to house the projects overseen by the Patent Directors related to the Strategic Development Committee. As described in Chapter 3, we divided the analysis of each individual site to examine the manager involvement, presence and depth of the project plan, the date during which it as last updated, and by whom the documents or assignments in the site were updated. Our observations are limited to the SDC project site because this was the primary component of the overall SharePoint usage to which we had owner-level access. These results were compiled from a set of data available to anyone with access to the site

Our first analysis pertained to the presence of an action plan within each project site. From an executive's perspective, the action plan was defined as the most important part of the SharePoint site. An update, visible action plan allows an executive to determined project progress and task assignments in addition to the general timeline of the project. During our team's exploration of the SDC site, we determined that there were 62 total relevant projects sites, but less than half of these sites (25 project sites) actually had action plans. This means that

nearly 60% of the sites were without action plans, deemed the most important component of the SharePoint site. Only three sites were explicitly deemed "inactive," meaning that there were 59 "active" projects. The percentage is not heavily impacted by excluding inactive project sites, with only 42% of active projects having action plans.

These results do not necessarily mean that the plans were implemented correctly into the site, simply that they were present in some capacity. As defined by the USPTO project directors who organized the SDC project site, a correct project plan would be situated under the "Project Summary" section of the individual SDC SharePoint site as an excel file, titled "Project Action Plan. Furthermore, the document would be organized as a timeline, with completion dates, meeting dates, and task assignments. Problems with the current project site action plans included: incorrect placement of files within the repository, incomplete project plans, and incorrect formatting. These data were not meant to evaluate how well members were utilizing the Microsoft SharePoint site (from an organizational standpoint), but rather, the consistency of use among all Patent Directors.

Our next analysis demonstrated the involvement of the managers overseeing each individual project. We used this part of our exploration to determine whether those overseeing the project were participating actively in the sites, or if they were relying on the managers directing individual aspects of the projects to do most of the updating.

There were 62 total relevant SDC projects at the time of this report. Out of those 62 projects, there were 22 cases (35.48%) in which executives actively participated in their assigned project. This does not mean that 22 different executives participated, because each executive may oversee more than one project. Rather, it means that there were 22 cases in which an executive participated (therefore some executives could participate more than once, and some

not at all). Participation included, but was not limited to: updates made to the project plan, creation of organizational spaces (folders, links) within the project site, uploading documents, and creation of or modification of a Wiki page.

Our analysis then broke down the results further to determine whether or not there was an obvious set of circumstances separating the presence of executive involvement in projects with and without project plans. We found that approximately 40% of executives were involved with projects that included project plans, and consequently, 60% of projects that included project plans had no executive involvement. In a similar fashion, 32.43% of executives were involved in projects that did not include projects plans, with almost 70% of executives not participating in these types of project sites. These data points were not arbitrary – it was important that both percentages were significantly less than half. Neither projects that included project plans nor projects without projects plans had high levels of executive participation.

While dealing with the SharePoint sites, our team discovered that each project was given a priority rating, either low (1), medium (2), or high (3). These priority ratings were assigned by the project managers in charge of the SDC project initiatives, not by our team during the project analysis. To the best of our ability (given inconsistent input), we attempted to determine whether or not there was a significant difference in the number project plans versus the assigned project priority.

The project plans did not contain the priority ratings, the project charter did. Consequently, not all projects with an action plan had a priority rating, and not all projects with a priority rating had an action plan. They are supposed to show whether a high priority project site is used more than a low priority project site, and not to draw definitive conclusions on the impact of assigning projects via a priority system. In this analysis, we assumed that projects that

followed a project plan were used more often that those without project plans (persistent observation proved this to be accurate). Table 6 shows the preliminary results of the priority analysis, in which the priority values were recorded and the average priority was taken from projects with and without plans.

Table 6: Priority Analysis of Current SDC Project Sites. N = 34.

Priority Analysis	
Priority Scale	**Average Priorities**
High Priority: 3 **Moderate Priority: 2** **Low Priority: 1**	Projects with plans: 2.67 Projects without plans: 1.74

As the table demonstrates, the planned projects (17 projects included in this analysis) had an average priority rating of 2.67 out of a maximum of 3.00 while the projects that lacked action plans (17 projects included in this analysis) had an average priority of 1.74 out of a maximum of 3.00. Table 6 does not include data from projects that were on hold, which would have received a rating of zero on the priority scale, thus skewing the data. We used a T-test to determine whether or not there is a statistically significant difference in the mean priority rankings of projects with and without plans. The difference was statistically significant ($t=0.49$, $df=1$, $p<0.001$), because the "t" and "p" show that there is low variability between the two data sets. We also noted that the sites with higher priorities tended to be more developed than those with lower priority by assessing the dates during which the projects were updated, as well as the variety of documents contained in the Shared and Working Documents repositories.

Finally, we investigated the average amount of time since the project sites were last updated. While investigating the sites, we noticed that the majority of the sites were not updated

frequently, if at all. We separated the project sites into categories based on most recent update of any documents or the project's action plan, or the most recent layout changes. These categories were: within 0-4 weeks, within 4-8 weeks, within 8-12 weeks, within 3-6 months, earlier but during 2010 , and any time during 2009. Figure 4 shows the breakdown of these categories by percentage of all SDC project sites not designated as "On Hold."

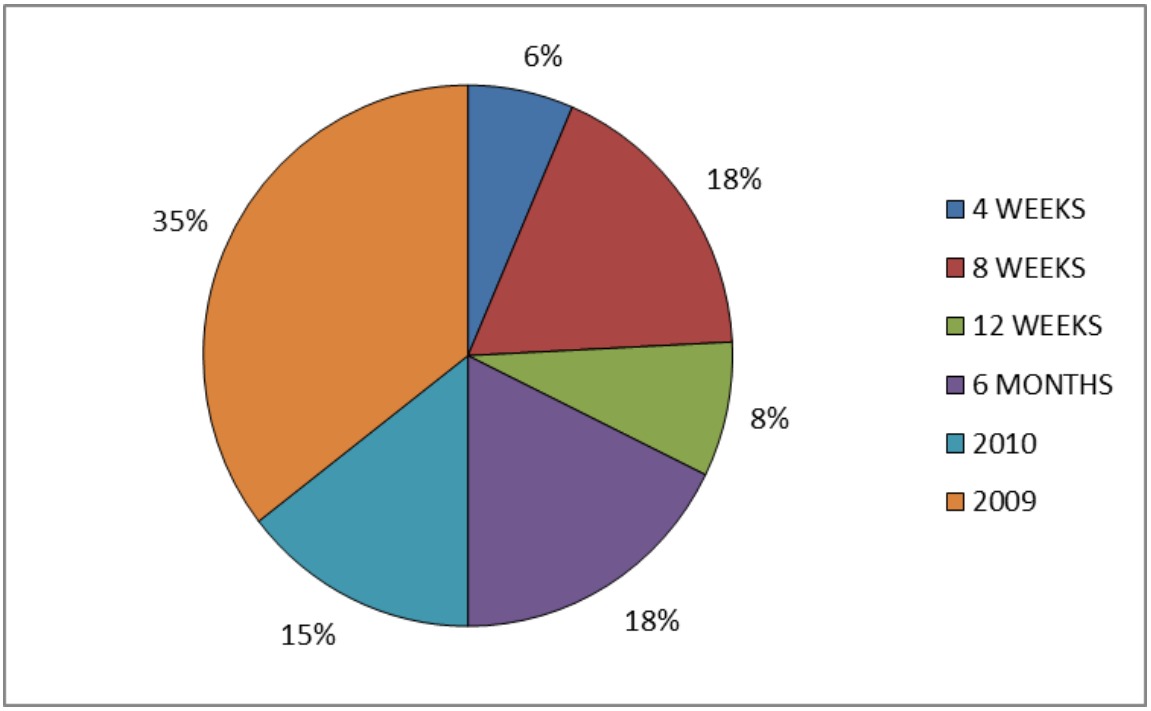

Figure 4: Breakdown of Times When SDC Project Site Were Last Updated. N = 62.

The analysis of the project-update timeline yielded that only 6% of the projects had been updated in the last four weeks, while nearly 35% of the projects had not been updated since 2009. Updates from six months, three months, and two months were all similar, representing 18%, 8%, and 18% of the projects respectively. The average update time for all projects from this sample was approximately 32.5 weeks. These results included projects that were on indefinite hold, retired, and currently active. Therefore, some of the data were skewed, as

projects that were on hold or retired would not be expected to be updated since they were no longer designated as active. However, that data was important to include because it was still available on the SDC project site. The update times are available for anyone with access to the site to review and draw conclusions.

In contrast, to examine the most extreme circumstance (with the largest number of theoretically "inactive" projects), we removed all project sites not updated in 2010, assuming that the projects were inactive due to the long gap in updates. Figure 5 represents the results of all sites considered active (not designated as "On Hold") if updated during 2010.

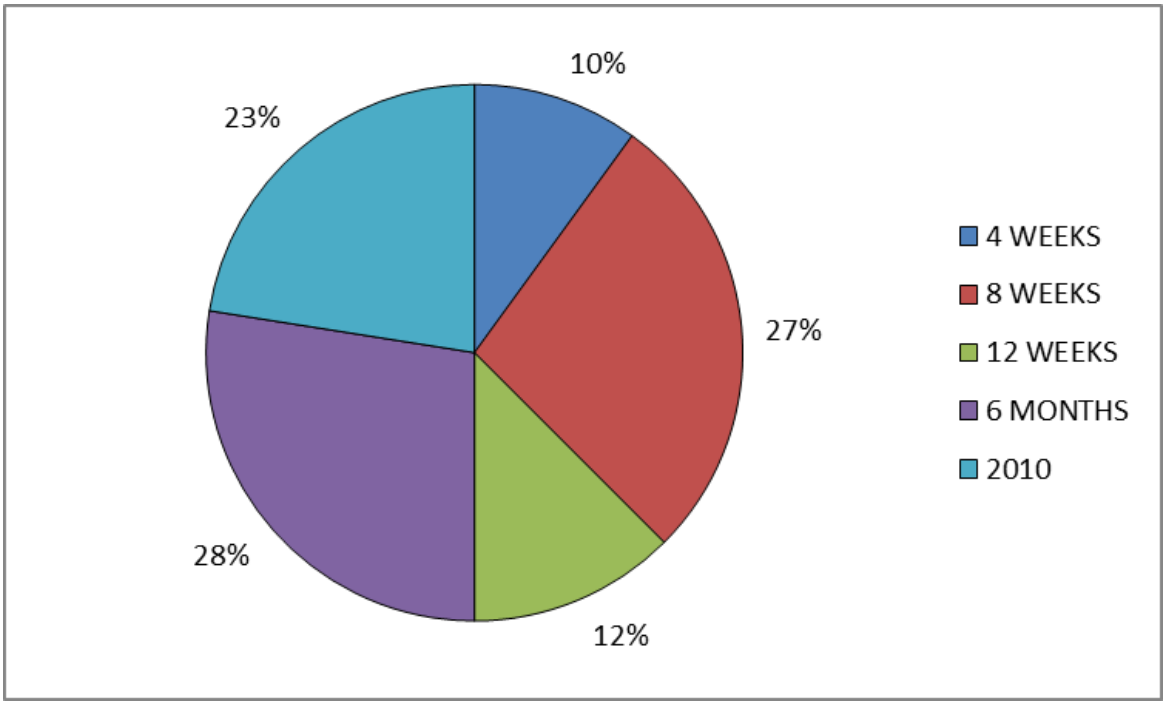

Figure 5: Breakdown of Times Within 2010 When Active SDC Project Site Were Last Updated. N = 40.

The final sample set shows a much different set of update percentages. The majority of the updates (63%) happened between the first of the year, and 3 months prior to the submission of this report. It is important to note that still only 10% of project sites had been updated in the

past month. It is also important to note that, even with the removal of all projects deemed "on-hold" if updated in 2009, the average update time for all SDC projects is still approximately 24 weeks prior to the writing of this report.

4.1.2 SharePoint Test-Site Template Development

During the initial stages of our project, our team created two SharePoint test sites on the WPI SharePoint server: one to replicate the current template of a SDC project site (Figure 6), and one to test modifications to the current SDC site template that might enhance ease of use for project members and executives (Figure 7). Figure 6 shows the layout of the mock SDC project site we created. It has three main components: the Project Summary document library, the Shared Documents document library, and a shared calendar. The Project Summary is meant to hold the action plan, project charter, and any important data that executives may need to access. The Shared Documents, on the other hand, contains working versions of project data and documents for use by the team members.

During preliminary discussions regarding the use of SDC SharePoint project sites our liaison at the USPTO expressed a few specific concerns regarding the availability of information from an executive standpoint. Outside of usage by participating project initiative groups, she stressed the importance of maintaining up-to-date information critical to the project so that it would be accurate and easily accessible for executives. She pointed out that the action plan and project charter documents were intended to handle this, but many times they were either heavily outdated, difficult to locate within the project site, or even nonexistent.

While discussing the prospect of modifying the current template of the SDC project sites with Sean Vincent, he advised our group to avoid using SharePoint Designer as much as possible, and to use the web interface instead. He explained how working on sites within Designer was not only more difficult, as it involved working with the code of the website itself,

but also modifying the wrong parts could affect other sites beyond the site targeted for modification.

Figure 7 shows the layout of the preliminary modifications that our team made. These modifications were made using the "Edit Page" site action through the web interface for the SharePoint site rather than through use of SharePoint Designer, as per Mr. Vincent's recommendation. This means that the changes we made were done with the "out-of-the-box" software functionality, rather than requiring in-depth editing of the site code itself, which is more time and skill intensive. This template was designed to address the major issues of information availability raised by Ms. Ostrup, while also keeping a similar look and feel to the current layout in order to avoid confusion. Our design utilized an Excel Web Access web-part to display the project action plan on the home page of the project site in order better present information regarding progress on milestones and tasks. Additionally, we moved the project charter into a Wiki document displayed adjacent to the action plan so that the basic information pertaining to project goals and resources would always be readily available. Displaying these two documents on the main page was an attempt to expedite the process of locating project progress and information for executives. Previously, executives (often lacking the time or desire) would need to search through document libraries and open copies of the documents on their local machines.

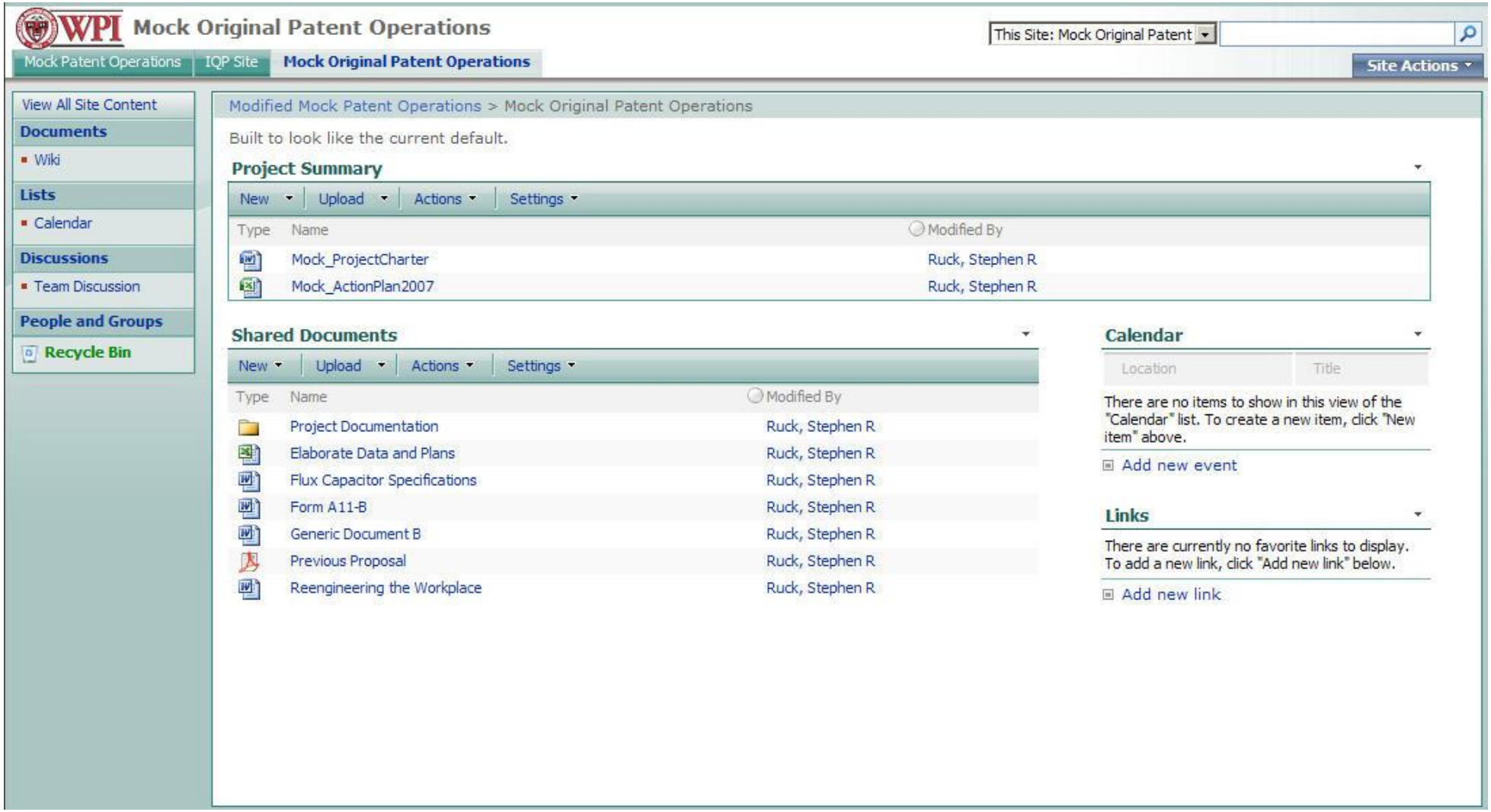

Figure 6: Mock SDC Project Site Created for Experimentation.

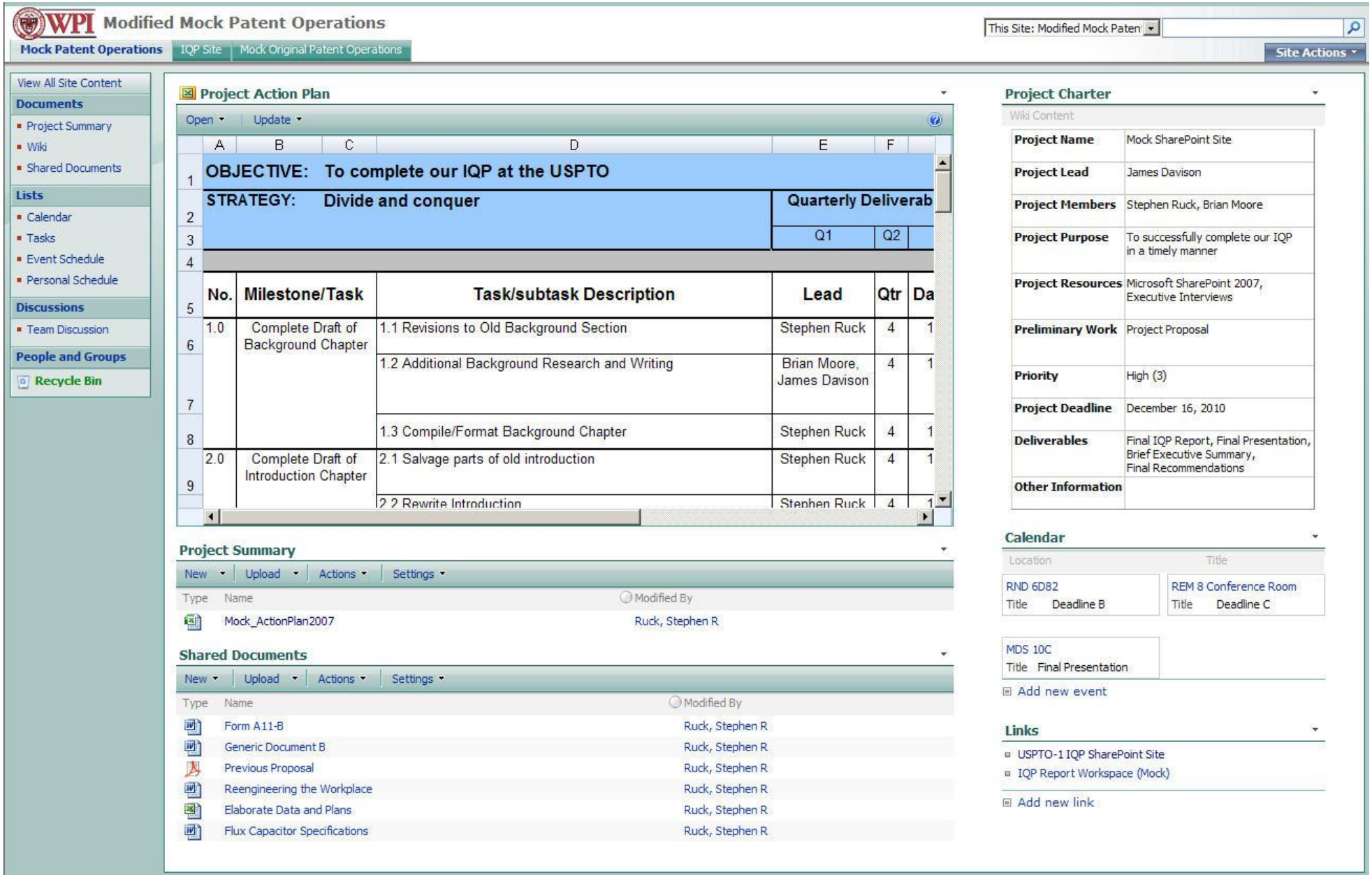

Figure 7: Modified SDC Project Site Created to Test Enhancements. In this figure, the action plan and charter are displayed on the front page in an attempt to make the location of critical information for executives.

4.2 Objective 2: Identifying the Usage of and Objections to the Current USPTO SharePoint System and Objective 3: Determining Current Executive Benefits Gained by Using the Microsoft SharePoint System

4.2.1 Qualitative Analysis of the Deputy Commissioner & Associate Commissioner Interviews

Reviewing the interviews conducted with the Deputy Commissioner and Associate Deputy Commissioners (ADC) for Patent Operations allowed us to analyze the overall goals for the system. We broke down the results as shown in Chapter 3, Table 5. Since the interviews conducted were open-ended, the responses our team got to the individual questions (Appendix E and Appendix F) did not always fit into distinct categories. To compensate, our team grouped together key pieces of the executives' responses. For instance, when asked what problems they were experiencing with the system, one executive responded that they found it "difficult to adapt to a different layout for every SDC site they visited." In our analysis, we categorized every response that was similar to this functionality as "Lack of Convention." These categories were developed after looking at the whole set of data, and determining the common terms that were used by the executives. There were some suggestions that could not be categorized systematically, and these responses were evaluated on a case-by-case basis.

Unlike the Patent Director Interviews (detailed in the next section), the Deputy Commissioner and ADCs were viewed as guidelines rather than a survey of preferences. This section discusses the target path for the SharePoint server, as well as the current use of the sites by the high-level executives overseeing the projects involved.

Table 7 breaks down the usage of, problems with, and goals for the SharePoint system as envisioned by the ADCs and the Deputy Commissioner.

Table 7: Aggregation of Data Collected from ADC and Deputy Commissioner Interviews.

Current Usage of SharePoint	Current Problems while Using SharePoint	Suggestions and Potential Automations to Improve SharePoint
Meeting Agendas Document Storage Calendar Scheduling Document Review	Program is Not Intuitive Complicated Navigation Lack of Convention	Updated Project Work More Accessible Data Notification System Replace Excessive Email

The current usage of the system by the high-level executives included primarily management processes, such as scheduling meetings and reviewing documents and schedules that have been posted by their subordinates. The executives admitted that their use of SharePoint was not as extensive as they would like, because of problems that they encountered in using the software. They reported that the program lacks an "intuitive feel" and is "overly complicated." When asked to explain, the directors indicated that, to them, intuitive meant the ability to learn the program independently without a large time commitment. They also pointed to difficulty navigating the SharePoint server, and a lack of standardized layout for grouping together, organizing, or analyzing data and files.

The suggestions of the high-level executives included both user-based and software-based improvements. Both the ADCs and the Deputy Commissioner requested a notification system to remind users to update the site, and to collect information from the various project sites. Additionally, the high-level executives requested that SharePoint project sites eventually create an environment where email was replaced by those sites as a primary collaboration and communication method for projects among managers and executives at the USPTO. The SharePoint was envisioned as a primary work environment, where all involved with the software would go before attempting other forms of communication. Finally, they suggested that data be

made more accessible through a uniform design for all project and management sites within the USPTO SharePoint server.

The other results produced by our interviews with the Deputy Commissioner and ADCs for Patent Operations included three main goals for the future of the SharePoint system at the USPTO. The high-level executives envisioned the SharePoint: containing reliable and easily accessed information, reducing the overlap of data being sent around the office, and providing a primary workspace for the Patent Directors to work. Reliable information was defined by the high-level executives as information that is updated consistently and in a timely manner among all project groups. Overlap of data was defined as inconsistent duplication of data between project sites; for instance, some sites had data from six months ago, and other groups duplicated that data set instead of receiving the most recent update. Finally, the notion of a primary workspace was described as an attempt to replace email, where all communication (uploading, downloading, and scheduling) for a project initiative would be done through the respective SharePoint site, rather than through other communicative means.

4.2.2 Qualitative Analysis of the Patent Director Interviews

After the interviews with the Patent Directors were completed, the results were compiled as shown in Chapter 3, Table 5. We were able to interview 14 Patent Directors (out of the 24 total selected Patent Directors) representing 8 out of 10 of the technology centers at the USPTO. Our team then quantified each individual response category (current use, problem areas, current benefits, and possible solutions).

In an approach similar to the one taken when quantifying the high-level executive responses, when interviewing the Patent Directors our team needed to categorize complex responses into discrete categories. There were almost four times more interviews of Patent Directors than there were of ADCs, so our categories had to be broader and encompass a larger

range of response. For instance, anything involving time management was considered "scheduling," and any response involving organization of data or files was considered "document storage." The relevance of any responses that could not be categorized was dealt with on a case-by-case basis.

Since the responses given often digressed from the question asked, the Patent Directors would generally give more than one response per category. Initially, we tried to extrapolate the most common function for each executive per category, but the data was not useful. Rather, we decided to keep a running tally of each "type" of response (for instance, everything involving scheduling, or everything involving document storage). This allowed us to see the overall use of the system, rather than considering the usage of each individual executive. Following that analysis, we broke down the popularity of each individual response in each category. This means that we looked at each response given, versus the number of individuals who gave that response, and weighed it against the total number of Patent Directors interviewed, yielding the response percentage (and therefore popularity).

Figures 8-11 show the responses for each of the questions we asked in our interviews with the Patent Directors (see Appendix G). These figures each show responses from a total of 14 executives, but since we allowed each executive to provide as many responses to each question as they felt were applicable, each question received more than 14 responses. Thus, we wanted to show both the overall representation of each response category in the total collection of responses (the "popularity" of the categories) and the percentages of executives that selected each response category (the "frequency" of each category). For each graph, the dark bars represent the percentage of the total collection of responses (which varies by question) in each category, and thus should total to 100% across all categories. The light bars represent the

percentage of the 14 Patent Directors that provided each response, thus each bar is out of 100%; the total of all light colored bars should not equal 100%.

Figure 8 shows the breakdown of current usage of the Microsoft SharePoint system by the USPTO executives as well as the popularity of the individual responses.

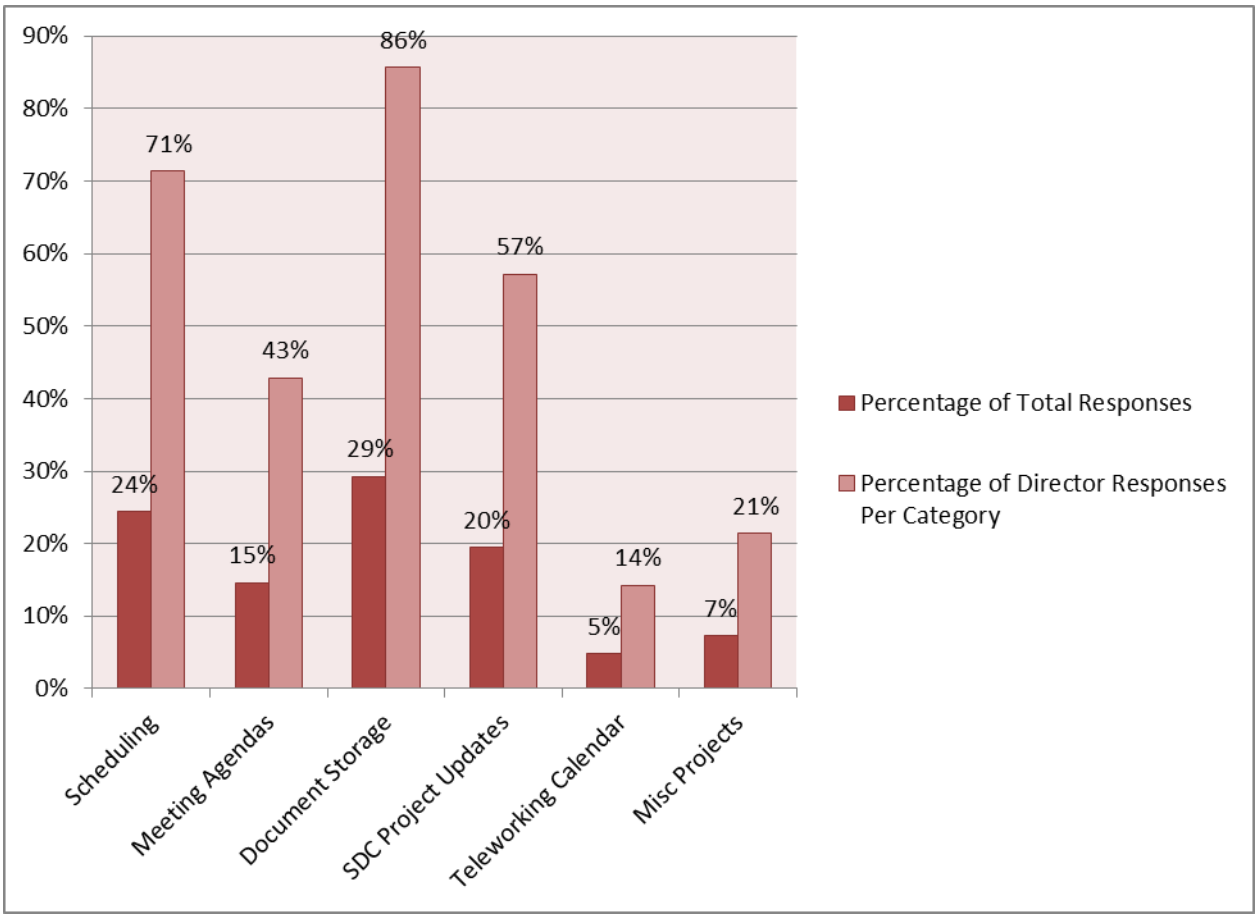

Figure 8: Current Usage of SharePoint by USPTO Patent Directors. Percentages of total responses are out of 41 total responses (N = 41), while percentages of director responses are out of 14 Patent Directors (N = 14). See text for detailed description of data analysis.

Current use of the system can be attributed to three main sources: scheduling (availability, meetings, etc.); document storage (downloads and uploads); and SDC project updates (either making updates, or checking for updates). Nearly three quarters of all aggregated responses that "claimed" usage of the system can be attributed to these three functions. These

three functions were stressed during the implementation process, so it makes sense that these stand out as easy-to-use and useful functions for executives involved in the SharePoint server.

We also analyzed the popularity of each response on an executive-by-executive basis. If all fourteen executives interviewed chose any one response, the graph would have shown 100% popularity for that response. In total, 86% of the executives interviewed confirmed that they currently use Microsoft SharePoint for document storage, while 71% of executives said they used it for scheduling, and 57% claimed to update their SDC project sites.

After comparing the current usage of Microsoft SharePoint, our team compared the prevalence of problems mentioned during the interviews we conducted. Figure 9 shows the breakdown of problems commonly experienced by USPTO executives while using Microsoft SharePoint as well as the popularity of the individual responses.

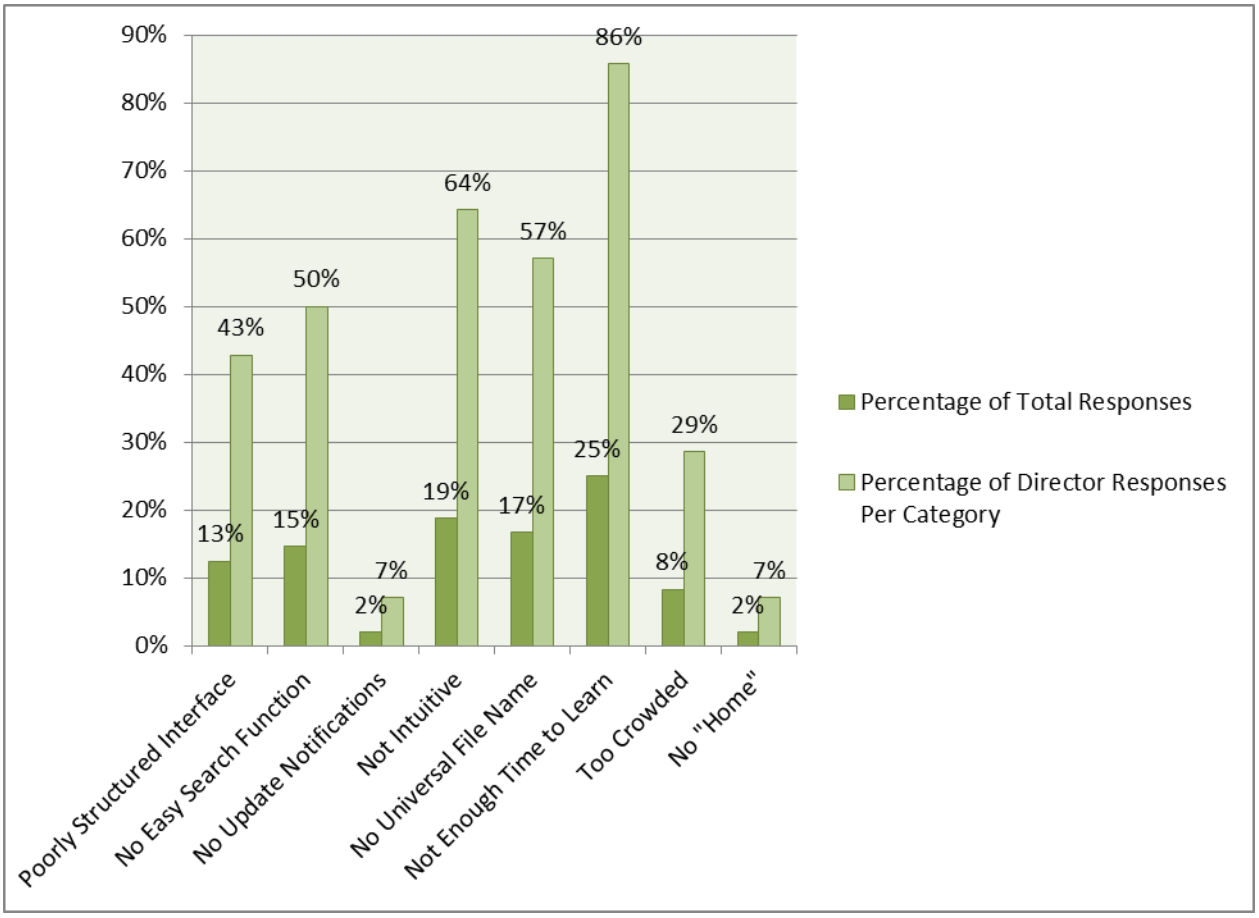

Figure 9: Current Problems Experienced by Patent Directors Using Microsoft SharePoint. Percentages of total responses are out of 48 total responses (N = 48), while percentages of director responses are out of 14 Patent Directors (N = 14). See text for detailed description of data analysis.

Major usage constraints currently experienced by the Patent Directors include: an inefficient (time-intensive) learning curve, the lack of an intuitive search function, the lack of universal file nomenclature and organization, and the lack of an intuitive interface. Additionally, there were some scattered problems experienced, such as feeling confused when the file libraries became too crowded and the lack of update notifications. The executives indicated that the main reason that their usage of the SharePoint system was inconsistent was attributable to the problems that they experienced while using the system. On more than one occasion, an

interviewee claimed that frustration compounded while using the software, until it was too much of a time sink to keep up with.

The consensus was that the executives did not have enough time to learn how to use the software. Other common responses included that the software was not intuitive, and that the executives could not figure out how to use it by themselves in an efficient manner. More than half of the executives also agreed that the lack of a universal naming system was a problem. This means that, without a naming convention, the executives often found themselves unable to determine exactly what to search for when attempting to find a certain type of document. Additionally, half of the executives disliked the search function associated with the program, and 43% disliked the basic interface, either because it was inconsistent, visually unappealing, or confusing to use.

After analyzing the usage and current problems, we analyzed the benefits from using the current system. The executives were asked which functions of SharePoint helped them complete tasks or assignments associated with every-day work. Figure 10 shows the breakdown of benefits from the current system as well as the popularity of the individual responses.

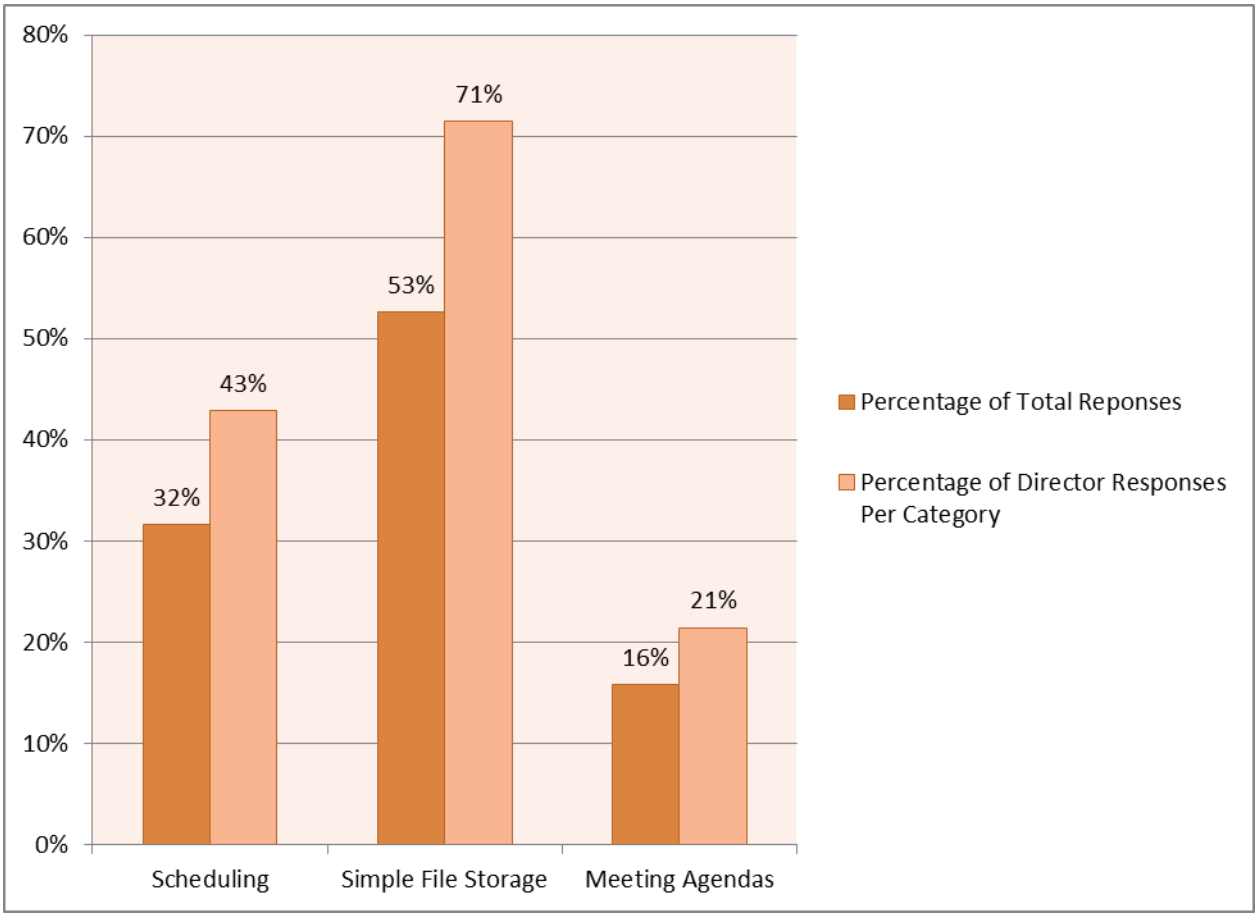

Figure 10: Current Benefits Attributed to the Microsoft SharePoint System by Patent Directors. Percentages of total responses are out of 19 total responses (N = 19), while percentages of director responses are out of 14 Patent Directors (N = 14). See text for detailed description of data analysis.

The list of benefits currently attributed to the Microsoft SharePoint system was significantly shorter than the list of problems or current usages. In total, there were only three identifiable categories. First, the executives reported that they enjoyed being able to post their schedule changes and availability (teleworking days, vacation time, etc…) and enjoyed being able to find other managers' schedules. It was almost universally agreed that the file storage system and functions for planning and displaying meeting agendas and minutes were easy to use.

Next, we analyzed the popularity of each response. There were only three categories of responses given by the executives; some executives could not think of anything that they

currently gain by using SharePoint. Those data points were excluded because the point of this exercise was to determine which parts of the SharePoint system should be retained. Even though not all 14 executives benefited from the simple file storage offered by SharePoint, it was important to explore that the majority (71%) did benefit from it.

Our team's final considerations were focused on analyzing the proposed solutions courtesy of the Patent Directors. The directors were asked what changes would make their job easier on a daily basis. As with the other breakdowns that were analyzed, many of the responses delivered by the Patent Directors were complicated, and many suggested more than one outcome. Because of this, we categorized the responses. Table 8 defines the different categories, and what sort of outcome would be associated with their implementation.

Table 8: Definition of Categories for Proposed Improvements from Patent Directors.

Category	Definition
Notification System	Implement or improve a system to give automatic alerts concerning site updates, modifications, or task reminders.
Universal Template	SharePoint sites across the SDC SharePoint; these should be aesthetically and functionally identical.
Consistent Nomenclature	Organized naming system for files, this way there is no question about what to name a file.
Better Search System	Improve on the search function contained in Microsoft SharePoint.
Teach Managers how to use the Sites	Teach either managers, or technology directors for each technology center how to use the SharePoint sites in place of executives
Simplify	Reduce the amount of clutter associated with the SharePoint sites; make sure that the sites do not get overcrowded.
Tooltips	Small indicators explaining how to use functions of the site that appear on the site as one mouses over a function.
Guide to SharePoint	A separate set of instructions on how to use the SharePoint functions

Figure 11 shows the breakdown of solutions proposed by the Patent Directors as well as the popularity of the individual responses.

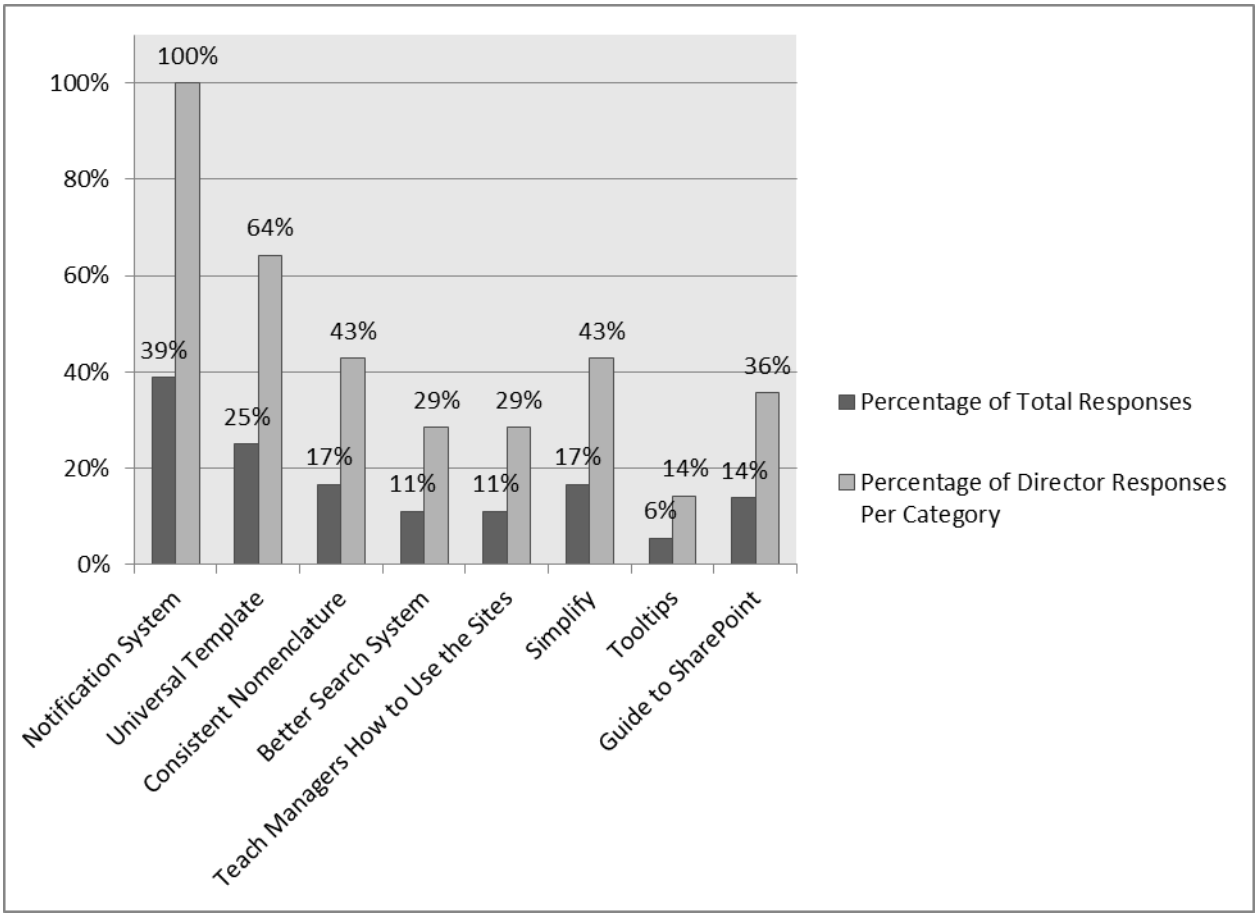

Figure 11: Proposed Solutions to SharePoint Issues by Patent Directors. Percentages of total responses are out of 36 total responses (N = 36), while percentages of director responses are out of 14 Patent Directors (N = 14). See text for detailed description of data analysis.

The most prevalent suggestion received was the implementation of a notification system, making up almost 1/3 of the total suggestions, and being suggested by almost every director interviewed. The requests for notifications took several forms, from update reminders, to task assignment reminders, to actual project update notifications. In addition, the Patent Directors requested that a universal site template be implemented. They wanted the information to be available in the same spot on every project site, so that a single interface could be learned, that knowledge could be applied to all project sites. Another consistent theme was the request for

consistent nomenclature while assigning file names. More than half of the Patent Directors voiced concern about being able to find files efficiently because they were improperly named or distributed throughout the site. Finally, the directors suggested that a more reliable, functional search feature be implemented.

As with the other three analyses, we examined the popularity of each individual response on an executive-by-executive basis. Figure 11 shows the popularity breakdown for each proposed solution.

As indicated, 100%, or 14 out of 14, of the Patent Directors interviewed requested some sort of automatic notification system, either to help remind them to update the site, or to provide notifications when the site has been updated. Almost two-thirds of the executives requested that a consistent site template be installed, to allow for easier navigation and browsing. In addition, 43% of the Patent Directors requested that the sites be simplified, and that a consistent nomenclature system be implemented and enforced.

Our team analyzed the data further; the top considerations from each of the three most important categories were extracted. The categories included "Top Functions to Preserve" which was a combination of the benefits from currently using SharePoint and the current usage and implementation of the system. In addition, we identified the "Top Issues to Consider," based on the most commonly reported problems associated with executive use of the SharePoint system. Finally, we identified the "Top Proposed Solutions." These solutions were taken from the Patent Directors' own suggestions.

The top three in each category were determined through a combination of examining the most popular answers per executive, the most popular answers overall, and the feasibility within SharePoint. Generally, each category followed the popularity of the responses, but we ran each

suggestion through the three aforementioned evaluations to ensure that they were possible to change, examine, or retain. It would not have made sense for our recommendations to include functions that required software or training outside of the scope of Microsoft SharePoint. Table 9 shows the top considerations from each of the three categories.

Table 9: Aggregation of Top Recommendation Considerations from Patent Director Interviews.

Top Functions to Preserve	Top Issues to Consider	Top Proposed Solutions
Ability to coordinate schedules among multiple employees and monitor availability	The SharePoint lacks a universal naming system – executives and managers are often confused about how to name files	Develop a user-friendly notification to remind executives managers when to update, or to alert them to new developments on the project site
Simple File Storage on a centralized server to keep desktops clutter free	The search function is not intuitive and it is unconventional; it takes more time to use than it allows the user to retain	Implement a universal template that is used for all SDC sites, so SharePoint navigation is consistent
Community storage and access to past and future meeting agendas, minutes taken, and announcements	The executives do not have enough time to learn how to use the system effectively	Develop a nomenclature system that allows executives and managers to have a consistent naming pattern for documents

The functions we identified as the most important to conserve are all basic functions included in the general Microsoft SharePoint package. The scheduling calendar, ability to store files, and ability to create different storage sections for meeting agendas are all intrinsic functions upon which the program's capabilities are built. These are easy functions to perform, and are essential to the success of any shared workspace.

The functions we identified as crucial problems for further consideration are human interface problems rather than software problems. The software package has no control over the names assigned to files, the way that the user searches, and the time that a user has to learn about the functions of the program.

The suggestions listed under "Top Proposed Solutions" involve a combination of software configuration, and human interaction with the software. A notification system must be set up within the framework of the software. In Microsoft SharePoint, these can be customized by permission levels, individual accounts, and then by events that occur within the website. For instance, one could set a notification email to be sent out once a week to all members of a project team reminding them to update their work and upload it onto the site.

A universal template is a solution that requires both user input and software configuration. The template can be set up in Microsoft SharePoint, but each user must use the system as it is intended to be used. Finally, the implementation of consistent nomenclature is a user-facilitated approach. Nomenclature means nothing to the software outside of a name under which to store the data that has been uploaded. Consistent nomenclature must be enforced by those using the system and upheld universally in order for such a system to work.

4.3 Objective 4: Identifying when and why Shared Workspaces are used in Work Environments

4.3.1 Qualitative Analysis of WPI Survey Results

To observe the usage of SharePoint in settings outside of the USPTO, we administered a five-question survey to a portion of the Worcester Polytechnic Institute community: faculty members, staff members, and the junior and senior classes. These groups were selected due to their higher likelihood to have used Microsoft SharePoint at some point, as some faculty and staff organizations rely on the software, as well as student organizations and project groups. Each question had five possible multiple-choice answers: four discrete answers, and a fifth open-ended "other" category. Of the 197 responses, there were only 3 responses from faculty and 15 responses from the staff, while the remaining 179 responses were gathered from junior and senior students. As there was not a substantial number of responses from the faculty and staff

surveys, and all subjects surveyed were part of the same technological community, we felt that the data would not be skewed by analyzing all three groups together.

The first question, "How important is Microsoft SharePoint to your work/project?" was intended to determine how often an individual utilized Microsoft SharePoint. A graphical representation of the results has been created to view the responses based on percentage and can be seen in Figure 12.

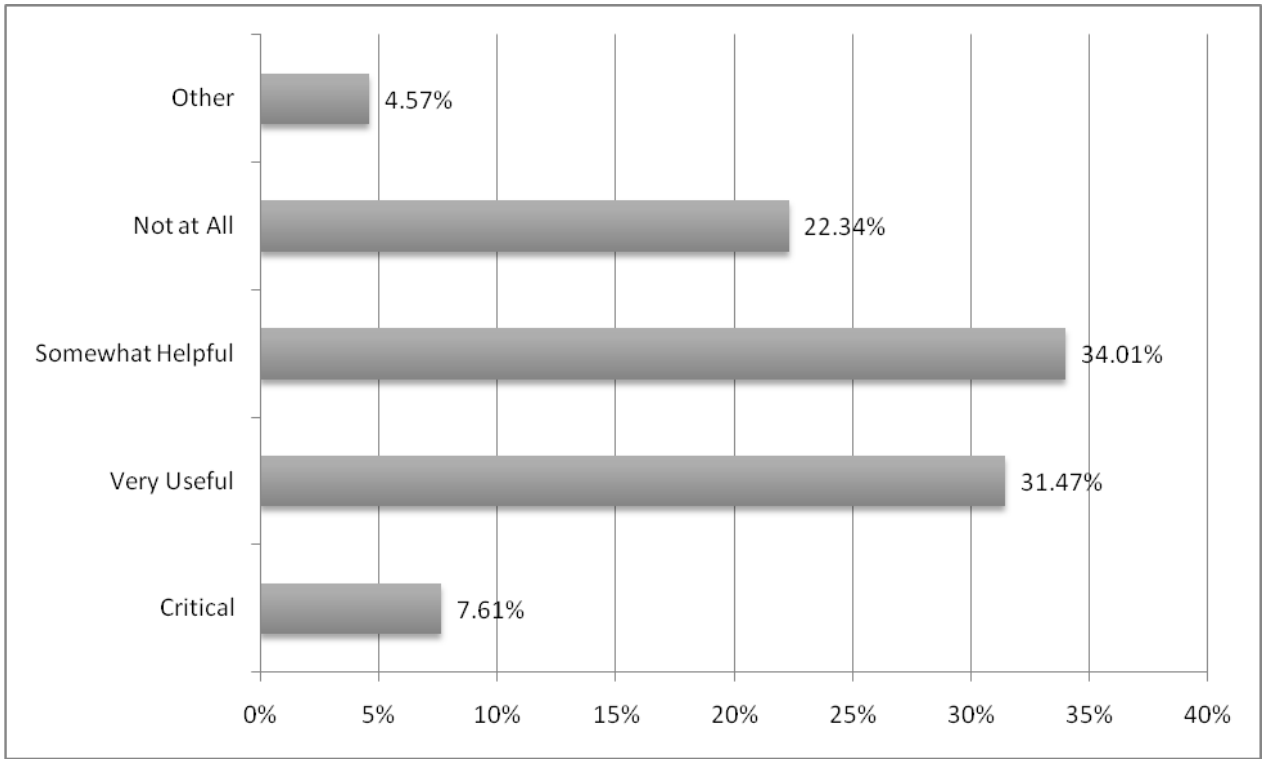

Figure 12: Responses from WPI Community Regarding Usefulness of SharePoint. N = 197.

Figure 12 shows the response percentages for the importance of Microsoft SharePoint. To be exact, 34.01% of the 197 responses found Microsoft SharePoint "somewhat helpful". Only 7.61% of the 197 responses found the program to be of critical importance for the work and/or project. Almost three times the amount of critical responses found that Microsoft SharePoint was not important at all to their work and/or project.

The second question, "How familiar are you with the capabilities of Microsoft SharePoint?" was intended to discover what functions of the program users are familiar with relative to how often they use it. A graphical representation of the survey question has been created and can be seen in Figure 13.

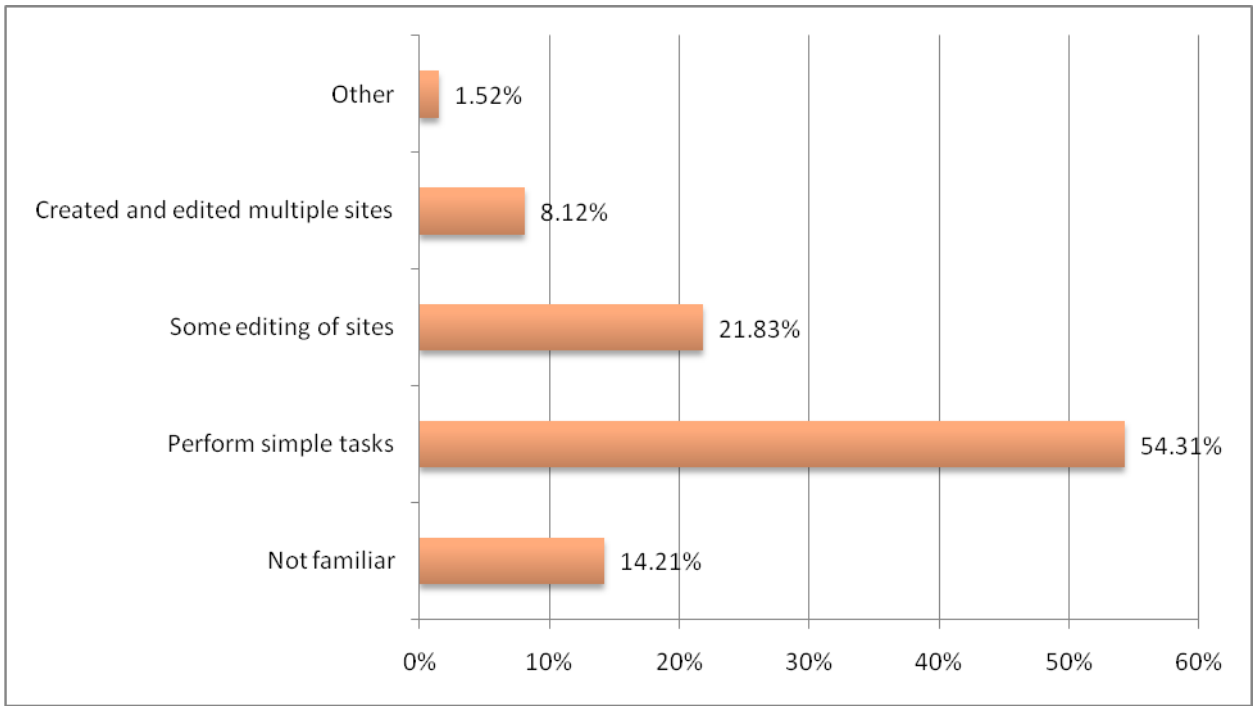

Figure 13: Responses from WPI Community Regarding SharePoint Familiarity. N = 197.

Figure 13 shows that being able to perform simple tasks such as uploading documents and creating folders was the most popular response. As the most popular response, 54.31% of the 197 responses chose this answer over any of the answers available. This is by far the most popular choice as the next closest answer was only 21.83%. There was a larger percent of users that were not familiar with the capabilities of Microsoft SharePoint (14.21%) than users that have created an edited multiple sites (8.12%).

The third question, "What parts of Microsoft SharePoint did you find easy to use?" was intended to reveal how easy certain parts of the program were for users relative to how often and in-depth they have used the program. The responses to this question can be seen in Figure 14.

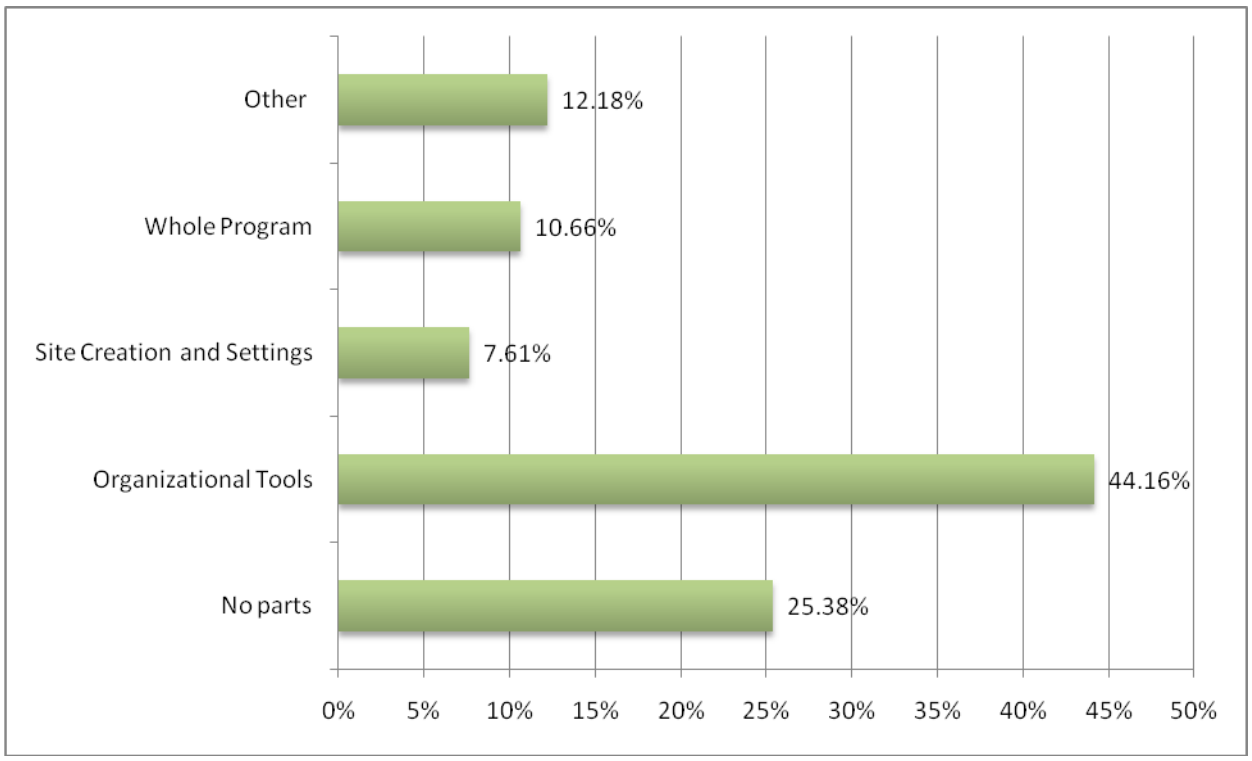

Figure 14: Responses from WPI Community Regarding Ease of SharePoint Usage. N = 197.

Figure 14 shows that, based on the responses given, the organizational tools were the easiest to use; 44.16% of the population responded accordingly. Interestingly, one quarter of the population did not find any of SharePoint's features easy to use. Conversely, just over 10% of the population thought that the entire program was easy to use.

The next parameter that our team's survey addressed was the specific use for Microsoft SharePoint amongst a technically inclined population. Our team offered a range of options to those answering the survey, as well as an option to input their own responses. Figure 15 shows the breakdown of responses to the fourth question: "What specifically were you using Microsoft SharePoint for?"

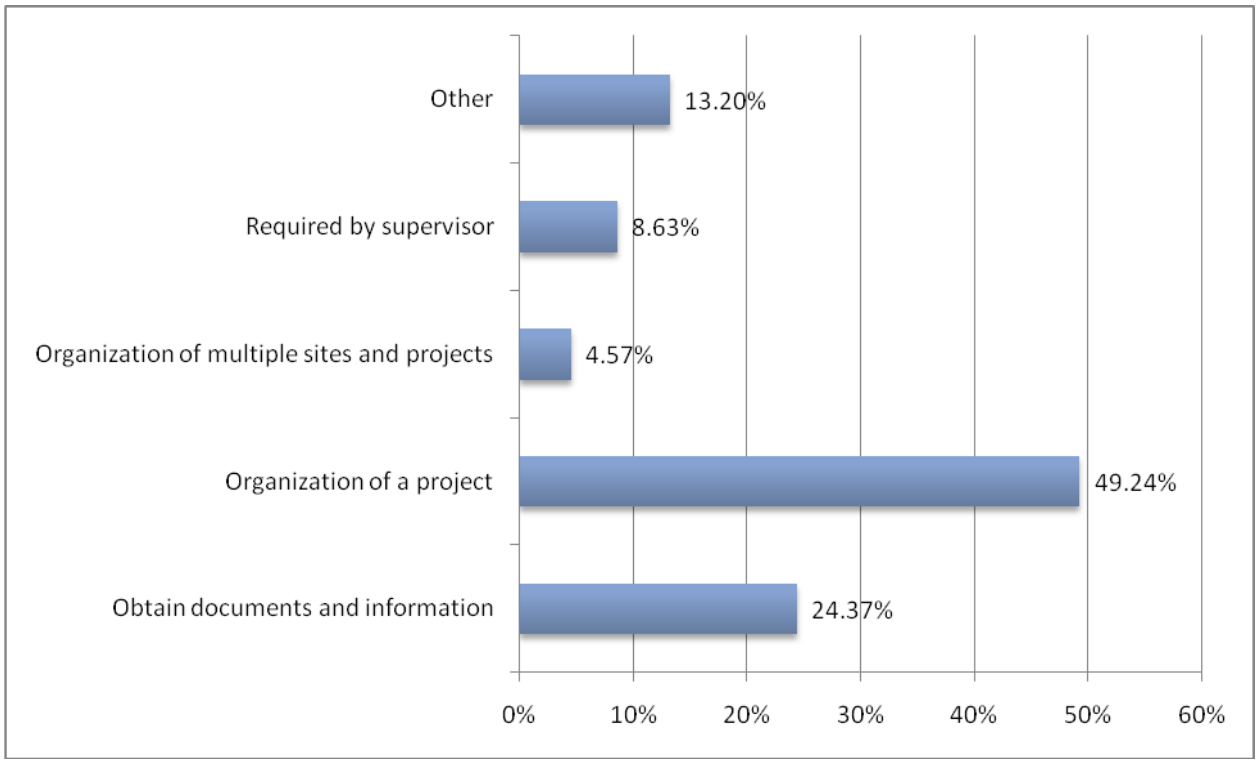

Figure 15: Responses from WPI Community Regarding Reasons for Using SharePoint. N = 197.

Figure 15 shows that almost half of the sample (49.24%) responded that they were using the software for organizational purposes. The next most common responses included "obtaining documents or information" with 24.37%, and miscellaneous Reponses with 13.20%. The data shows that not many, 8.63%, of the individuals surveyed on the WPI campus were required to use the system by a supervisor and that even less, 4.57%, of the surveyed individuals were using the software to manage multiple sites or servers.

Finally, our group used the survey much as we used the interview with the USPTO executives, to gather some input regarding potential changes to be made to Microsoft SharePoint. Responses to the fifth question of the survey, which asked for recommendations to improve Microsoft SharePoint usage, were evenly distributed. Figure 16 shows the results of question 5:

"Do you have any recommendations on how to improve the usage of Microsoft SharePoint?"

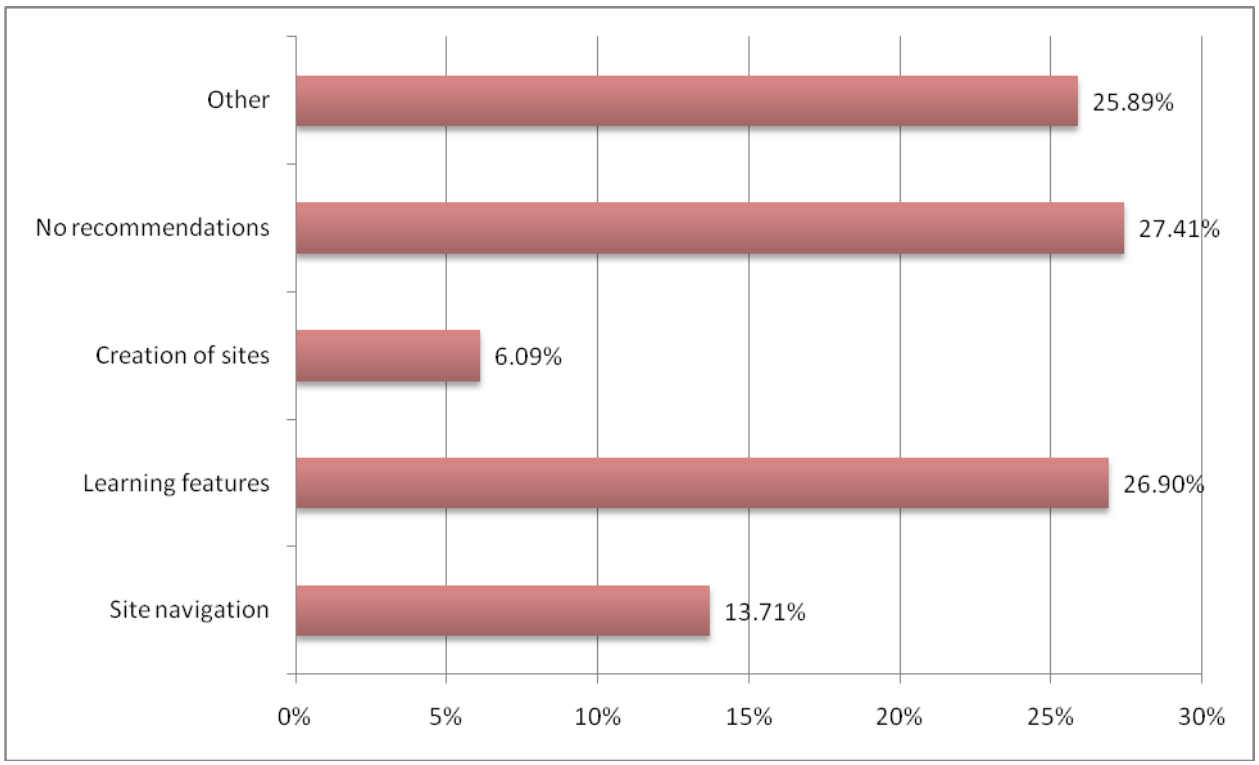

Figure 16: Responses from WPI Community Regarding SharePoint Improvements. N = 197.

The majority of the WPI population surveyed was satisfied with its performance and had no recommendations to make. The second largest finding was that 26.90% of the population wanted the software to be easier to learn, or to have some sort of learning tool provided to facilitate the learning process. A small number of users wanted it to be easier to create sites (6.09%), while almost twice as many (13.71%) wanted it to be easier to navigate said sites.

The important statistic to note in this data sample was the large number of "other" responses. One quarter of those who participated in the survey had another suggestion to make about how to solve the problems associated with SharePoint. The four most common suggestions were as follows:

- Expand the availability of instructional sessions;

- Make the interface as simple as possible so that one can pick it up and use it without instruction;
- Implement a notification system for updates;
- Implementation of a live editing feature similar to Google Docs.

The suggestions provided by the WPI community included: instructional approaches, software modification, and user interaction. Expanding the availability of instructional sessions was an example of a suggestion that would take time away from the user to learn how to use the software, and rely on either documents or additional educational materials. Modification of the interface and implementation of a live editing feature involve changing the actual organizational structure of the software. Finally, implementation of a notification system is a combination of the former, because it relies of existing technology being used effectively by the parties in question.

After surveying the WPI community, our team interviewed three directors at organizations and companies different from the USPTO. The first interview was conducted with the director of WPI Residential Services, Mike Hamilton. The goal of the interview was to determine what types of applications SharePoint had in an environment outside of the USPTO. The interview revealed that the organization migrated from a paper-based system to Microsoft SharePoint because the previous stem lacked organization. Three years after the implementation, WPI Residential Services now uses the SharePoint server as a primary workspace. They have eliminated the need to upload and download documents entirely.

WPI Residential Services implemented the system by doing a test run prior to distributing the system to the entire staff. Additionally, every year the members of the Residential Services staff required to use the software is trained in how to use the software, and the format in which

all submissions must be arranged. To ensure the consistent use of the system, WPI Residential Services has an individual in charge of keeping the SharePoint up-to-date and organized.

4.3.3 Interview Results with Oracle and DHMC

Oracle and Dartmouth Hitchcock Medical Center (DHMC) are two different organizations with two entirely different infrastructures. However, they both employ shared workspaces effectively. Our team conducted an interview with Jay Davison, Senior Director of Software Development at Oracle Corporation. During this interview, we discovered that Oracle uses a piece of software called Oracle Beehive, which manages the company's email, voicemail, and shared workspaces. He explained that Oracle's team-collaboration efforts are hosted on shared workspaces, and that they make extensive use of Wiki pages and document repositories. All troubleshooting and instruction was managed by inside parties (Oracle Beehive is an internally developed product similar in function to Microsoft SharePoint). Mr. Davison also explained that the directors are too dependent on email, explaining that a malfunction in the email system can halt productivity.

Through an interview with Barbara Moore, we learned that DHMC, relatively small with 6500 employees (compared to the USPTO's 9000 and Oracle Corporation's 105,000), uses Microsoft SharePoint to help manage the organization. DHMC's SharePoint system has a permissions arrangement that is similar in complexity to the USPTO's. Different patient files need to be awarded different permission levels to maintain strict confidentiality standards. Mrs. Moore elaborated, explaining that the use of Microsoft SharePoint helps to maintain a "need-to-know" policy at DHMC, helping to organize an otherwise labyrinthine set of instructional materials and patient files. Additionally, she explained that the organization had a department dedicated to the maintenance of the system.

4.4 Objective 5: Development of a Protocol for SharePoint Usage among Executives at the USPTO

Our group created a series of eight Wiki pages within the SDC SharePoint project site template to serve as an accessible protocol detailing how to perform various tasks within a project site. The intention of these pages was to be brief and informative, so that users would not be discouraged from referring to them, while providing precise instructions and descriptions for several functions of the site. The "welcome" Wiki page provides a brief description of the benefits of properly using an SDC project site and links to the other Wiki pages. This page is accessible through the "Protocol Wiki" option on the side bar, and is presented on the home page of the site for new users until it is hidden or closed. The "Action Plan Management" and "Charter Management" pages explain the importance of maintaining an up-to-date action plan and charter within the site, as well as instructions for proper editing of those documents. The "Document Management" page explains the difference between the Project Summary, Shared Documents, and Working Documents document libraries, as well as instructions on how to properly upload, download, and modify documents. That page also contains the protocol for proper naming of files within the libraries. The "Alert Management," "Calendar Management," "Task Management," and "Using the Search Function" pages each provide instruction on the capabilities and use of their respected features. Transcripts for the instructional Wiki pages can be found in Appendix J.

5. Discussion

After our investigation of the USPTO's executive communication system through independent exploration, interviews with Patent Directors and high-level executives, and the development of a SharePoint protocol, it was important to pull together all that we learned. This section discusses the results gathered, how the executives interact with each other, and what type of an impact they had on our final recommendations. Below, each individual objective is discussed in detail, specifying how each objective was completed, and then discussing the consequences of the results that verify the completion of each objective. Following the individual analyses, the objectives are discussed as a whole, highlighting how they impact each other, and how the results for each objective can be looked at concurrently. Finally, this chapter discusses the goal of SharePoint at the USPTO, what the program is supposed to do, and how the problems our team uncovered during our project are holding the use of the system back.

5.1 The Current Advantages and Disadvantages of the Microsoft SharePoint System at the USPTO

The first objective of our project was to determine the current advantages and disadvantages of using Microsoft SharePoint at the USPTO. To accomplish this objective, we explored the usage and setup of the existing SharePoint system, spoke with the root administrator of the SDC SharePoint site, and spoke with the Project Director in charge of the SDC site.

During our investigation, it became evident that the USPTO executives could benefit from the use of a centralized SharePoint system. The volumes of data being transferred inside of each technology center, between technology centers, and to the high-level executives were confusing to an outsider. It was also evident (by looking at the permissions settings and group members) that the USPTO's management structure was strict and hierarchical. SharePoint is an effective tool for dealing with such complexities – the program allows for: different permissions

settings among parent sites and sub-sites and expansive document storage. Additionally, SharePoint contains a search function, and can be arranged to fit an individual user's preferences.

As we explored the SDC SharePoint site, our team was able to see: how the project sites were being used; whether the use was "appropriate" based on the Patent Directors' specifications; and we were able to determine whether the various functions were advantageous to the USPTO executives. After spending enough time with the site, we isolated one defining problem, and one defining advantage.

5.1.1 The Major Problem: Inconsistent Usage

The main problem was that the site was simply not being used by the executives as intended by the project directors. Use of the site was so low that, after only three days of exploring the site at the start of this project, our team's activity represented nearly 100% of all recorded activity on the site. The average update time for a project was between 24 and 38 weeks, and some project sites had never been updated.

If the SharePoint site was not capable of benefitting the USPTO executive communications, the lack of consistent usage would not be a problem. In such a scenario, the system would simply be discarded. During the interviews our team conducted, multiple executives said that they spend too much time organizing emails, retrieving updates, and wished that these tasks were automated so they had more time to spend on essential PTO tasks. SharePoint is an exemplary tool to help solve these common problems. When asked why the directors and high-level executives did not take more of an initiative to learn how to use the software, they answered almost unanimously that they simply did not have the time to learn it. Therefore, we isolated our number one problem to deal with: lack of time caused inconsistent usage of the SharePoint system.

5.1.2 Why is it Worth the Trouble?

Not all aspects of the USPTO executives SharePoint sites went unused. The document storage and scheduling features were used extensively on the project sites that were updated. If this was accepted as common practice throughout the entire USPTO, it would reduce overall email traffic, increase electronic security, and allow for circumvention of the conventional system of gathering updates on projects (phone, email, face-to-face). Each of these operations represents time spent by the executives. The elimination of such tasks would thereby increasing managerial efficiency.

In particular, one piece of evidence gathered during our investigation showed that SharePoint is capable of being used among executives at the USPTO. The comparison done of the priority rating of the projects to the number of planned projects (essentially the projects that used SharePoint) showed that high-priority projects were more likely to create an action plan and follow it on their SharePoint site. High priority projects are monitored more closely by the high-level executives, so their SharePoint sites were updated more regularly. Perhaps the knowledge that their projects could be monitored as effectively over the SharePoint as via email or telephone call would entice the Patent Directors and project managers to use the SharePoint more consistently.

5.2 Identifying the Current Usage of Microsoft SharePoint at the USPTO

This portion of our project gave us a specific direction in which to take our site modifications and recommendations. Since time was repeatedly stressed as the limiting factor for executives at the USPTO, we always accounted for time in all of the modifications we planned to make. During our initial exploration, we discovered that the SDC SharePoint site was not being used consistently enough to make it worthwhile. The “diagnosis” for this problem was that the sites were out of date and the information was difficult to find. The logic quickly

becomes circular, because if the executives used the site, they would not be out of date, and the information would be reliable. However, since they were repeatedly "let down" by the reliability and validity of information on the SDC SharePoint site, executives were wary about using it.

5.2.1 Preliminary Problem Solving

Our first attempts to solve the problems posed by the executive SharePoint site resulted in a template that was much more widely accepted by the executives to whom we talked than was the basic template included on the current site. The majority of the Patent Directors interviewed claimed that they would use a site that was more accessible (like the one we presented to them). This showed us that the current usage of the SharePoint site depends not only on user preference (those who like direct communication versus shared workspaces), but also on software configuration.

These problem-solving attempts also allowed us to confirm that effective changes to the system could be made without rewriting the software code. That was particularly important, because the budget for addressing this problem was literally nonexistent. This meant that our team would be able to develop the template and present it to the USPTO executives as part of our recommendations. If they chose to use it, it could be implemented immediately and use of SharePoint could continue without any expensive or time-consuming hindrances.

5.3 The Views and Goals Expressed by the Deputy Commissioner and Associate Commissioners

Since the Deputy Commissioner and the Associate Commissioners for Patent Operations directly oversee the most projects of any of the directors and executives associated with the USPTO Executive SharePoint site, their opinions on the operation of the system were essential. Discussions with the high-level executives helped us complete the following objectives:

- Identify the reasons that use of the SharePoint system is avoided;
- Determine how executives who do use the SharePoint system benefit from its different applications.

As discussed in Section 4.3, the high-level executives at the patent office mostly use the SharePoint to store and review meeting agendas, various documents, to schedule meetings, check manager schedules, and to review projects. They asserted that the program's setup was not intuitive, that the navigation was too complicated when trying to find a specific project initiative, and that the organization lacked convention.

At an intrinsic level, the high-level executives were excited about the opportunities that SharePoint presented, but were disappointed by its implementation. They liked the idea that SharePoint could be used as a primary workspace for their patent operations initiatives, but were not sure how to condition their managers and Patent Directors to use the software effectively. They felt that the software could be used in four major ways: store consistent and reliable project updates; make necessary data more accessible; implement an automatic notification system; and use the SharePoint to replace excessive email spam.

5.3.1 Reliable Project Updates

The high-level executives do not directly manage the SDC project groups, but they supervise initiatives made up of SDC projects. Therefore, it is important that they be able to receive up-to-date project information in an efficient manner. Currently, the ADCs admitted that they do not use the SharePoint as much as possible, because the information on the site is not reliable. Changing this problem relies not only on the high-level executives, but also on the Patent Directors, and the project managers. Dedication to updating the SharePoint is necessary from all parties if any recommendations made are to be implemented and effective.

5.3.2 Accessibility of Data

The Deputy Commissioner and Associate Commissioners for Patent Operations also commented that the data is not accessible enough on the SharePoint site. Even on projects sites where the SharePoint is being used, documents are being stored, and effective communication is happening, the high-level executives struggle to locate the necessary data. The current SharePoint system has a restricted search functionality that is hindered by an unconventional naming system. The executives wanted a way to get the data they needed more efficiently. This input was critically important to our recommendations. It was the first indication that a universal naming system would be a good idea, and that the site needed to be changed aesthetically.

5.3.3 Automatic Notification Systems and Eliminating Email Traffic

When interviewed as a panel, the ADCs agreed unanimously that an automatic notification system was an important consideration to be made when improving the effectiveness of the executive SharePoint site. While exploring exactly what an automatic notification system was to the executives, we made several other discoveries about what they were looking for the SharePoint system to do.

Our team determined that the high-level executives were envisioning a notification system that would eliminate a majority of the current email traffic. The executives and directors complained about an overload of emails hindering their daily productivity. Since they kept asking for such a notification system to be added, it became evident that those using the system were unaware of its built-in capabilities.

The notification system needed to perform multiple functions. In order to advertise use of the software, the high-level executives requested that the notification system simply remind the project managers and Patent Directors to check and update the SharePoint. In addition, they wanted a customizable notification system that would alert the user about when projects to which

they have subscribed have been altered or updated. Conveniently, these features were all available in the basic SharePoint package. We determined that our best course of action was to take the suggestions that they gave us, and simply bring to light the possibilities that exist within the software that the USPTO already possesses.

5.4 SharePoint and the Patent Directors

The Patent Directors had a similar outlook on the executives SharePoint system, but these interviews allowed us to get the perspective of those working directly with the SDC projects. This group was to be the main user base of the SharePoint site. Consequently, their opinions were held in high regard when considering what recommendations our team would make.

Initially, we believed that instructional materials explaining how to use the basics of the site would be the most important recommendation to make. After our analysis of the Patent Directors' current usage, it was evident that they had a grasp of the basic concepts of SharePoint, but were not necessarily sure how to apply that knowledge. The Patent Directors used the sites for scheduling, project updates, and document storage, so instruction on the basics would not have been an effective recommendation.

It was interesting to note that the USPTO executives seemed to claim that they used the SharePoint site more than our initial investigation revealed. As we interviewed more and more directors, we realized that the Patent Directors were occasionally confused about where their project information should be going. For instance, some said that they used SharePoint extensively within their own individual technology centers, but failed to use the executive SharePoint site for their respective SDC sites. Accommodating the directors' individual needs proved to be important when attempting to encourage the increased use of the SDC SharePoint.

Not surprisingly, many of the problems that were associated with the SharePoint and many of the solutions proposed related to the amount of time that it takes to complete tasks on the project sites. The Patent Directors, like the DC and ADCs, have little free time to learn how to use an entirely new software system. This discourages the use of the SharePoint, and that leads to inconsistent use, which leads to disuse altogether after enough time passes.

5.4.1 Saving Time and Solving Problems

Because almost all of the problems that the executives have with the SharePoint system can be attributed to a lack of time, analyzing their individual responses allowed us to determine whether or not they were based on time constraints. Excluding the most popular response ("not enough time to learn"), the three most pertinent and addressable responses were: SharePoint lacks a usable search function; there is no established universal file naming system; and the system is not intuitive.

The lack of a usable search function is a complex problem. Microsoft SharePoint has a functional searching feature included in the basic package. The problem is, most of the executives at the USPTO are used to "smart" searching programs, such as Bing™ and Google™. These major search engines learn from the individual's preferences, and also have access to the entire internet as a well for information. SharePoint sites have the capability to search for what has been put into them. When the executives ask for a more functional search engine, they are really asking for their sites to be organized more efficiently.

This discussion is directly related to the lack of a consistent naming system. Many of the problems associated with the poor search functionality can be fixed by implementing a consistent set of nomenclature for naming files. The problems associated with implementing such a solution lie in the "start-up costs" measured in terms of time. It will take longer to categorize and name a file under a strict naming system, and this may seem immediately disadvantageous to

the busy executives. After the implementation of the system, it would drastically reduce the amount of time needed to find a file, or specific set of project updates.

Finally, the executives complained about how unintuitive the system was. This is a problem that our team believes deals with the aesthetic setup of the project sites. When the executives said that the sites were not intuitive, they were saying that they needed to spend too long to figure out how to accomplish tasks that they felt should be simplistic. While discussing potential changes with the Patent Directors, the consensus was to make the sites "flow" better (less uploading and downloading, more on-site work), and to make important information stand out as soon as one enters the SDC project site.

5.4.2 The Final Consensus: Benefits versus Disadvantages

According to the Patent Directors, SharePoint was a program that they sincerely wished that they used, but did not have time to learn to use. The knowledge that the executives were open to changes in the system, disliked the current format, but ultimately believed it could work was necessary for our project to be successful. If the executives had completely dismissed SharePoint, our attempts to recommend changes would have been null. The fact that they were interested in the software, and excited to see the recommendations we had to make ensured that their responses were deliberate and meaningful.

5.5 SharePoint Outside of the USPTO

To identify how Microsoft SharePoint is currently being utilized by people in the WPI community, we surveyed a large portion of students, faculty and staff. The results gave us insight into what users actually utilize the SharePoint system for, and how comfortable they are using it. Contrary to the opinion fostered by the Patent Directors, the majority of WPI users found Microsoft SharePoint to be either "somewhat helpful" or "very useful" in completing their

work or projects. This told us that Microsoft SharePoint has the potential for successful use within an organization.

Among WPI users, performing simple tasks was most common, such as uploading documents and using the SharePoint calendar or similar organizational tools. The majority of users did not employ the more complex and automatic functions of Microsoft SharePoint. It could be argued that since most projects do not require the use of such functions, users were not forced to learn to use them at all. If a group of students suddenly needed to use a more complex feature, they might not be able to. If we extend this analogy to the USPTO, we see that the executives want to use SharePoint, but they are unable to, because they have not been conditioned to learn those features.

For the WPI community to be expanded to the "real world," we were forced to consider the complications of drastically expanding the size of the projects. A "project" at WPI and a "project" at the USPTO are not the same; scale, importance, and confidentiality need to be considered. Our interviews with Oracle Corporation and DHMC allowed us to explore these possibilities. Projects and initiatives are completed on shared workspaces at Dartmouth Hitchcock and Oracle Corporation (as well as at WPI) with great success. It is safe to assume that with the right configuration, the USPTO can succeed as well.

5.6 SharePoint Protocol

Through our interviews with the Patent Directors, it became clear that they never received any substantial instruction on how a project site should be operated and maintained. Rather, they were given the sites and told to use them. Multiple directors expressed frustration; they did not have the time to teach themselves how to use their sites. Consequently, their project sites were used inconsistently (if at all). While many of the directors were not interested in

formal training seminars or workshops, they did express some interest in accessible, integrated reference material. Additionally, one executive informed us that in the past there had been one or two Project Managers tasked with maintaining the SDC project sites. Those managers were reassigned and nobody had been given their task of carrying on with site maintenance.

We felt that the creation of an official protocol for SDC site usage through instructional materials would encourage proper usage of the sites by executives and project teams. By keeping the materials brief and informative, project members and the directors in charge would be more likely to utilize the protocol. Additionally, by creating the material within Wiki pages hosted on the project sites, it would be accessible to anybody working within the SDC site.

5.7 Creating an Effective Executive Communication Tool

An effective executive communication tool needs to be tailored to fit the needs of an exceptionally busy individual. As we have seen while exploring the uses of Microsoft SharePoint (and other communication tools) outside of the USPTO, SharePoint is an effective tool for managing a variety of projects and organizations. Additionally, our team noticed that, depending on the size of the organization using the software, the management strategies differed drastically.

In a small group environment, such as our own IQP project site, it was easy to use a SharePoint site for document storage, task assignments, calendar scheduling, experimentation, and intra-group communication. The volume of data being transferred was limited to what our group could accomplish, and we did not need to coordinate with any other project groups on a larger, overarching objective.

When one begins to consider the possibilities for a larger organization, such as the USPTO, Dartmouth Hitchcock, or Oracle, our results showed that the layout of any sort of

shared workspace needed to be multi-faceted. Unlike an individual group project, a workspace structured for a company needed to have different levels of permissions, as well as enough depth for those working on the project to accomplish their goal, all while retaining the simplicity needed for managers who oversee a large collection of projects.

From the responses we gathered, any type of large-scale (or moderate scale, when considering WPI Residential Services) organization had individuals dedicated to keeping the workspace organized and up-to-date. When asked why, responses indicated that, even when everyone contributed to the workspace as they were supposed to, individual preferences and aesthetic tastes kept the workspace from being as organized as it should have been. By assigning an individual the job of maintaining and organizing these workspaces in a consistent manner, those organizations guaranteed the reliability and consistency of the material contained on those workspaces.

Furthermore, the implementation of an effective executive communication tool required, in all successful cases examined, planning and testing prior to implementation. Planning for the projected use of the system before implementation allows for the proper installation and configuration prior to the system's introduction. This ensures that those expected to use the system will be aware of the changes that are happening, and aware of the benefits that they can gain from utilizing the system. Testing the system in a small environment also proved useful in the organizations our team spoke with. The tests allowed them to work out the problems within the system on a small scale, before exposing their employee base to the new infrastructure.

Many of the problems that the executives at the USPTO face with their Microsoft SharePoint system stem from problems caused by the steps that were skipped during the introduction process.

5.8 The Future of SharePoint at the USPTO

Microsoft SharePoint has the capabilities to accommodate the needs of the USPTO Patent Directors and high-level executives. Detailed in the following chapter are the recommendations that our team has made to help the executives better utilizing the system that they currently have. In order for our recommendations to have a substantial impact, the executives and Patent Directors must modify their work habits and embrace the SharePoint as a valid communication system.

In the research that our team conducted, we discovered that SharePoint was designed with the capability of being a primary workspace. Problems arise when some parties use the system as a primary workspace, when some use it as a secondary, and some as a tertiary space. By solving the problems that are currently experienced, and maintaining the parts of the site that benefit the executives, we believe that the newly modified site can increase efficiency in communications among Patent Directors and high-level executives. We were able to model the recommendations that we made after shared workspaces that are utilized successfully outside of the USPTO, and to develop a protocol for use of the remodeled site specifically tailored to the USPTO.

6. Recommendations

Our goal for this project was to recommend a strategy for a more effective introduction and implementation of the Microsoft SharePoint server through software usage education and promotion to the USPTO executives. Our recommendations had to be feasible, deliverable, and presentable to the executives at the USPTO involved with the Strategic Development Committee. We considered three major "improvement principles": improved efficiency, improved usability, and improved functionality.

Efficiency was defined by our team as a combination of the amount of time needed to update and manage a project through the Microsoft SharePoint system (manager's perspective), and the amount of time and effort needed to use the site to evaluate a project (executive's perspective). Usability was defined by our team as a combination of the amount of "searching" that was needed to learn the basic functions of the SharePoint site, from both a site-modification and site-examination standpoint. Finally, functionality was defined as the non-numerical "ratio" of the amount of power that the site had, combined with the level of simplicity contained within the site.

In order to fulfill these requirements, our recommendations were four-fold. Described in this chapter is each of the functions that we chose to add to, improve upon, or eliminate from the USPTO executive SharePoint site. We recommended that the executives:

1. Introduce integrated instructional tools;
2. Redesign and enforce a universal SharePoint site template;
3. Employ a document nomenclature to help with organization;
4. Implement a series of infrastructure upgrades (technological and vocational) that we felt would benefit the agency.

At the end of this chapter, it will be evident why each recommendation was made, how it adheres to our three improvement principles, and what it should accomplish if utilized as we recommended.

6.1 Overall Template Changes

In order to facilitate ease of access to data for executives, as well as uniform use of the SharePoint system by project members, we recommend a series of modifications to the current SDC SharePoint project site template. These modifications include the presentation of the project action plan and charter, expanded "Quick Launch" toolbar, and the creation of an instructional set of Wiki pages with a welcome displayed on the main page. Figure 17 below shows our modified site template (for reference, Figure 3 in Section 3.1.1 shows the current project site template).

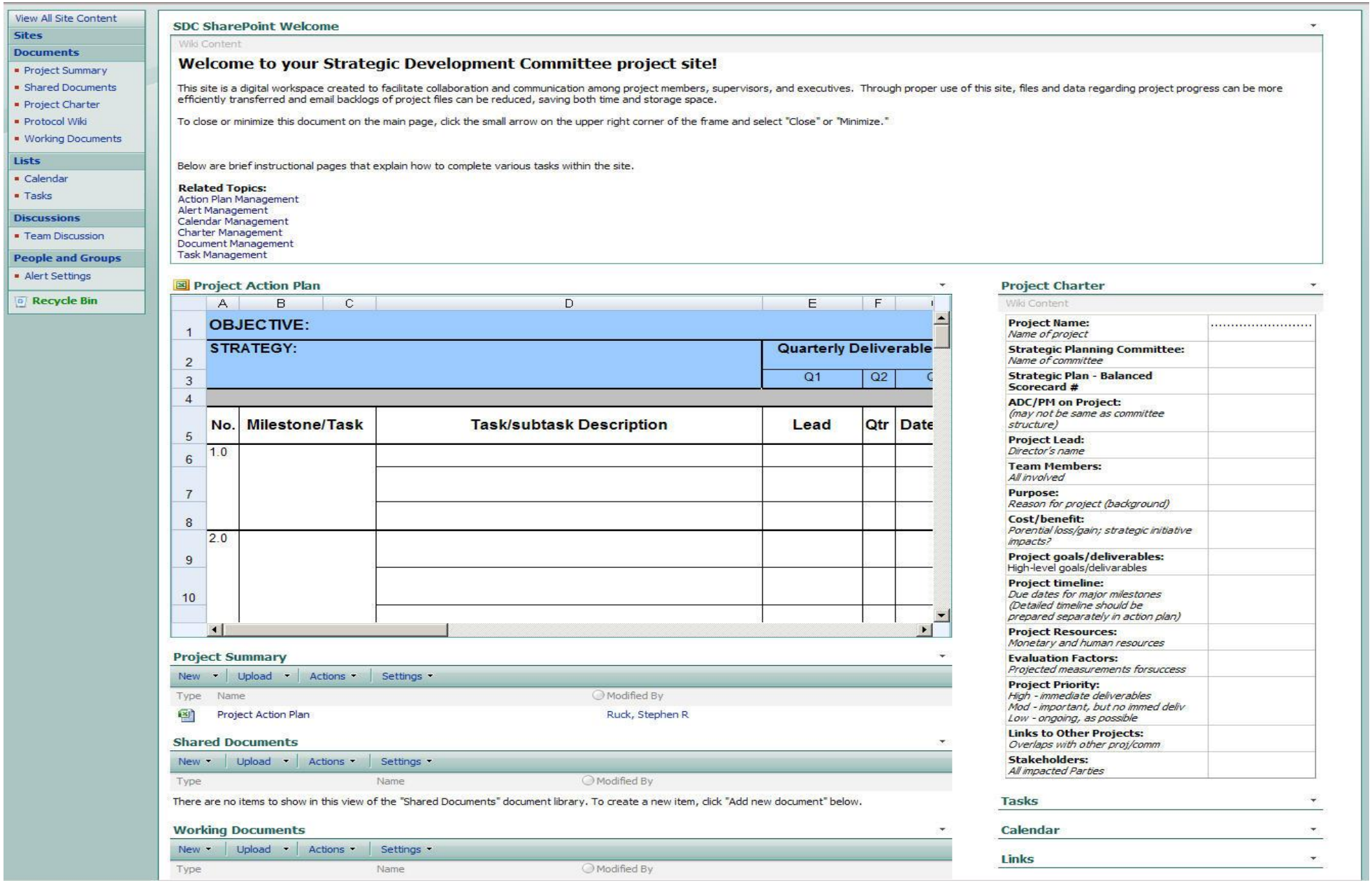

Figure 17: Modified SDC Project Site Template Exhibiting Recommended Enhancements.

6.1.1 Initial Welcome Wiki Page

As part of our recommended instructional materials, which will be presented later in this chapter, we felt that a "welcome page" at the top of the project page would be appropriate, particularly for newly created SDC project sites. This portion of the page exists to brief the user on the purposes of a project site and link them to additional material should they desire more information about how to operate the site. Once this welcome is no longer necessary, it can be minimized or removed from the page in order to reduce clutter.

6.1.2 Presentation of the Action Plan

Previously, the project action plan was intended to be stored in the Project Summary document library, although it was occasionally located elsewhere or nonexistent. To check the status of the action plan, one would first have to locate the document and then download and open the document. In our recommended template, the action plan spreadsheet must be located within the Project Summary document library and saved as an ".xlsx" (Microsoft Excel 2007) file extension for compatibility purposes. Then, the contents of the document are open and displayed within the project homepage itself, although they cannot be changed without following the standard document revision procedure. This modification significantly improves the accessibility of the data stored within the action plan, decreasing the amount of time it would take an executive to locate information regarding the action plan while also increasing the likelihood that project members would notice if updates to the plan fell behind.

6.1.3 Presentation of the Project Charter

Similar to our changes regarding the action plan, the project charter is now displayed on site adjacent to the action plan. As with the action plan, displaying the project charter on the main page of a project site would make it much easier for executives to locate basic data regarding the project. However, rather than storing the charter as a word document within the

Project Summary, it is now stored within a Wiki page hosted on the site itself. This alternative was selected to reduce the effort required to make changes to the charter, as the Wiki page can be easily edited within the web browser, with changes that take effect immediately.

6.1.4 Expanded Quick Launch Toolbar

Our final alteration to the SDC project site template was an expansion of the links accessible within the Quick Launch toolbar, located on the left-hand side of the screen. As it existed in the current site template (Figure 3) the toolbar often only provided links to an unused Wiki and team discussion board, as well as the project calendar. Our recommended modifications to the template (Figure 17) included reformatting this toolbar to contain links to the various areas within the site that should be active: the three document libraries, the protocol Wiki pages, the project charter, the calendar and task lists, a team discussion board, and the personal alerts page. These changes are a subtle improvement over the previous version, as they enhance the ease of navigation between the different areas of a project site without having to route through the main page.

6.2 Creation of Instructional Materials

In light of the previous lack of formal instruction regarding use of the SDC SharePoint project sites, along with the modification recommendations we made regarding the site template, we recommended that an official protocol for site usage be created and referenced. Within our recommended site prototype, this was achieved through writing a series of linked Wiki pages containing brief instructions detailing how to use the site properly. These pages also relayed the importance of critical site elements, namely the project charter and action plan. The site usage protocol was divided into seven subpages, transcripts for which can be found in Appendix J:

1. Action Plan Management;
2. Alert Management;
3. Calendar Management;
4. Charter Management;
5. Document Management;
6. Task Management;
7. Using the Search Feature.

These topics were carefully selected to cover the primary purposes of the SDC project sites: organization of project teams, accessibility of accurate information for directors and executives, and use of SharePoint as the primary workspace rather than email and shared network drives. Alert, calendar, and task management are each key aspects of keeping a project organized, enabling members to receive updates, schedule meetings, create and assign tasks, and track progress. Maintaining the project charter and action plan enables members to stay on track with the project goals, as well as provide critical information to executive parties regarding the state of a project. Proper use of the three document repositories and the search function within the project sites facilitates usage of project sites as primary collaboration spaces.

The implementation of these instructional pages is a strong improvement over the current state of the available information regarding SDC project site usage. While usage of the sites was primarily left to the interpretation of project directors and members, the institution of a distinct protocol would eliminate confusion and encourage all sites to be operated uniformly. Uniform use of the project sites would not only provide a more efficient workspace environment, but would also make them more accessible to users that do not actively work on a given project, as they would not have to re-learn how that particular site operated.

6.3 Implementation of a Universal Document Naming System

Complaints gathered from the Patent Directors and ADCs indicated that the current system lacked organization, and the search function was not used extensively. Organization is based mostly on the user interacting with the system, and without some sort of guidance, it is easy for a communication system to fall into disarray. Our team developed a universal nomenclature for the documents produced by the USPTO executives, and their project managers to use within the SDC SharePoint site. This naming system was developed as a recommendation that would solve both the organization issues experienced by the executives and increase efficiency by optimizing SharePoint's built-in search engine.

During our time at the USPTO, the interviews conducted with the executives, and independent explorations of the SDC SharePoint site, our team determined that the patent operations initiatives was in need of an organization tool for their document repositories. These initiatives are housed in different technology centers and apply to different categories of work within the patent operations division of the USPTO. Consequently, our team decided that we could use these broad categories (technology center and initiative category), as a way to organize and classify documents stored within the USPTO site.

Our team determined that each project site housed within the SDC SharePoint had enough capabilities to classify data within each project. However, when an outsider or high-level executive attempted to look for a specific document, there was no universal organization or file naming system. Our goal was not to restrict the customization of document storage within each SDC project, but, rather, to allow anyone looking for an individual document to utilize the search function to find it efficiently. The search function works off of a priority system. First, the search looks for words in a document title, then in the address of the file, and finally within

the document itself. We used this to our advantage to develop a nomenclature that would allow for efficient, effective searching with the SharePoint sites.

6.3.1 Document Name Structure

Our recommendations proposed that the executives utilize a naming system structured around a three-part document nomenclature. This allows for increased search ability, and greater overall organization efficiency in exchange for a short "up-front-cost" of time associated with assigning names to individual documents. The nomenclature was broken down into the following categories in the order that they are listed below:

- Technology Center;
- Category Keyword;
- Document Title.

As stated before, each project site will still have the freedom to organize its folders as it wishes, but our team recommended that the executives, managers, and any other employees working with the SDC SharePoint site adopt this document nomenclature. The structure for the individual names was set up as demonstrated below:

Parent Office – Assigned Keyword – Document Title

By specifying the technology center as the first line part of any document name, this allows a high-level executive to search (perhaps in a project or initiative that is assigned to two technology centers) for every document that a technology center has submitted to the SharePoint site. By specifying the category via a keyword, anyone using the site can search for all documents pertaining to an individual category. Finally, if an individual accessing the SDC sites is looking for a specific document, the final part of the name specifies the actual document title.

Additionally, the search function is not limited to a single parameter. If a high-level executive wanted all document outputs by a certain technology center pertaining to administrative procedures, they could combine the two search parameters, and narrow their pool of documents to sort through. The screenshot below depicts several examples of document names pertaining to different categories. The increased usability of the search functionality is discussed in Section 6.3.3.

Figure 18: Example of Documents Following Naming Convention.

6.3.2 Keyword Classification Breakdown

In order for the nomenclature to be effective, our team developed a series of keywords that corresponded to categories of assignments designated by the USPTO executives. The table below outlines the different categories, the corresponding keyword or abbreviation, and a brief description of the type of documents that should be found under each category.

Each keyword was designed to be intuitive and telling without (when necessary) including a long, drawn out category name. Our team wanted to avoid creating documents with names that prohibited easy reading due to their length.

Table 10: Categories and Keywords for Recommended File-Naming System.

Category	Keyword	Description
Administrative Procedures	ADMIN	Administrative documents, procedural concerns.
Awards	AWARD	Documentation of awards given out to employees
Budget	BUDGET	Documentation of budget updates or concerns
Classification	CLASSIF	Documents pertaining to patent or initiative classification
Customer Service	CUSTOMER	Documents pertaining to customer complaints and resolutions
Employee Relations	ER	Employee evaluations, disciplinary documentation, retention decisions
Hiring	HIRE	Hiring documents, procedures, initiatives
Initiatives	INIT	Initiatives headed up by project managers, such as the SDC executive suite
Legal, Policies, Practice	LEGAL	Legal documentation, policy modifications, rules, court decisions
Labor Relations	LR	Documentation pertaining to union rules, decisions, requests
Mid-Year	MIDY	Mid-year reports and documentation, employee reviews
End-of-Year	EOY	End –of-year reports and documentation, employee reviews
Position Descriptions	POSITION	Documentation describing open positions, filled positions, current positions
Promotions	PROMO	Documentation of promotions of employees
Pendency – Production	PENDENCY	Documentation of patent processing timelines
Quality	QUALITY	Quality of application process of employees (searches, action taken)
Ratings	RATINGS	Documentation of employee ratings
Training	TRAINING	Documentation of training materials and exercises
TSS	TECH	Documents pertaining to the technology support staff

6.3.3 Search Functionality

Besides an inherent sense of organization that comes from a universally implemented document naming system this recommendation also has the advantage of improving the functionality of Microsoft SharePoint's built-in search function. Below is a screenshot of the shared documents folder on our team's "Mock SDC SharePoint Site." The folders have been

adjusted so that there are several layers, with an assortment of documents included within. This screenshot shows a sample of documents that do NOT follow our proposed naming system.

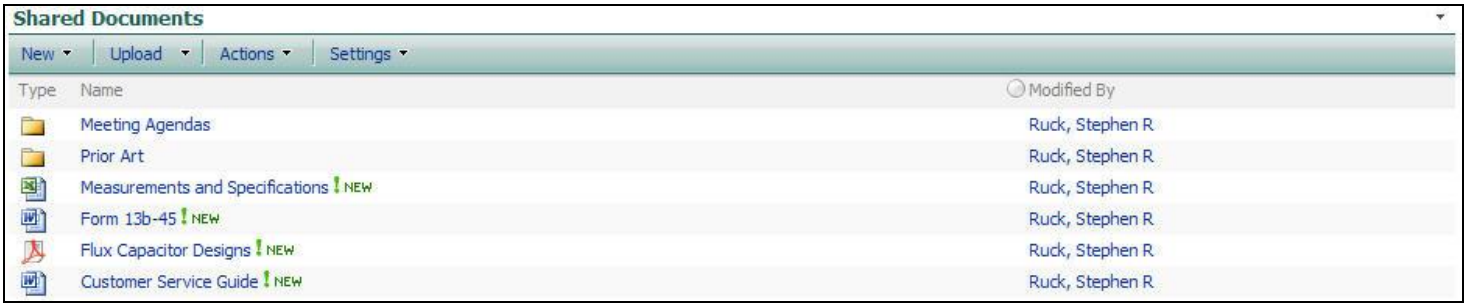

Figure 19: Example of Documents without Naming System.

As an experiment, our team pretended that we wanted to find a document about customer service pertaining to Technology Center 1600. We typed the phrase "customer service TC1600" into the search bar, and the Figure 20 displays the results of the search.

Figure 20: Search Results on Documents without Naming System.

The figure shows the inability for the search engine to intelligently determine what a user wants to see, and simply displays all documents that match any of the search parameters. Our second experiment involved documents that were named according to our naming system as shown in Figure 18. We searched by the same criteria, giving the search engine an input that followed the convention: "TC1600-CUSTOMER." Figure 21 below displays the results.

Figure 21: Search Results on Documents Following Naming System.

This time, using our proposed naming system, we were able to search by keyword and technology center, and locate the file that we were looking for (without knowing the document name). This usefulness is applicable to any type of executive SharePoint site when one might want to extract specific pieces of data from a large volume of files and folders.

6.3.4 Improving Efficiency, Usability, and Functionality

The biggest challenge to delivering this recommendation was that it had a "startup cost." Time needed to be spent to name each individual file, which, to a busy executive, could seem like a waste of time. However, when looking at the future of the system (and considering the vision of SharePoint as a primary workspace), the cost up front is small compared to the eventual payoff. The implementation and effective use of the universal file naming system recommended provides a valuable tool to improve efficiency among executive communications. Rigid organization reduces confusion, consequently increasing usability across the board. Finally, such a system inherently increases the functionality of the system without any modification or additional training.

6.4 Miscellaneous Recommendations

Our group had some additional recommendations to make that were not within our permissions or initial scope to attempt to implement. These recommendations deal with our

team's perceived necessity for the USPTO to upgrade its technology and potentially modify its vocational structure surrounding the executive SharePoint suite.

6.4.1 Upgrading the Microsoft Office Suite

At the time this report was submitted, the USPTO was still using Microsoft Office 2003. While the employees were familiar and comfortable with the software, they were losing out on a lot of functionality based around the integration of Microsoft Office with Microsoft SharePoint. By upgrading to Microsoft Office 2007 or, preferably, 2010, such integrations become possible. Functions such as scheduling and document editing would be made much easier by using integrated calendars and advanced editing software provided by the recent Microsoft Office packages.

6.4.2 Appointing Technical Officers to Oversee the SharePoint

One of the common threads that all of the organizations researched outside of the USPTO's facilities had was the appointment of an individual to oversee the shared workspace. Not only did those organizations have IT departments to help with errors encountered while using the system, but they employed an individual whose job it was to keep the shared workspaces updated and organized. Funding permitting, our team recommended that the USPTO executives appoint a technical officer to manage their SharePoint sites. This would deter the natural entropy encountered when individuals of different organizational backgrounds and preferences all use a common workspace.

7.0 Conclusion

In an organization with a hierarchal management structure, executive communications and the tools that assist the executives are of paramount importance. In August of 2010, the United States Patent and Trademark Office approached Worcester Polytechnic Institute with a proposal: to conduct a study that would result in recommend changes that could potentially fix the inefficiencies caused by their current executive communication system.

By exploring the USPTO's executive SharePoint suite, interviewing the patent executives, and exploring external uses of Microsoft SharePoint, our team successfully diagnosed the shortcomings associated with the USPTO site. We determined that the communication system was not being used consistently enough.

During our exploration process, we completed each of our objectives to the best of our team's ability. While hindered occasionally by scheduling issues, or resource availability, we successfully determined the advantages and disadvantages, as well as the current use of the SharePoint system; diagnosed the problems associated with the system; determined what the executives wanted to get out of the sites; identified outside usage of Microsoft SharePoint; developed a USPTO-specific protocol for SharePoint usage.

Our recommendations addressed these issues by filling in the gaps that were left by the previous implementation efforts. Our team took the time to evaluate what the executives were looking for the site to do, and tried to recommend changes that would best accommodate these requests. We feel that these recommendations will bring a new level of efficiency and productivity to the USPTO. By eliminating the frustration that they currently face while using their Microsoft SharePoint sites, we hope that our recommendations will foster a positive, digital, working environment.

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Appendix A: Sponsor Description

The United States Patent and Trademark Office (USPTO) (2010) is one of the oldest government organizations in the country. It was founded, in its most rudimentary form, in 1793 (USPTO, 2010a). Originally, the President and the Secretary of State would sign off on patents, but as the American drive and ingenuity took over, the job soon overwhelmed them. On June 1, 1802, William Thornton was appointed to run the first official patent office by President Thomas Jefferson (Architect of the Capitol, 2010). Since then, the office has grown to support the publishing trademarks, and an ever increasing influx of annual patent applications.

As described in its 2010 budget report, the mission of the United States Patent and Trademark Office (2009b) is to "foster innovation and competitiveness by providing high quality and timely examination of patent and trademark applications, guiding domestic and international intellectual property policy, and delivering intellectual property information and education worldwide."

The Patent and Trademark Office's tasks represent a hugely important undertaking. Patents protect the intellectual property of individuals, allowing them to produce commodities or merchandise and prosper accordingly (USPTO, 2010a). Trademarks protect the right to marketing, including but not limited to: names of products, catch-phrases, slogans, and designs. By offering these services, the USPTO helps to promote national economic stability and prosperity.

Currently, the United States Patent and Trademark Office is a labyrinth of office buildings and red tape. The agency's work force is divided throughout ten separate buildings in downtown Alexandria, Virginia. Employment requires United States citizenship, along with background checks and fingerprinting (USA Jobs, 2010). Daunting and competitive, the job application process is complicated, and the requirements are relatively steep. The organization's

personnel infrastructure is elaborate; it houses over 9000 employees spread across eight main departments and offices (USPTO, 2010e). These departments range from the investigation of chemistry and textiles all the way to nuclear engineering. The patent office also staffs departments dedicated to external affairs, public relations, and petitions. The following is a flow chart to show a basic organization of the Patent Office's structure (Felton, 2001):

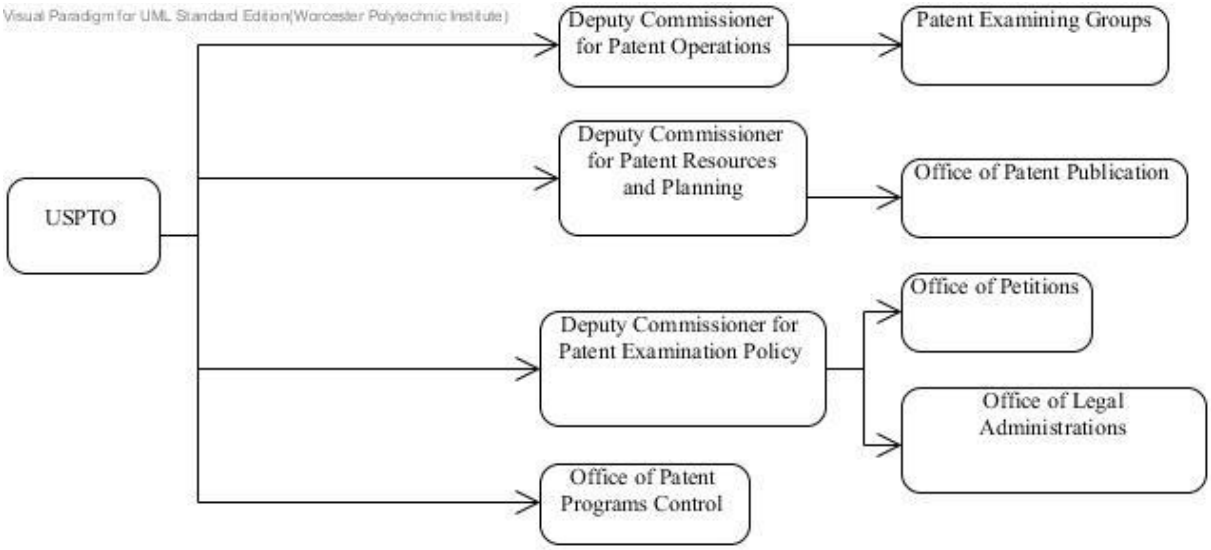

Figure 22: Chain of Command of the United States Patent and Trademark Office. Adapted from Felton (2001).

Figure 22 is an outline of the major divisions at the USPTO and the chain of command. While each group can communicate with the entity above it, there is a defined level between, for instance, patent examining groups and their supervisors. That is not to imply that there are not subsets within the large groups shown above. For instance, within the patent examining groups, there is a subset known as the Technology Center (TC) (USPTO, 2010a). Within the TC, there are nine substituent technology centers, such as TC 2100, which deals with the rapid and expansive advancement of computer software.

The USPTO (2010g) is a government run organization. As such, its budget and revenue are subject to review and absolute regulation by Congress (*Departments of Transportation and Housing*, 2009). It is one of the only profit making federal agencies; in fact, the USPTO places no tax burden on the public. The office is a fee-funded organization generating revenue from application and maintenance fees on patent and trademarks. During the 2009 fiscal year, the combined revenue generated by patent and trademark applications and fees totaled over 1.9 billion dollars (USPTO, 2009a).

The USPTO (2010a), as a controlling government agency, has a legal monopoly over the business of patent and trademark issuance. Consequently, it has no competitors and no other organizations with which one can compare it. However, the USPTO is a government organization and therefore can be compared to other bureaucracies within the United States government. First and foremost, the agency's communications can be compared the communications within its parent organization, the United States Department of Commerce.

As a profit-seeking entity, the agency also shares common threads with private technological organizations. Large corporations such as Microsoft, Oracle, or Hewlett Packard are technology-driven companies focused on efficiency and product distribution, much like the Patent and Trademark Office. These companies are independent in nature, but also have a vested interest in how the USPTO operates, because they claim patents for their software and procedures (Masnick, 2010, Oracle vs. Google). Currently, Oracle is locked in a heated lawsuit with Google over the rights to the Android mobile device software. This is a 300 million dollar per year industry, and its foundation rests on the work of the USPTO.

Similarly, international patent and trademark administrations relate to the USPTO. Currently, United States patents do not provide universal protection of one's intellectual

property, only national (Medical College of Wisconsin, 2010). This means that the United States is not the only country issuing patents, and consequently, the USPTO is not the only authority on the matter. Patents allow for the protection of intellectual property, which makes them very attractive to businesses and inventors. So attractive, in fact, that since 1790, between 6.5 and 7 million patents have been approved by the USPTO (USPTO, 2010f). The agency has already published over 6 million of these patents, as well as approximately 1 million patent applications for public access, either on their website or through Google Patents ™. The growth in patent applications and approvals shows no signs of slowing down, in fact, one third of those patents were approved in the last thirty years. The USPTO will need to continue to adapt and grow to suit the needs of an ever-growing consumer base.

Appendix B: Understanding the Patent Process

In order to secure rights to intellectual property or an invention, a patent is required. Although obtaining a patent is optional if a person invents something, without a patent someone else can use the invention or idea without the permission of the original inventor. If an inventor or corporation decides to obtain a patent, they must go through a carefully defined patent process. In the United States, the only way to get a patent is through the United States Patent and Trademark Office. If one requires a patent outside the U.S., then he or she must apply at the patent office of the country in which he or she desires the patent.

To begin the patent process, the applicant must search to see if previous patents already exist for their invention. If nothing exists, then the applicant must decide which of the three different types of patents they want to apply for: a Design Patent, issued for new designs for articles of manufacture; Utility Patent, issued for the invention of a new process, machine, or improvement; or a Plant Patent, issued for the invention or discovery of new, asexually reproduced plants (USPTO, 2010b). Then the applicant must determine whether he or she wants to file globally for international protection, because a United States patent will not protect an invention internationally. If the applicant wants a Utility Patent, then he or she must file for either a provisional or a non-provisional patent. The applicants can then consider the expedited examination process and whether or not they file themselves (also called pro se), or if they should hire a registered patent attorney. The electronic application can then be filled out and submitted via the electronic filing system. The USPTO examines the application and determines whether the application is allowed to be processed. If the application is not allowed, the applicant can request reconsideration or file appeals as necessary. If the application is allowed, then the applicant will be informed of the issue fee and the publication fee that must be paid. Once paid, the patent will then be granted to the applicant; however the process is not completely

over. According to the USPTO (2010c), there are maintenance fees due 3 ½, 7 ½, and 11 ½ years after the patent has been granted.

To obtain a patent, one must go through a lengthy process that includes an application, an examination, and service fees, among other things. The public has criticized this patent process for its lengthy start-to-finish time (Patently-O, 2010). From application to the distribution of a patent takes an average of 35 months (USPTO, 2010g). The introduction of the Accelerated Examination program at the USPTO is an attempt to fix this problem. This program reduces the average time of getting a patent from 35 months to 12 months, but this program also costs substantially more and is only applicable with the submission of a successful petition for special processing. Although the executives are not directly involved in the actual examination process, they are in charge of determining and presenting the official stance of the Patent Office for any issues regarding copyrights or trademarks. In addition to this, they are responsible for ensuring quality of service by assuring that the processes of patent examination are kept efficient and up to date (USPTO, 2010g).

Appendix C: Interview Question Responses from Sean Vincent

1. *Do you have any general thoughts/opinions on the current use of the SharePoint system?*
   SharePoint use across the enterprise varies. Note that I'm only responsible for a couple of site collections when the USPTO has at least a dozen. Within the executive sites in SharePoint, I think it's still used mostly for document sharing and meeting/agenda collaboration. We are looking for ways to enhance user adoption and visibility of information.

2. *How was the old system of communications converted when the SharePoint system was implemented?*
   I don't think there was a conversion of any kind. Considering how differently SharePoint is utilized in different places, you have to pick a specific SharePoint effort to answer this. In the executive sites, there may have been some files copied from network file shares into SharePoint libraries. If so, that happened when I was working on a previous project, not on SharePoint.

3. *How long has the Strategic Development Committees section of the SharePoint been active?*
   A little over a year, I think.

4. *Has the SharePoint ever been used for external communication?*
   No, all of USPTO's SharePoint is internal at this time

5. *Are there any methods of monitoring executive user usage of the SharePoint system?*
   SharePoint has usage reporting built into each site's settings pages. It only stores the past 30 days of users and requests data but it has monthly average data that goes back farther. SharePoint audit logging has not been used for this yet because of performance concerns.

6. *Do executives undergo any training workshops or receive some form of instruction on how the USPTO SharePoint works and how they are supposed to use it?*
   Some training was prepared for the executives by STIC. I'm not entirely clear on why the training was not completely delivered.

7. *When sites are created for new projects, what is the basic template for these?*

   Unless we determine that something special or custom is needed, we usually create from the out of the box team site in SharePoint.
   - *Also, does the basic template come with any empty/template documents (i.e. charter or action plan)?*

     For SDC sites, a template was saved for re-use. It has a charter template document in it, I believe.

Appendix D: Executive Interview Schedule

Position	Name	Office	Meeting	Interview Status	Scheduled Time
Deputy Commissioner for Patents	Peggy Focarino	MDE 10C85	MDE10C85	**EVERYONE COMPLETE**	11/15 at 10:30 AM
Associate Commissioner for Patent Operations	Bruce Kisliuk	REM 4C03	MDE 10C55	**EVERYONE COMPLETE**	11/10 at 8:30 AM
Associate Commissioner for Patent Operations	Jim Dwyer	RND 4D19	MDE 10C55	**EVERYONE COMPLETE**	11/10 at 8:30 AM
Associate Commissioner for Patent Operations	Andy Faile	JEF 2D79	MDE 10C55	**EVERYONE COMPLETE**	11/10 at 8:30 AM
Associate Commissioner for Patent Operations	Bob Oberleitner	KNX 4D71	MDE 10C55	**EVERYONE COMPLETE**	11/10 at 8:30 AM
TC 1600 Patent Executive	George Elliott	REM 4D05	REM 4D05	**BRIAN/STEVE COMPLETE**	11/12 at 1:00 PM
TC 1600 Patent Executive	Jackie Stone	REM 4D15	REM 4D15	**JAMIE COMPLETE**	11/12 at 10:00 AM
TC 1600 Patent Executive	Remy Yucel	REM 4C09	REM 4C09	**JAMIE/BRIAN COMPLETE**	11/19 at 3:30 PM
TC 1700 Patent Executive	Sharon Gibson	REM 8D19			
TC 1700 Patent Executive	Gary Jones	REM 8D13	REM 8D13	**JAMIE COMPLETE**	11/12 at 11:00 AM
TC 2100 Patent Executive	Wendy Garber	RND 4C09			
TC 2100 Patent Executive	Jack Harvey	RND 4D05	RND 4D05	**JAMIE COMPLETE**	11/9 at 12:00 PM
TC 2100 Patent Executive	Nestor Ramirez	RND 4D15	RND 4D15	**JAMIE/STEVE COMPLETE**	11/18 at 1:00 PM
TC 2400 Patent Executive	Tim Callahan	JEF 4C81			
TC 2400 Patent Executive	Nancy Le	JEF 4D79			
TC 2400 Patent Executive	Valencia Martin-Wallace	JEF 4D85	JEF 4D85	**JAMIE/STEVE COMPLETE**	11/23 at 4:00 PM
TC 2600 Patent Executive	John LeGuyader	KNX 8D77			
TC 2600 Patent Executive	Mark Powell	KNX 8D75			
TC 2600 Patent Executive	Wanda Walker	KNX 8D71	KNX 8D71	**BRIAN/STEVE COMPLETE**	11/19 at 10:30 AM
TC 2800 Patent Executive	John Cabeca	JEF 8D71	JEF 8D71	**JAMIE/STEVE COMPLETE**	11/23 at 1:30 PM
TC 2800 Patent Executive	Rick Seidel	JEF 8D75	JEF 8D75	**BRIAN/STEVE COMPLETE**	11/17 at 3:30 PM
TC 2900 Patent Executive	Bob Olszewski	REM 8C15			
TC 3600 Patent Executive	Wynn Coggins	KNX 4D79	KNX 4D44	**EVERYONE COMPLETE**	11/15 at 11:15 AM
TC 3600 Patent Executive	Kathy Matecki	KNX 4D85	KNX 4D44	**EVERYONE COMPLETE**	11/15 at 11:15 AM
TC 3600 Patent Executive	Dave Talbott	KNX 4C81			
TC 3700 Patent Executive	Don Hajec	RND 8D15	RND 8D15	**BRIAN/STEVE COMPLETE**	11/15 at 2:30 PM
TC 3700 Patent Executive	Angela Sykes	RND 8D13			
TC 3700 Patent Executive	Karen Young	RND 8D19	RND 8D19	**BRIAN/STEVE COMPLETE**	11/9 at 1:00 PM
TC 4100 Patent Executive (Training Academy)	Jin Ng	MDW 2223			

Figure 23: Final USPTO Executive Interview Schedule.

Appendix E: Summarized Interview Notes for Margaret Focarino

Attending Members: James Davison, Stephen Ruck, and Brian Moore
Meeting Date and Time: 11/15/2010 10:30-11:00 AM
Meeting Location: Madison East 10C85

1. *How would you say that you currently utilize the Microsoft SharePoint system?*
    a. *i.e. meeting agendas, minutes, document storage, calendar, etc…*

- Uses it to check Examiner Performance Appraisal Plan (PAP) documentation
- Occasionally look at Technology Center sites for policy updates and scheduling

2. *What computer-based tasks do you perform on a regular basis that you would like to be completed automatically?*
    a. *i.e. reminder emails, project updates, etc…*

- Showed interest in receiving email updates regarding sites of interest

3. *How would you like to receive updates about projects handled by the Microsoft SharePoint system?*

- Ability to look at a site and find easily find important information
- Data points are usually what are sought, not necessarily the plan or milestones
- Would like to avoid the need to call and email to find updates

4. *What is your future expectation for the Microsoft SharePoint system? What would you like it to be used for?*

- People should use the SharePoint sites uniformly as a primary project workspace
- Reduce the overlap of data between sites
- Indication of most recent updates and progress

Appendix F: Summarized Interview Notes for Associate Deputy Commissioners

Interviewees: Bruce Kisliuk, James Dwyer, Andrew Faile, Robert Oberleitner
Attending Members: James Davison, Stephen Ruck, and Brian Moore
Meeting Date and Time: 11/15/2010 10:30-11:00 AM
Meeting Location: Madison East 10C85

1. *How would you say that you currently utilize the Microsoft SharePoint system?*
    b. *i.e. meeting agendas, minutes, document storage, calendar, etc…*

- SharePoint meeting workspaces for managing agendas and items of relevance
- Use calendar to share availability
- Use for document storage and collaboration

2. *Did you find the current system difficult to navigate?*
    a. *Poor Graphic Layout?*
    b. *Not Intuitive?*
    c. *Too time consuming?*

- Both difficult and not intuitive, often hard to find links to the correct sites
- SDC web navigation is very well handled
- Lack of convention means that each site is set up differently, becomes difficult to know how to use/navigate each different site
- Would like to see either a simplification to make it easier to use across sites OR some convention (template?) among them so that they all function in a similar way for general use

3. *Are there any changes that could be made to the current SharePoint system that you feel would make it more efficient?*

- Found our prototype design to be somewhat helpful for Project Sites
- Thinks that Project Summary should always be used to contain updated information for upper level executives to easily access (currently not always used properly)
    - Updated Project Summary
    - Updated Data/Measures
    - Updated Presentations

4. *Are there any tasks that you complete on a regular basis that, if automated, would make your job easier?*

- Update reminders sent to project managers/members would be useful
- Email alerts for significant events/updates
- Example: everything something is attached to a WIL meeting agenda, ping all WIL executives with an email notifying them
- Perhaps set it up to ping members with emails until the SP takes off and is used without need to email

- Try to get SP used in lieu of email correspondence, convince people that SP is good and easy to use
- Again, try to have a similar/identical front-end interface among sites

5. *If possible, how long would you say that it takes you to receive an update on the status of a project, and how would you go about getting that update?*
    a. *Does this change on a daily/weekly basis?*

- Depends on type of update required
- If information not on SP, must email asking for recent updates, either receive update or have to wait for them to make the update and send it
- Can take 1 week or more
- Agree that failsafe update reminders may be useful

6. *What do you feel the Microsoft SharePoint server would be best used for within the USPTO?*
    a. *Is it document storage, meeting minutes and agendas, project status updates, managerial tool?*
    b. *What do you want to get out of the Microsoft SharePoint system?*

- Three most important features
    - Meeting agendas/plans
    - Project updates
    - Global document storage
- Confidence that information you seek is correct and up to date

Appendix G: Interview Questions for Patent Directors

1. How would you say that you currently utilize the Microsoft SharePoint system?
    a. i.e. meeting agendas, minutes, document storage, calendar, etc…

2. Do you find it time consuming or difficult to keep the sites updated with relevant project information?

3. Did you find the current system difficult to navigate?
    a. Poor Graphic Layout?
    b. Not Intuitive?
    c. Too time consuming?

4. Are there any improvements or adjustments that you believe would make the SharePoint system more efficient and worthwhile to executives?
    a. What adjustments to the site, if any, might make you more likely to use it for managing projects and tracking progress than alternate means?

5. What computer-based tasks do you perform on a regular basis that you would like to be completed automatically?
    a. i.e. reminder emails, project updates, etc…

6. If the layout of the website changed dramatically, do you think that you would still be able to use and navigate the SharePoint sites?
    a. Would you find it helpful if a static protocol were provided to guide you through the use of the SharePoint website for each project you manage?
    b. i.e. if the website contained a document instructing how to set the site up when you were first starting up a project, would this be helpful?

7. Do you feel that you could benefit more from SharePoint if you were included in a brief seminar detailing its different features?
    a. i.e. do you feel that you could use additional training in the use of the software?

Appendix H: Summarized Interview Notes for Patent Directors

Feedback from Patent Directors	
Reasons for Use	Checking meeting agendas, Uploading documents, Checking managers' availability SDC project Green Tech, document repository Teleworking calendar Documents related to other people's projects Required to use calendar function Uploads files from Shared drive, Updates projects occasionally Meeting Schedules Created and maintains two sites not on the SDC site, updates,
Problem Areas	Doesn't check regularly for updates… maybe once a week if that (whereas email is instantaneous) Cannot find documents easily, no consistency between sites, cannot take time to learn Document searching, it's not user-friendly Not enough instruction and not knowing how to do something immediately leads to disuse Not enough time, Too much clutter/noise, Not easily accessible, no universal tablet There is no common "home" link or button, there needs to be more of a SP tutorial, there is too much on the SDC site Difficult to navigate, Project updating is difficult and time consuming,

Current Benefits	Meeting agendas, Scheduling availability Individual setup, extracting files is easy Used mostly as a repository, Theoretically it has great potential, it's just not user friendly It's easy to update and upload documents It helps her manage projects, and is easy to update sites. It's a good operational tool
Proposed Solutions	Reminder emails would be great, especially for definite timelines, Information more accessible More intuitive search, better navigation, less validation checkpoints Updates given by email, possibly a tooltip, NOT a pamphlet Some system for naming project documents, Teach managers and members how to use the site, executives don't need to train, Simplify it, make it more consistent, make people recognize the value of the program Update emails on relevant changes, Potentially link task cells in Action Plan to applicable documents (comment on prototype) A generic template for all projects

Appendix I: Interview Notes for Contacts Outside of the USPTO

Interview Notes for Mike Hamilton (Director of WPI Residential Services)

1. *How do you currently use Microsoft SharePoint to manage Residential Services?*
   - Manage paperwork, forms to be filled out
   - Track RA programming
   - Track Weekly reports, nightly duty logs
   - Work Order filled through SharePoint
   - Calendar Scheduling; departmental calendar
   - Contact list, synced up with Microsoft outlook
   - Archive folder for past years, to help with resources for RAs
   - Paperless RA manual

2. *Why did Residential Services first adopt Microsoft SharePoint?*
   - January 2007
     - Too much paper
     - Lack of organization
   - Did a test run beforehand (slow introduction to make sure it would work)

3. *What did Residential Services use before Microsoft SharePoint*
   - Paper, paper, paper… too many paper documents

4. *Are all RA's, CA's, and Residential Services staff required to use the program?*
   a. *In what capacity?*
   - Required to use it for work
   - Different permissions structure based on needed
   - Administrative staff uses it

5. *Do Residential Services employees receive any formal training on the use of the software?*
   - Formal training on specific usage necessary for individual jobs

6. *How is the site kept up to date? Is it a collaborative effort, or are certain individuals assigned to different aspects of the site?*
   - Mike is the main guy for archiving
   - Individual job
   - Archive shows what has happened before so you can learn from the past
   - In depth search program so you can see what has happened beforehand
   - No file uploads, all stored on the SharePoint server (primary workspace)

7. *Do you have any suggestions for changes or enhancements?*
   - Search functionality could use some work

Interview Question Reponses from Jay Davison (Oracle Corporation)

Responses from Jay Davison
Senior Director, Software Development
Oracle Corporation

1. How does Oracle Corporation handle communicating large amounts of data both internally and externally?

For internal communication on corporate-wide issues, it's mostly done via email.

For external communication with the public, we mainly rely on our website and numerous press releases via online news sites like Reuters, Associated Press, Business Week, Wall Street Journal, etc.

In terms of data storage and access, we're a database software company, so we use our own products (like the Oracle Database and Middleware Applications) to efficiently store and retrieve the data that is communicated internally and externally. For example, we have a "bug" database that is used to track issues for our products, and it can be accessed both internally and externally via a simple, web-driven application.

2. What types of software does Oracle use to communicate?

For Email, Calendar, Web Conferencing, Instant Messaging, Voice Mail, Contacts, Task Lists, Mobile Sync, and Team Collaboration/Workspaces, we use a product called Oracle Beehive, which is an internally developed software package. Email uses an SMTP protocol, so it supports most popular clients like Thunderbird, Outlook, etc.

3. What is the difference between "need to know" and "CC-me-on-everything?"

Most of our internal communication falls into "need to know" - basically, just involving the people that are specifically involved. Email can be overwhelming in volume for everyone, so we try not to do too much of "CC-me-on-everything" communication. Most of the "need to know" communication is Oracle-confidential information.

a. How do these volumes of data differ?

Probably 90% of the communication data is "need to know", and the remaining is generally available information.

4. How has Oracle's communication system evolved over the years?

We started out with different systems that handled each of the various communications tasks independently, and there was no workflow process or interaction between them. Now we have a consolidated system that handles all of these tasks (like email, scheduling, workspaces, etc), and allows for information to flow between them, and it can all be accessed via a single application that everyone uses.

5. What types of problems does Oracle encounter on a day-to-day basis concerning communications?

At a general communication level, probably the most common "problem" would be over-dependence on email. Sometimes, during a particular work day, I may spend all day reading and responding to email questions.

At a technical level, there are occasions where our internal communication systems have software or hardware issues, resulting a mass outage for an extended time period. Things can quickly grind to a halt if our email database has some type of problem for an hour.

a. Any examples of serious miscommunications either internally or externally?

I'm not aware of any serious miscommunications. There are occasionally misunderstandings based on something that was improperly communicated via email. I don't recall any recent cases where something that people should not have been notified about was "leaked out" mistakenly.

b. How are these problems solved?

I think those types of "misunderstanding" issues are often resolved by personal contact - face-to-face interaction or a phone call, sometimes followed by a clarifying statement or email.

6. What types of communications do you use that go outside of shared workspaces?

We used shared workspaces (membership-based) for collaborative efforts, as well as Wiki pages for communicating information that can be somewhat dynamic but needs to be persistently available. We also use online document libraries for confidential information, like project specifications.

a. How much face-to-face interaction do you have?

Each development group (usually 3-8 people) meets weekly. Groups that are involved in software development have daily personal interactions - small office meetings to ask/answer

questions, investigate problems, etc.

b. Do you feel that conference calls are more or less effective than email?

Conference calls (or meetings) are more effective for "many-to-many" interactions, where everyone needs to hear some information and be able to respond and hear other responses. They are also better for project reviews and other more lengthy interactions. Email is better for mass communication of smaller pieces of information. Email is also better for capturing and retaining ideas persistently - my email folders are like a database of searchable information that is critical to my job. We often use email a bit too much for exchange of ideas, and sometimes the email chain becomes excessively long and cumbersome.

For direct customer interaction regarding issues, we generally rely on conference calls.

c. Is any physical media used at Oracle?

Most of our external communications are done electronically. Software and patches are also distributed via downloads. User documentation is available via our doc website, and can also be downloaded in ".pdf" format. Internally, for data storage, we certainly store lots of information on physical media - disks and tape backups.

Interview Notes for Barbara Moore (Dartmouth-Hitchcock Medical Center)

Responses from Barbara Moore
Director of Billing Operations and RMD
Dartmouth-Hitchcock Medical Center

1. How long has DHMC been running on a Microsoft SharePoint system?
I'm not certain of the exact date, but began to see folks using this tool two to three years ago.

a. How often is the system updated?
I'm not certain of this either as it is handled by our IS group.

b. Is there a department staffed to take care of the system?
Yes, it is managed through our IS group.

c. How accessible is DHMC's IT department?
They're very accessible. We have an internal help desk system that we can communicate with almost round the clock.

2. How did DHMC communicate and organize its infrastructure before MS SharePoint?
The majority of folks used a shared drive to communicate, store documents, and organize.

a. Was the transition difficult?
It is always difficult for some to accept change. There are still some groups that use a shared drive and prefer that. As with any change, the longer we use it and people become more comfortable with it, the more it is accepted.

b. Were you given training when the system was implemented or when you started working at DHMC?
I was not given any training on the system, but I have had other users offer to assist me which has worked well for me.

c. How much face to face interaction do you have?
I have not had any face to face training.

d. Do you feel that conference calls and face to face meetings are more or less effective than email?
I feel face to face training is the most effective.

3. Do people at DHMC have different levels of access to the software?
Yes access is granted at different levels depending upon role.

4. Do you work on a "need to know" basis?
Yes, information related to patients is strictly on a need to know basis.

a. Does the concept of a shared workspace help maintain this policy?
It does maintain this policy as we can limit who has access to the information.

b. Do you find that SharePoint distances you too much from the other employees at the hospital?
I don't feel that SharePoint distances us too much. I believe it helps to build a collaborative environment in which people have access to the information they need to do their jobs.

Appendix J: Transcripts of Instructional Wiki Pages

Welcome to your Strategic Development Committee project site!

This site is a digital workspace created to facilitate collaboration and communication among project members, supervisors, and executives. Through proper use of this site, files and data regarding project progress can be more efficiently transferred and email backlogs of project files can be reduced, saving both time and storage space.

To close or minimize this document on the main page, click the small arrow on the upper right corner of the frame and select "Close" or "Minimize."

Below are brief instructional pages that explain how to complete various tasks within the site.

Related Topics:
[[Action Plan Management]]
[[Alert Management]]
[[Calendar Management]]
[[Charter Management]]
[[Document Management]]
[[Task Management]]
[[Using the Search Function]]

Managing the Project Action Plan

The project action plan is a critical document for conveying information regarding project milestones and tasks, as well as scheduled due dates and status updates. Maintaining this document ensures ease of access to current status of project milestones.

In order to modify the action plan, first select "Project Summary" under Documents in the Quick Launch side-bar on the left-hand side of the page. Next, mouse over the action plan file in the document list, then click on the drop-down menu and select "Edit in Microsoft Excel." You will be prompted to check the document out, then it will open after any necessary security dialogues. When edits are completed, close the document and choose to "Check In" in order for changes to take effect.

Managing and Assigning Email Alerts

Creating and Assigning Alerts

To create an alert, select "Alert Settings" under People and Groups in the Quick Launch side-bar on the left-hand side of the page. This will bring you to your personal alerts page for this site. Next, select "Add Alert" in the upper left corner of the page, which will bring you to the New Alert page. Here, select the list or library for which you want to configure alerts, then choose next. Here, you can configure the following settings:

- Alert title
- Who to send alerts to (enter usernames or email addresses separated by semicolons)
- Type of changes that trigger alerts
- Whether to filter alerts by specific critereia
- When to send alerts (immediate, daily summary, or weekly summary)

Note: This can also be done from within a list or library by selecting "Actions" on the toolbar, then selecting "Alert Me."

Managing Your Alerts
In order to manage your alerts, select "Alert Settings" under People and Groups in the Quick Launch side-bar on the left-hand side of the page. This will bring you to your personal alerts page for this site. Here you can mark and delete alerts, or select individual alerts for modification by selecting the title. By selecting the title, you have the option to change the following:

- Alert title
- Type of changes that trigger alerts
- Whether to filter alerts by specific critereia
- When to send alerts (immediate, daily summary, or weekly summary)

Calendar Management

Creating and Managing Calendar Items
To access the Calendar, select "Calendar" under Lists in the Quick Launch side-bar on the left-hand side of the page. Here, new calendar items can be created by selecting "New" from the toolbar, then "New Item" from the dropdown menu. When creating an event, the following details can be customized:

- Title (required)
- Location
- Start Time (required)
- End Time (required)
- Description
- Whether it's an all-day event
- Recurrence (declaring a repeating event)
- Creation of a meeting workspace for the item

Within the Calendar view, selecting an event on the calendar will allow you to view details about that item. Additionally, you have the option to edit, delete, and manage permissions for that item, should you have sufficient security permissions.

Integration with Outlook*
**This function applies to Microsoft Outlook 2003/2007/2010*

If you are a user of Outlook 2003 or newer, this calendar can be synchronized with your Outlook client. This can be done by selecting "Connect to Outlook" from the "Actions" toolbar dropdown, then following through the prompts. Completing this will import the project calendar into your Outlook calendar tab under "Other Calendars." This calendar will receive updates from the site calendar, and changes to the calendar within Outlook will take effect within the site calendar.

Managing the Project Charter

The project charter is a critical document for conveying summary information about the project lead, members, goals, and other essential details. Maintaining this document ensures ease of understanding for executives or other project members visiting the project site.

In order to make changes to the charter, select "Project Charter" under Documents in the Quick Launch side-bar on the left-hand side of the page. Next, should you have appropriate permissions, select "Edit" at the upper-right corner of the Wiki page, this will bring you to the Wiki editor for the Project Charter.

Managing Documents

Project Summary

The Project Summary document library is meant to hold files that contain critical summary about the project, such as the project action plan or current data report.

Shared Documents

The Shared Documents document library is meant to hold project documents that are meant to be accessible to anyone viewing the project, but do not belong in the Project Summary.

Working Documents

The Working Documents document library is meant to hold working documents for use by project members. This library is not visible to users that are not working on the project.

Managing Documents

To upload a document, select the appropriate document library from the Quick Launch toolbar. Next, choose the "Upload" option from the library toolbar and select the file on your local machine.

Proper File Names

In order to streamline file organization and to enhance the capabilities of the seach feature, documents uploaded to the document libraries should be named according to the following model:

TC####-KEYWORD-DOCUMENT TITLE

For example, a mid-year report for a project within TC-1600 would look something like:

"TC1600-MIDY-Project Report.doc"

Category	**Keyword**	**Description**
Administrative Procedures	ADMIN	Administrative documents, procedural concerns.
Awards	AWARD	Documentation of awards given out to employees
Budget	BUDGET	Documentation of budget updates or concerns
Classification	CLASSIF	Documents pertaining to patent or initiative classification
Customer Service	CUSTOMER	Documents pertaining to customer complaints and resolutions
Employee Relations	ER	Employee evaluations, disciplinary documentation, retention decisions
Hiring	HIRE	Hiring documents, procedures, initiatives
Initiatives	INIT	Initiatives headed up by project managers, such as the SDC executive suite
Legal, Policies, Practice	LEGAL	Legal documentation, policy modifications, rules, court decisions
Labor Relations	LR	Documentation pertaining to union rules, decisions, requests
Mid-Year	MIDY	Mid-year reports and documentation, employee reviews
End-of-Year	EOY	End –of-year reports and documentation, employee reviews
Position Descriptions	POSITION	Documentation describing open positions, filled positions, current positions
Promotions	PROMO	Documentation of promotions of employees
Pendency – Production	PENDENCY	Documentation of patent processing timelines
Quality	QUALITY	Quality of application process of employees (searches, action taken)
Ratings	RATINGS	Documentation of employee ratings
Training	TRAINING	Documentation of training materials and exercises
TSS	TECH	Documents pertaining to the technology support staff

Managing and Assigning Tasks

Creating and Assigning Tasks

To create a task, select "Tasks" under Lists in the Quick Launch side-bar on the left-hand side of the page. Next, select "New" from the toolbar, then "New Item" from the dropdown menu. When creating an event, the following details can be customized:

- Title (required)
- Priority
- Status
- % Complete
- Assigned To (enter usernames or email addresses to assign members to a task)
- Description
- Start date
- End date

Managing Tasks

To access the task library, select "Tasks" under Lists in the Quick Launch side-bar on the left-hand side of the page. The tasks list can then be filtered using the dropdown menu in the upper-right corner of the frame by criteria such as "All Tasks," "Active Tasks," and "My Tasks." Selecting a task will allow you to view its details, as well as edit, delete, or manage permissions depending on your security permissions level. Editing the task will allow you to modify details mentioned above, which is useful for reporting progress for members assigned to tasks.

Integration with Outlook*

**This function applies to Microsoft Outlook 2007/2010*

If you are a user of Outlook 2007 or 2010, the Tasks list can be synchronized with your Outlook client. This can be done by selecting "Connect to Outlook" from the "Actions" toolbar dropdown, then following through the prompts. Completing this will import the your project tasks into your Outlook Tasks tab under Other Tasks. These tasks will receive updates from the site Tasks list, and changes to any tasks within Outlook will take effect within the site.

Using the Search Function

As all document titles should follow the same convention: OFFICE-KEYWORD-DOCUMENT TITLE, there are numerous ways to use the built-in search functionality to filter results. The Keyword categories can be found below.

For example:
To search for all documents from TC1600, one would enter: TC1600
To search for all documents regarding Customer Service, one would enter: CUSTOMER
To search for all documents that are from TC1600 and contain Customer in the title or keyword, one would enter: TC1600 CUSTOMER or TC1600+CUSTOMER
To search only for Customer Service documents from TC1600, one would enter: "TC1600-CUSTOMER"

Category	Keyword	Description
Administrative Procedures	ADMIN	Administrative documents, procedural concerns.
Awards	AWARD	Documentation of awards given out to employees
Budget	BUDGET	Documentation of budget updates or concerns
Classification	CLASSIF	Documents pertaining to patent or initiative classification
Customer Service	CUSTOMER	Documents pertaining to customer complaints and resolutions
Employee Relations	ER	Employee evaluations, disciplinary documentation, retention decisions
Hiring	HIRE	Hiring documents, procedures, initiatives
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