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# The Influence of Social Networking Technology in an Engineering Organization

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## ABSTRACT

### THE INFLUENCE OF SOCIAL NETWORKING TECHNOLOGY IN AN ENGINEERING ORGANIZATION

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Computer facilitated Social Networking (SN) is becoming more prevalent in our society, both in our personal and professional lives. As its use grows, there is a desire to determine how it will impact an organization. If it can positively impact an organization then it is an initiative that could be embraced and leveraged for any number of business related activities from marketing to engineering. This project develops and implements a social networking treatment for an engineering organization in order to determine how it impacts the responsiveness and performance of the organization. The treatment includes an online tool, a training package, and organizational support throughout the study. The analysis of the data showed that, within the scope of this study, when an organization is provided with a social networking program and associated training and resource allocation there is no apparent impact on the organization. The tool was not used enough to itself have a significant impact on the organization however, subtle changes in the organization as a result of the overall treatment process are noticeable. Some factors that may have impacted the results were a lack of usefulness of the SN tool, the adequacy of the training was insufficient, and participants didn't see the instilled benefit in using the SN tool. This paper presents the methodology, results, conclusions, and courses of action for follow up research.

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# CHAPTER 1

# INTRODUCTION

The purpose of this paper is to present the research and results of a project that was conducted as part of a Doctorate of Engineering (DEng) program through Old Dominion University (ODU). It was done with support and funding from the Naval Surface Warfare Center (NSWC) in Dahlgren, Virginia. The project is based on an engineering management field of study with a focus on social networking and knowledge management. The research project was conducted at NSWC between May 2012 and Jan 2013 with the intention of providing a qualitative analysis of the impact of the treatment on the organization. Human subject testing was approved by the ODU Internal Review Board with concurrence from NSWC Dahlgren.

## Research Question

Based on research interests, the environment of the organization, a review of relevant literature and recent doctoral coursework, a research question was developed and refined. This research project attempted to answer the question:

"How does computer facilitated social networking, as part of a knowledge management process, influence the responsiveness and performance of the Manned Platform Integration Branch (G81) at the Naval Surface Warfare Center (NSWC) in Dahlgren Virginia?"

This research question effectively bound the scope of the problem to a manageable size and provided a methodological point of departure for the research. It also identified the parameters that were to be used to qualify the findings.

## Summary

In setting the stage for the project it was necessary to discuss what knowledge management (KM) is as well as discuss the environment of the Department of Defense (DoD), Navy, and G80 in which the research was conducted. A comprehensive understanding of the practice of knowledge management was critical to developing, conducting and evaluating the

research. A discussion of the environment was also important because an understanding of the environment, and the way business is conducted in the federal government versus the private/commercial sector, is essential to determine the root sources for change in the organization.

The review of the literature presented in this document demonstrates the feasibility of the project and lays the foundation for the methodology, management plan, timeline, and analysis. Many comparable papers document knowledge management programs, their results, and how they can be measured, but prior to this paper the researcher was unable to identify any literature discussing a pretest-posttest qualitative analysis of a social networking initiative within a government research and development organization. The literature review also addressed some of the many different social networking programs available at the time and identifies the software solution that met the goals, needs, and requirements of the organization and the research project.

The intention when embarking on this research was to qualitatively answer the proposed research question. A successful implementation of the process would promote a more comprehensive implementation within the Warfare Center and possibly in other organizations outside the center. A follow up to this research project should be a more in-depth quantitative analysis which will be able to more accurately quantify the benefits of implementing a process and provide more concrete numbers in terms of cost savings, increased productivity, and/or increased effectiveness which will be an important step in fostering KM growth.

**Knowledge Management**

A critical step in any knowledge management study is to accurately define what knowledge management is and why it is important to an organization. Knowledge management, or a knowledge management system (KMS), is intended to facilitate the creation, collection and dissemination of information and/or knowledge within an organization. KM aims to use, improve, maintain, and create organizational capabilities to generate a sustained competitive advantage (Landaeta, 2009). In terms of value to an organization, KM is the transformation of information

and intellectual assets into enduring value (UniSA, 2010) that allows the value of a KM process to the organization to be realized. The term *enduring value* really encompasses the essence of what is trying to be done when implementing knowledge management. Both money and time are invested in creating knowledge, and unless it is captured, the value of that investment is lost.

It is important to note that the use of the term "knowledge" when describing knowledge management or knowledge management systems is for all intents and purposes a generic placeholder covering related terms and concepts such as data, information and wisdom. The nuances of this terminology are discussed in a later section.

In general terms knowledge management refers to the generation, representation, storage, transfer, transformation, application, embedding and protecting of organizational knowledge (Schultze, 2002). The specifics of how those functions are executed continue to be refined, analyzed and revisited in the related literature, and the effectiveness of such processes in adding value is often a matter of contention and is difficult to quantify.

An integral aspect of KM that is sometimes neglected in its definition is that in order to be effective, the processes, tools, and techniques need to make available the right knowledge to the right knowledge worker at the right time (Landaeta, 2009). Knowledge that is inaccessible or late is worthless.

**History of Knowledge Management**

Although it can be argued that knowledge management has been around for centuries, it was not until the 70s that it began to be formally discussed as an integral and essential part of a successful organization. Much of the early work came as a result of papers published by Peter Drucker and Paul Straussman in which they observed the growing importance of information and explicit knowledge as valuable assets of organizations (Uriarte, 2008). Knowledge management as it exists today has come around in part as the result of a book written by Ikujiro Nonaka and Hirotaka Takeuchi entitled, *The Knowledge Creating Company: How Japanese Companies*

*Create the Dynamics of Innovation*. This work highlights the success of Japanese organizations' skills and expertise at "organizational knowledge creation" in which the company has the ability to create new knowledge, disseminate it throughout the organization, and embody it in products, services and systems (Nonaka, 1995).

Over the past 10 years the Navy has continually tried to implement both knowledge management software solutions and process solutions to increase its effectiveness. Being such a large organization, many smaller KM initiatives have been implemented at individual sites and some have had an impact Navy wide. One of the initiatives implemented across the Navy to improve knowledge management was the establishment of communities of practice. The term "Communities of Practice" was first coined by Etienne Wenger and Jean Lave in their book *Situated Learning* based in part on interactions with Quartermasters on US Navy Ships (Wenger, 1991). They were developed to facilitate the exchange of successes and lessons learned and offer the opportunity to benchmark against best practices by associating groups of people who share a concern, set of problems, or a passion about topic and interact regularly (Kendall, 2003). Another KM facilitator within the Navy has been the development of the Navy Home Port which improves productivity through eliminating non-value activities and promoting access to and reuse of knowledge, while supporting collaborative decision-making which is estimated to save 18,000 staff hours per month (Bennet, 2002). Another resource that has been serving the Navy and DoD for 65 years is the Defense Technical Information Center (DTIC) which serves the DoD community as the largest central resource for DoD and government-funded scientific, technical, engineering, and business related information (DTIC, 2010). Those are just a few examples highlighting that the Navy recognizes the value of knowledge and is working to capture and distribute as much as possible.

Although the Navy has made a significant effort to leverage KM processes, the end results of its initiatives have often fallen short of expectations, and the benefits can be hard to quantify. Robert Sutton estimates companies have wasted hundreds of millions on worthless

knowledge management systems (Sutton, 2000). To say they have been worthless is probably an exaggeration, but achieving success is challenging. Even in failure there is something to be learned that can be applied to the next iteration.

KM continues to be an ongoing endeavor that will never be solved all at once, but with each attempt at a solution there is a benefit on some level. With that being said it would be naive to assume that this research project could solve all the issues associated with knowledge management which is why it focused on a small portion of the overall process in order to keep the scope of the project manageable and the results objective.

**Importance of KM**

Until the past couple of decades the importance and value of knowledge management has sometimes been questioned however, the increased topicality—if not to say pervasiveness—of the term through the writings of such well-known and recognized authors as Drucker (1993), Wheatley (2001), De Geus (1997), and Senge (1999) strongly suggest that KM is a credible concept (Bredillet, 2004). It is important to remember that organizations exist to create value that members cannot always create individually (Qureshi, 2006), and without the ability to effectively capture, share and communicate information and knowledge throughout the organization the benefits of working in an organization are negatively impacted. Knowledge has become an important part of the capital of an organization and is recognized as being an essential part of increasing an organization's competitiveness and effectiveness. The ability to capture knowledge can help an organization overcome the loss of personnel who have gained valuable expertise in their time with the organization.

Generally when someone thinks of organizational capital they usual think of the more tangible components such as manufacturing capacity, supply chain infrastructure, workforce, and cash on hand, but as Alan Greenspan, former chairman of the Federal Reserve, noted an ever increasing share of GDP has reflected the value of ideas more than material substance or manual labor input, particularly during the past two decades (Qureshi, 2006). Not only has gross domestic

product (GDP) reflected an increase in the value of knowledge, but more and more knowledge assets have become widely recognized as the single most important source for competitive advantage (Hoe, 2006). In today's business environment, with its increasing use of technology products, the knowledge component of an organization's capital contributes significantly to the overall value of the organization. In a study of 10,000 companies conducted by Arthur Anderson it was found that between 1978 and 1998, the non-book value of all companies rose from 5% to 72% of market value (Boulton, 2000). The majority of that non-book value is related to the knowledge assets of an organization, which means that it is a major part of the organization that cannot be overlooked.

This value of knowledge in an organization is manifested by the increased ability of the organization to execute its mission making it a more efficient, competitive and effective entity. A quality KM process allows an organization to be more responsive to customers' needs because time is not lost either searching for the correct information or recreating information that has been gained and subsequently lost. It also helps reduce errors and mistakes by providing the information needed to make the correct decisions and capturing the knowledge gained and lessons learned from previous projects.

The exceptional growth of computers and the internet, and their inherent applicability to the KM process has created an environment in which an organization can be just as effective regardless of the location of its employees. As long as an employee has access to a computer and the internet s/he has the ability to access all the data and information within an organization, whether it is from home, at a hotel or even while deployed around the world. At what appears to be an ever increasing pace developments in collaborative technology are focusing on enabling diverse and distributed teams to come together (Qureshi, 2006) to collaborate and work together regardless of capabilities, distance and sometimes even time.

If an organization is successful in capturing the knowledge of its employees then it can realize the return on its investment in employees even after an employee is no longer with the

organization. To put an organization's employee investment into perspective it is helpful to look at how much a Navy engineer's career costs.

Figure 1 is a conservative example of how much the organization invests in an employee over a 40-year career. As can be seen the rough order of magnitude cost is in excess of 8 million dollars invested which does not take into account inflation or the additional education and training dollars spent throughout the career.

| Organizational Investment in an Engineer | |
|---|---|
| Navy Engineer Cost per Hour* | $123.00 |
| Hours charged in a year | 1744 |
| Cost of a Navy Engineer for 1 year | $214,512 |
| Years worked (22 yrs. old to retirement at 62) | 40 |
| Cost of a Navy Engineers Career | $8,580,480 |

**Approximate rate with overhead for a mid-level engineer at NSWC Dahlgren.*

Figure 1: Organizational Investment in an Engineer

Since an organization cannot prevent an employee from retiring or leaving the only way to preserve that investment is to capture the knowledge the employee has gained over their career and make it available to the next generation of employees.

The fear of losing knowledge when an employee leaves grows as the upcoming wave of retirement of the baby boom generation approaches. 2012 marks the first year that baby boomers are eligible for retirement, and over the next 9 years the US is estimated to lose one-fifth of its workforce, approximately 25 million. That means that unless captured, one-fifth of the knowledge will be walking out of the door. Even more is lost if you take into account the fact that senior engineers would have much more experience than junior engineers. A natural question would be how accepting is the retirement generation of new social media technology? According to a relatively recent study it would appear that their acceptance of social networking is growing.

46% of the baby boomer generation maintains a social network profile with an increase of 107% between 2008 and 2009 (Social Media Boomer, 2011), so it would appear that the stigma of computer illiteracy for the older generations is fading.

**Technical vs. Socio-Technical Perspectives**

When discussing knowledge management and knowledge management systems it is important to keep in mind that there are really two different perspectives: the technical and the socio-technical perspectives. The technical perspective defines a KMS as being technology-centered. The socio-technical perspective defines a KMS as being more people-centered than technology-centered (Meso, 2000). Both perspectives are important to the successful implementation of a KM/KMS process.

The technical perspective focuses on the technology associated with the KM process. This includes both the software and hardware required to capture, store, and disseminate information and knowledge within the organization. It generally involves the extensive use of computers, databases, archives, web portals, search engines and anything else designed for such purposes.

The socio-technical perspective recognizes the human element of a knowledge management process as being the key to successful implementation. Since the socio-technical perspective is less reliant on technology to be effective it has been an integral part of organizations for many years. The perspective does not rule out the use of technology, but it argues that useful knowledge, as opposed to data and information, can only truly be communicated and transferred through social interaction and experience.

The most robust solution to the KM problem is bound to be some combination of both perspectives. As technology matures the benefits of the technical perspective continue to increase, but Davenport and Prusak (1998) argue that technology alone will not lead to a knowledge management culture within an organization, which is a key factor to the effectiveness

of the KM process. In order to influence the culture of an organization the social framework of the organization needs to be addressed. There are some aspects of knowledge management that the technical perspective more adequately addresses such as storage, overcoming distance, and reaching a broad audience, but experience, intuition and more tacit knowledge is more effectively promoted with a socio-technical approach.

**Tacit vs. Explicit Knowledge**

A knowledge worker's comprehension of information can range between two different types – tacit and explicit. When discussing knowledge management explicit knowledge is more commonly the type of knowledge being addressed. Explicit knowledge can be readily articulated and recorded which makes it much easier to manage with a database-centric knowledge management system. Tacit knowledge, on the other hand, is much harder to address with a KMS because it is much more difficult to communicate and share. It is tacit knowledge that guides ones behavior but is not readily available for introspection by oneself or others (Von Krogh, 2000). It is the difference between the "have" in which organizations use a codification approach and rely primarily on repositories of explicit knowledge and the "be" in which personalization approaches imply that the primary mode of knowledge transfer is direct interaction among people (Bredillet, 2004). Both types of knowledge are beneficial to a knowledge management system but are not without drawbacks.

As mentioned before explicit knowledge is well suited for a knowledge management system because it can be easily identified, obtained, stored and transferred. The information and communication technologies (ICTs) associated with KMS such as computers, databases and the internet excel at organizing an organization's explicit know-what, know-how and know-why. Once captured the knowledge can be shared, searched and referenced from anywhere in the world at any time in order to accomplish a task. Explicit knowledge has many advantages within a KMS, but there are some significant challenges associated with it. Explicit knowledge struggles to fully convey the pertinent information in a way that truly allows for meaningful application. For

example, someone can read a book on heart surgery, but that does not mean s/he is qualified to start operating on people. An individual needs to observe, train and practice before s/he truly has an understanding; this is where tacit knowledge is essential.

Tacit knowledge is not something that can be gained by referencing a database or reading an article. It is a personal knowledge embedded in individual experiences and involves intangible factors such as personal believe, perspective and values (Nonaka, 1995). In many cases people do not even realize the amount of knowledge they possess because it has become ingrained in who they are and how they operate. Tacit knowledge has been described as a gut feeling or intuition (Hoe, 2006). This type of knowledge application on a subconscious level requires more than a technical solution to ascertain. The complexity of this knowledge, however, means that it is not easily transferred from the holder to the person needing it because much of it is ingrained in the holder's mind and can be difficult to articulate (Vance, 1997). Tacit knowledge cannot be easily identified, obtained, stored or transferred. In fact, it could be argued that tacit knowledge can never be directly transferred from one person to another. Tacit knowledge needs to be articulated as explicit knowledge so that it can be transferred at which point it requires the receiver of the knowledge to assimilate the information in order to generate her/his own tacit knowledge. Because of the complexity of this process a socio-technical perspective is more adequately suited.

The true challenge for a knowledge management system is to be able to leverage both tacit and explicit knowledge where necessary and when required to be able to transform tacit knowledge to explicit knowledge and vice versa. In the end the organizational culture will dictate which type of knowledge will play the bigger role. As an example, even today the Japanese approach the field of KM differently than Westerners. The West still focuses on explicit knowledge, while our Japanese counterparts find most gains in the areas of tacit knowledge (Wheatly, 2001). Japanese firms try to create knowledge, and the American perspective attempts to manage knowledge (Takeuchi, 2001). Additionally, the focus on tacit verses explicit

knowledge depends on the content of the knowledge that is trying to be conveyed. Some concepts are better suited for explicit knowledge transfer while some are truly tacit and will require a different approach. In the end a viable knowledge management process is the result of carefully balancing both types of knowledge because for explicit knowledge transfer to be successful it must be enhanced with a tacit component, and for tacit knowledge transfer to be successful it must be complemented through explicit support (Jelavic, 2011).

**Data, Information, Knowledge and Wisdom**

The term "knowledge" has been used to cover a range of information types, which is often the case when knowledge management is discussed. It is important, however, to address the different types of knowledge and discuss their characteristics. Generally, data, information, knowledge and wisdom are seen as the 4 intermediate levels of understanding (Hoe, 2006).

Figure 2 shows how these information types compare to each other.

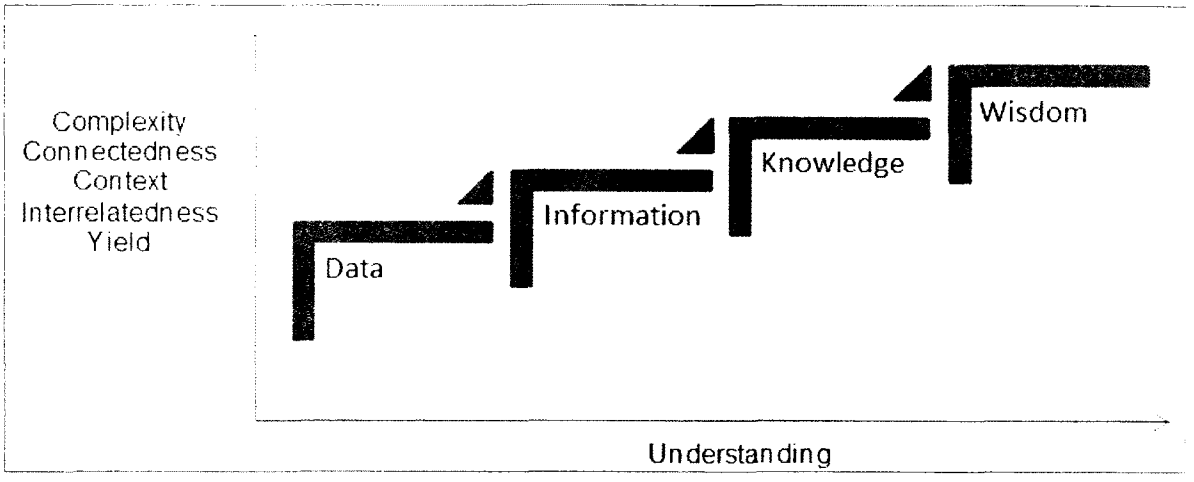


Figure 2: Four Types of "Knowledge"

The figure shows that there are many factors tied to the level of understanding, and as the level of understanding increase so does the complexity, connectedness, context,

interrelatedness and yield just to name a few. A brief discussion of each level of understanding highlights the complexities of managing each level.

## Data

Data is the most basic level of information and understanding. It consists of raw facts or numbers void of context. Because of is simplicity and lack of interpretation, data alone is almost entirely meaningless. Figure 3 is an example of data.

| Data |
| --- |
| Blue |
| 175 lbs. |
| Blonde |
| 74 inches |

Figure 3: Examples of Data

There are 4 pieces of data presented and based only on the data in the table and without applying any knowledge or wisdom it means nothing. The benefit of data is that it is extremely easy to capture, store and share. The growth of computing has made the storage of data a mundane and simple task, and there is almost no limit to how much can be managed. In 1965 Gordon Moore predicted that computing capacity would double every 2 years (Moore, 1965). This trend, known as Moore's Law, has resulted in the exponential growth in computing power with extreme reduction in costs, which now allows the average engineer to store terabytes of data on a personal computer.

## Information

Information is the next step in understanding. Information is data with the added benefit of context. Information is what is generally communicated in books and articles and allows the raw data to be understood. The data presented in Figure 3 can become information with the addition of context as shown in Figure 4.

| Information | |
|---|---|
| Eye Color | Blue |
| Weight | 175 lbs. |
| Hair Color | Blonde |
| Height | 74 inches |

Figure 4: Examples of Information.

Now it is possible to see what the data was representing because it has an associated context. Much like data, information is also easily captured, stored, distributed and referenced using computers and software and is well suited for a knowledge management system, and unlike data, information itself has value. Unfortunately, information, no matter how complete and speedy, is not knowledge" Deming (Deming, 1993).

Knowledge

Knowledge involves assigning meaning to information. The value of knowledge can often be overlooked when developing KM solutions because many people have the mistaken idea that what is in people's heads (knowledge) is fundamentally the same stuff as can be documented in words, pictures charts, etc. (information). It is important to acknowledge, though, that "This underestimates the unique and essential value-adding role of people, who make things happen by applying skills, experience, reason, intuition, passion, and decision to information." (Palmer, 2010) Human beings apply knowledge and wisdom to everything around them. Knowledge and wisdom was probably applied in the two previous sections subconsciously giving the data and information meaning. The result of applying knowledge to the information is the understanding of the data to represent a person, specifically the author of this paper. If a person were given this information s/he would be able to use it to identify people who meet the criteria. It is at this level of understanding where human beings begin to be more effective than technology and a technology based knowledge management system becomes increasingly more challenging. The

example given is very basic and for the most part everyone has the knowledge, but for new concepts it can be difficult to transfer the knowledge from one person to the other. A more challenging concept might be when presented with a challenging calculus equation. It is possible to read the book to obtain the information, but to correctly solve the problem can require a greater understanding that could only be obtained from previous experiences solving problems.

### Wisdom

Wisdom is described as the ability to best use knowledge for achieving desired goals (Hoe, 2006). It is the highest level of understanding and provides the greatest benefit to an organization, but it is also the hardest level to reach and even harder if not impossible to quantify, capture, store and transfer. It relates to the ability to effectively choose and apply the appropriate knowledge in a given situation (Bierly, 2000). It requires a greater wealth of knowledge from which a deeper understanding of the knowledge and information can be obtained. So far the knowledge obtained from the example data and information is that it is describing a person who has been identified as the author of this paper, but with wisdom a breadth of knowledge can be brought to bear to make further judgment. With additional wisdom one could determine that the subject identified in the previous sections is probably male, Caucasian and of average build based on a person's greater understanding of the world around them.

In order to have a successful knowledge management system it is necessary to plan for and address all four levels of understanding and develop ways to capture, store and transfer each. For data and information a more technical approach may be appropriate, but when an organization wants to attempt to "manage" knowledge and wisdom it will need to take a more socio-technical approach, which will involve more than just a database.

## KM Challenges

The concept of a knowledge management process touts great benefits to an organization, but when it comes to the actual real life implementation there are many challenges that the process needs to address and overcome in order to prove its utility to the organization.

The challenges can be broken down into two basic areas. The first area involves the technical challenges associated with the tools being used while the other involves the social aspect of a knowledge management process that can often be neglected when implementing a knowledge management system.

A large portion of knowledge management systems focus primarily on the technology challenges. The first challenge, which in this day and age has become almost a non-issue, is the ability to store the significant amount of data necessary. The cost of storage is a minimal concern for a KMS. The major technical issue then becomes being able to capture and transfer knowledge. Computers and software are very good at doing this with explicit data and information but struggle to manage the more complex knowledge and wisdom.

More and more knowledge management professionals are realizing that knowledge management is not [just] about technology (Bredillet, 2004; Wheatly, 2001). In fact, the results of recent research conducted by Rafael Landaeta have reemphasized the idea that effective knowledge management is 80% related to organizational culture and human factors, and 20% is related to technology (Becerra-Fernandez, 2005). It is in that 80% where some of the most significant social challenges lie.

The culture of an organization probably has the most significant influence on the success of any new processes within the organization. The culture of the employees is generally well established and therefore resistant to change. Environments such as a lack of a learning culture, the wrong selection of methods and tools to execute knowledge processes, and lack of motivation to share and apply knowledge are some of the factors commonly referred to in the literature (Dixon, 2000; Kerssens-Van Drongelen, 1996; Leonard, 2002; Maya, 2005; Landaeta, 2009).

It is not only the culture of the users of the KMS that need to accept the new process, but also the culture of management must be supportive and encouraging and provide all of the tools necessary for a successful implementation. In Landaeta's analysis of a failed KMS there was also

a lack of project and program managers' encouragement to create and share lessons learned throughout the phases of the projects (Landaeta, 2009).

Based on the research the top challenges for implementing a knowledge management process within an engineering organization such as NSWC Dahlgren are:

Technical

- Overcoming computing restrictions imposed by the organization
- Using technology to facilitate the transfer of Knowledge and Wisdom verses just data and information

Social

- Lack of a robust lessons learned/knowledge management culture
- Skepticism of the culture towards new processes
- Lack of support from Management

**The Social Networking Component of Knowledge Management**

Knowledge management encompasses many different components that facilitate capturing, maintaining, sharing and applying ideas, thoughts, and principles. The variety and scope of these methods is very large, so in order to scale this research project to a manageable and executable size it was necessary to focus on a specific and smaller subset of the whole knowledge management puzzle. Lucas McDonnell (McDonnell, 2010) provides a simple breakdown of many of the components that go into a knowledge management process. Figure 5 should not be considered a definitive list, but it does begin to show how complex a knowledge management process can be in order to try to address all of the possible components.

| Issues | Processes and Methods | Skills and Disciplines | Technology | People |
|---|---|---|---|---|
| Personal Organization | Training | Presenting | Technology Standards | Communities |
| Knowledge Reuse | Communication | Performance | Artificial Intelligence | **Social Networking** |
| Technology Adoption | Data Mining | Information Architecture | Portals | Network Analysis |
| Information Security | Knowledge Mapping | Cognitive Science | Portable Delivery | Team Building |
| Knowledge Sharing | Succession Planning | Document Management | Feeds | Experts |
| Intellectual Capital | Outsourcing | Change Management | Wikis | |
| Information Literacy | Collaboration | Writing | Semantic Web | |
| Collective Organization | Behavioral Change | Customer Management | Metadata | |
| Fundability | Documenting | Library Science | Expertise Directories | |
| Learning | Incentives | Information Management | Web 2.0 | |
| User Roles | Cultural Change | Records Management | Blogs | |
| Vocabularies | Narrative/ Storytelling | Competitive Intelligence | Search | |
| Innovation | Metrics | | | |
| | Cleansing | | | |

Figure 5: Component of Knowledge Management (McDonnell L. , 2010)

Out of the 56 components shown, a few, most of which have been conducted at some level prior to this project, stick out as possibilities for a research project. There have been many studies on the technologies available, and for the most part they have found that technology alone does not solve all of the knowledge management issues. Learning and training are also critical components to the whole process. Often times a technological solution is implemented with insufficient training, which results in failure of the technology no matter how good it is.

With the increasing prevalence of social networking technology such as MySpace, Facebook, LinkedIn and others there is still a lot to learn about the influence of technology facilitated social networking as a component of knowledge management within an organization. It is on this aspect of knowledge management that this research focuses. The literature review of

this proposal provides a more detailed description of these technologies and identifies a particular technology that will best fit the research goal.

**Research Environment**

When looking at implementing a knowledge management process it was important to be familiar with the environment in which it occurred. Every organization is unique and requires a process that can take into account the existing structure, culture and regulations. For this research it was proposed that the process be implemented in the Manned Platform Integration Branch – G81 which is part of the Naval Surface Warfare Center (NSWC) in Dahlgren Virginia. G81 falls under 3 major hierarchies of the organization, the Department of Defense (DoD), the Navy, and G department. Each shapes the environment and culture and will influence the implementation and impact of the project. There are two significant issues that stretch across all levels and challenge them to adjust the way they operate. The first is the predicted decrease in budgets due to the reduction in OCONUS (outside the continental United States) operations and global economic challenges. The other challenge is the loss of organizational knowledge which includes not only the failure to capture and save information on a day to day basis but is also affected by the loss of personnel either due to program reassignment, job change, or retirement. The retirement component is a major concern for organizations due to the onset of the retirement of the baby-boom generation (Deloitte, 2007; US OPM, 2008; CBO, 2003).

Department of Defense

The overarching organization is the Department of Defense whose mission is to provide the military forces needed to deter war and to protect the security of our country (DoD, 2011). In the 2000s due to the multiple conflicts the United States has been engaged in the operating budget of the DoD increased from a little over 300 billion dollars in 2001 to just over 700 billion dollars in 2011 (Ackerman, 2010). This growth allowed the DoD to focus on rapidly equipping troops overseas but resulted in decreased efforts to increase the efficiency of the organization. Beginning in 2012, though, the DoD has had to implement significant cuts to its budget.

Secretary of Defense Robert Gates presented plans to make over $100 billion dollars in "efficiency savings" over the following 5 years (Gates, 2011). These savings would in turn cascade down through all levels of the DoD organization and require personnel at all levels to evaluate how they conduct business and figure out how to be more efficient. This financial situation is further exacerbated by federal government sequestration.

In addition to the push to increase efficiencies within the DoD another major challenge is the loss of knowledge within the organization. One of the major ways knowledge is lost within an organization is the retirement of senior personnel, which is predominantly made up of the baby-boomer generation. In 2009 the DoD had a little over 787,214 employees, of which 321,116 (about 41%) would be eligible for retirement over the next 10 years (RAND Corporation, 2009). That means there is the potential for a lot of human capital to walk out the door and probably take most of its decade's worth of knowledge with it. Additionally, many of those who are retiring are less technologically savvy than their younger counterparts and therefore have a more challenging time fully utilizing knowledge management processes, which are generally computer intensive. As retirees they also will likely have less motivation to contribute to a knowledge management system since they will no longer be associated with the organization.

### The Navy

The Department of the Navy as an organization recognized the need for a knowledge management process. In a Navy-wide memorandum, the Department of the Navy Chief Information Officer Knowledge Management Team Leader stated that the DON vision of KM is to create, capture, share and reuse knowledge to enable effective and agile decision-making, increase the efficiency of task accomplishment and improve mission effectiveness (Wennergren, 2005). Documents such as the DON IM/IT Strategic Plan 2011-2013 (DON CIO, 2011), the Naval Transformation Roadmap 2003 (England, 2003), and FORCEnet (Clark, 2011) all cited the importance of knowledge sharing and help to promote a more comprehensive knowledge management strategy and culture within the Navy.

In response to the continued focus on knowledge management, the Navy implemented a number of processes and programs. Some of which included:

- Navy Knowledge Online (NKO)
- Navy E-Learning courses
- MarineNET
- Communities of Practice

The Navy prides itself on being forward thinking when it comes to knowledge management processes, and it does a lot to promote such efforts from the enterprise perspective, but when it comes to the actual implementation, use, and effectiveness of such initiatives within the science & technology and research & development side of the Navy it is the management, culture, and acceptance of the individuals within the labs that determine the effectiveness of the process.

NSWC, G Department, and the Manned Platform Integration Branch – G81

The Naval Surface Warfare Center in Dahlgren, Virginia was established in 1918 and is responsible for science & technology and research & development for the DoD and Navy. NSWC is made up of 5 departments; Z, K, Q, G and W. Each department combines the corporate culture of NSWC with its own policies, procedures and culture. G department's mission is to "Support the warfare with safe, innovative and cost effective full spectrum engagement systems by conducting analysis, research & development, test & evaluation, and systems engineering and integration" (NSWC, 2010).

It is made up of 5 divisions:

- G20 – Weapons Effectiveness and Launcher Division
- G30 – Gun Systems and Light Weapons Division
- G60 – Test and Evaluation Division

- G70 – System Safety Engineering Division
- G80 – Platform Integration Division

Each division is further divided into branches. This research will be taking place under G80, which is divided into 4 branches:

- G81 – Manned Platform Integration Branch
- G82 – Unmanned Platform Integration Branch
- G83 – Communication and Sensors Integration Branch
- G84 – Weapon Control Systems Development Branch

As a branch, G81 has had tremendous success executing rapid research, development and deployment programs over the last decade. The ability of each successive project to build on the success and knowledge of the previous project has been instrumental to the growth and development of the branch. The issue is that most of the knowledge gained within the organization either remained in the brains of the scientists and engineers or was recorded and documented in such a way that it is either inaccessible or unknown. The culture of the organization reflected the fact that only 4% of employees (Tepaske, 2009) know of a KM process within the organization, which means that knowledge was generally not being captured or referenced by the organization. Although historically G81 has been successful, it is mainly due to the consistency of its social capital with the same engineers working on similar projects putting their individual knowledge to bear on a problem. The success of the branch did not mean, however, that it was operating at its most efficient. Lack of access to knowledge did reduce the effectiveness of the organization; it was just not reduced enough to produce poor results. However, as time went on, the branch could fall victim to the same challenges that all of DoD was facing. The branch needed to do more with less in an ever-tightening financial environment which meant the efficiency of the employees needed to increase. Also, the loss of social capital due to baby-boomer retirement, cuts in the contractor workforce, and the progression of

knowledgeable scientists and engineers into new positions resulted in knowledge being lost, further reducing the efficiency of the organization.

The warfare center and its departments implemented some processes to address knowledge management and information sharing within the organization. Some of those initiatives included:

- Mentorship
- Growth Opportunity and Learning (GOAL) program
- Dahlgren Technical Library
- Technical Briefs
- External Assignments
- SharePoint
- DD Workspace

All of these processes help to maintain knowledge within the organization although their effectiveness is questionable. A few of them are mandatory such as participation in the GOAL program, but the use of most of them is left to the discretion of the employees. Based on a study of the branch the actual knowledge or use of KM processes is very limited with 67% of the participants responding that KM is not encouraged by the organization and only 4% of respondents claiming to know of a KM process (Tepaske, 2009).

# CHAPTER 2

## BACKGROUND OF THE STUDY

By tailoring the literature review to reflect the research framework it was possible to address the project goals and the resulting research statement. As a guide for the review there are a number of subtopics that help build a case and lay the foundation for a knowledge management research project. Those subtopics include technology based social networks in today's society, social networking's relationship to knowledge management, and social networking's acceptance by organizations. Although these are not the only areas that were reviewed they are the most significant. A thorough review of the literature only highlighted the need for the proposed research project, but it provided valuable resources that were used to develop a robust project and analysis plan.

It is hard to dispute how pervasive social networking technologies are in today's society. Social networking sites like Facebook, LinkedIn, MySpace and GovLoop all allow users to interact in any number of ways online. Information such as personal and professional information, pictures, events, and job experience barely scratch the surface of what is shared. Over the 2000s and early 2010s social networking providers have enjoyed tremendous growth across all demographics. Facebook, the world's largest social network, reached more than 1 billion active users (Shaughnessy, 2012) spending hundreds of billions of minutes per month networking. LinkedIn, which caters to professionals, achieved more than 200 million members (Hughes, 2013) with visitor traffic increasing significantly every year. Literature on this topic is abundant, and the options for social networking seem to never end. At the time of this writing Wikipedia listed 198 social networking sites, and even at a glance they are already missing some new ones (Wikipedia, 2013). Of particular interest as far as social networking sites goes is a technology called Aristotle which was developed by the Air Force Research Laboratory (AFRL) in response to the perceived utility of a government based social networking program. It was adopted by the Defense Technical Information Center (DTIC), which provides online scientific and technical

services for the DoD, (DTIC, 2010) and was made available to all government employees. A DoD Privacy Impact Assessment described it best as "a program developed with the objective of discovering ways and means to influence the behavior of AFRL scientists and engineers so that they can be more effective as they seek, create, and relate to information. In its current phase, it explores ways to enhance user-driven discovery of information, foster collaboration - both real time and asynchronous, across geographic and organizational boundaries - and facilitate the growth of connections between previously undiscovered intersections (DoD, 2007)." Based on the fact that the government owned the social networking solution it was the preferred technology for this project. It is the only social networking technology that can meet the security requirements of government employees. If another technology was used it would greatly limit the utility of the program to government users and negatively impact the study.

Many people view social networking as entertainment, but the fundamentals of social networking are actually critical to knowledge management with the primary goal of improving organizational performance by enabling individuals to capture, share, and apply their collective knowledge to make optimal decisions (Smith, 2000). The idea of being able to do all of that information sharing in the past might have seemed difficult, but new social networking technologies have made it easier and easier to do so and, thus, facilitate better knowledge management. Additionally, it was said that awareness of individual and group activities is critical to successful collaboration (Dourish, 1992). Social networking technologies such as Facebook exemplify awareness of other individuals by allowing a user to keep all of her/his friends aware of almost every aspect life from relationship status to her/his opinion of lunch.

Additionally, Kimball touched on 12 ways that social networks can enable an organization, including making sure knowledge gets to people who can act on it in time, multiplying intellectual capital by the power of social capital, reducing social friction and encouraging social cohesion and creating a community memory for group deliberation and brainstorming that stimulates the capture of ideas and facilitates finding information when it is

needed (Kimball, 2003). As Smith and Farquhar stated, "It is clear that a primary focus of knowledge management work is finding effective ways to connect groups of people." (Smith, 2000)

Although it is clear that social networking has become an integral part of our society, as evident by the fact that a study by Research Now found that 92% of children in the US have an online presence by the age of 2 (AVG, 2010), it appears that social networking in the corporate arena developed slower but steadily increases. A survey showed that approximately 80% of companies used social media sites to extract information relating to competitors, industry developments, consumer trends and more (Digimind, 2012) with at least 90 percent of recruiters using social media to find, source and connect with talented candidates (NNPA, 2013).

When it comes to the effects of social networking sites on organizations there have been two schools of thought. The first is that they are a distraction and take away from productivity. The second is that they are a valuable tool that increases productivity, awareness and effectiveness within an organization. In reality both are correct to some degree. The determining factor probably has to do more with job satisfaction and worker productivity as opposed to the actual networking software. One could argue that these social networks do not cause the loss in productivity but, much like the solitaire computer game, are merely distractions from the work that employees didn't want to do in the first place. This research provides another investigation into which school of thought best applies when the process is implemented well.

There is the old saying in business that "It's not what you know, but who you know" or "who knows who knows what" (Kimball, 2003). Every indication is that social networking in its new form allows an organization to approach the point where everyone knows everyone. This integration of members of an organization should result in a much more cohesive environment that will foster increased performance.

The rise of social networking discussions, studies and commentaries within the commercial sector has been very apparent, but social networking has also become a popular topic for research and policy within the US government and DoD. Historically, the government has been slow to react to changes when compared to private industry, but little by little it has moved to evaluate, quantify and instill the benefits of this developing business tool.

In 2010 the Human Capital Institute conducted a study of social networking in government. Through this study they were able to quantify many aspects of social networking in government organizations and highlight significant areas for future growth. Their research found that between fifty-two (52) percent and sixty-seven (67) percent of respondents expect to achieve at least one benefit (and usually many more) from the use of specific SN tools in the future (HCI, 2010). Those numbers are promising considering that the study found low satisfaction with the usefulness of currently used SN tools to improve learning and development. (HCI, 2010).

A major development in the adoption of social networking and social media occurred in 2010 in a memo issued by the office of the Deputy Secretary of Defense. The purpose of the memo was to recognize that Internet-based capabilities are integral to the operations across the Department of Defense. Internet based capabilities include all publicly accessible information capabilities and applications available across the internet in locations not owned, operated or controlled by the DoD or federal government which includes collaborative tools such as SNS, social media, user generated content, social software, email, instant messaging, and discussion forums (e.g. YouTube, Facebook, MySpace, twitter, Google apps). (DSD 2010) This policy not only highlights the benefit of such technologies, but it paved the way for its use as a productivity enhancer within the DoD. Prior to this policy issuance the acceptance of social networking technologies fluctuated depending on the organization or personnel involved. By having a solid policy to reference, the organization could make continual and steady forward progress.

In the literature there were many documents that discussed the positive impacts of social networking as an effective business tool as it pertains to knowledge management (HCI, 2010;

Venkatraman, 2010; Lamont, 2008; Inkpen, 2005). This included case studies (Marshall, 2007; Pinson, 2011; Bartczak, 2010; Bennet, 2002) and position papers (Bennet, 2002) that presented theoretical discussions of how KM and social networking will improve organizations. There were also papers that discussed KM within an organization at a single point in time (Hoopengardner, 2010; Rodriguez, 2011), which has provided a snapshot of the current environment and highlighted areas that could be improved. This caused many organizations, including the Navy, to develop KM implementation plans (CNIC, 2008; Rodriguez, 2011) and policy (Lynn, 2010; Wennergren, 2005). In addition to the possible benefits of a KM process some documents assessed faulty knowledge management systems (Landaeta, 2009) and highlighted areas of concern with respect to social networking in an organization (Reid, 2009; HCI, 2010).

When it comes to the challenge of assessing the impact and change within the organization there have been multiple documents published that address measuring change within an organization (Army; Alpander, 1974; Frankel, 2008). Some documents are even more specific and discuss how the return on knowledge management initiatives can be estimated (BEI, 2003) and qualitatively measured (DON CIO, 2001) based on intellectual capital (Liu, 2008) and knowledge based assets (Tilquist, 2001). The body of research, however, did not uncover any examples of a qualitative pretest posttest study conducted to determine the impact of social networking technology on a government or DoD engineering organization which is why this research project was proposed

In an effort to gain information relating to the research question and answer the stakeholder's questions, a comprehensive search was conducted. Most of the literature addressed the rapid growth, prevalence and pervasiveness of social media technologies in society. Additionally there has been a fair amount of information published on the impacts of these technologies on social interactions, relationships and impacts on organizations.

**The KM Measurement Process**

The Office of the Chief Information Officer (CIO) for the Department of the Navy (DON) developed the "Metrics Guide for Knowledge Management Initiatives" which presented a practical framework for measuring the value of investments in KM initiatives. It was intended to be an aid to help identify and apply appropriate metrics used to determine the value to the organization. The document laid out the process as shown in Figure 6.

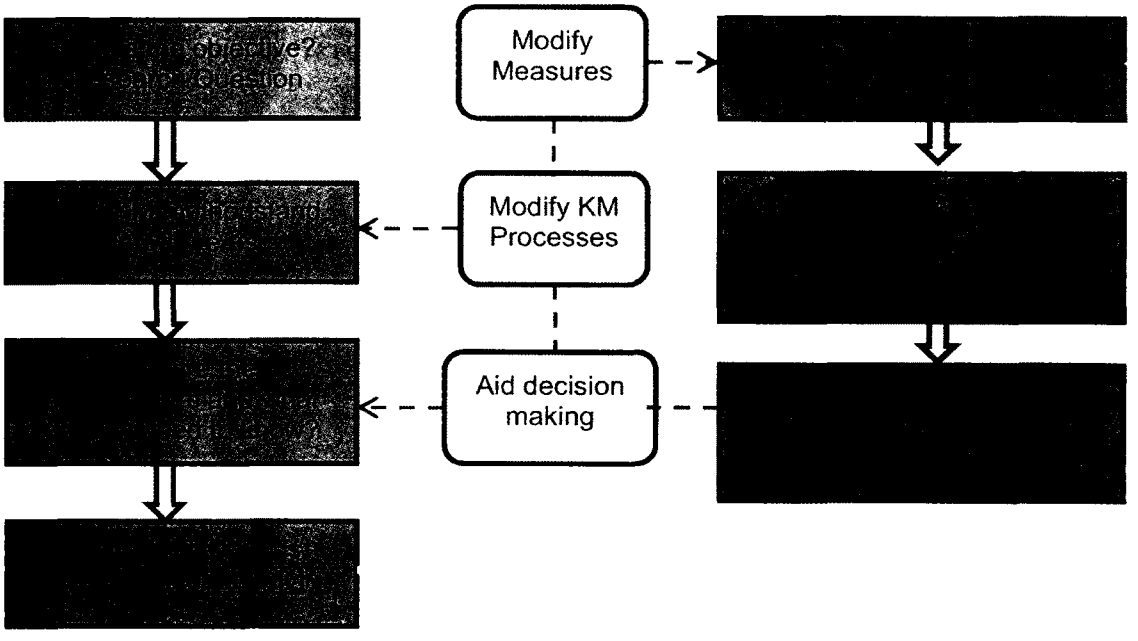


Figure 6: The KM Measurement Process (DON CIO, 2001)

**Objective**

The objective for this study was to successfully address and answer the proposed research question of:

"How does computer facilitated social networking, as part of a knowledge management process, influence the responsiveness and performance of, the Manned Platform Integration Branch (G81) at the Naval Surface Warfare Center (NSWC) in Dahlgren Virginia?"

**KM Methods**

The research question also designates computer facilitated social networking as the KM method that was used. It could be argued that the actual technology used is arbitrary. For this research, however, the government developed and operated technology called Aristotle was used.

**Stakeholders**

It is advisable to avoid a larger number or wide range of stakeholders because it becomes difficult to accommodate all of their concerns and needs (DON CIO, 2001). For this study 3 primary stakeholders were identified. They were Derrick Tepaske who is KM project champion and his 2 immediate supervisors in the organization, Dave Manley and Robin Lacy.

In order to determine what should be measured and how the data should be analyzed it was necessary to identify the key questions that the stakeholders would like to have answered. Based on discussions between the project champion and his supervisors a list of three key questions was generated from which the appropriate metrics can be captured and analyzed to provide answers. The three basic questions posed were:

1. How does the use of the KMS impact engineers' jobs (Primary)
2. Do/will members of the organization use a KMS? (Secondary)
3. Is knowledge being captured and shared? (Secondary)

The first question was the primary concern and correlates directly to the proposed research question. The second and third questions were secondary subsets to the research question, and although they do not directly relate to the primary question, answering them will

provide valuable insight into the process, which the organization can use to determine ways to improve the process.

# CHAPTER 3

# METHODOLOGY

As part of this research it was imperative to thoroughly and effectively outline the methodology for a couple of reasons. The first reason was that using an extant framework allowed researchers to lodge their plans in ideas well-grounded in the literature and recognized by audiences that will read and support the research (Creswell, 2003). With the framework for the research fully identified and correlated to the related literature it allowed for the research to be relevant, focused and efficient. Additionally, by providing comprehensive documentation of the methodology and identifying its relevance it was possible to convey to the audience how and why the research is being done and get everyone involved on the same page.

There are three aspects of the methodology addressed in this section. It discussed the selection of the research approach, "quantitative vs. qualitative", the experimental design, and the treatment plan which outlined the actual process that was followed in the implementation of the study.

## Quantitative vs. Qualitative Methodology

There were many decisions that needed to be made when determining what project methodology should be used to address the research questions. One of the more significant decisions was whether to use a qualitative or quantitative approach. Both approaches have their benefits and to some degree either method could have been applied to the problem. The question then became, which method will be the best fit for what is trying to be accomplished. Three considerations play into the decision: the research problem, the personal experience of the researcher, and the audience for whom the study is being conducted (Creswell, 2003).

For some research problems, especially ones that will provide measurable data, a quantitative approach is generally the best fit, but for studies studying human events in which it can be difficult to obtain measureable data it is argued that a qualitative study is more

appropriate. It is suggested that in projects where evaluation is going to be done, qualitative studies provide a means through which a researcher can judge the effectiveness of particular practices such as in this case of implementation of social networking (Leedy, 2010). Additionally, qualitative design allows for more flexibility, which is desirable for early research where exact metrics cannot necessarily be defined. Qualitative research is exploratory and useful when the researcher does not know the important variables to examine (Creswell, 2003). Therefore, a good qualitative research experiment can often pave the way for a follow-up quantitative project by providing guidance in the development of a hypothesis and how the quantitative analysis should be structured to achieve optimum results.

In many instances either methodology could be utilized, and the overall effectiveness of the study depends more on which methodology the researcher is familiar or proficient with. Quantitative studies are the traditional mode of research with carefully worked out procedures and rules, which often make it the preferred method of faculty and academia (Creswell, 2003). Because of the historical dominance of this type of research many novice researchers believe it is the best method for conducting a study.

For this study, it was the preference of the researcher to use a mixed methods approach. In addition to the research benefits of such an approach the researcher was confident in his ability to effectively analyze and present the findings using such a format. The quantitative approach provided numbers while a qualitative approach allows more room for the researcher to be creative and innovative in the analysis (Creswell, 2003).

There were two audiences for this research. The primary audience was the academic audience who ultimately determines completion and acceptance of the study. The other audience was the government audience, which may make organizational decisions based on the outcome of the study.

The academic audience, composed of advisors and faculty from ODU, did not identify its preferred method and supported whatever method was most appropriate for the type of research being conducted. By contrast, the government audience, and in many cases management in general, greatly preferred the perceived decisiveness of a quantitative study. It has been found that some managers like findings that can be presented in a simple and easy-to-understand manner as in, for instance, the percentage of people who mark "Yes or No" (or "True" or "False") (Edwards, 1997). As with most organizations, in order to justify implementing a process the return on investment needs to be shown, preferably in the format of dollars saved or a percentage increase in production. The challenge with a social networking process is that the impact it has does not easily transfer into quantitative numbers. Given multiple years of data collection in a controlled environment it might have been possible to obtain those types of hard numbers. Unfortunately, without any prior research a multi-year investment could not be justified. It was also not possible to obtain a controlled environment within the large and continually changing NAVSEA organization.

The relatively recent emergence of social networking technology and limited prior research meant there is little documentation with which to develop and justify a more detailed quantitative approach. The researcher has had experience in both approaches and felt he would be able to effectively communicate the findings of the study in a mixed methods format. The challenge when in selecting the format was making sure that both audiences are satisfied. The academic audience supported either method so long as it was justified. The government audience, which preferred a quantitative study, recognized that by conducting a preliminary mixed methods study it would be possible to make a case for a more in depth quantitative study in the future. Based on the difficulty in obtaining hard numbers, the preference of the researcher, and the unknowns of the methodology where interpretation by the researcher will be required, a mixed method qualitative/quantitative approach is appropriate.

**Qualitative Methodology**

There are multiple methods within the qualitative design framework by which research can be conducted. These include case studies, ethnography, phenomenology, grounded theory and content analysis (Leedy, 2010). For the proposed social networking research a case study was the most appropriate design. In a case study a particular event or program is studied for a defined period of time. The data collection associated with a case study includes observations, interviews and surveys all of which were a part of the research.

**Experimental Design**

The experimental design that was chosen for this case study methodology was a One-Group Pretest-Posttest Design (Leedy, 2010). This design actually falls into the Pre-Experimental Design, which was desirable for multiple reasons. These reasons included the planned timeframe for the research and experimentation of approximately one year, the available resources and access to participants, and the inability to generate random groups or keep groups isolated. The negative side effect was that these experimental designs did not definitively show cause-and-effect relationships and due to the lack of control may have resulted in some decreased internal validity.

Of the reasons mentioned above for the design selection the most significant was the inability to generate random groups and keep them isolated. A major challenge in a case study is getting access to the group one wants to study. Since this project was conducted with the support of the Naval Surface Warfare Center in Dahlgren it was not difficult to get access to the people, but it was not possible to compare the impact of a process between two different groups because each group on base is very dissimilar. In the rare circumstance where two groups could be considered somewhat similar, such as G81 and G82, it would have been nearly impossible to isolate the two groups and prevent interaction between the two, especially since the process being evaluated was a social networking process intended to foster a culture of communication and interaction.

The proposed sample size is approximately 40 people. There are multiple reasons for using an organization this size. The first is the resources required to conduct a study. NSWC Dahlgren was willing to allow employees to participate on the clock to use the tool. Even at 50 people there are significant costs to the organization which they were willing to accept in order to gain some insight into the impact of the process. A larger sample size, which would increase the validity of the results, is cost prohibitive since a study like the one proposed had not been conducted before, and there are a lot of unknowns. Additionally, a larger study would exceed the capabilities of a single researcher. The smaller sample size will reduce the applicability of the study across the organization, but the data collected and the conclusions that are drawn can provide support for future research.

**Treatment Plan**

A very straightforward treatment plan was for the most part conducted by Aristotle employees. The initial training involved a single 3-hour course taught by an Aristotle instructor at NSWC Dahlgren. The course was offered at two different times to accommodate participants' schedules. Appendix B contains the slide package that was presented. The package itself was used as a guide and should not be considered comprehensive. Most of the training involved live demonstration by the instructor using Aristotle. The classroom facilities allowed all trainees to have access to a Common Access Card (CAC) enabled computer during the class so they could begin using the program immediately and follow along with the instructor.

Following the training there was 6 month period during which employees were encouraged, but not required, to actively use Aristotle in any capacity they saw fit with up to 30 minutes per week allowed on the clock. In addition, the participants had access to the researcher who was available to provide additional information and guidance regarding the effective use of the social networking system.

**Data Collection**

For this case study there were many possible sources of data from which conclusions could be drawn. Data was available in the form of observations, interviews, and surveys. Although important to have enough data to make solid conclusions, the researcher tried to avoid excessive data gathering which can be time consuming and useless. The best way to avoid excessive data was to have a robust plan in place for what data would be required and what analysis would be done prior to beginning data collection. If this cannot be established it is often recommended that a pre-study to help bound the study (Leedy, 2010), but for this project there appeared to be enough substantiating information in the related literature to warrant a full study.

For this research project two methods of data collection were used in both the pre-test and post-test sections. Individual one hour interviews were conducted by the researcher with the participants prior to the implementation and training of the social networking process and about 6 months after the implementation, although in some cases exit interviews were conducted 7-8 months after. During these interviews survey questions were answered. In addition the interview allowed for more unstructured discussions between the participant and the researcher relating to the process. The survey questions focused on social networking, organizational knowledge and effectiveness. In order to maintain anonymity data collection was done privately and participants were assigned random ID numbers. Individual responses to the assessments were kept confidential. No individual level results are reported in this document; results are reported only on an aggregate level. In addition to the interviews the group was observed by the researcher throughout the implementation of the social networking process. Appendix B contains a separate document that outlines the step by step processes used to create the final assessment instruments (Tepaske D. M., 2011) and addresses the specific aspects of social networking that were explored with traceability of the questions back to the research question.

Likert scales were used to capture responses to many of the questions, providing the qualitative data for the study by identifying the magnitude of responses to opinion-based

questions. This data is essential in allowing statistical analysis of the data which will be the foundation of the conclusions with supporting information in the form of qualitative data.

Human Subjects Testing Internal Review Board

Prior to conducting the study the proposed research plan was presented to the Internal Review Board (IRB) at Old Dominion University (ODU) in order to get approval for human subject research. The application is included in Appendix C. The approval from the ODU IRB was provided to the NSWC DD IRB and received concurrence.

**Variables**

A comparison of the variables from the entrance interviews and exit interviews will be made to determine changes in the organization. They capture use of social networking and knowledge management tools as well as behavioral aspects of the organization. The variables, their descriptions, and metrics are listed in Figure 7.

| Variable | Definition | Metric |
|---|---|---|
| Conventional Networking | Determines interaction between people that occurs normally in an organization | • What formal lines of communication do you use? In general? everyday?<br>• What informal lines of communication do you use? In general? everyday? |
| Social Networking Technology | Determines familiarity and use of computer based social networking tools for example Facebook. | • Are you familiar with social networking?<br>• Are you a member of a social networking site? Which ones?<br>• How often to you use them? What do you use them for?<br>• Would you recommend it to a friend/coworker? |
| Knowledge Management | Determines understanding an use of tools that facilitate the capture, storage, and sharing of information | • Are you familiar with Knowledge Management?<br>• What Dahlgren KM resources are you aware of?<br>• How often do you use each<br>• How much time do you use them?<br>• Rate the quality of Dahlgren's KM resources.<br>• What Navy or DoD KM resources are you aware of?<br>• How often do you use them?<br>• How much time do you use them?<br>• Rate the quality of Navy/DoD KM resources.<br>• How likely are you to use KM if it meets your needs<br>• How beneficial is KM to your job?<br>• What is your perceived value of the content available on a KMS?<br>• What would you like to see in a KMS? |
| Knowledge Acquisition | Determines the processes used to gathering information | • Where do you go for technical information?<br>• Where do you go for programmatic information such as funding documents, instructions, forms, and training.<br>• Where do you store your information?<br>• How can others obtain information on what you have done or learned?<br>• How can others obtain your information when you leave? |
| Efficiency | Determines what impacts the ability to accomplish a job in the least amount of time | • How easily can you find information pertinent to your work |
| Quality | Determines the ability to find and use data to accomplish ones job. | • Do you trust the data available to you?<br>• Please rate the accuracy of the data available to you<br>• Please rate the relevancy of the data available to you<br>• How recent is the data that is available to you? |
| Management | Determines how the organization | • Is the method used to gather information effective? |

| | | |
|---|---|---|
| | shares and collects data important to its operation | • Is the method used to distribute information effective? |
| Job Satisfaction | Determines how the work environment impacts employees perspective on the work they do and the organization. | • How does the current availability of quality information impact your work experience? |
| Demographics | Determines the composition of the organization from an age and experience perspective | • NSWC Employment: 0-2 years, 3-5 years, 5-10 years, 11-20 years, 20+ years<br>• Age: 18-20, 20-25, 25-30, 30-35, 35-40, 40-45, 50+ |
| Organizational Culture | Determines what underlying themes within the organization impact how things are done. | • Do you feel like the Navy encourages knowledge management? these are sensitive questions<br>• Do you feel like the G Department encourages KM?<br>• Do you feel like the G81 encourages knowledge management? |
| Familiarity with members of the organization | Determines the extent to which the members of the organization maintain awareness of what their coworkers are doing | • Do you know what other members of the organization are working on?<br>• Do you know what expertise the members of your organization possess? |
| Familiarity with the work of the organization | Determines the extent to which the members of the organization maintain awareness of what their organization is doing in terms of technical work | • Do you know what programs G81 is working on?<br>• Do you know who G81s current sponsoring organizations are? Provide examples<br>• Do you know who the contacts are at the sponsoring organizations?<br>• How much do you know about the sponsoring organization and what they do?<br>• Do you know who G81s customers are? Provide examples<br>• Do you know who to contact within those examples?<br>• How much do you know about your customer and what they do? |

Figure 7: Variables and Metrics

## Proposed Analysis

The intended method for analysis is laid out in this section. This method guided the analysis of the data collected from the interviews and observations within the organization. The analysis addresses not only the tool itself but also covers the overall behavior of the organization as a result of the study.

### Qualitative vs. Quantitative Analysis

When it comes to analysis of a project, quantitative methodologies tend to provide data in a format that is much more palatable to an organization than qualitative methods. In most cases the data gathered from a quantitative analysis can be manipulated, analyzed and plotted to provide a comprehensive summary of the data at a glance with concrete numbers. This research, which focuses more on the sociological side, did not lend itself entirely to a quantitative study. The focused incorporation of a qualitative approach allows for more flexibility. This is desirable for early research where exact metrics cannot necessarily be defined. Some of the data, however, was captured using Likert scales which allows for a quantitative approach to be taken with some of the subjective data.

### Phases of Qualitative Analysis

Following the completion of the project the next step was to analyze all of the collected data and generate a document that accurately communicates the findings of the research. The method described in Leedy (2010) as the data analysis spiral simply and accurately reflects a methodical approach to digesting the large amount of data that came from the research. The steps in the process are 1) Organizing 2) Perusal 3) Classification and 4) Synthesis. It is the last step of the spiral that really makes the difference between data collection and legitimate research. It is in this phase that new ideas can be formed based on the observations of the research. Once the analysis was competed the findings are communicated. The value and legitimacy of the findings are a reflection of the rigor and completeness of the research and analysis. To ensure

confidence in the report it was vetted through peers both within and outside the organization. It is this concurrence from the community that differentiates true research from general opinions and assumptions.

### Organization

The sample population size was 30 engineers within G81. With this many people there is significant data generated and it is necessary to organize it in such a manner so that it was useful and easily evaluated throughout the process. Some recommended methods included index cards, wire diagrams, or a computer database. In addition to the method in which the information is organized it was necessary to reduce the information into manageable sentences or words without losing the meaning behind it.

### Perusal

Perusal of the data was an ongoing process throughout the research project, but in the analysis played an important role in gaining a general sense of what the data indicates. With the data organized it was possible to determine the general trends in the data and being to identify possible classification topics for use in the next step. During this phase it was also possible to get a feel for the quality of the data and whether or not there is enough information to draw defendable conclusions.

### Classification

Once the data was organized and perused it was possible to move on to the next step – classification of the data. The data was grouped into themes from which reasonable assumptions could be made. It was possible to predict some of the themes in the data based on the preliminary research and discussions with the organization. These themes include responsiveness, performance, personnel awareness, program knowledge and communication.

Synthesis

This step of the spiral really made the difference between data collection and legitimate research. The synthesis of the data into an overall summary of the research helped develop hypothesis and theories about how the Social Networking process may influence the organization. During this phase it was necessary to analytically look at the data and generate ideas as to the truth behind the data. The end result is a report of the findings based on insight and analysis that cannot be gained from the data alone.

Validation

The value and legitimacy of this report is a reflection of the rigor and completeness of the research and analysis. To ensure confidence in the report it was necessary to have it vetted through peers both within and outside the organization. It was this concurrence from the community that differentiates true research from general opinions and assumptions. For this project the community included social networking developers as well as managers and members of the sample organization.

The software used for this research was Aristotle, which is a government, owned and operated which means there was a formal organization in place that manages it and was very interested in the results of any research conducted using their program. The members of the organization were experts in their field and were able to objectively critique the research results. In addition to the representatives from Aristotle, there were many others in the social networking community who provided feedback on the results as well as many studies conducted on social networking that provided a good comparison.

From an organizational standpoint there were a couple ways to socialize the results of the research. The first was by presenting the research in an open forum for the organization. Presenting the results of the research to participants provided an opportunity for feedback on the process and makes sure that any assumptions made in the synthesis are acceptable. G

Department at NSWC holds weekly tech briefs that provided an excellent forum for such a presentation.

Although consultation with the people mentioned above was good and helped to validate the results of the research it really came down to the feedback of a few select individuals to determine the success of the project. These individuals were the managers who were directly responsible for implementing a social networking process on a permanent basis. Had the results of the research project been favorable and vetted through all of the peers mentioned above then a compelling argument could have been made to either conduct more in depth qualitative analysis or adopt the process as a permanent part of the organization.

### Quantitative Analysis

It was determined that this research project in its current state and level of maturity lent itself to a mixed methods approach, which can incorporate the flexibility of a qualitative study with the easily interpreted numbers of a qualitative study. In the early stages of the project when socializing the method, management at NSWC wanted to see a cost benefit analysis to justify the costs of training. Ideally the impact of the social networking process would be quantified in terms of money saved. In order to do that there needed to be some empirical data collected from the years preceding the treatment and the year following which would mean a minimum of 2 years and additional resources committed. It was decided that it is not in the organization's best interest to invest that much time or resources, so a true quantitative analysis to address funding could not be done. However, it could be possible to develop an estimate for the cost benefit based on information gathered in the mixed method. A compelling synthesis of a qualitative study is beneficial, especially when vying for further research, but concrete numbers in terms of dollars or performance speak volumes.

### Statistical Analysis

For some of the data collected in this study a statistical analysis will be possible. Responses to questions using the Likert scale will be compared between the entrance and exit interviews, and it is necessary to determine if the changes are statistically significant. Based on research into the different types of analysis including T-Tests, Wilcoxon, and Mann-Whitney, as well as discussions with members of this study's doctoral committee it was determined that the Mann-Whitney test is the best fit for the data. Reasons for the selection of the Mann-Whitney are that the test allows for non-parametric (T-Test requires a normal distribution), and that populations, although composed of the same people, are independent based on the aggregate data collection method meaning participant #1 in the entrance interview may not necessarily be participant #1 in the exit interview. Wilcoxon requires paired data.

**Management Plan, Timeline, Feasibility**

A crucial part of the research project is an effective management plan that lays out roles and responsibilities for its execution.

The doctoral candidate who will have overall responsibly for the execution of this research project was Derrick Marcus Tepaske. He received his bachelor's degree in Mechanical Engineering from Virginia Tech and his Master's Degree in Engineering Management from Old Dominion University. This research is part of a Doctorate in Engineering program with a focus on Engineering Management at Old Dominion University. Mr. Tepaske was responsible for the majority of the tasks related to the research project.

The faculty advisor for this research project was Rafael Landaeta, an Associate Tenured Professor at Old Dominion University in the Department of Engineering Management and Systems Engineering. His research philosophy was to generate, transfer, and apply multi-disciplinary knowledge that addresses current and future continuous improvement challenges of knowledge-intensive organizations (Landaeta R. , 2011). He was responsible for providing guidance on research methods, analysis and reporting. It was his responsibility to identify the exit criteria for the doctoral project and approve its satisfactory completion.

Organizational oversight was provided by David Manley who is the G80 division head. Mr. Manley was a strong supporter of developing processes that will improve the function of the organization. Working level input and coordination with the test group was facilitated by Robin Lacy. Robin Lacy was the branch head for the Manned Platform Integration Branch (G81). Robin helped develop the implementation plan and support the training and execution of the treatment. Her participation was also instrumental in developing the metrics used to gauge the effect on the organization.

**Timeline**

The original conceptual timeline was to be conducted between 8 January 2011 and February 2012. As will be presented in the results, delays in the research caused the timeline to be pushed to a later date; however, the duration of the events remained the same.

**Feasibility**

It would have been counterproductive to develop a research proposal that was not feasible, but in most projects there are aspects that make it challenging and if the possible risks are not adequately managed and addressed there is the possibility for failure. The most significant risk to this research project was the timeline in which it was scheduled to occur. It allowed for 15 months from start to finish and did not have a lot of slack time built in to account for any unforeseen delays. The original research timeline was based on the Academic Fellowship Program funding which was provided to the researcher in order to complete his doctorate. This program provided funding for 50% for one year.

# CHAPTER 4

# RESULTS AND ANALYSIS

## Implementation Timeline

The proposed timeline for the research was to be from June – December of 2011. Delays in the review and approval process delayed the timeline by a year. The timeline as it was actually implemented is shown in

Figure 8 shows that implementation of the research project occurred from 31 October 2011 through 22 March 2013.

| | |
|---|---|
| 31 Oct 2011 | Committee review of proposal |
| 16 Feb 2012 | ODU IRB Review |
| 25 Feb 2012 | ODU IRB Review comments provided for edit |
| 8 Mar 2012 | Edits made and submitted to OB IRB |
| 6 Par 2012 | NSWC DD Concurs with ODU IRB and approves research |
| 30 Apr – 4 May 2012 | Entrance Interviews |
| 7 May 2012 | Aristotle training |
| 7 May – 7 Nov 2012 | Aristotle trial period (6 Months) |
| 7 Nov 2012 – 31 Jan 2013 | Exit interviews |

Figure 8: Implementation Timeline

The entrance interviews were conducted over a one week period prior to attending the training. The training was then provided in two sessions to allow for flexible attendance. The trial period was originally expected to last between 4-6 months. As the trial period progressed it was apparent that a minimum of 6 months would be necessary, so it was run to the 6 month mark. Due to schedule and time conflicts the exit interviews could not all be conducted in the week following the trial period. As a result some of the participants had longer trial period timeframes. The additional time is not expected to have an impact on the data collected because the assessment was not designed to be time dependent.

**Participation**

At the start of the research study there were 40 members of the branch available to participate in the study. Contractors were not included because they are often deployed and would not be able to use the system. The researcher was also not included in the eligible population. Of the 40 possible participants 34 (85%) signed consent forms to participate in the research. The primary reason given by participants for not participating was lack of time. Of those who signed consent forms, 33 (83%) participated in the entrance interviews, 27 (68%) attended the training events, and 30 (75%) provided exit interviews; 9% attrition occurred over the course of the research. The losses were a result of reassignment (1), medical leave (1), and one participant not wanting to complete the research. The participants who did not receive training were still able to use the software and participate in the research and individual training was available but not requested. Reasons for not receiving the training were primarily due to the participant's perceived lack of time to attend a 3 hour training session and general lack of interest in learning new software. As will be seen in the presentation of the data, the responses of those who did not attend training do not appear to differ significantly from the rest of the group.

In terms of response rates this study was successful. Babbie (1973) indicates that a good response rate of 50% or greater is adequate, a response rate of 60% is good, and a rate of 70% or more is very good (Babbie, 1973). By having 83% engagement on the entrance and 75% in the exit interviews and over 68% engagement on the training, it was assumed that the nonresponse bias does not play a significant factor in the conclusions formulated from the research because a relatively large portion of the population was represented.

Although limited, the number of participants is enough to allow for accurate generalizations for the branch. However, when we begin to look at larger subsets of the DoD/Navy population, the limited number of participants will reduced the validity of the study. The four branches in G80 all have similar population size and similar functions, so the results of a study in G81 would be directly applicable to the other branches and in turn all of the division.

However, when looking at G department as a whole, which encompasses approximately 800 people doing a large variety of work, the limited size of the study will make generalization difficult and inaccurate.

### Data Processing

Data for this research was captured using the assessment instrument included in Appendix E. The researcher met with each participant and documented answers on hard copies based on the questions and discussions with the participant. Following the interviews the data was transcribed by the researcher into a fixed-field Excel file so that it could be organized and manipulated as necessary. The process of manual data entry allows for the possibility of inaccurate results being recorded. This "dirty" data could then produce misleading results. Every effort was made to accurately capture the data and check-sums were used to check for inconsistencies. Given the nature of this study, small errors in the transcription did not appear to have a noticeable impact on the study as a whole. The selected format of the study should also be able to accommodate missing data that respondents did not answer in their interviews. The data was used to generate statistics and also used to compare trends between the pre-test and post-test assessments and summarize comments into a comprehensive qualitative discussion. To account for the response rate being different between the entrance and exit interviews, the data was dropped for those participants who did not complete the exit interviews.

### Entrance Data

The purpose of the entrance interview was to establish a baseline within the organization with regard to knowledge management and social networking that would be used for comparison when the exit interviews were conducted. As discussed in the assessment instrument development document located in Appendix B, there are 4 focus areas for the questions: computer facilitated social networking, knowledge management process, responsiveness and performance, and the manned platform integration branch. Within each of those focus areas there are additional sub topics from which specific interview questions were generated. This

section includes a discussion of how the responses to those subtopics created a baseline for comparison.

The first focus area, computer facilitated social networking, addressed the participants' understanding and use of both conventional networking and social networking technologies. An understanding of conventional networking provides a baseline to which computer facilitated social networking can be compared. To understand the participants' conventional networking interaction levels and techniques, they were asked a number of questions. Question #4 asked them to identify all the organizations with which they interact. Out of a total of 82 different organizations that were identified, the mean interaction of each employee was just over 10 organizations with an average of 10.4 and a standard deviation of 6.6. The top organizations that were worked with were G81, USMC, Q Department, W Department, and the US Army. The follow up question, #5, was then, "What formal and informal lines of communication do you use?" Participants were asked to list the methods and identify their frequency of use on a 1-5 scale (almost never, rarely, sometimes, often, most of the time) and their perceived value on a 1-3 scale (no value added, some value added, and high value added). Examples of formal lines of communication include peer reviews, performance reviews, tech briefs, and formal reports. 13 different formal lines of communication were identified by the participants. Using the same response format question #6 asked, "What informal lines of communication do you use?" The result was 16 different methods of communication used with some of the informal methods such as phone, email and face-to-face showing a much higher usage and perceived value than any other method whether formal or informal. Since this data is being used as a baseline, an in-depth discussion of the results will not be included in this section, but any significant variations will be addressed following the discussion of the exit interview data.

The second subtopic determined the user's familiarity with social networking technology, provided qualitative usage information, and identified reasons employees use social networking technology. The first question for this section, #7, asked the participants to consider the

statement, "You are familiar with Social Networking," on a 1-5 Likert scale going from 1 ( strongly disagree) to 5 (strongly agree). 43% of the entrance population agreed with the statement while 43% strongly agreed. The average is 4.27 (agree) with a standard deviation of 0.78. The follow up question #8 asked the participants to identify their frequency of use (I don't know what it is (1), I know what it isbut never use it (2), I use it once a year (3), I use it once a month (4), I use it once a week (5), I use it daily (6)), duration of use per visit (<5 min, 5-30 min, 30-60 min, >60 min), and recommendation (no, maybe, yes) for a number of social networking tools. 15 social networking tools were identified; however, their use was very limited with only Facebook having more than 50% of the participants using it a least monthly. Facebook has an average response of 4.13 and a standard deviation of 1.72.

The second focus area of "knowledge management processes" identifies KM processes within the organization and determines usage of those processes as well as how employees gain and transfer knowledge. The first subtopic in this focus area, knowledge management, asks the participants to answer statement #9, "You are familiar with Knowledge Management" on a 1-5 Likert scale going from 1 (strongly disagree) to 5 (strongly agree). 47% of respondents agreed with the statement however a relatively large percentage chose neither agree/disagree (27%) or disagree (13%). The average response is 3.60 (neither agree/disagree) and a standard deviation of 0.89. One thing to note is that this question addresses familiarity with KM, not actual usage. The fact that almost half of the branch does not agree with the statement above reemphasizes the assumption that insufficient knowledge management practices exist within the organization. Question #10 asked the participants to use the same scale as question #10 to identify their frequency of use, duration of use per visit, and their recommendation as it pertains to KM processes within the organization. 25 knowledge processes were identified, and every member of the organization was actively using at least one of them. The order in which the two previous questions were asked and the answers provided again highlight the educational shortcomings of

the organization when it comes to KM education because while all members of the organization were using a KM process they did not realize exactly what constitutes knowledge management.

The next set of questions delved a little deeper into the participants' understanding and use of knowledge management systems. These questions again asked participants to respond to a statement on a 1-5 agreement scale as in previous questions. Question #11, "If knowledge management met your needs you would use it?" received a very favorable response with 63% agreeing and 33% strongly agreeing. The average is 4.30 (agree) and the standard deviation is 0.53. Question #12 then asked if, "Knowledge management is beneficial to your job?" The responses to this were again favorable, with 60% agreeing and 37% strongly agreeing and an average of 4.33 (agree) with a standard deviation of 0.55. Question #13 followed up by asking if, "There is value in the information available in a knowledge management system," which also had positive results of 63% agreeing and 33% strongly agreeing. The average was 4.30 and a standard deviation of 0.53. It is apparent that the members of the organization recognize the value in KM and in theory think it is beneficial.

The next section of questions and results take a look at which Social Networking (SN) and Knowledge Management (KM) processes the participants are using to both find data and store data. Question #15 asked where they go to find technical information, question #16 asked where they go to find programmatic information, and question #17 is where they find technical and programmatic information. Figure 9 is a graphic representation of the data.

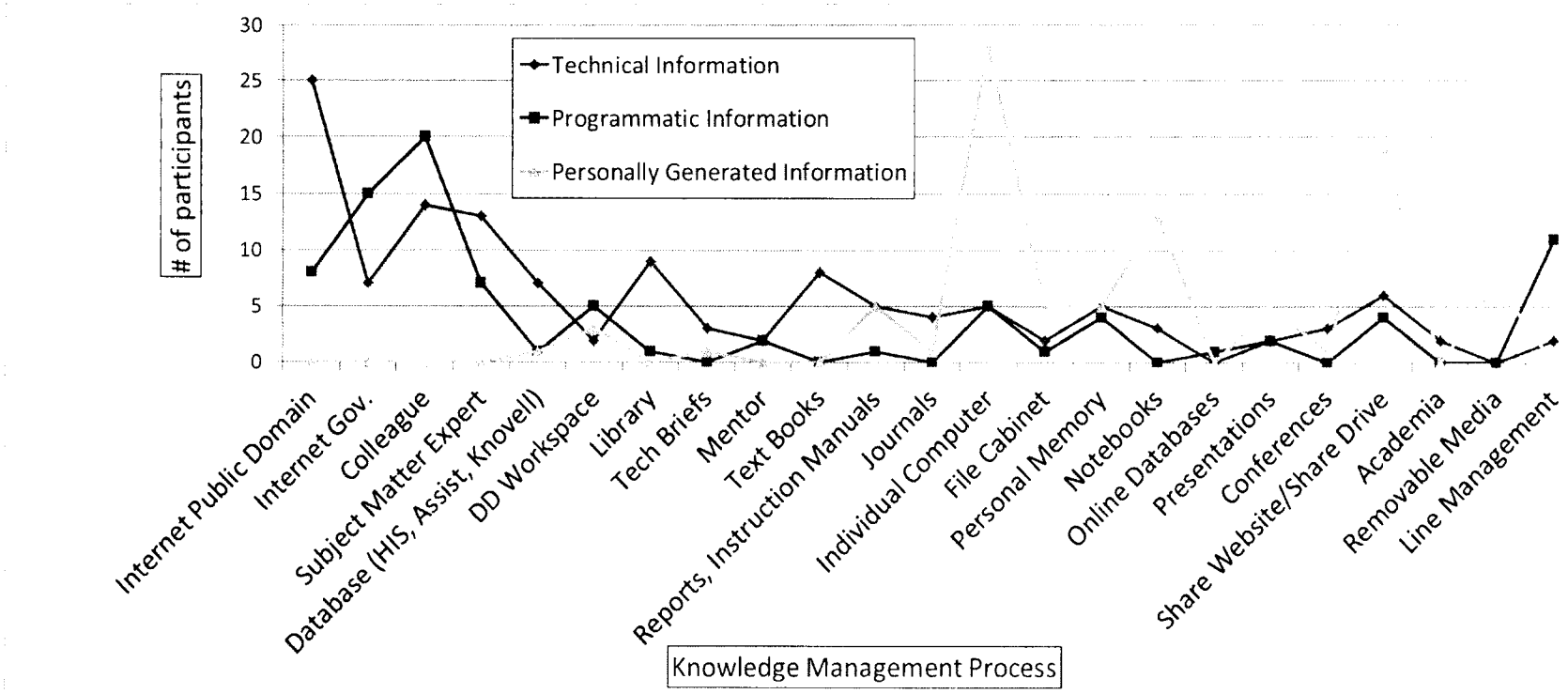


Figure 9: Graphical representation how participants obtain and store information.

The trend that can be seen in an initial glance at the data is that the locations participants go to find data are different from where they store their data, as shown by the discrepancy between the peaks. Additionally, out of the top three methods used to store individual data (individual computer, share website/share drive, and notebooks), two (individual computer and notebooks) are generally only accessible by the individual which all, but negates their contribution to the overall knowledge of the organization in the absence of said individual

The data above alludes to the challenges with sharing information, and the next set of questions asks the participants their opinions on similar topics. Again, on a scale of 1 (strongly disagree) to 5 (strongly agree), they were asked to respond to the following statements: #17, other members of the organization are able to find and access information you created in a timely manner, #18, you are able to access information others have created in a timely manner, and #18b, others will be able to find information you created after you leave the organization.

For the first statement, regarding the timely access of information the participant created himself, the responses showed 27% neither agree/disagree and 37% disagree and 27% agree. The average was 2.83 and the standard deviation was 1.02. Responses to the second statement regarding the timely access of information created by others were skewed slightly toward disagree (36%) with an average of 2.68 and a standard deviation of 1.07. The third statement of weather others will be able to find information you created after you leave the organization was surprisingly aligned with the agree response at 47% and an average of 3.03 and a standard deviation 1.22. During the interviews this discrepancy was noted and upon further discussion it was found that many of the participants believed that, prior to leaving the organization, they would organize their information and make it accessible by the rest of the organization. The last question in this section, #19, asked participants to identify their top challenges when trying to gain new knowledge. They identified 28 challenges, with the most common challenges being not knowing where it is (26) and not having enough time (8).

The third focus area was the responsiveness and performance of the organization. The questions in this section attempted to provide some insight into the efficiency, quality, management and job satisfaction within the organization.

The questions in the efficiency subtopic were used to address how the efficiency increased or decreased as a result of the treatment. Question #20 was an open-ended question that asks what aspects of the job consume the most time. Out of nearly one hundred responses a relatively small number (5) included references to finding information, while many of the comments addressed email (12) and communications (8). The follow-up, question #21, asked what tools were used to accomplish those tasks more rapidly. 50% (39/78) of the tools were computer and software-based with some focus on communications through all mediums, including DCO chat. A relatively small number (11/78) of responses identified knowledge management tools and processes that help them in their jobs. When asked question #20 of what could be done to make performing their jobs easier, a relatively large number (21/62) of comments were computer/software/network focused with some comments addressing training (4) and purchasing (4). Question #23 asked participants to rate on a 1 (strongly disagree) to 5 (strongly agree) scale their response to the statement, "You can easily find information pertinent to your work." The response was that 40% neither agree/disagree and 43% agreed with an average of 3.47 (neither agree/disagree) and a standard deviation of 0.78. A more in-depth discussion of these results will be included in the conclusions section.

It is proposed that the efficiency with which persons can do their job is closely tied with the quality of information available to them because if the information available is high quality it will reduce time spent gathering data. The questions in this subtopic address the perceived quality of the information available to the participants and were answered with ratings from 1 (strongly disagree) to 5 (strongly agree). Question #24 asked if the participants had confidence in the data available to them. 50% agreed with the statement while 40% neither agreed/disagreed with an average of 3.50 (neither agree/disagree) and a standard deviation of 0.68. Question #25 asked if they believed the data available to them was accurate. 60% agreed with that statement.

The average was 3.53 (neither agree/disagree) with a standard deviation 0.63. Question #26 asked if the participants felt the data available to them was relevant to their work. The average is 3.87 (agree) with a standard deviation of 0.63 and 60% of them agreeing with the statement. The final question in the section, #27, asked if the data available was up-to-date and resulted in the least consensus on responses with 21% disagreeing, 34% neither agreeing/disagreeing, and 41% agreeing. The average was 3.28 and a standard deviation of 0.84.

Management's role in the responsiveness and performance of the organization is at some level all-encompassing, but for this study only two questions attempted to gauge the manager's impact. Question #31 asked participants to finish the statement, "The current method used by management to maintain awareness of what employees are doing is _____" based on a scale of 1 (very ineffective) to 5 (very effective). The response skewed slightly to the left with a combined 70% answering very ineffective (1), ineffective (2) or neutral (3). The average was 2.73 (neutral) and the standard deviation was 1.05. Using the same scale the question #32 asked participants to finish the statement, "The current method used by management to distribute information is_____." The response to this question was slightly skewed to the right with a combined 77% answering neutral (3) or effective (4). The average was 3.10 and the standard deviation was 0.84.

The factors that influence job satisfaction are extremely numerous and it could be argued that accomplishing one's job plays only a small part in the big picture. In any case it is possible that the effective use of a KM/SN process could have an impact, so a few questions were included in this study that address contributing factors to job satisfaction. Question #33 asked participants to complete the statement, "The current availability of quality information makes your job _____" using a 1 (very frustrating) to 5 (a lot easier) scale. The majority of the responses were moderate with answers of 32% frustrating (2), 26% no impact (3), and 39% easier. The average was 3.10 (no impact) and the standard deviation was 0.92. Question #43 asked what aspects of the participant's jobs they felt were burdensome. This was an open-ended question that generated a variety of responses. The responses spoke to training, policy, emails, funding,

purchasing and IT. Many of the areas cited could benefit from a knowledge management/social networking process.

The fourth and final focus area was on the participants' understanding and view of the manned platform integration branch as it pertains to organizational culture, familiarity with members of the organization, and familiarity with the work of the organization.

Culture can encompass many aspects of the organization. It has the ability to impact every aspect of the job both positively and negatively, often times without realizing it. For this research the questions focus solely on whether or not knowledge management is encouraged by the organization. Questions #28, #29 and #30 ask if the participants felt that knowledge management is encouraged by a) the Navy, b) G Department, and c) G81 on a scale of 1 (strongly disagree) to 5 (strongly agree). The responses were similar for both the Navy and G Department with 50% and 43% agreeing (4) respectively. For question #28 the average was 3.27 (neither agree/disagree) and the standard deviation was 0.98. For question #29 the average was 3.30 (neither agree/disagree) and the standard deviation was 0.84. For G81 63% agreed (4) with the statement that G81 encourages knowledge management with an average of 3.43 (neither agree/disagree) and a standard deviation of 0.82. Across all 3 questions approximately 25% disagreed (1) with the statement.

The next two subtopics focus on participant's knowledge of the people and organizations with which they work, both internal to the organization as well as with program sponsors and the user community. These questions were included because it is those types of interaction and that level of understanding that could benefit from effective use of a social networking program. Those are also areas that can be accomplished without a social networking tool but require consistent and ongoing personnel interaction which can often be challenging in an engineering organization.

The first set of questions addresses familiarity amongst members of the organization in an effort to demonstrate the connectivity of the employee to the other members of the

organization. Question #34 asked if the participants knew what expertise the members of the organization possess. Responses were captured in a 1-5 scale with response of no (1), just my team member (2) some (3) many (4) and most (5). The data was centered with the most common response being "some programs" (3) at 37% and had an average of 3.27 (some programs) with a standard deviation of 1.05. Question 34b asked if the participants felt other members in the organization knew what expertise they possessed. Using the same scale the highest response was "some programs" (3) at 48% with a slight skew to the left. The average was 2.72 (some programs) and a standard deviation of 0.98. Question #42 asked how participants contact someone whom they know and who work within their building, whom they know outside their building, or whom they do not know. The primary options for communication were phone, email, face-to-face, through a coworker, through line management, or through social networking with the available responses being almost never, rarely, sometimes, often, and most of the time. For communication within the building, face-to-face was the most common form of communication with 60% of participants using it most of the time. It had an average of 4.50 and a standard deviation of 0.68. Social networking was the least used method with 72% responding "almost never". For communication with people whom they know outside the building, 53% used email most of the time with 57% using the phone often and 60% still communicating face to face sometimes. Social networking was again almost never used according to 70% of the participants. For communication with people they did not know, the respondents utilized phone and email primarily. Their utilization of coworkers and line management increased as compared to people they did know. Communication through social networking was even more limited with 87% saying they almost never used it. When participants were asked the open-ended question #42c of how someone finds them, the most common answer was "word of mouth" or "asking around to both coworkers and line management" with a combined 16/30 identifying those responses. Some (3) said that reports and documents were an avenue and in one instance social networking was cited. Once someone determined whom they needed to contact, all participants said that phone or email would be the method used, except for one response that stated interaction would take place face-to-face.

In addition to knowing what knowledge other members of the organization possess, the research also tried to capture participant's understanding and awareness of the programs and sponsors the branch was working on as well as the customers/users. Question #35 asked if they were aware of the programs the branch was working on. Responses ranged from just my program (1) to most current and future (5). The highest response rate was for some programs at 33% with 20% of participants identifying many (4) and 27% identifying most current and future (5). The average was 3.53 with a standard deviation of 1.11.

Sponsors and customers generally exist for every program within the organization and social networking helps to facilitate interaction both up and down the organization. This research will gauge the impact of the treatment on this aspect of organizational awareness. Three questions were asked with regard to both the sponsor and the user. They were, "Do you know who the sponsoring (#36) / (#39) user organizations are?", "Do you know who the sponsoring (#37) / user (#40) organization points of contact (POCs) are?", and "How familiar are you with the sponsor (#38) / user (#41) organization's mission?" Response were based on 1- 5 scale with options including just my program (1), a few programs (2) some programs (3), many (4) and most current and future (5). With regard to the sponsoring organizations most participants knew a few programs (33%) or some programs (33%).It had an average of 3.03 (some programs) and a standard deviation of 1.10. 60% knew the sponsors for just their programs, with responses rapidly decreasing across the scale to the right. The average was 1.57 (a few programs) and the standard deviation was 0.82. Participants' familiarity with the sponsor's mission centered around somewhat familiar (half) with 38% and familiar with 31%. It had an average of 3.41 (somewhat familiar) and a standard deviation of 0.95.

The top responses to the question of familiarity of user organizations of the branch (#39) were spread across the scale with 20% knowing just their program, 27% knowing some programs (half), and 27% familiar with most and current programs. The average was 3.07 (some programs) and a standard deviation of 1.48. The responses for POCs of user organizations followed the same trend as sponsoring organizations, with 46% knowing just their program and

rapidly decreasing across the scale to the right. The average was 1.96 (a few programs) and a standard deviation of 1.20. Participants expressed familiarity with the user's mission with a peak of 32% being somewhat familiar and a distribution skewed to the right. The average was 3.50 (somewhat familiar) and a standard deviation of 1.07.

The data from the entrance interviews presented above established a baseline within the organization with regard to knowledge management and social networking that can be used for comparison when the exit interviews were conducted. It was not presented in detail because its primary purpose is to be used for comparison to the exit interview data. Entrance data was later compared to the exit data in detail and any significant deviations was discussed as possible results of the treatment.

**Treatment – Aristotle Training**

The treatment was provided to the participants in a 3 hour training session. It allowed the participants to log onto Aristotle and use it in the class during instruction. The overall response to the training was positive with all but one of the participants responding that they felt it was adequate and provided a good overview of the software. The negative response felt that it was too short and the topics were brief.

**Exit Interviews**

The exit interviews were conducted in the same fashion as the entrance interviews. The interview questions were exactly the same with the addition of questions #44-#53 which focused specifically on Aristotle. This section will present the results of the exit interview and highlight any significant changes between the entrance and exit interviews. As a guide it includes figures of entrance responses compared to exit responses. Discussions as to the statistical significance of the changes as well as the reasons for those changes will be addressed in the conclusions section.

As introduced earlier, the first focus area of computer facilitated social networking addresses the participants understanding and use of both conventional networking and social

networking technologies. Figure 10 compares entrance and exit data for question #4 which asked which organizations the participant has worked with.

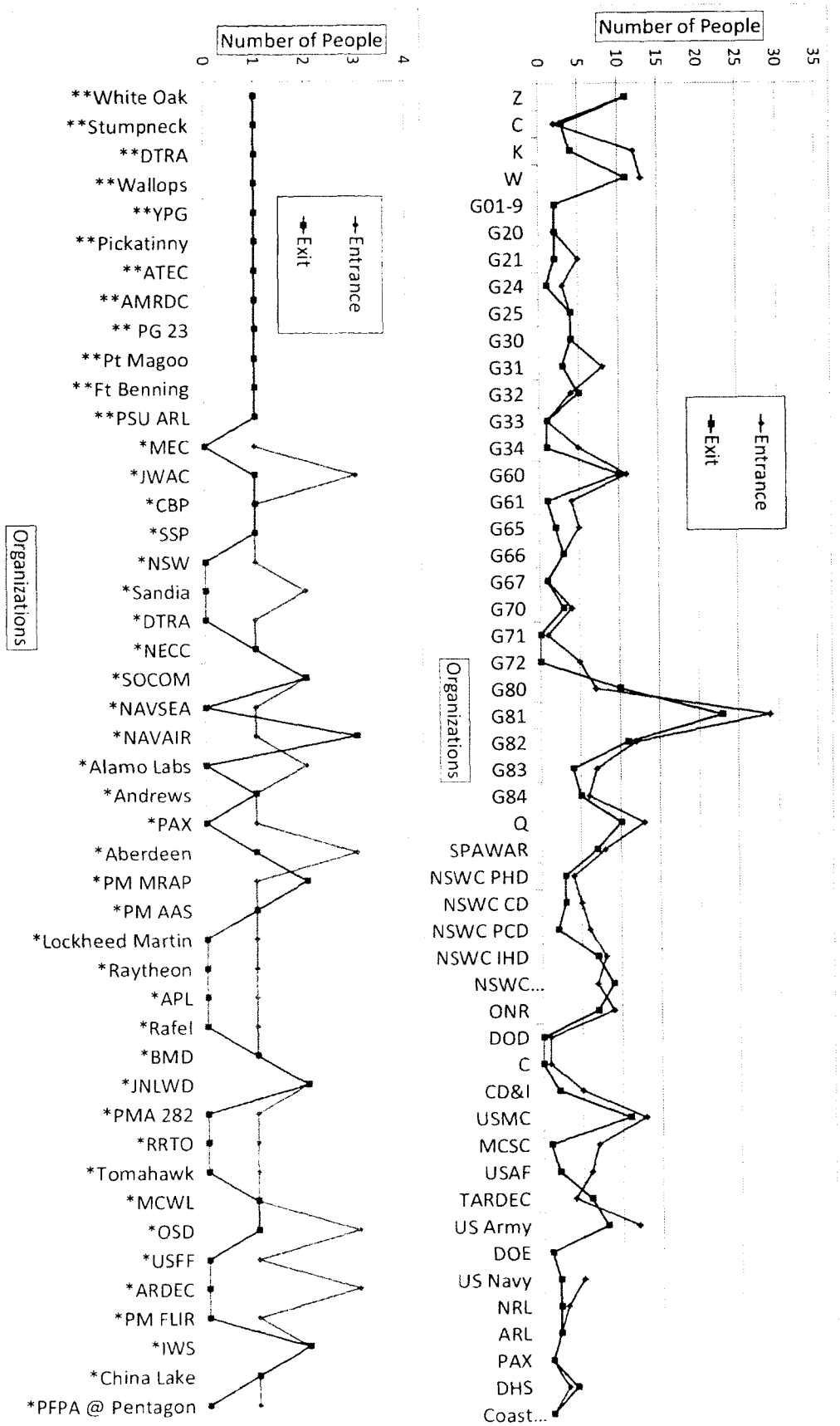


Figure 10: Organizations worked with

Based on perusal of Figure 10 the trends in the data are relatively the same. The exit interview participants identified 74 different organizations with an average of 8.8 and a standard deviation of 4.3 compared to 84, 10.3, and 6.6 for the entrance interviews. The follow up questions of formal (#5) and informal (#6) lines of communication used generated 16 different formal lines of communication as compared to 13 in the entrance interview. The scale used is the same as the one used in the entrance interviews with options almost never (1), rarely (2), sometimes (3) often (4) or most of the time (5) and perceived value options of no value, some value, or high value. Figure 11- Figure 18 show frequency of use and the value of the method for peer reviews, performance reviews, IDPs, line management review, NAVSEA instructions, program lines of communication, tech briefs, and formal reports.

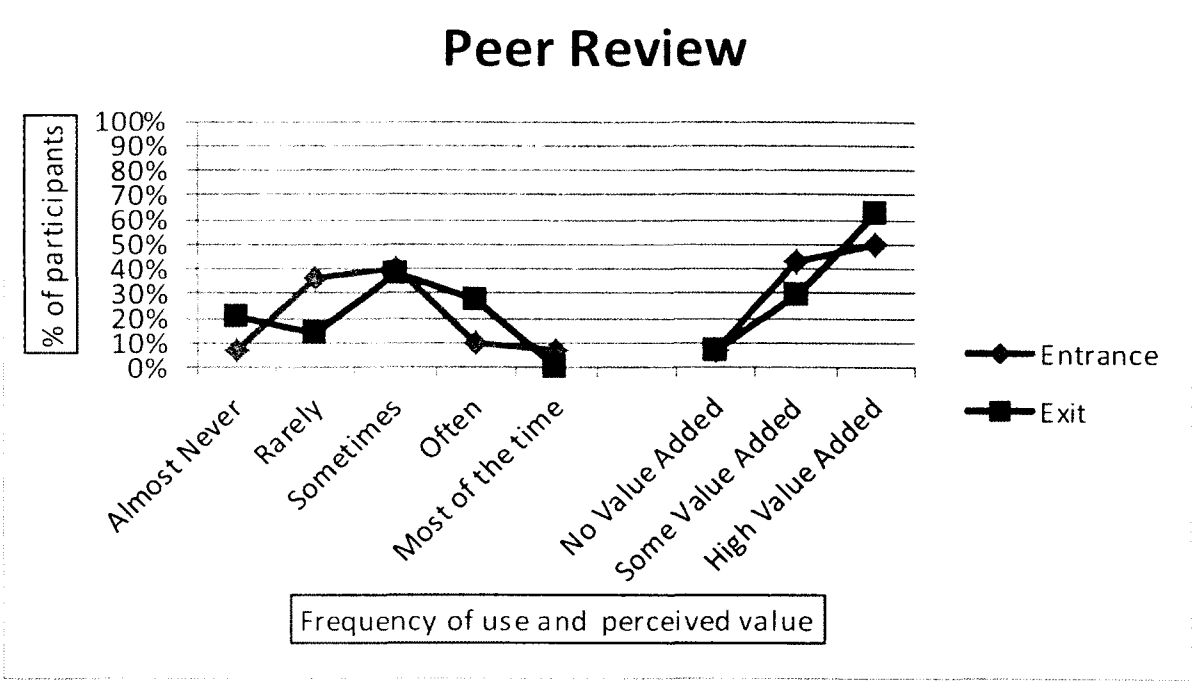


Figure 11: Peer Review

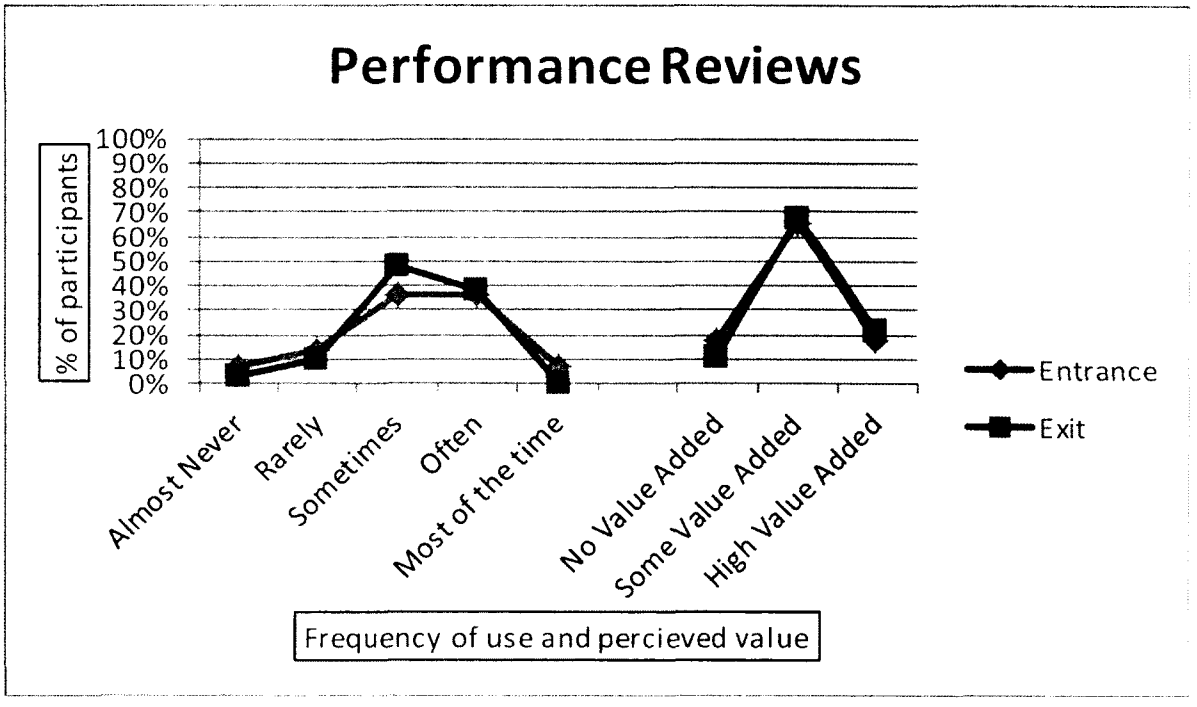


Figure 12: Performance Reviews

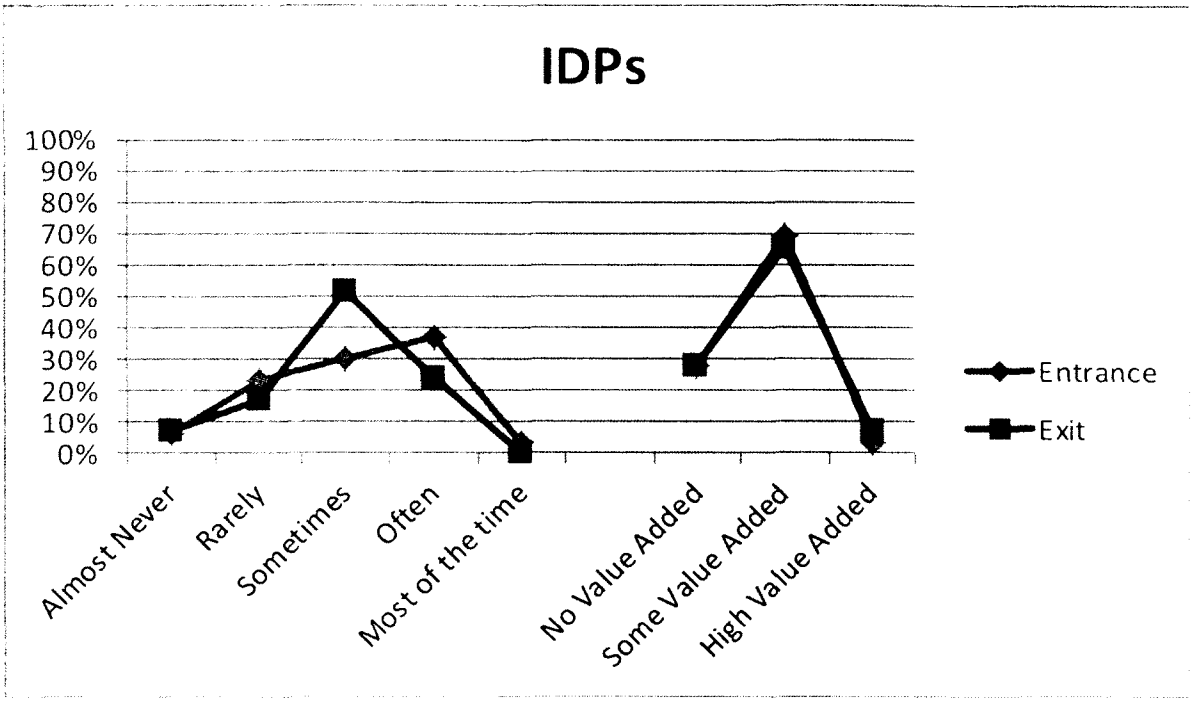


Figure 13: IDPs

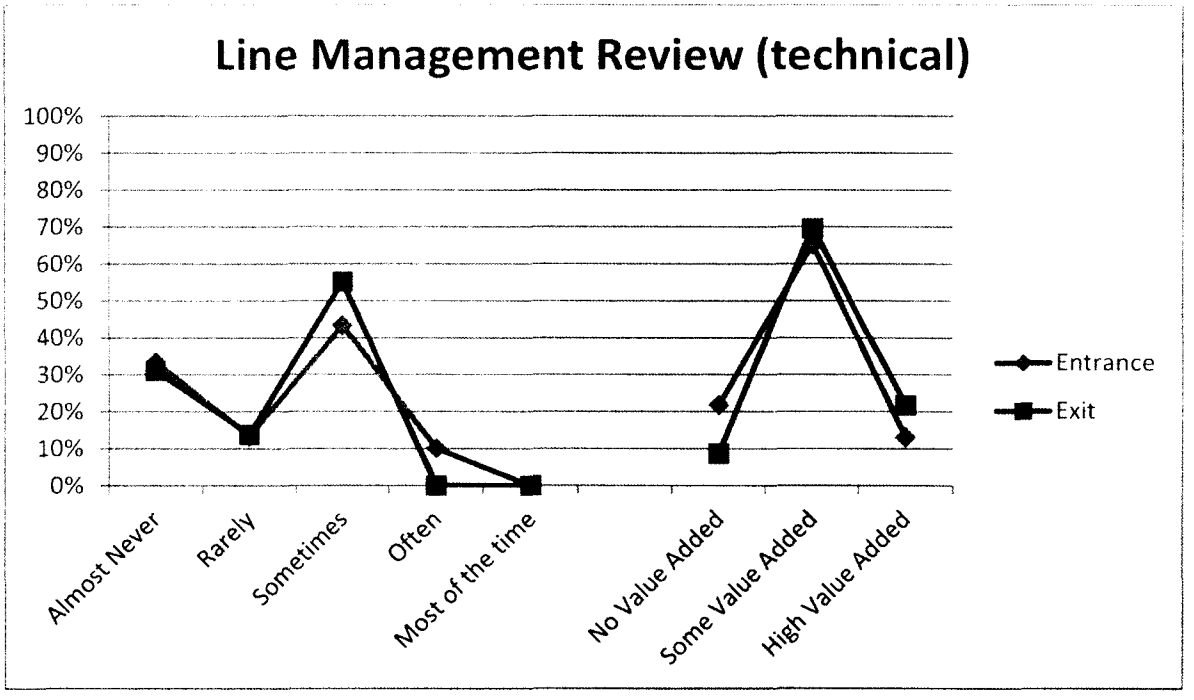


Figure 14: Line Management Review (technical)

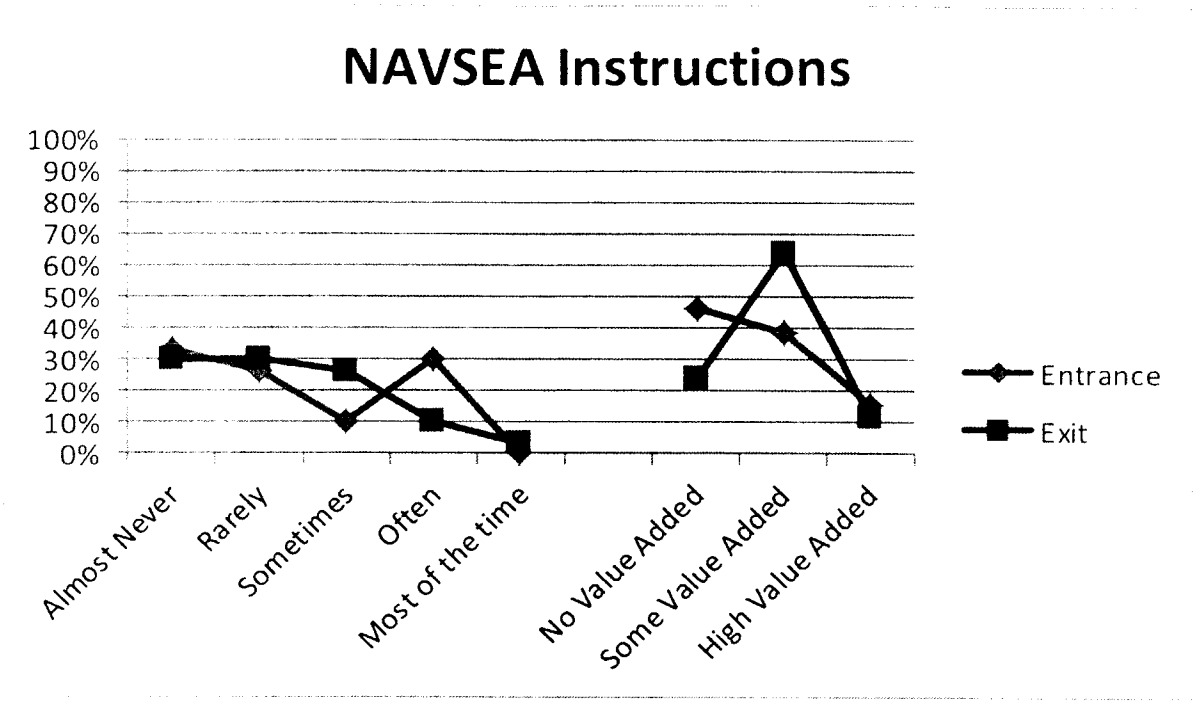


Figure 15: NAVSEA Instructions

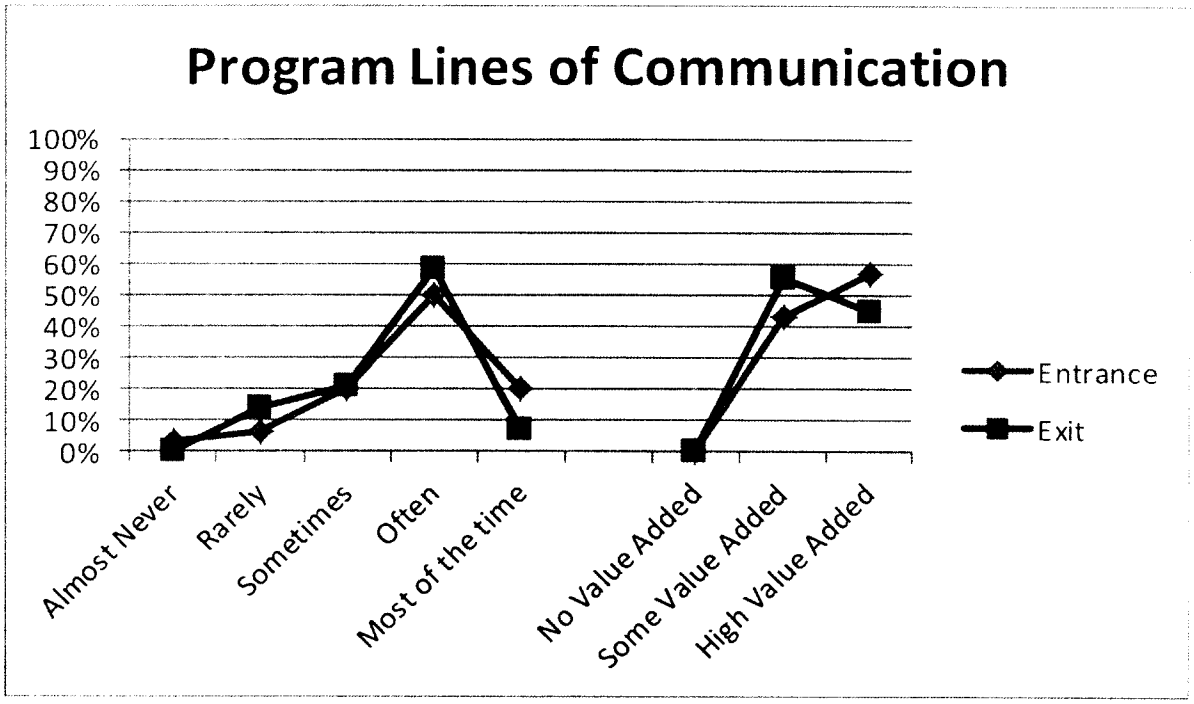


Figure 16: NAVSEA Instructions

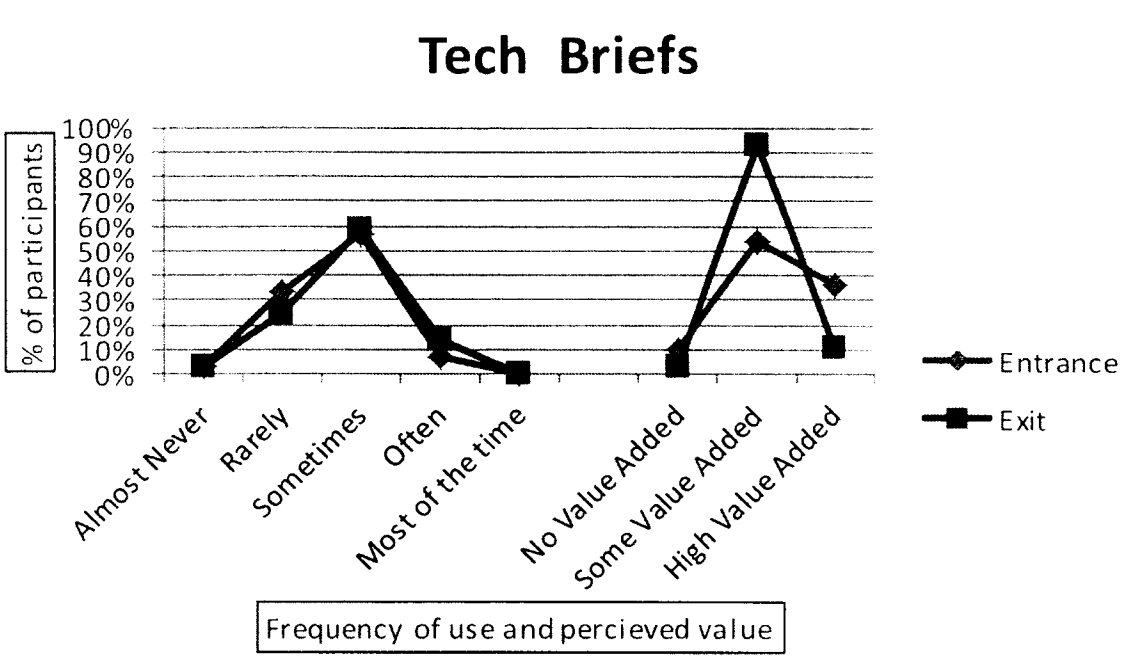


Figure 17: Tech Briefs

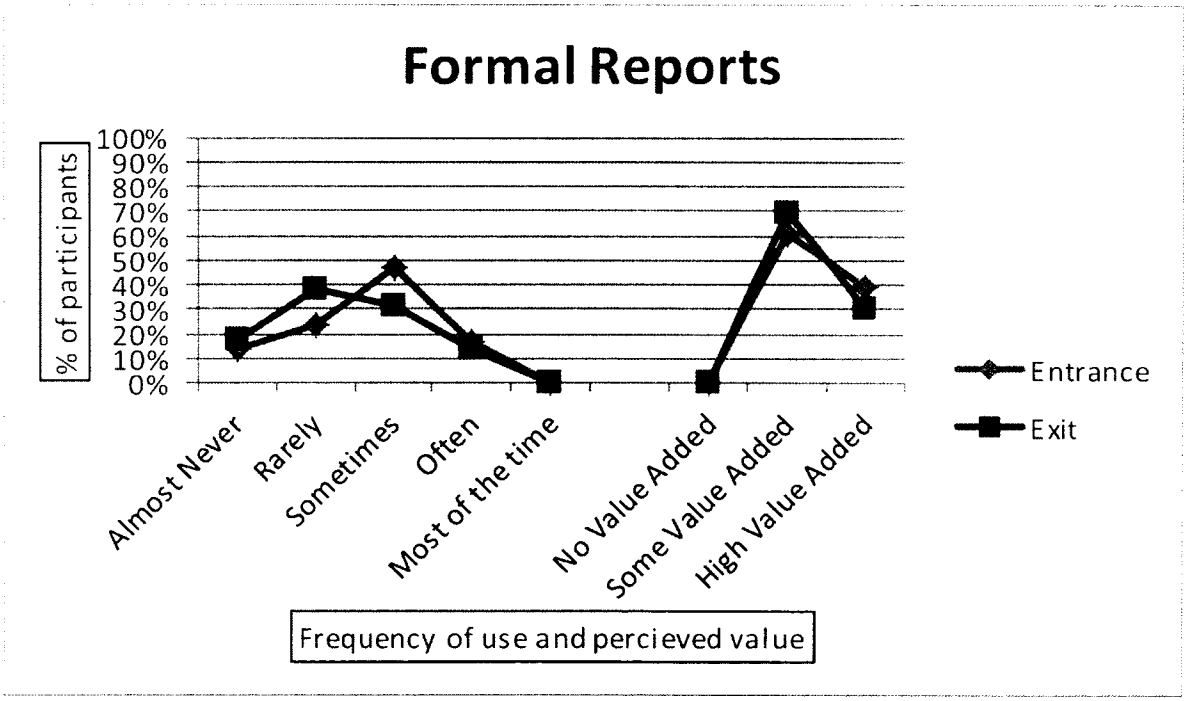


Figure 18: Formal Reports

These graphs facilitate interpretation of the data so that one can see how it has changed between the entrance and exit interviews. Plots that do not align or show significant discrepancies can be identified are discussed further in the conclusions section. For example, in the peer review plot, over a 20% change occurs in the "rarely" data point and the exit data is skewed to the right, whereas the entrance data was skewed to the left. The conclusion section will address the statistical significance of the changes and the reasons for them.

The exit data for peer reviews had an average of 2.70 (entrance was 2.73) and a standard deviation 1.09 (entrance was 0.98). These values are relatively close and the graph shows a 23% decrease in the rarely response and an 18% increase in the often response.

The exit data for performance reviews had an average of 3.20 (entrance was 3.23) and a standard deviation 0.76 (entrance was 1.01). These values are relatively close and the graph shows a 12% increase in the sometimes response.

The exit data for IDPs had an average of 2.93 (entrance was 3.07) and a standard deviation 0.83 (entrance was 1.01).These values are relatively close and the graph shows an increase of 22% the sometimes response.

The exit data for line management reviews had an average of 2.23 (entrance was 2.3) and a standard deviation 0.9 (entrance was 1.06).The entrance and exit data was relatively close and the graph shows a 12% increase in the sometimes response with a 10% decrease in the often response.

The exit data for NAVSEA instruction had an average of 2.17 (entrance was 2.37) and a standard deviation 0.99 (entrance was 1.06).The entrance and exit data was relatively close and the graph shows a 17% increase in the sometimes response with a 16% decrease in the often response.

The exit data for Program Lines of Communication had an average of 3.60 (entrance was 3.77) and a standard deviation 0.81 (entrance was 0.97).The entrance and exit data was relatively close and the graph shows a 13% decrease in the most of the time response.

The exit data for Tech Briefs had an average of 2.80 (entrance was 2.67) and a standard deviation 0.71 (entrance was 0.66).The entrance and exit data was relatively close and the graph shows no changes over 10%.

The exit data for Formal Reports had an average of 2.43 (entrance was 2.67) and a standard deviation 0.94 (entrance was 0.92).The entrance and exit data was relatively close and the graph shows a 15% increase in the sometimes response with a 20% decrease in the often response.

Question #6 in the exit interviews identified 15 different informal methods of communication versus 16 in the entrance interviews. Informal lines of communication data are shown in Figure 19 - Figure 25 for phone, email, face-to-face, shared website, mail, meetings, and informal reports.

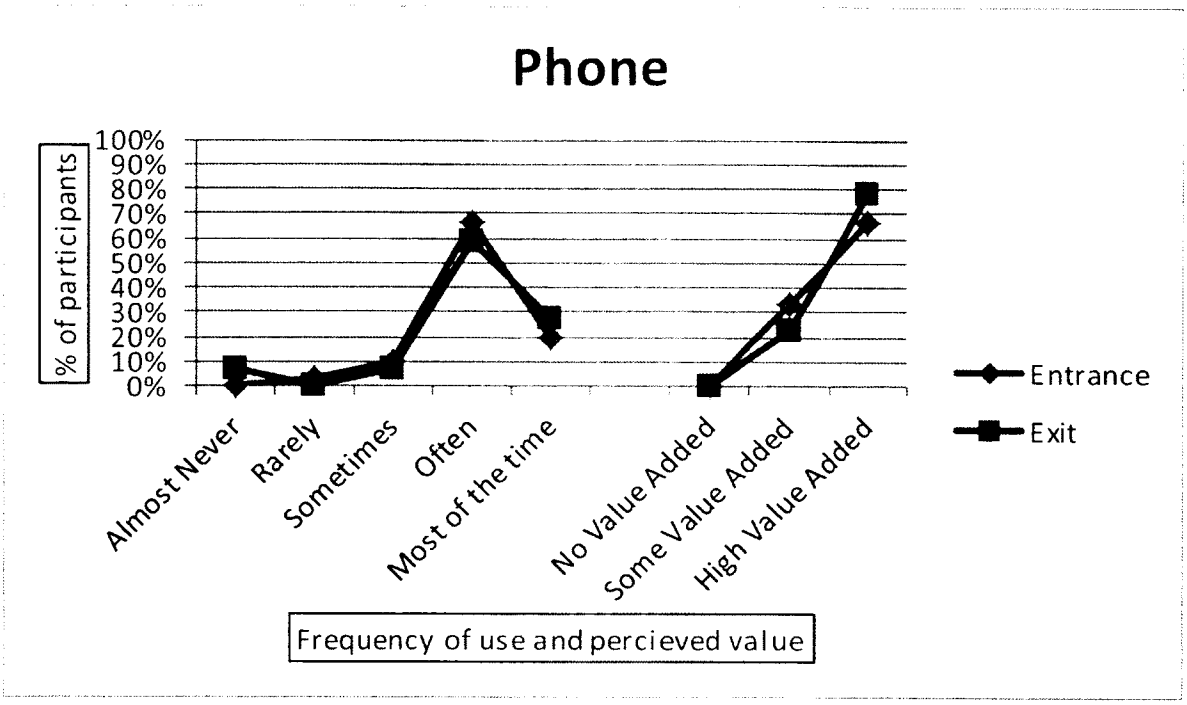


Figure 19: Phone

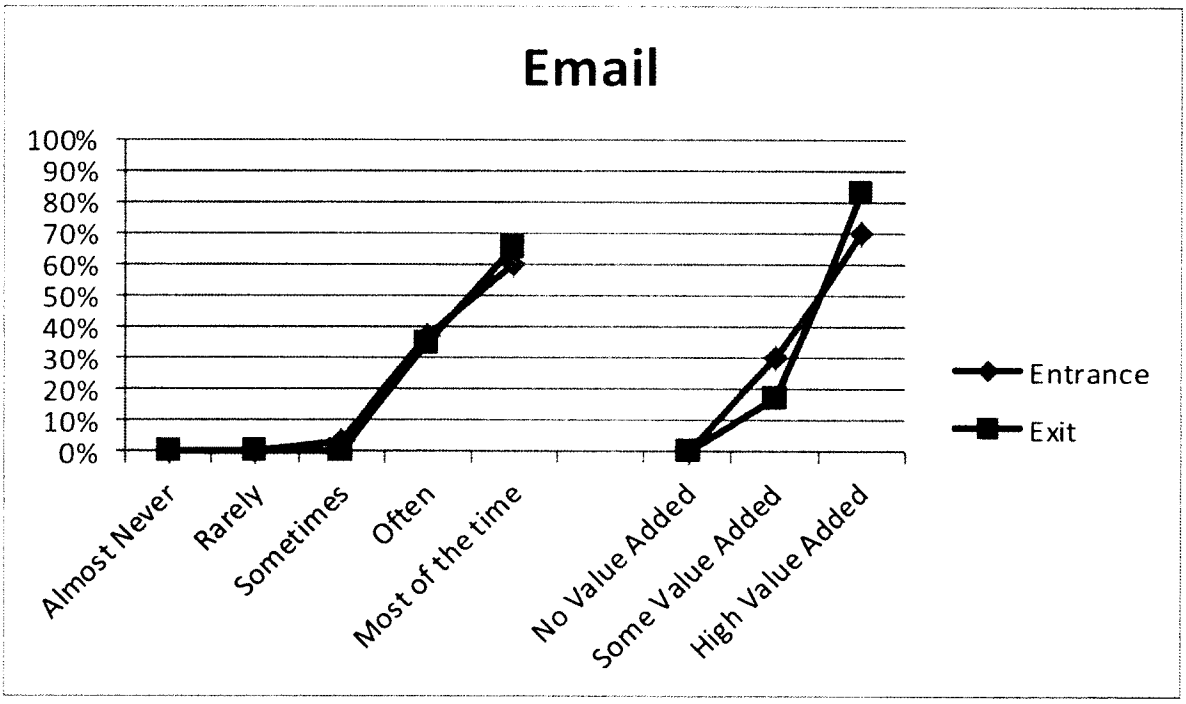


Figure 20: Email

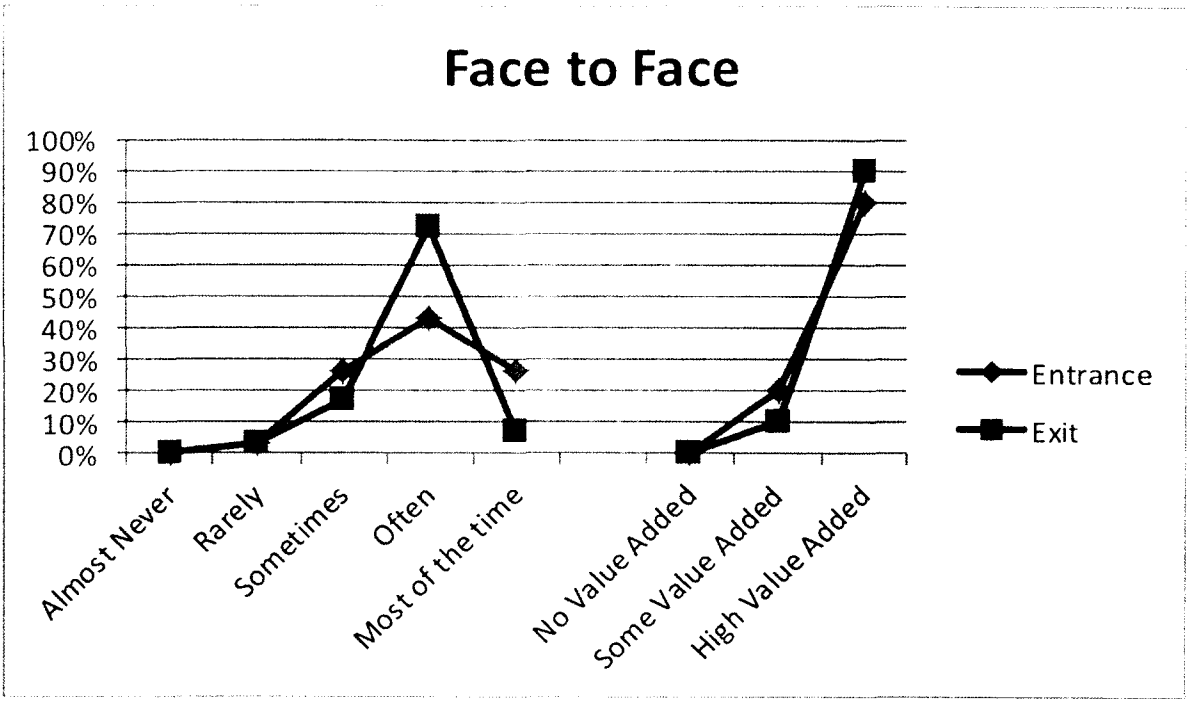


Figure 21: Face-to-Face

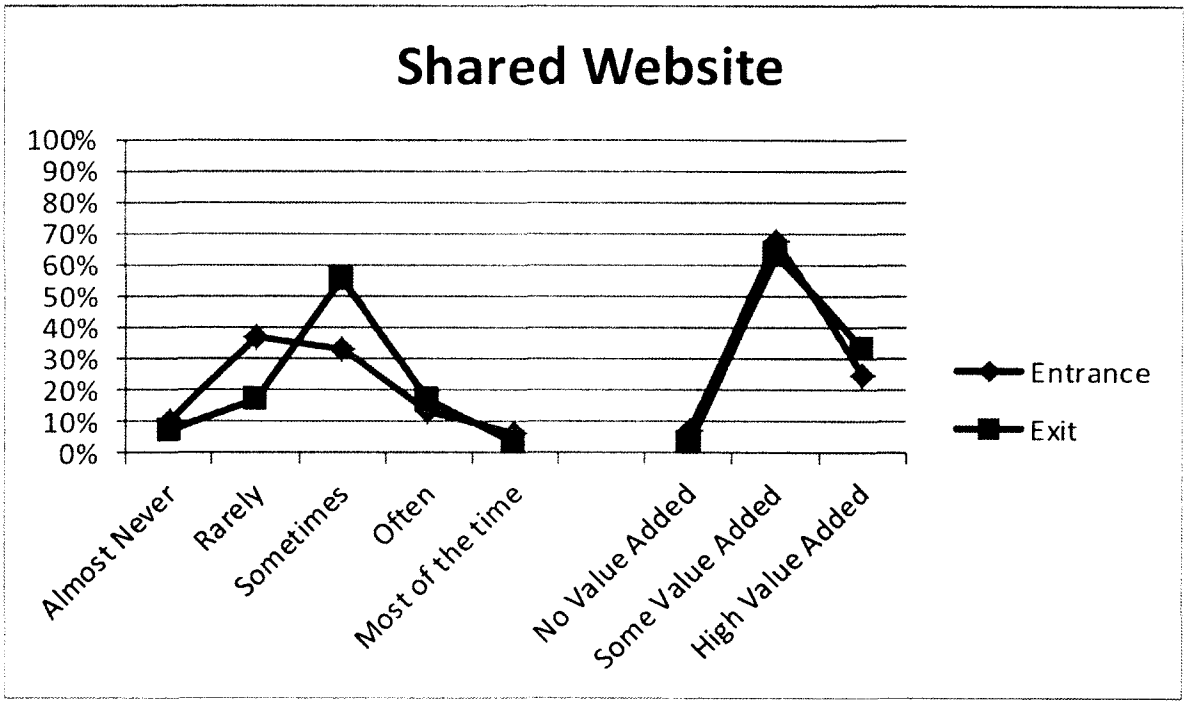


Figure 22: Shared Website

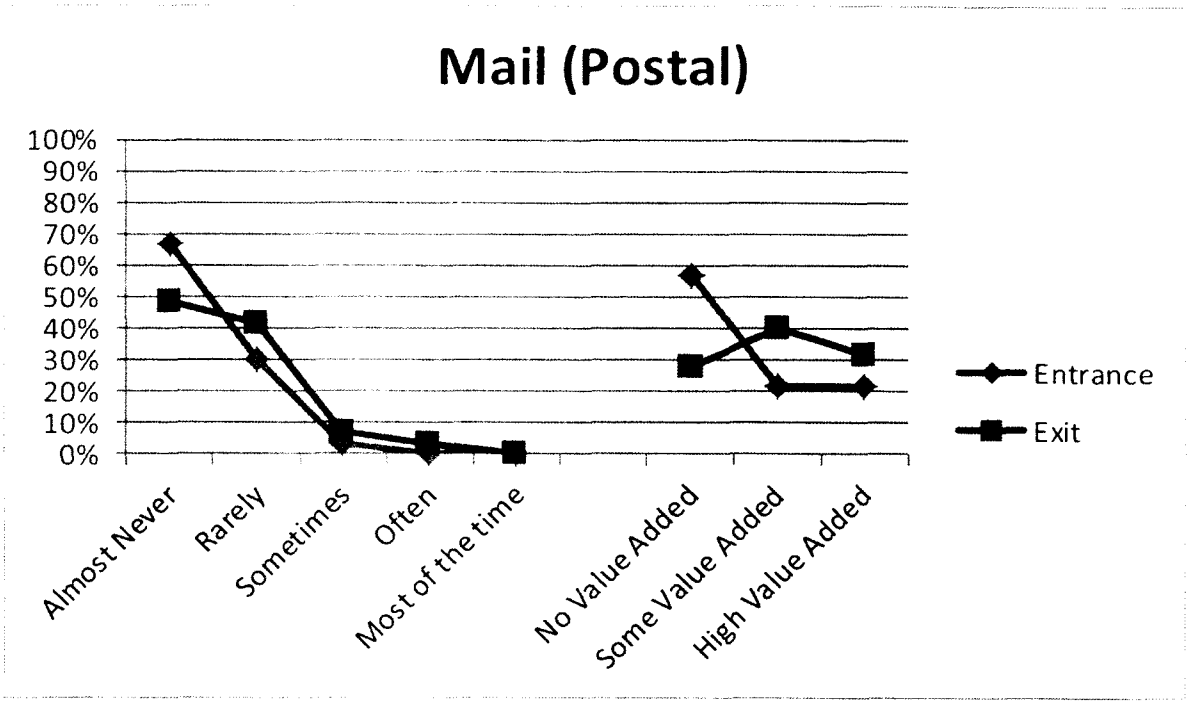


Figure 23: Mail (Postal)

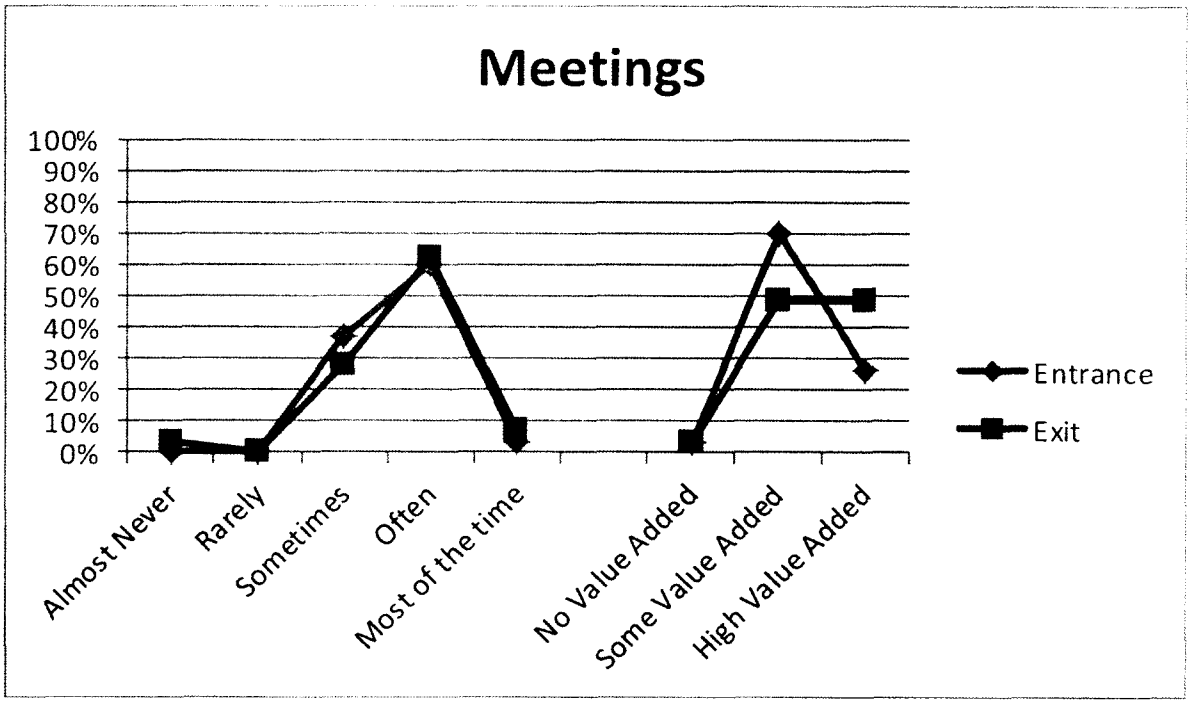


Figure 24: Meetings

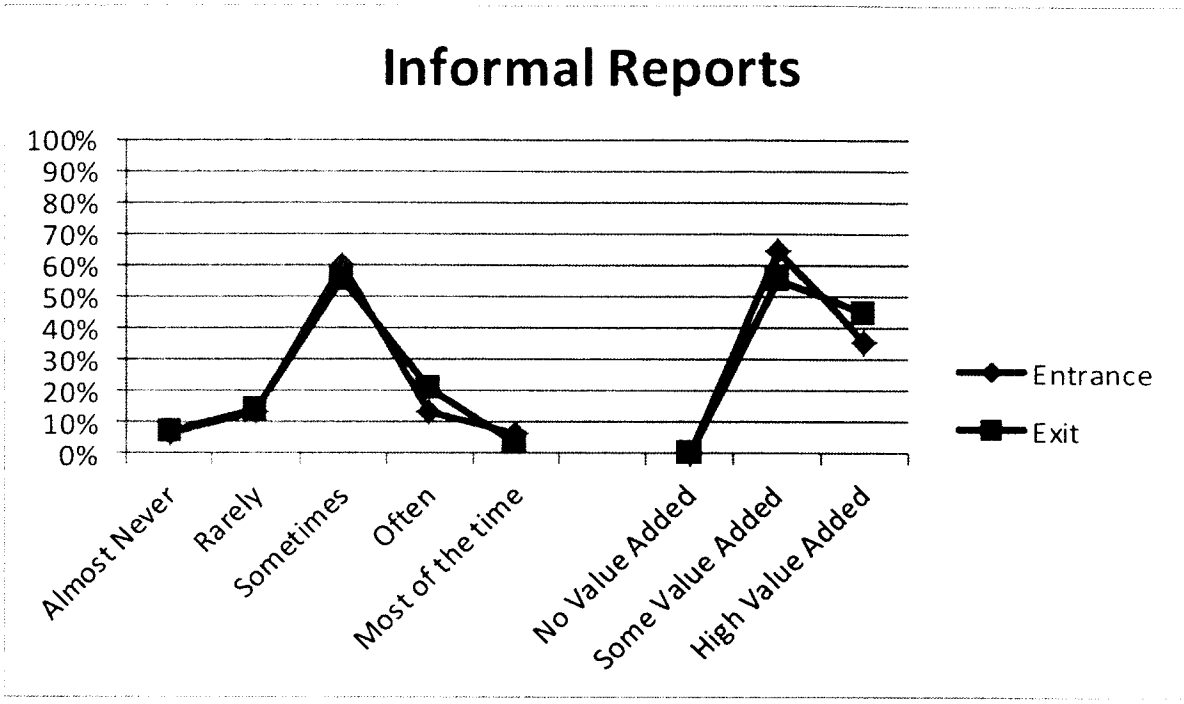


Figure 25: Informal Reports

The exit data for Phone had an average of 4.00 (entrance was 4.03) and a standard deviation 0.98 (entrance was 0.67).The entrance and exit data was relatively close and the graph shows no changes over 8%.

The exit data for Email had an average of 4.63 (entrance was 4.57) and a standard deviation 0.49 (entrance was 0.57).The entrance and exit data was relatively close and the graph shows no changes over 6%.

The exit data for Face to Face had an average of 3.83 (entrance was 3.87) and a standard deviation 0.59 (entrance was 0.86).The entrance and exit data was relatively close and the graph shows a 29% increase in the often response and a 20% decrease in most of the time.

The exit data for Shared Website had an average of 2.93 (entrance was 2.70) and a standard deviation 0.87 (entrance was 1.06).The entrance and exit data was relatively close and the graph shows a 19% decrease in the rarely response and a 22% increase in sometimes.

The exit data for Mail had an average of 1.67 (entrance was 1.37) and a standard deviation 0.76 (entrance was 0.56).The entrance and exit data was relatively close and the graph shows a 18% decrease in the almost never response and a 11% increase in rarely.

The exit data for Meetings had an average of 3.70 (entrance was 3.67) and a standard deviation 0.75 (entrance was 0.55).The entrance and exit data was relatively close and the graph shows no changes over 9%.

The exit data for Informal Reports had an average of 3.00 (entrance was 3.00) and a standard deviation 0.87 (entrance was 0.91).The entrance and exit data was relatively close and the graph shows no changes over 7%.

The second subtopic determines the user's familiarity with social networking technology. The participants were asked to answer question #7, "You are familiar with Social Networking," on a 1-5 Likert scale. The responses are shown in Figure 26.

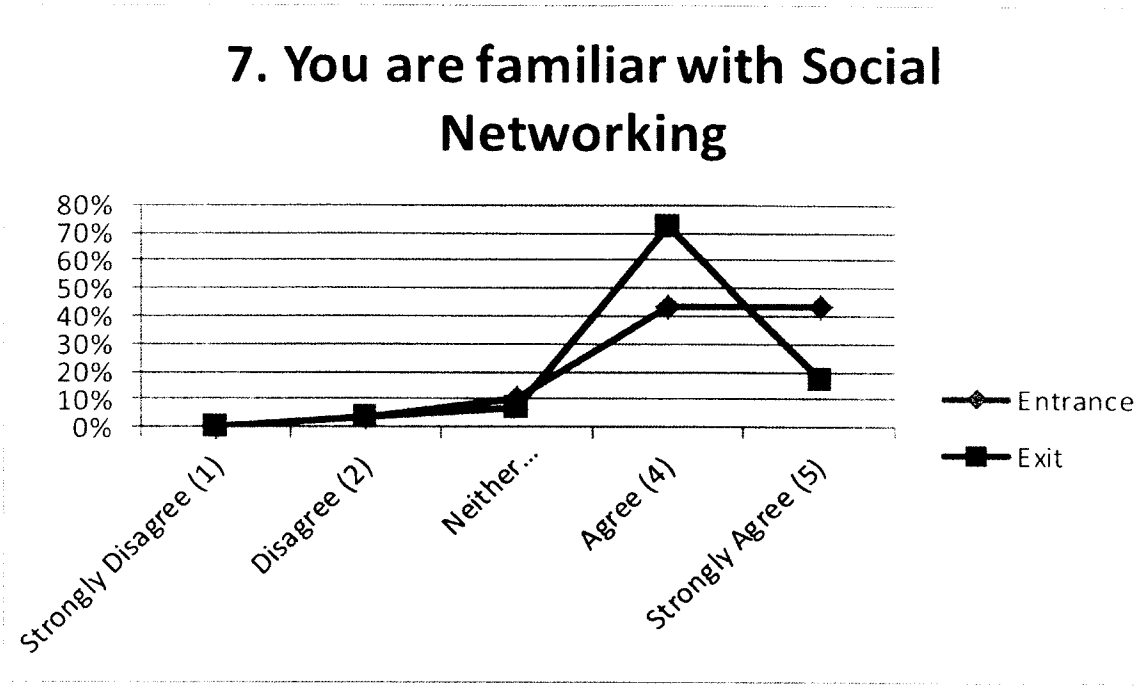


Figure 26: You are familiar with Social Networking

The exit data for question #7 had an average of 4.07 (entrance was 4.27) and a standard deviation 0.64 (entrance was 0.78). A shift can be seen from 48% to 71% of those who "agree" to an almost equal decrease in "strongly agree" from 39% to 18%. Since those responses are adjacent and the options are subjective the change is not anticipated to be significant.

For question #8 on the entrance interview, participants identified their frequency of use(I don't know what it is (1), I know what it is, but never use it (2), I use it once a year (3), I use it once a month (4), I use it once a week (5), I use it daily (6)), duration of use per visit (<5 min, 5-30 min, 30-60 min, >60 min), and recommendation (no, maybe, yes) for 15 social networking tools with only Facebook having substantial response (60% using it at least monthly). The results of the exit interview included 10 tools with Facebook again seeing 63% using it at least monthly. The exit interview had an average of 4.03 (entrance was 4.13) and a standard deviation1.65 (entrance was 1.72) Aristotle, which was the treatment tool provided, had some significant changes such as the percent of people not knowing what it was decreasing from 91% to 0%; however, only 8% used it at least monthly. This suggests that at a minimum the employees all have a familiarity with the program. The exit interview for Aristotle had an average of 2.50 (entrance was 1.13) and a standard deviation 0.78 (entrance was 0.43) Figure 27 and Figure 28 show graphs of Facebook and Aristotle use.

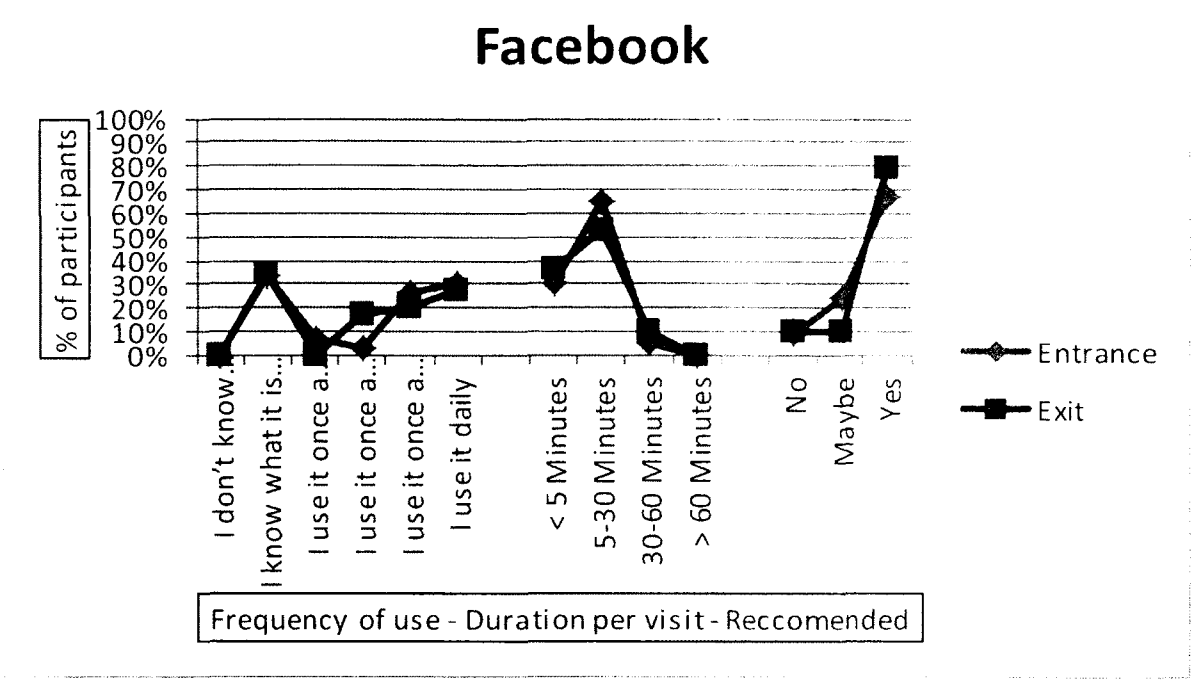


Figure 27: Facebook

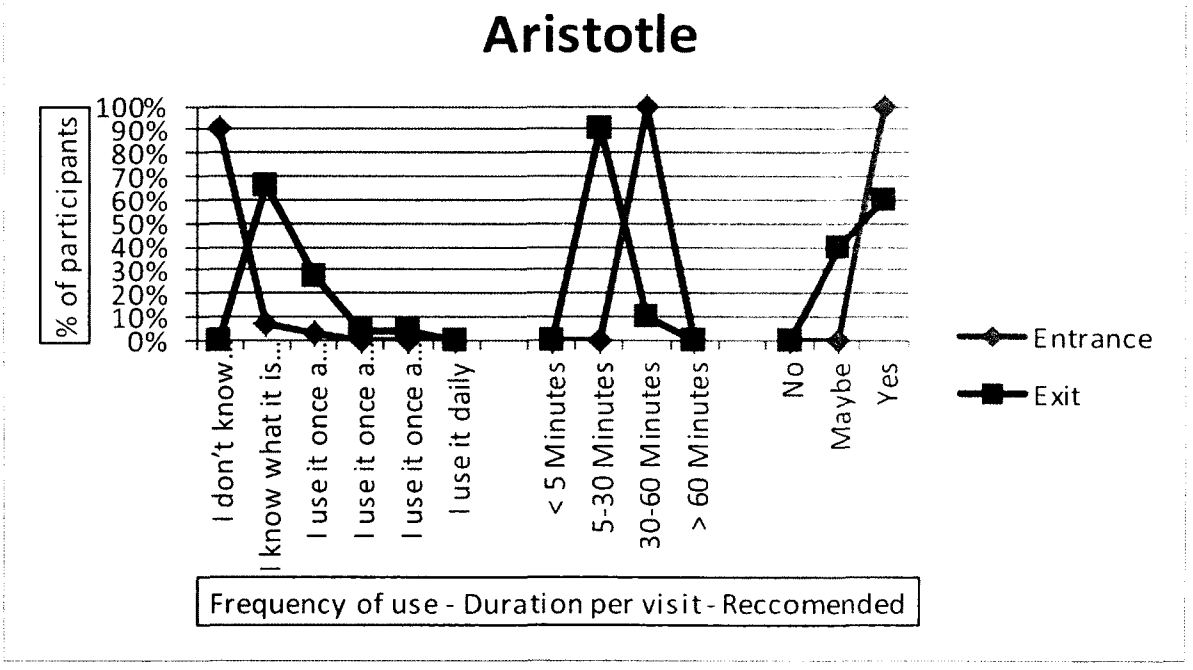


Figure 28: Aristotle

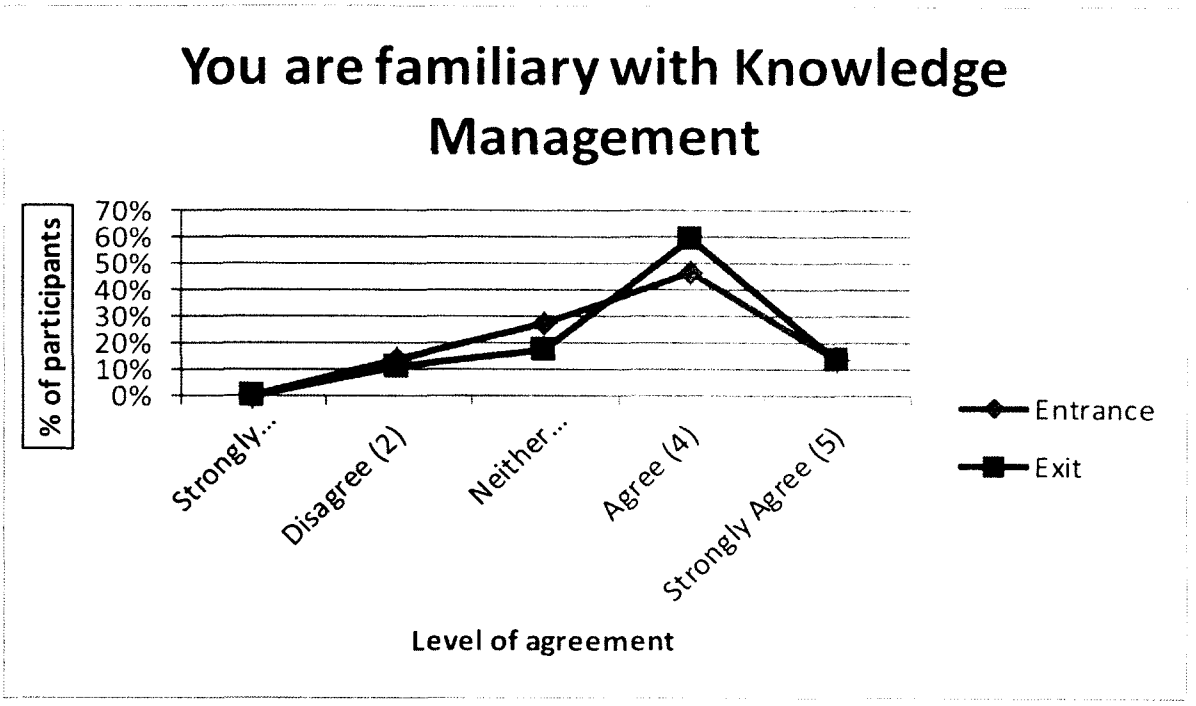


Figure 29: You Are Familiar with Knowledge Management

The second focus area was on knowledge management. The first subtopic in this focus area asked the participants to answer question #9, "You are familiar with Knowledge Management." The exit data had an average of 3.77(entrance was 3.60) and a standard deviation 0.82 (entrance was 0.89). Figure 29 compares the entrance and exit results. The comparison of the data shows skewing to the right.

The follow-up to that was question #10 which asked the participants to identify their frequency of use, duration of use per visit, and their recommendation as it pertains to KM processes within the organization. There were 25 KM processes identified and for the most part the data was relatively similar for both the entrance interviews. Figure 30 - Figure 34 show the processes that showed the largest changes between the entrance and exit interviews.

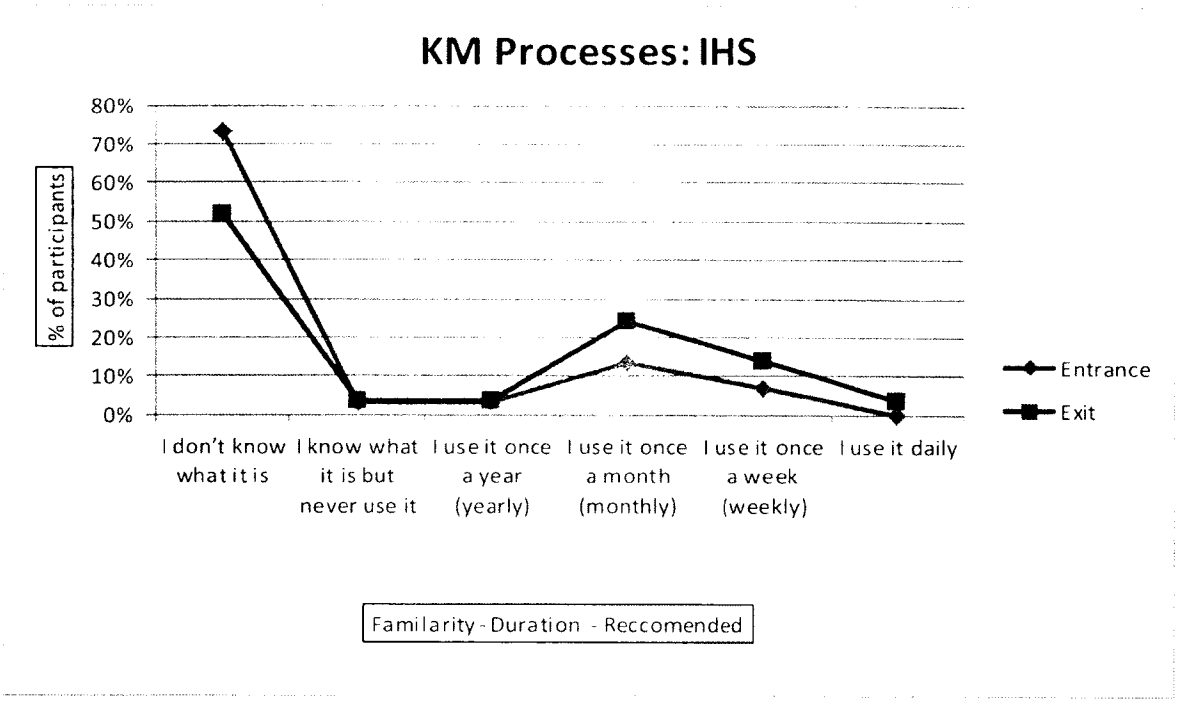


Figure 30: KM Processes IHS

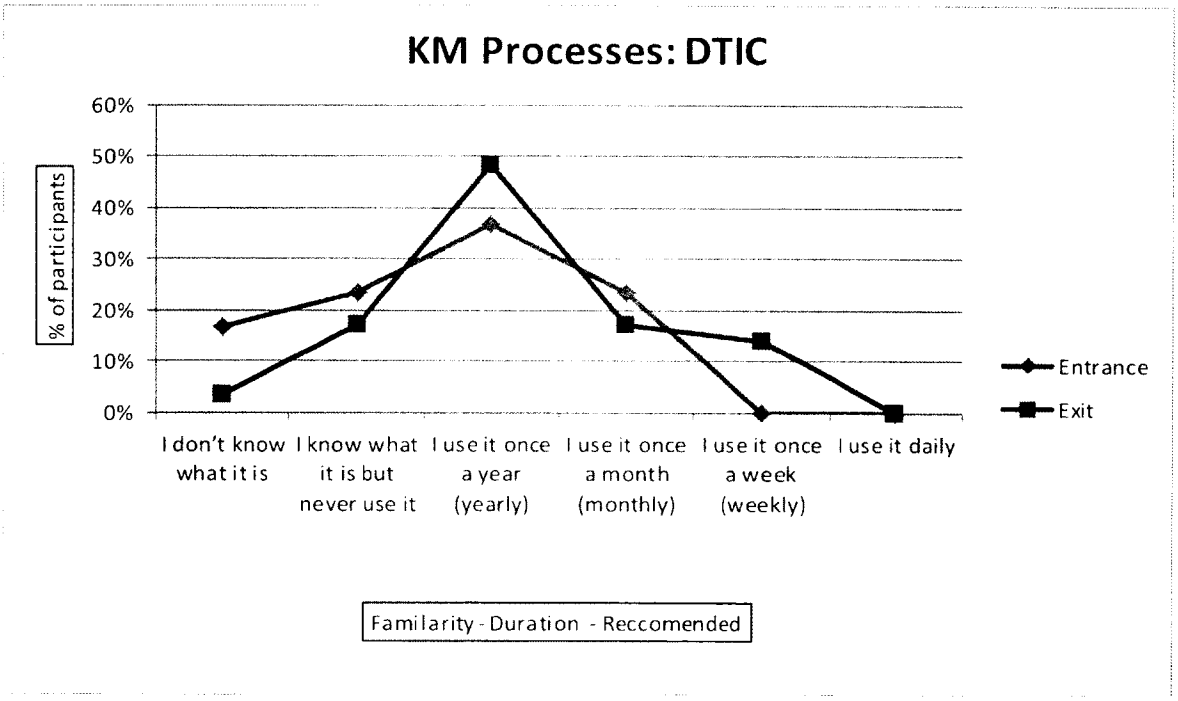


Figure 31: KM Processes DTIC

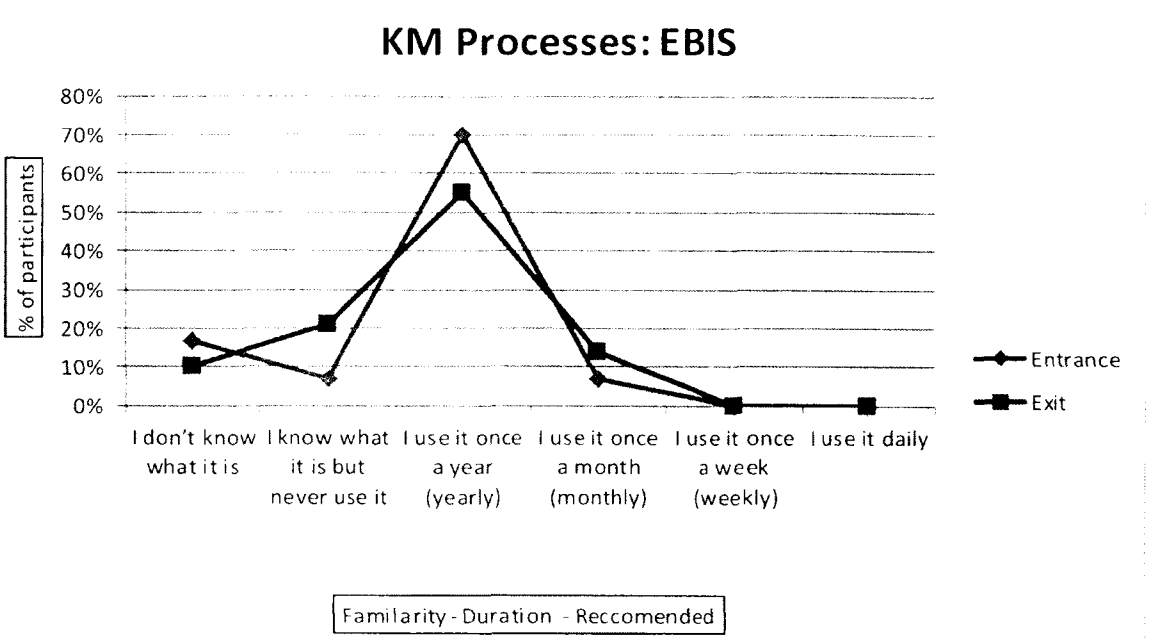


Figure 32: KM Processes EBIS

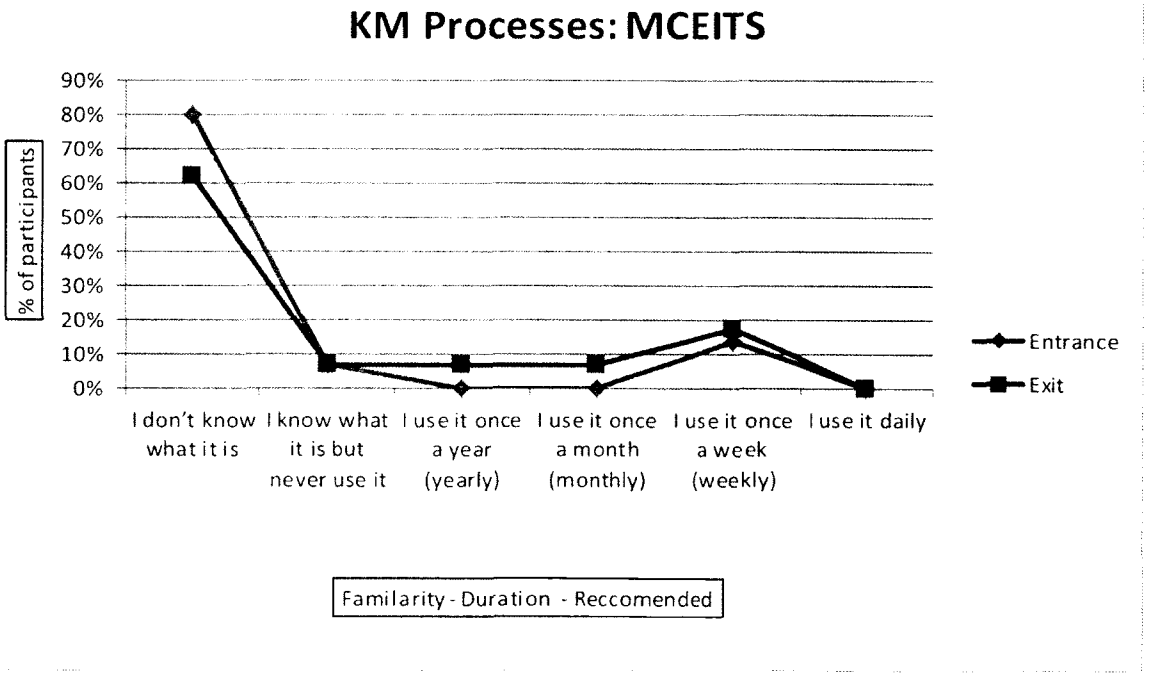


Figure 33: KM Processes MCEITS

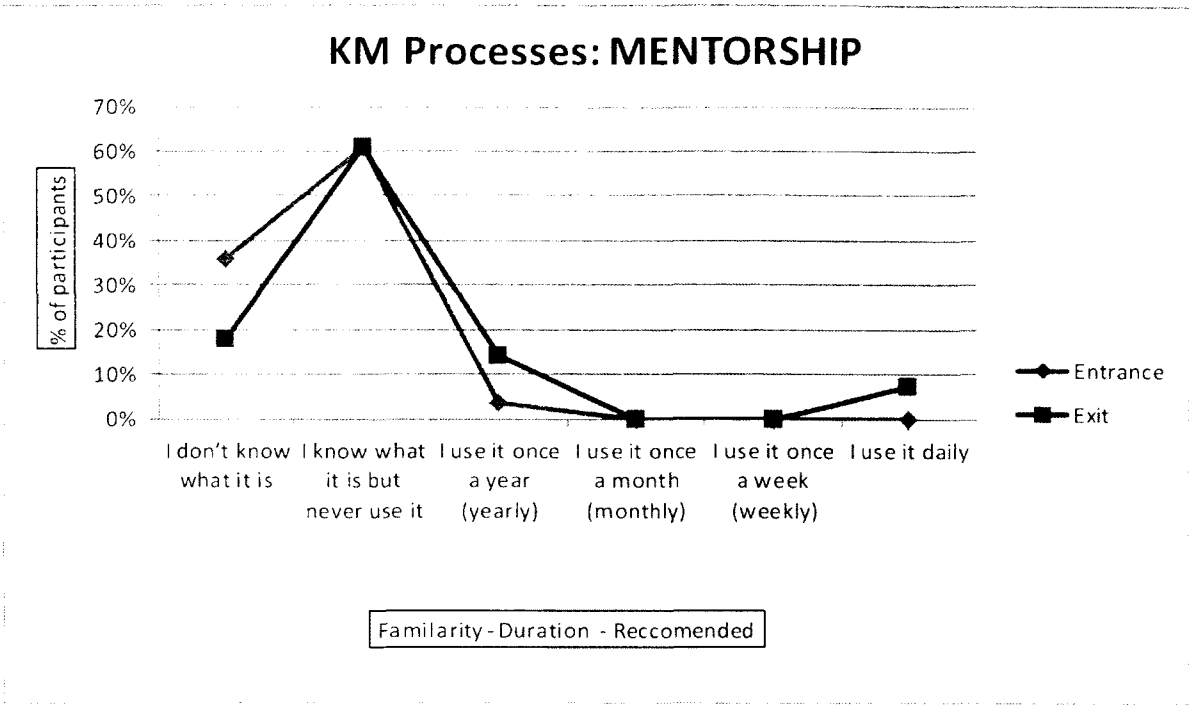


Figure 34: KM Processes MENTORSHIP

Figure 30 shows the data for IHS, which is an online tool for accessing the NSWC technical library. The average for the exit interview was 2.50 (entrance was 1.77) and the standard deviation was 1.76 (entrance was 1.38). There was a relatively significant change in the entrance and exit data which saw a 22% decrease in respondents not knowing what it is.

Figure 31 shows the data for DTIC, the Defense Technical Information Center, which is the primary online repository for DoD information. The average for the exit interview was 3.27 (entrance was 2.67) and the standard deviation was 1.05 (entrance was 1.03). There was a 12% increase in monthly use, a 13% decrease in not knowing what it is and a 14% decrease in weekly use.

Figure 32 shows the data for EBIS, which is the online portal for managing DoD health services. The average for the exit interview was 2.73 (entrance was 2.67) and the standard deviation was 0.83 (entrance was 0.84). There was a 14% increase in those who never use it and a 15% decrease yearly use.

Figure 33 shows the data for MCIETS, a USMC knowledge management server. The average for the exit interview was 2.07 (entrance was 1.60) and the standard deviation was 1.60 (entrance was 1.38). The highest response showed 18% participants not knowing what it is.

Figure 34 shows the data for the Mentorship Program at NSWC. The average for the exit interview was 2.24 (entrance was 1.68) and the standard deviation was 1.18 (entrance was 0.55). There was an 18% decrease in those who did not know about the program and an 11% increase in respondents using it yearly.

Questions #11 - #13 look at the participant's understanding and use of knowledge management systems. Figure 35-- Figure 37 show responses to: "If knowledge management met your needs you would use it", "Knowledge management is beneficial to your job," and "There is value in the information available in a knowledge management system." Very little change occurred between the entrance and exit interviews.

For question #11 the average of the exit interviews was 4.28 (entrance was 4.30) with a standard deviation of 0.59 (entrance was 0.53). Question #12 had an exit interview average of 4.24 (entrance was 4.33) with a standard deviation of 0.51 (entrance was 0.55). Question #13 had an exit interview average of 4.24 (entrance was 4.30) with a standard deviation of 0.58 (entrance was 0.53). The significance of the data for questions #11-#13 is addressed in a later section.

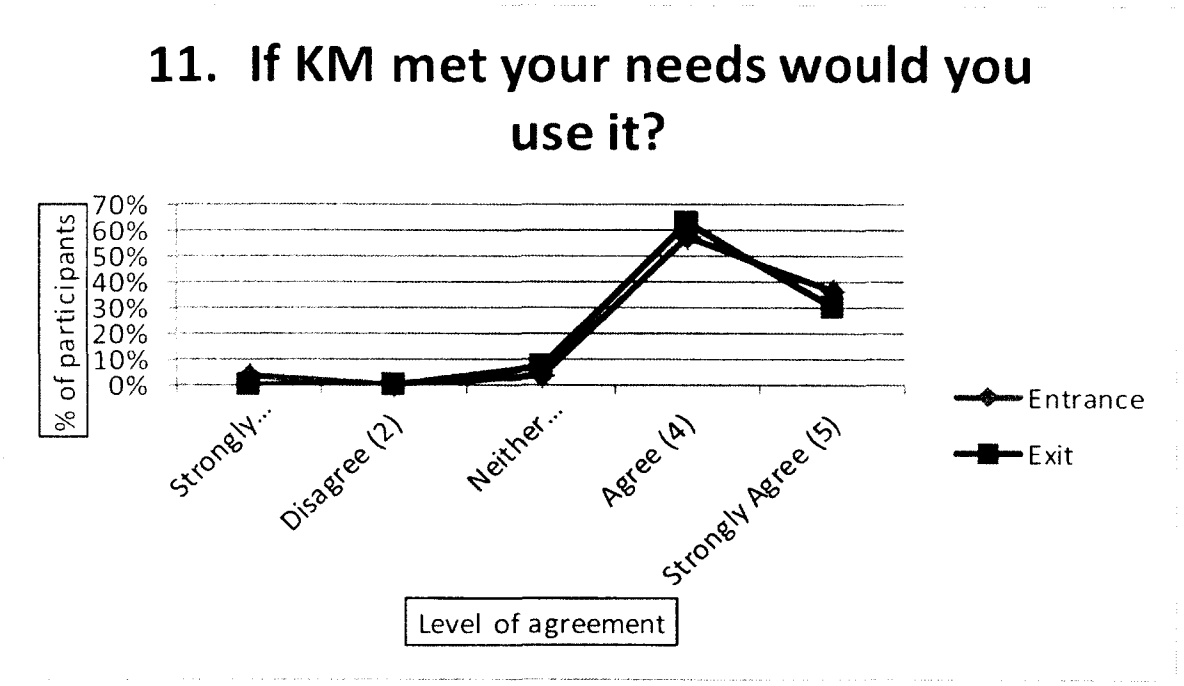


Figure 35: If KM met your needs would you use it?

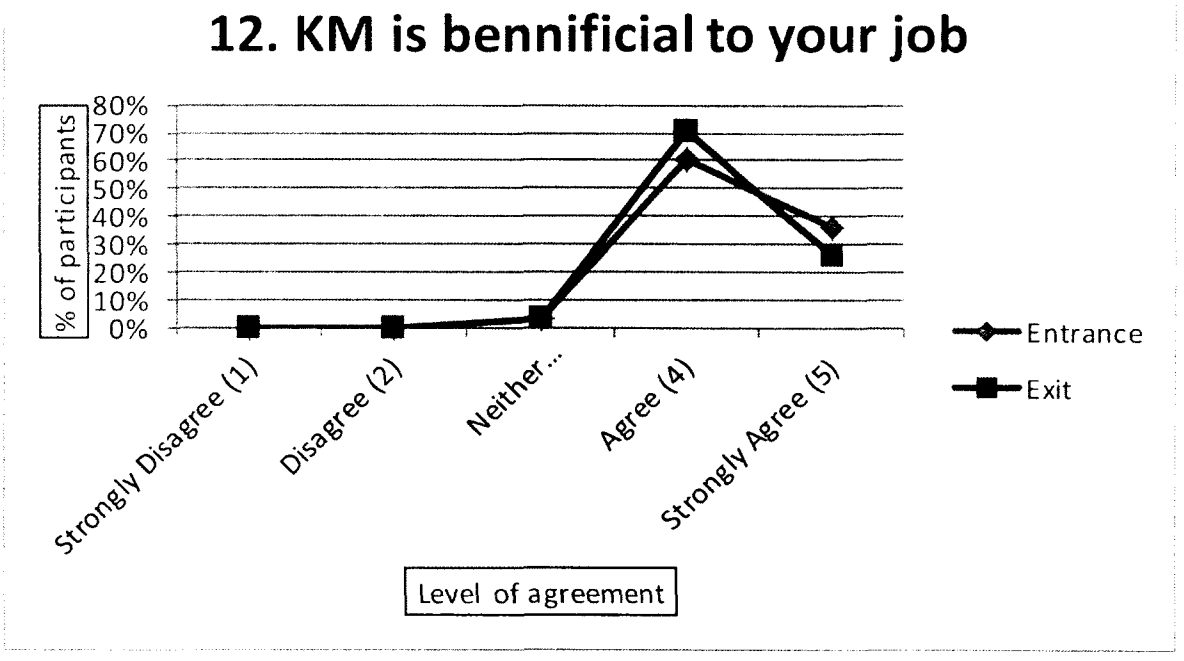


Figure 36: KM is bennificial to your job.

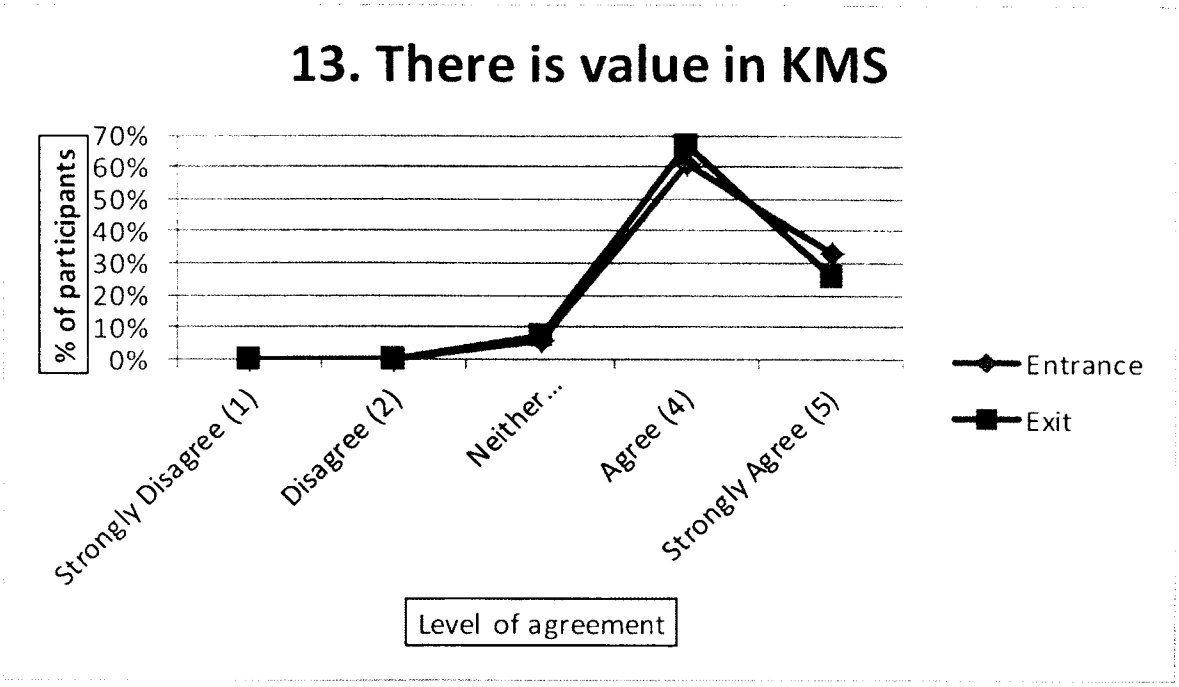


Figure 37: There is value in KM

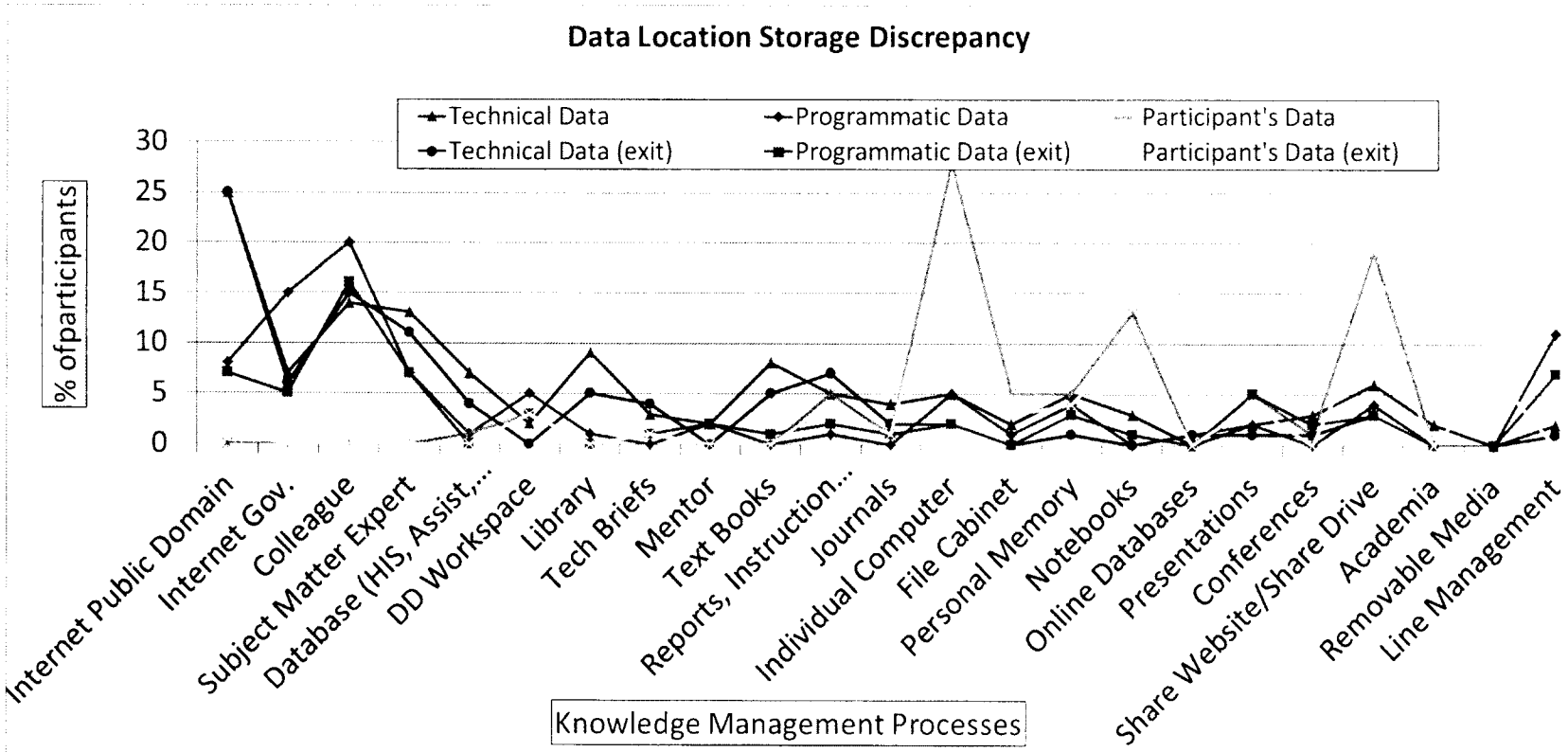


Figure 38: Data Storage

Figure 38 shows and compares where participants go to find technical information, where they go to find programmatic information, and where they store their information. Both entrance and exit data are included in the graph and one can see that there appears to be a strong correlation between the two. The trend established in the entrance interviews is similar to the trend in the exit interviews. The trend is that the locations participants go to find data are very different from where they store their data as shown by the discrepancy between the peaks. Again, out of the top three methods used to store individual data (individual computer, share website/share drive, and notebooks), two (individual computer and notebooks) are generally only accessible by the individual which all but negates their contribution to the overall knowledge of the organization in the absence of said individual. This makes knowledge management throughout an organization very difficult.

Figure 39 - Figure 41 show the data gathered in response to the questions #17, #17b, and #18; "Other members of the organization are able to find and access information you created in a timely manner," "You are able to access information others have created in a timely manner," and "Others will be able to find information you created after you leave the organization".

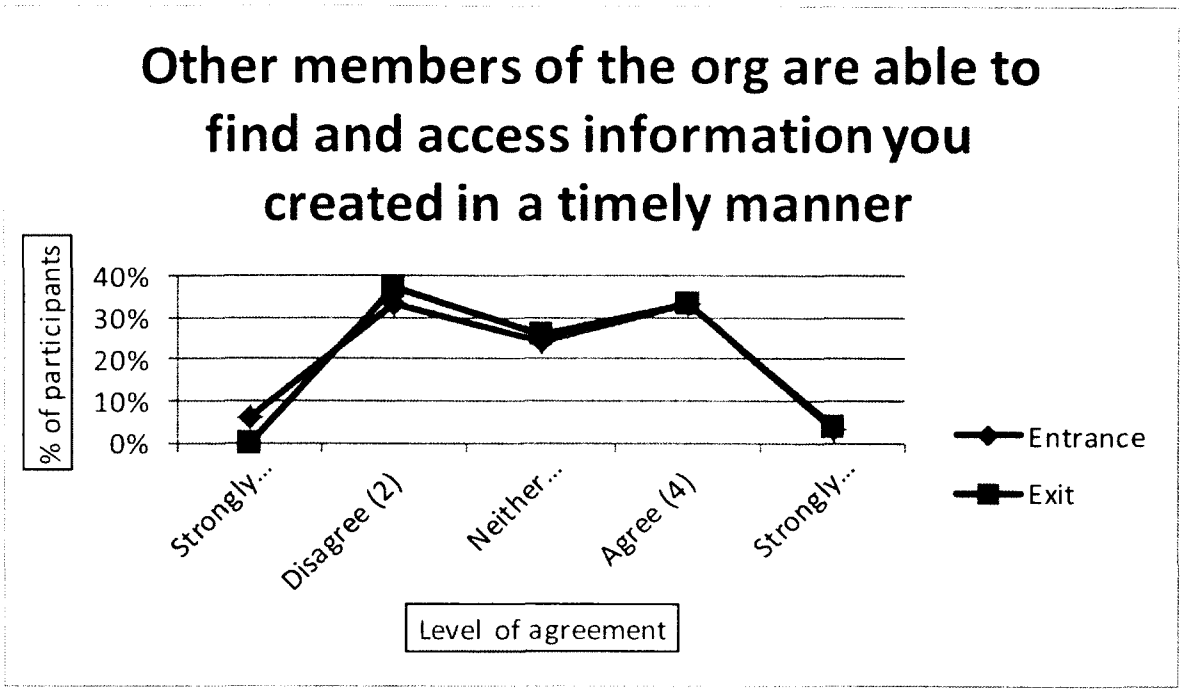


Figure 39: Organizational access to information

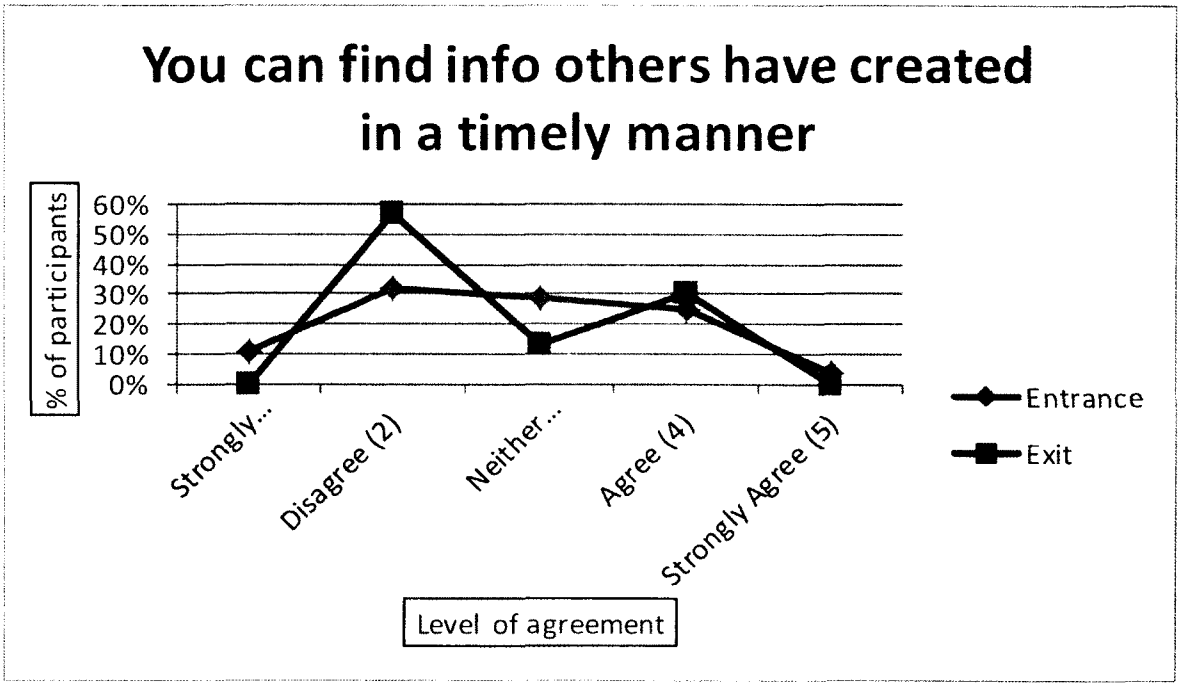


Figure 40: You can find info in a timely manner

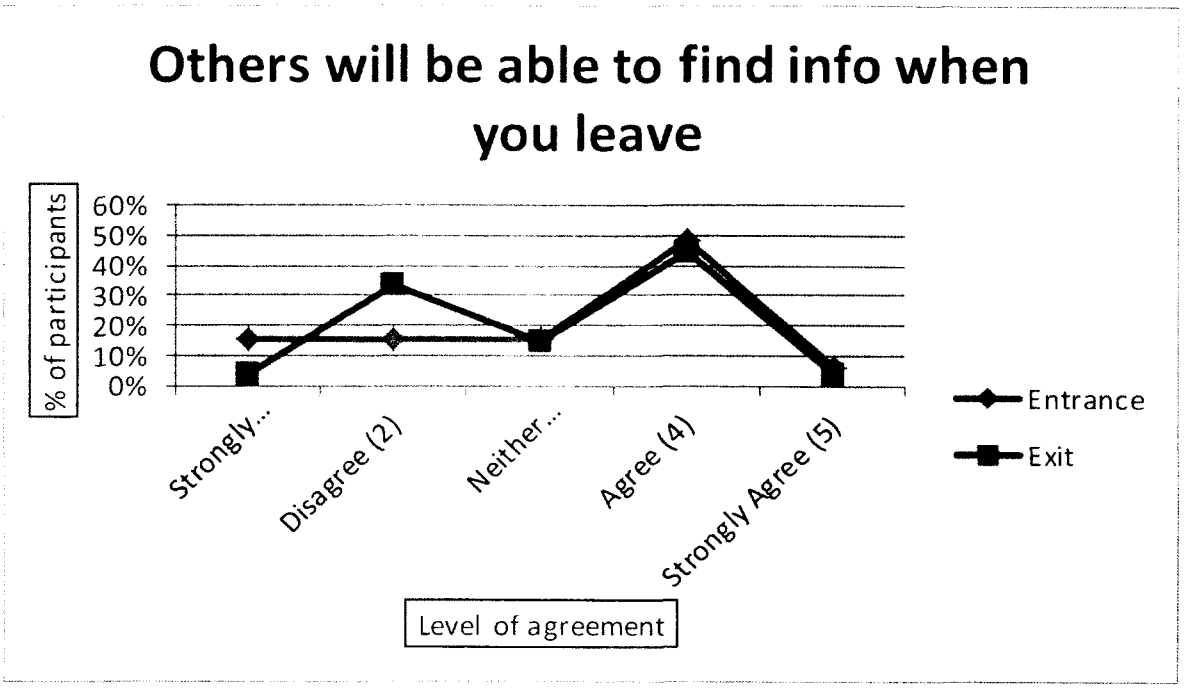


Figure 41: Others will be able to find info when you leave

For the first statement the responses were relatively consistent between entrance and exit interviews. The exit interview average was 3.00 (entrance was 2.83) and the standard deviation was 1.00 (entrance was 1.02) The second statement showed some relatively large changes in the "disagree" (32% to 57%) and "neither agree/disagree" (29% to 13%) categories. The exit interview average was 2.71 (entrance was 2.68) and the standard deviation was 0.91 (entrance was 1.07). The third statement had offsetting changes between "strongly disagree" (15% to 4%) and disagree (15% to 33%). The exit interview average was 3.00 (entrance was 3.03) and the standard deviation was 1.10 (entrance was 1.22)

Figure 42 shows the response to question #19. It asked participants to identify their top challenges when trying to gain new knowledge. They identified 28 challenges with the most common challenges identified in both the entrance and exit interviews being not knowing where it is (29% entrance and 23% exit) and not having enough time(9% entrance and 13% exit). The results were relatively consistent between the entrance and exit interviews.

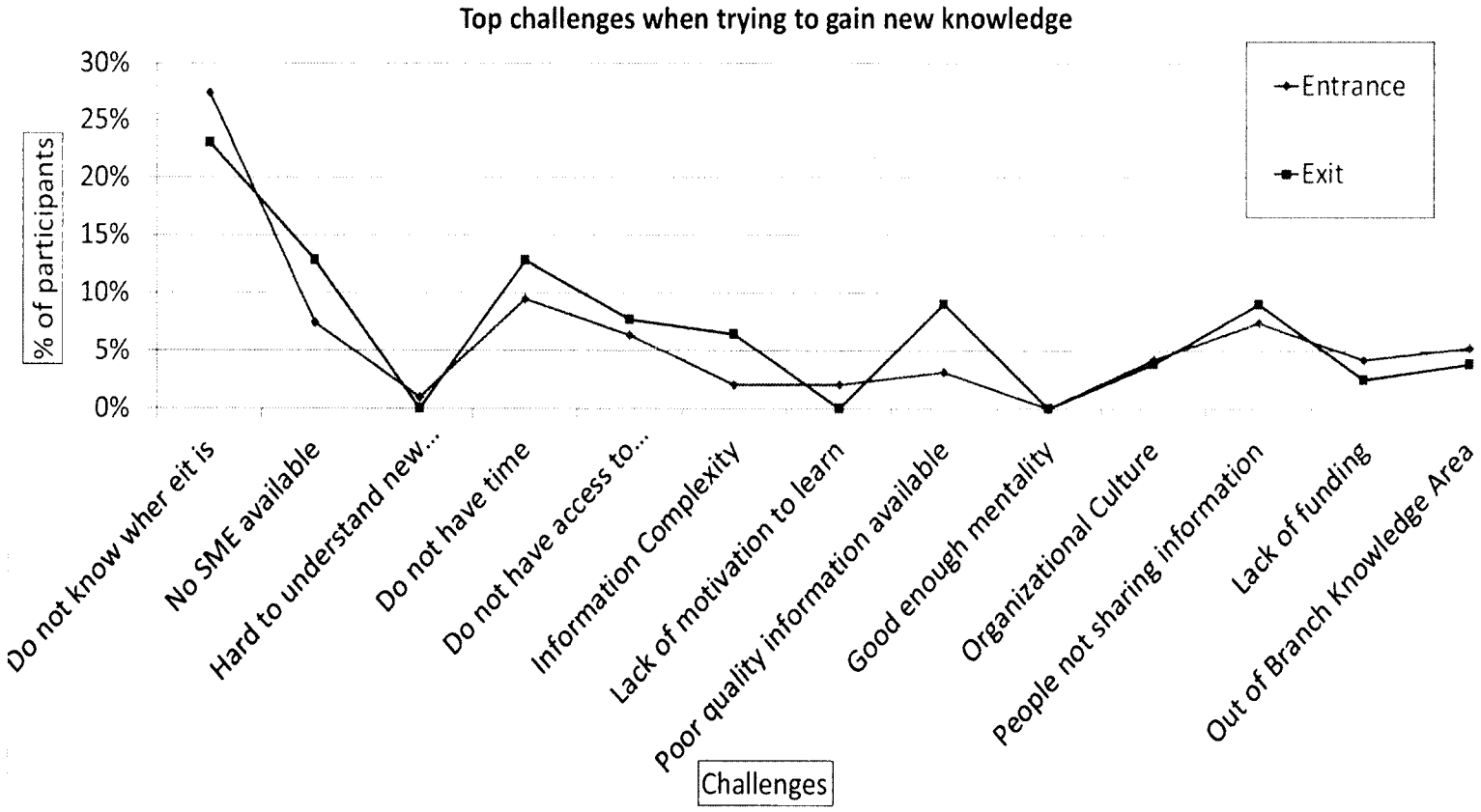


Figure 42: Top challenging when trying to gain new knowledge

The third focus area addressed the responsiveness and performance of the organization with questions examining the efficiency, quality, management and job satisfaction within the organization. In the "efficiency" subtopic the open-ended question #20 asked what aspects of the job consume the most time. The data from both the entrance and exit interviews was grouped and the results were very similar. In addition to their technical work both interviews included references to finding information time consuming while many of the comments addressed email and communications. A complete list of responses is included in Appendix F.

Question #21 asked the follow-up question of what tools were used to accomplish those tasks more rapidly. In both the entrance and exit interviews the majority of the tools were computer and software based, with some focus on communications through all mediums including DCO chat. In the entrance interviews a small percentage of responses identified knowledge management tools and processes that helped them in their jobs; however, in the exit interviews the reported use of knowledge management tools decreased.

When asked Question #22 what could be done to make performing their jobs easier in the entrance interview, a relatively large number of comments were computer/software/network focused with some comments addressing training and purchasing. The exit interview showed a slightly lesser focus on computer/software/network issues and more of a focus on personnel and personnel duties. The complete list of responses is included in Appendix F.

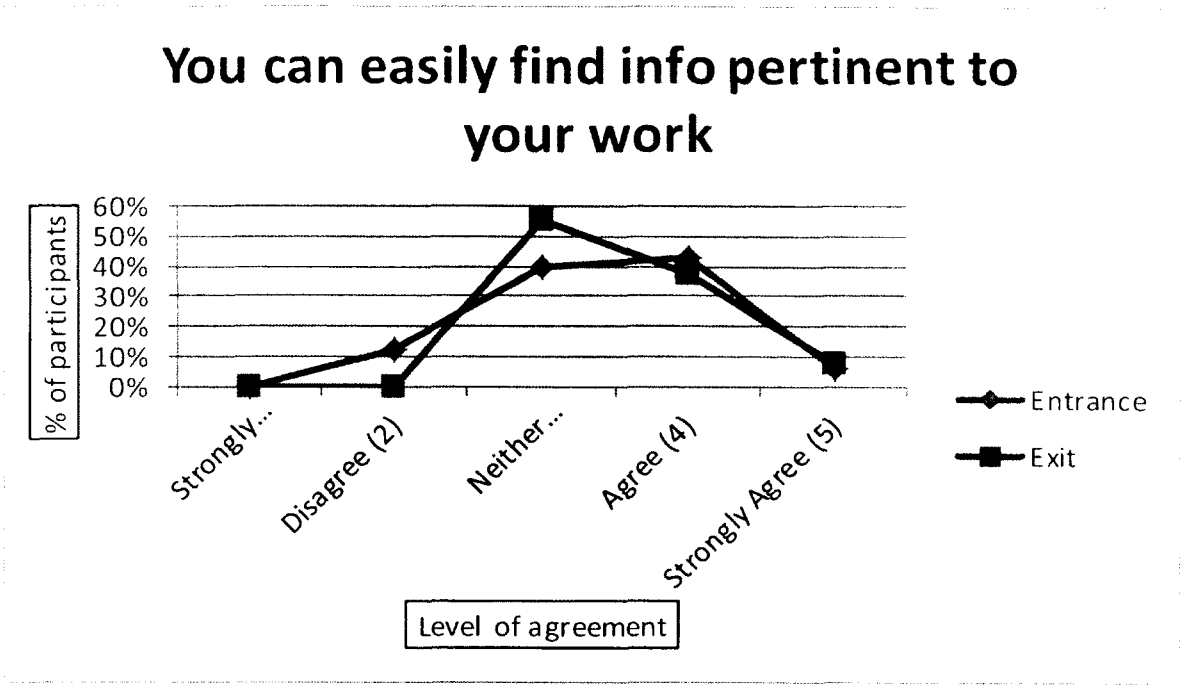


Figure 43: You can easily find info pertinent to you work

The response to Question #23, "You can easily find information pertinent to your work" based on a scale of 1 (strongly disagree) to 5 (strongly agree), is shown in Figure 43. The exit interview average was 3.57 (entrance was 3.47) and the standard deviation was 0.69 (entrance was 0.78). As can be seen in the figure, responses appear to have migrated from "disagree" and "agree" to be more centered on "neither agree/disagree" which increased from 39% to 56%.

The response to Question #24, "You have confidence in the data available to you" based on a scale of 1 (strongly disagree) to 5 (strongly agree), is shown in Figure 44. The exit interview average was 3.64 (entrance was 3.50) and the standard deviation was 0.78 (entrance was 0.68). As can be seen in the figure there is relatively little change between the entrance and exit interviews.

The response to Question #25, "The data available to you is accurate" based on a scale of 1 (strongly disagree) to 5 (strongly agree), is shown in Figure 45. The exit interview average was 3.75 (entrance was 3.53) and the standard deviation was 0.65 (entrance was 0.63). As can be seen in the figure there is relatively little change between the entrance and exit interviews.

The response to Question #26, "The data available to you is relevant to your work" based on a scale of 1 (strongly disagree) – 5 (strongly agree), is shown in Figure 46. The exit interview average was 3.96 (entrance was 3.87) and the standard deviation was 0.58 (entrance was 0.63). As can be seen in the figure there is a decrease of 20% in neither agree/disagree and a 19% increase participants who agreed between the entrance and exit interviews.

The response to Question #27, "The information available to do your job is up to date" based on a scale of 1 (strongly disagree) – 5 (strongly agree), is shown in Figure 47. The exit interview average was 3.21 (entrance was 3.28) and the standard deviation was 0.92 (entrance was 0.84). As can be seen in the figure there is relatively little change between the entrance and exit interviews.

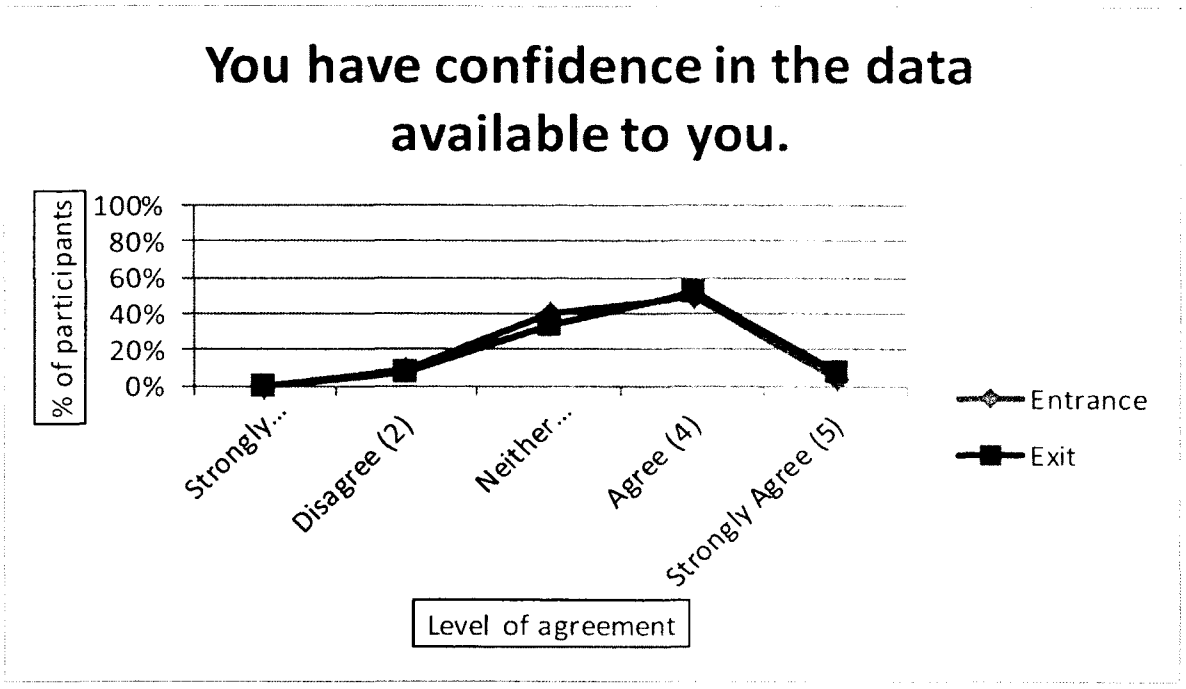


Figure 44: You have confidence in the data available to you.

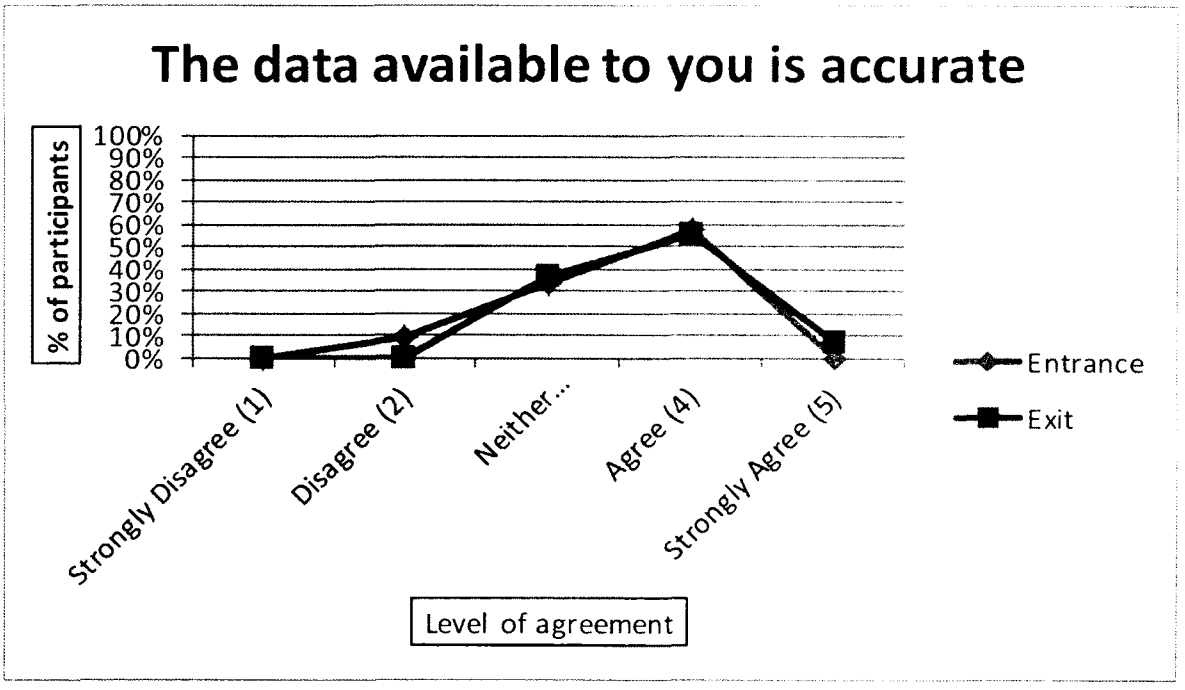


Figure 45: The data available to you is accurate.

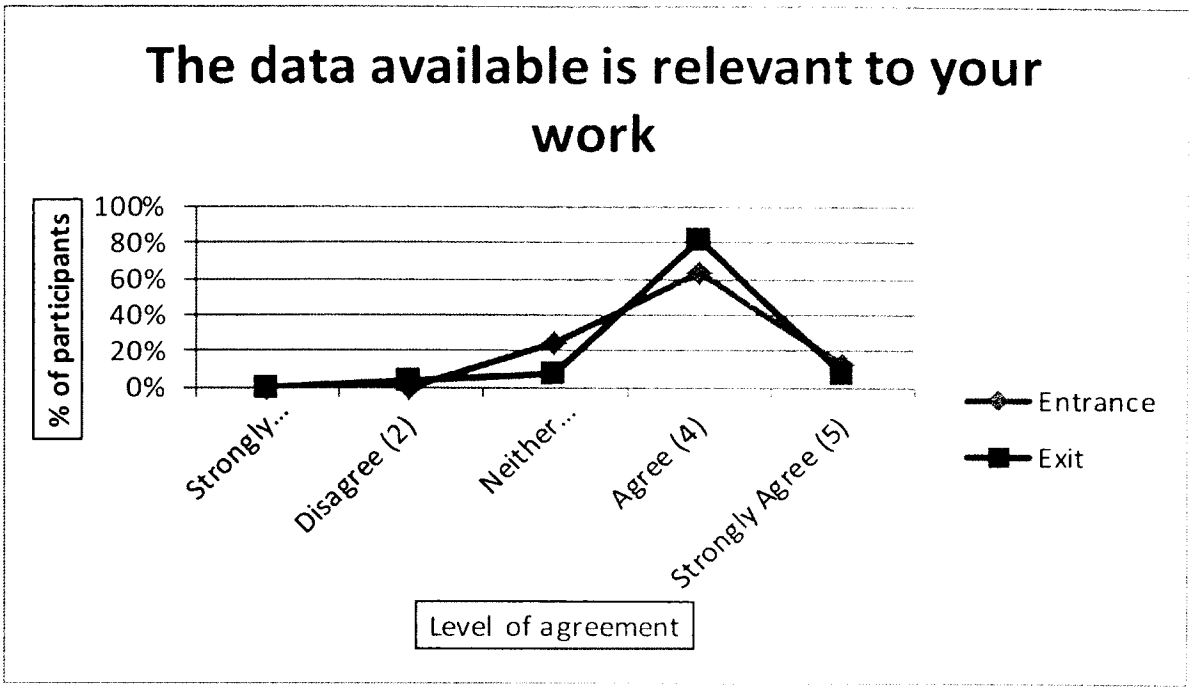


Figure 46: The data available to you is relevant to your work

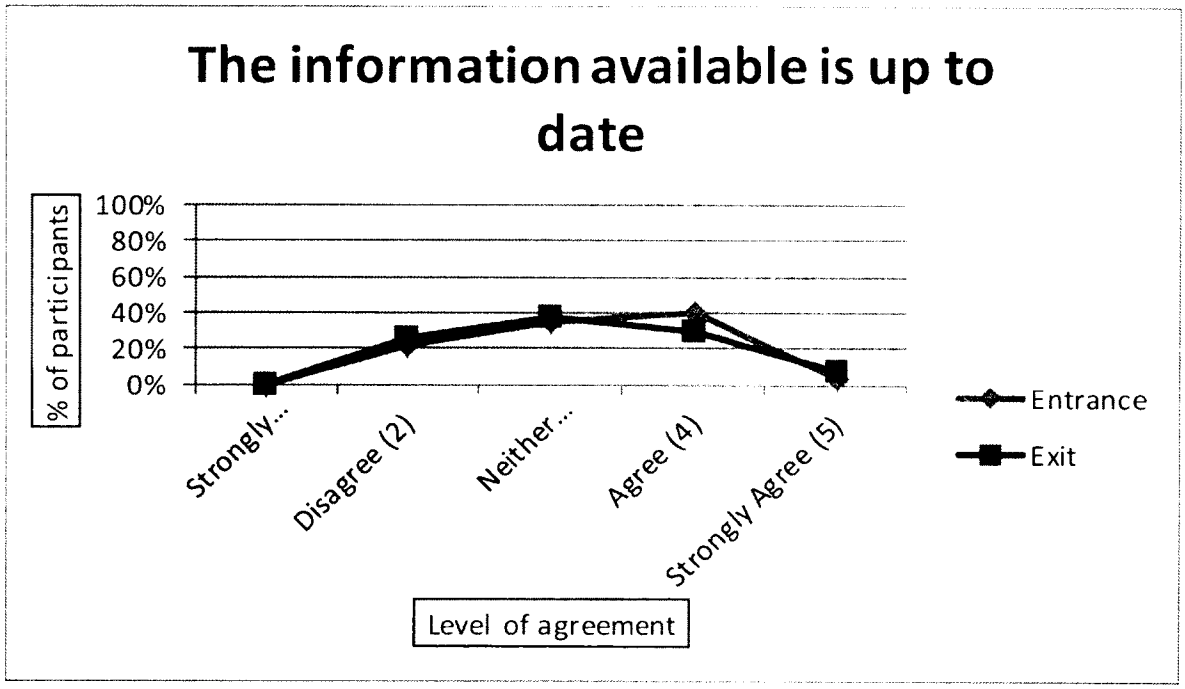


Figure 47: The information available to do your job is up to date

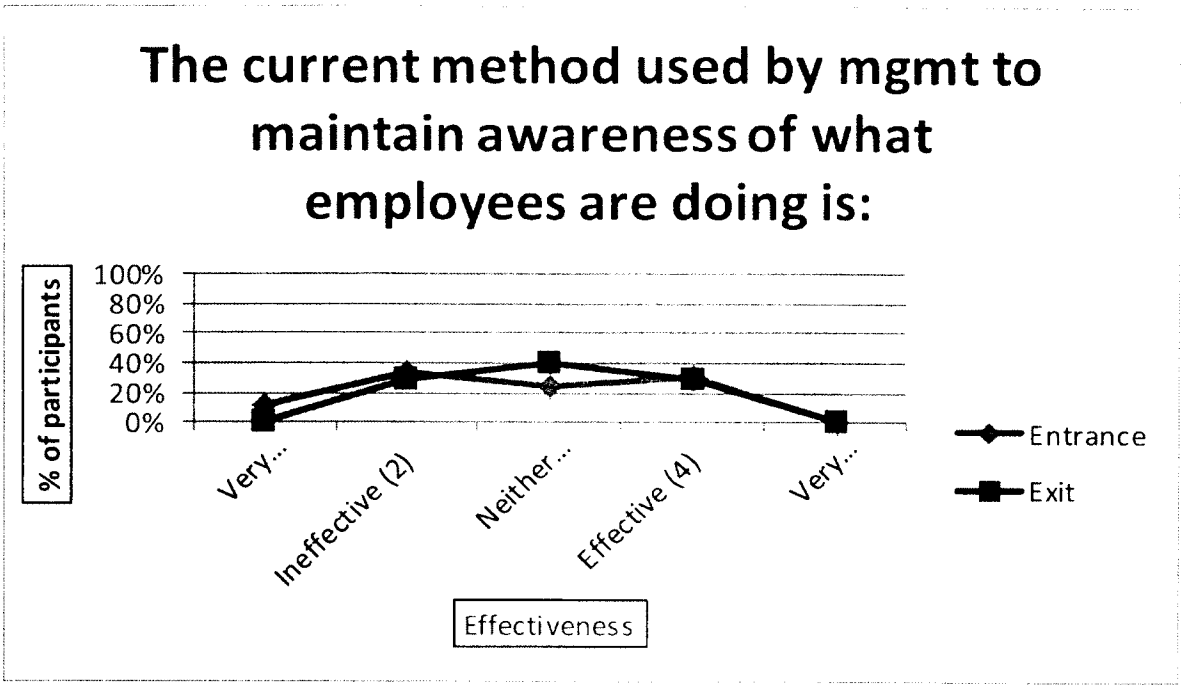


Figure 48: Effectivness of how management maintains awareness

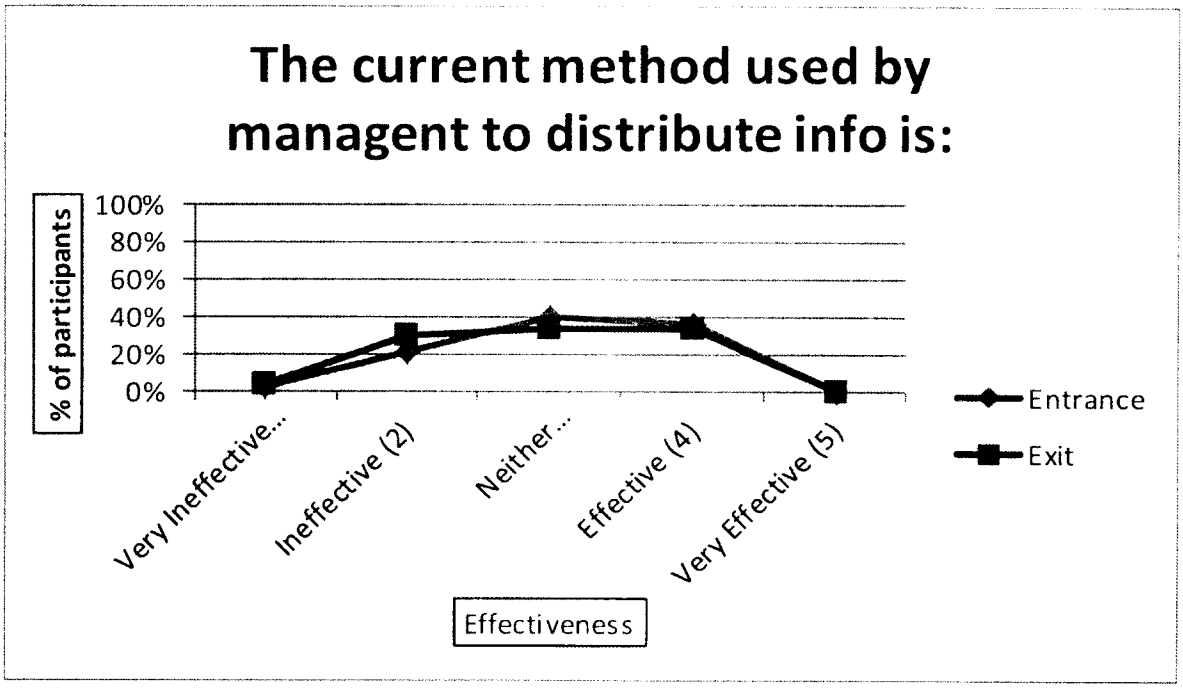


Figure 49: Effectivness of how management distributes information

The response to Question #31, "The current method used by management to maintain awareness of what employees are doing is:" based on a scale of 1 (Very Ineffective) – 5 (Very Effective), is shown in Figure 48. The exit interview average was 2.97 (entrance was 2.73) and the standard deviation was 0.78 (entrance was 1.05). As can be seen in the figure there is relatively little change between the entrance and exit interviews.

The response to Question #33, "The current method used by management distribute information is:" based on a scale of 1 (Very Ineffective) – 5 (Very Effective), is shown in Figure 49. The exit interview average was 2.93 (entrance was 3.10) and the standard deviation was 0.88 (entrance was 0.84). As can be seen in the figure there is relatively little change between the entrance and exit interviews.

The next two questions address job satisfaction. The response to Question #31, "The current availability of quality information makes your job _____" based on a scale of 1 (Very Frustrating) – 5 (A Lot Easier), is shown in Figure 50. The exit interview average was 2.86 (entrance was 3.10) and the standard deviation was 0.83 (entrance was 0.92). There is a 17% increase in the No Impact response and a 14% decrease in Easier.

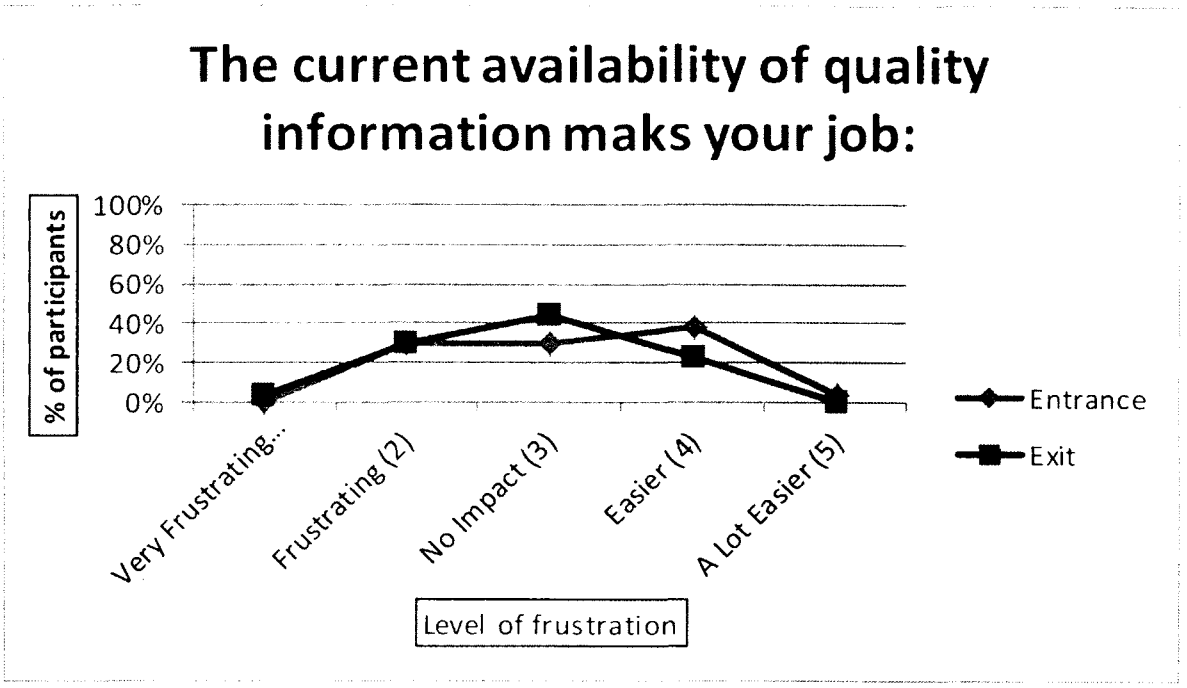


Figure 50: The current availability of quality information makes your job:

Question #43 was open-ended and asked what aspects of the participants' jobs they felt were burdensome. Many of the responses from the entrance interview spoke to training, policy, emails, funding, purchasing and IT. The exit interview contained very similar data. This data is available in Appendix F and will be further discussed in the conclusions section.

The fourth and final focus area is on the participants' understanding and view of the manned platform integration branch as it pertains to organizational culture, familiarity with members of the organization, and familiarity with the work of the organization.

The response to Question #28, "The Navy encourages KM" based on a scale of 1 (strongly disagree) – 5 (strongly agree), is shown in Figure 51. The exit interview average was 3.11 (entrance was 3.27) and the standard deviation was 0.92 (entrance was 0.98). As can be seen in the figure there is a 19% increase in the neither agree/disagree response and a 25% decrease in agree.

The response to Question #29, "G Department encourages KM" based on a scale of 1 (strongly disagree) – 5 (strongly agree), is shown in Figure 52. The exit interview average was 3.17 (entrance was 3.30) and the standard deviation was 0.80 (entrance was 0.84). As can be seen in the figure there is a 13% increase in the neither agree/disagree response and a 15% decrease in agree.

The response to Question #30, "G81 encourages KM" based on a scale of 1 (strongly disagree) – 5 (strongly agree), is shown in Figure 53. The exit interview average was 3.31 (entrance was 3.43) and the standard deviation was 0.76 (entrance was 0.82). As can be seen in the figure there is a 26% increase in the neither agree/disagree response and a 24% decrease in agree. There was a consistent shift in all three instances from participants agreeing with the statement at the entrance interview to a more centrally biased response in the exit interviews.

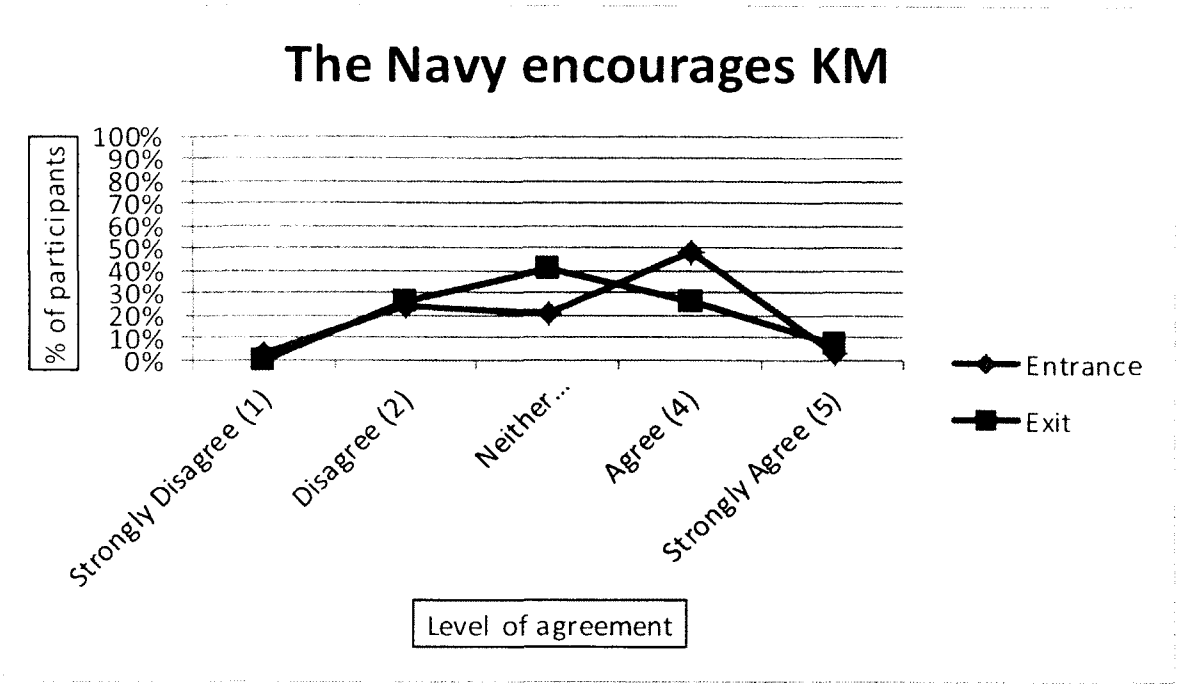


Figure 51: The Navy Encourages KM

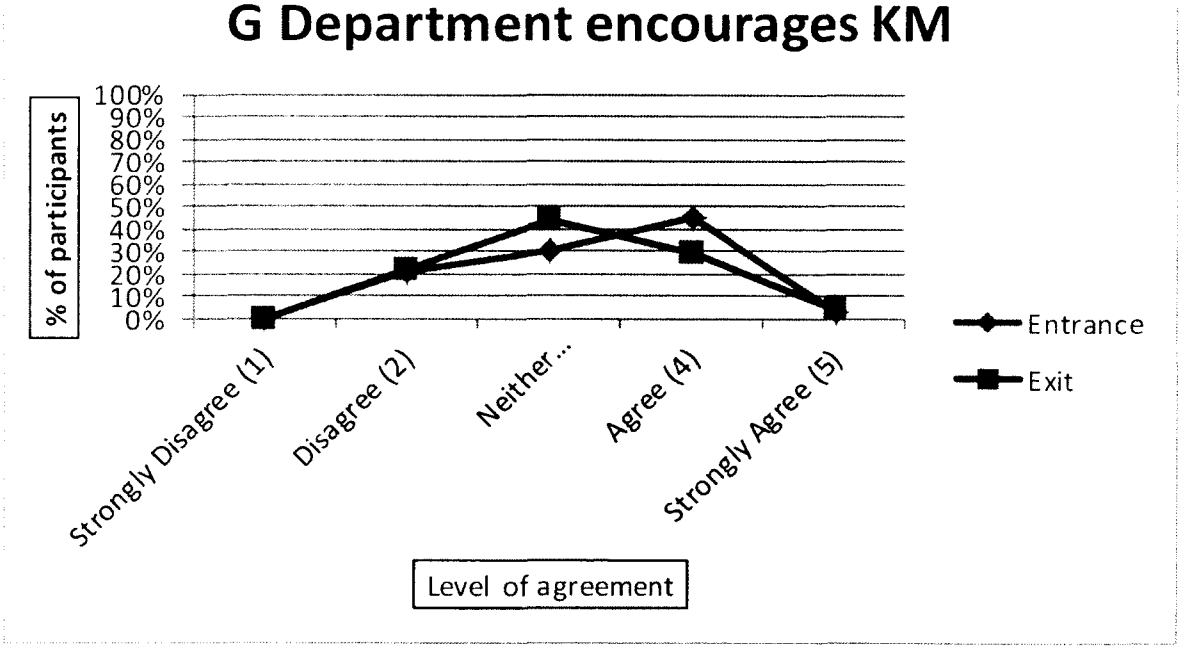


Figure 52: G Department Encourages KM

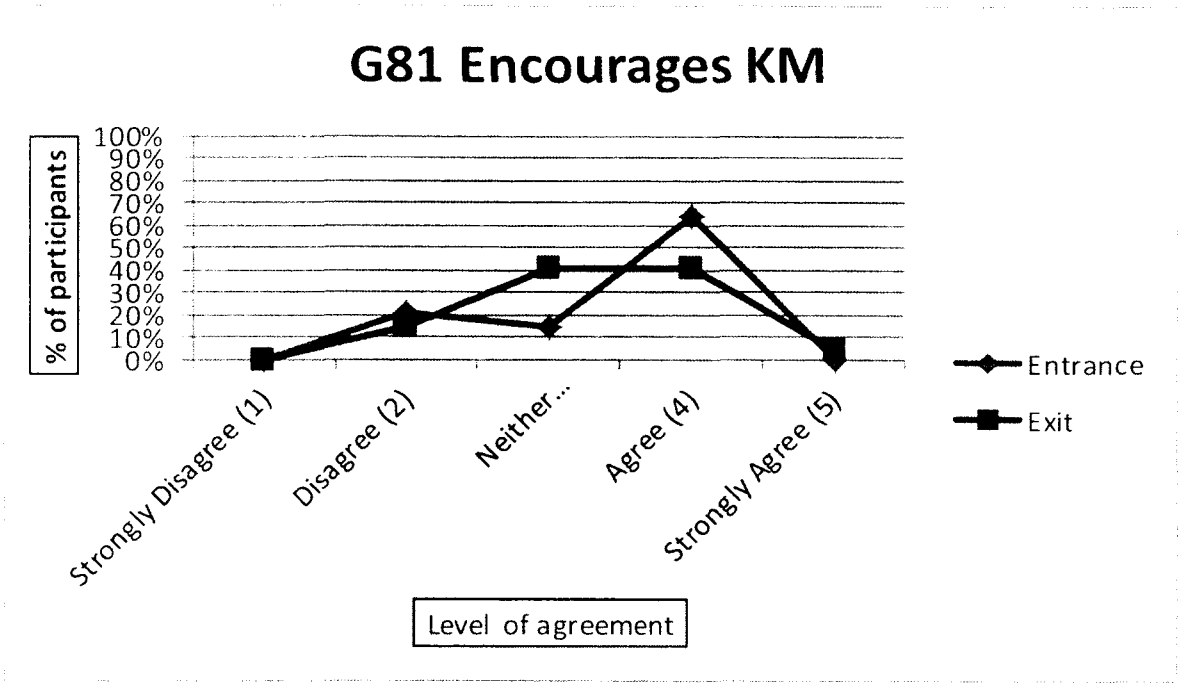


Figure 53: G81 Encourages KM

The next two subtopics focus on participants' knowledge of the people and organizations with which they work both internal to the organization as well as with program sponsors and the user community. Responses to the first set of questions addressed familiarity with members of the organization.

Question #34 asks if the participants know what expertise the members of the organization possess based on a scale of No(1), Just my team members(2), Some(3), Many (4), and Most of them(5) and is shown in Figure 54. The exit interview average was 3.28 (entrance was 3.27) and the standard deviation was 0.92 (entrance was 1.05). There was a relatively small decrease of 16% in the just my program response and a 13% increase in the Some response.

Question #34b asks participants if the other members of the organization knew what expertise they possess based on a scale of No(1), Just my team members(2), Some(3), Many (4), and Most of them(5) and is shown in Figure 55. The exit interview average was 2.77 (entrance was 2.72) and the standard deviation was 0.75 (entrance was 0.98). There was relatively little change between the entrance and exit interviews. The charts show very similar responses for the entrance and exit interviews with a slight increase in knowledge; however, it does not appear to be enough to make an impact.

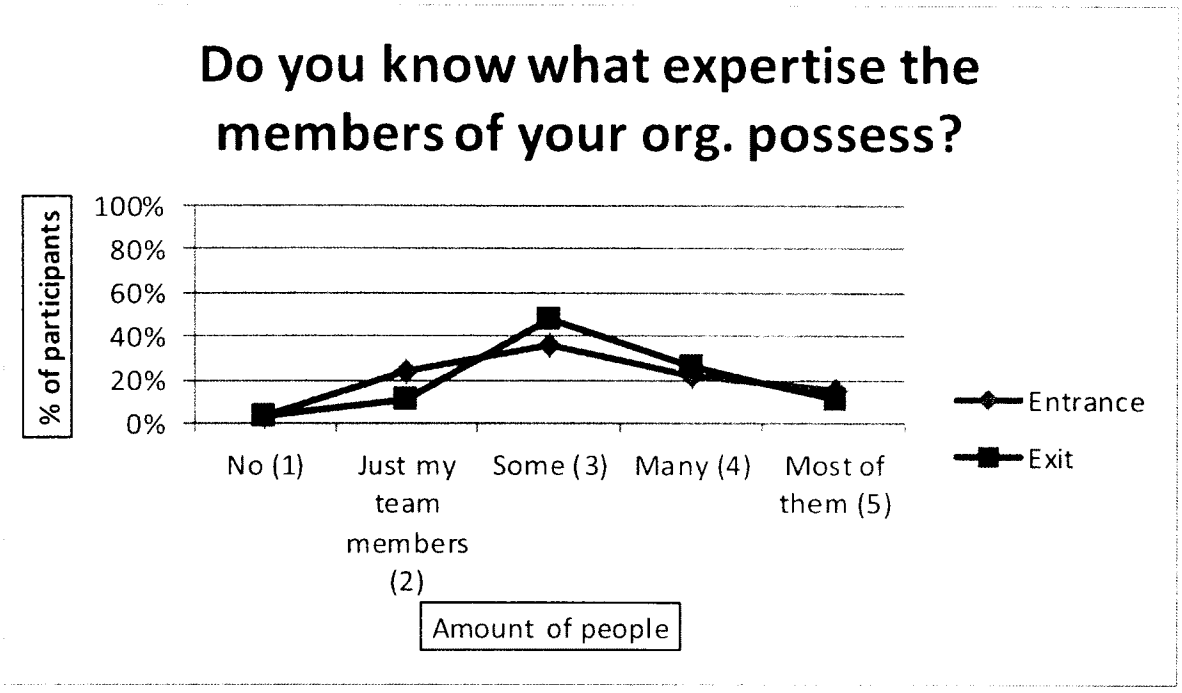


Figure 54: Do you know what expertise the members ofyour organization posess?

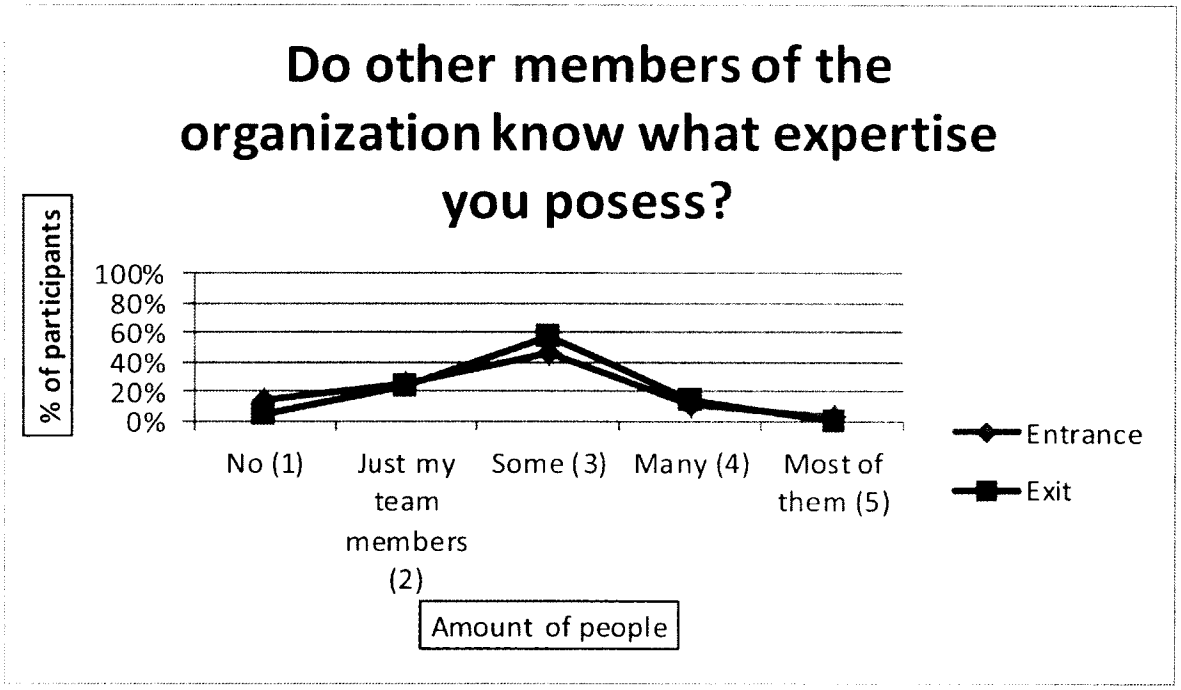


Figure 55: Do other members of the organization know what expertise you possess?

Question #42 asked how participants contact someone that they know within their building, that they know outside their building, and that they do not know. The data is shown in Figure 56 - Figure 73. Question #42 is broken into three sections which ask how people communicate with others in their building, outside their building, or that they do not know. For each of the three sections participants were asked to identify their frequency of use on a scale of almost never (1) to most of the time (5) for five different communication methods; Phone, Email, Face-to-Face, Through a Coworker, Through Line Management, and Through a Social Network.

This first group of data corresponds to how people contact someone that they know in their building. The data is shown in Figure 56 - Figure 67. For phone communication the standard deviation was 2.83 (entrance was 2.93) and the standard deviation was 1.28 (entrance was 1.26). The graph shows relatively large changes in the data with a 12% increase in the rarely response, an 8% increase in the often response and a 19% decrease in the sometimes response.

For email communication the standard deviation was 3.79 (entrance was 3.53) and the standard deviation was 0.90 (entrance was 0.97). The graph shows relatively equal change of a 19% decrease in the sometimes response and a 20% increase in the often response.

For Face-to-Face communication the standard deviation was 4.24 (entrance was 4.50) and the standard deviation was 0.83 (entrance was 0.68). The graph shows relatively consistent data with a 15% increase in the sometimes response and a 10% decrease in the Most of the Time response.

For communication through a coworker the standard deviation was 2.21 (entrance was 1.90) and the standard deviation was 0.90 (entrance was 0.92). The graphs appear to follow similar trends but show changes in the data with a 18% decrease in the Almost Never response and a 9% increase in the Rarely response.

For communication through line management the standard deviation was 1.55 (entrance was 1.63 and the standard deviation was 0.63 (entrance was 0.81). The graphs appear to show

similar trends but show changes in the data with a 15% increase in the rarely response and a 9% decrease in the Sometimes response.

For communication through Social Network the standard deviation was 1.39 (entrance was 1.48 and the standard deviation was 0.83 (entrance was 0.87). The graphs appear to show nearly identical trends with no changes over 5%.

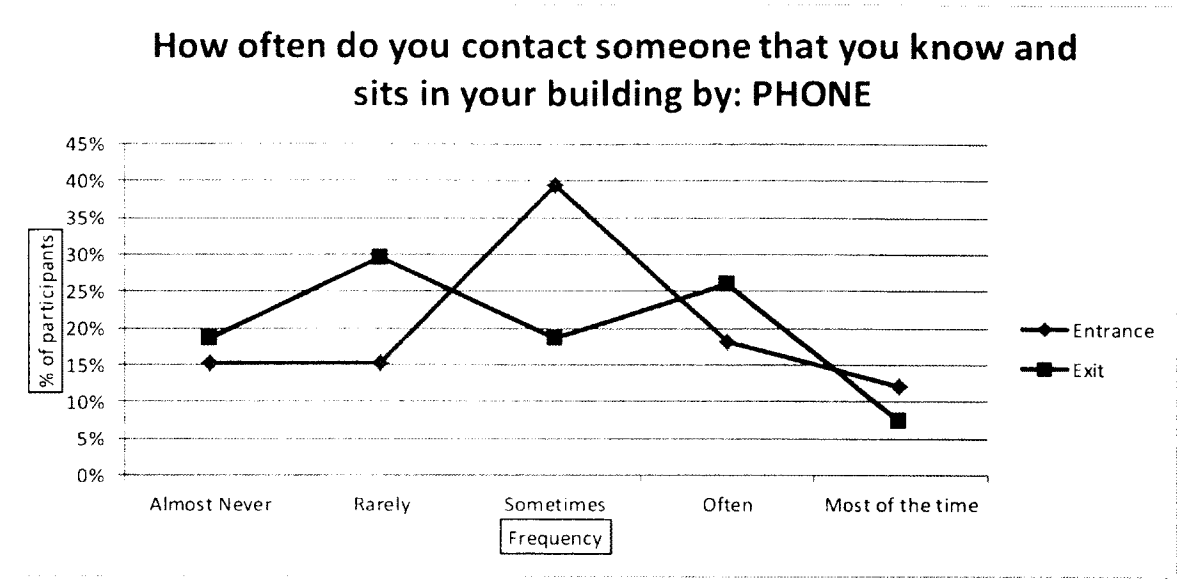


Figure 56: How do you contact someone that you know in your building

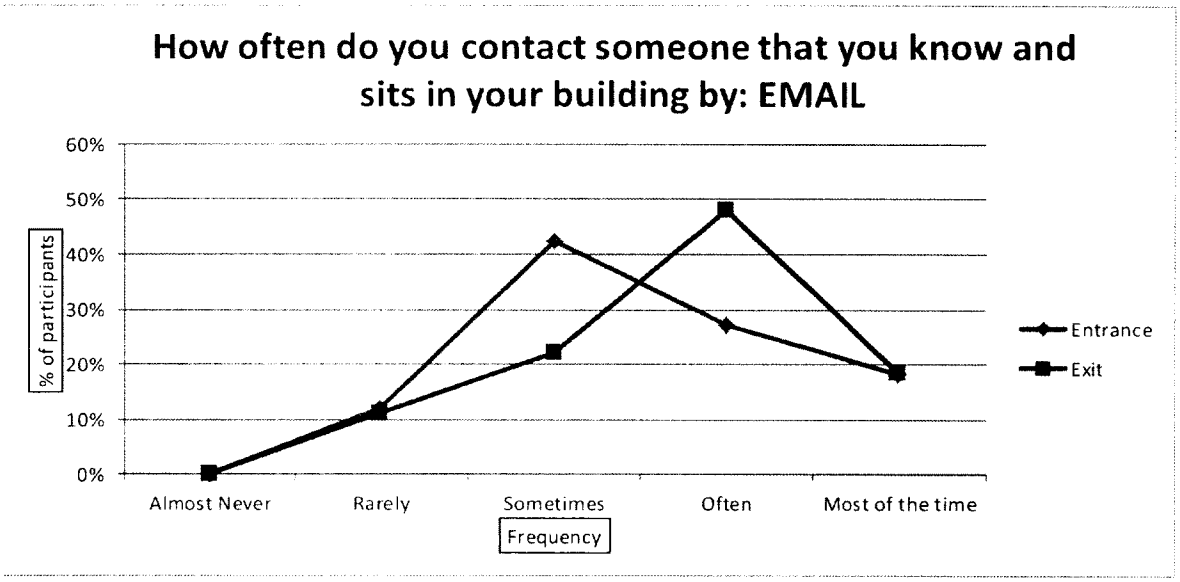


Figure 57: How do you contact someone that you know in your building

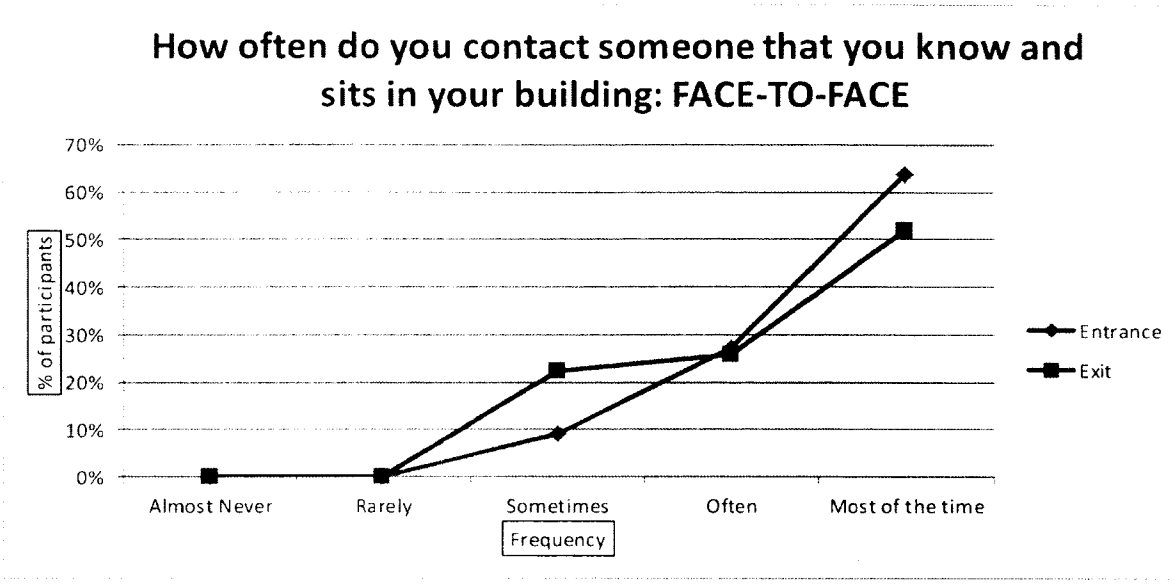


Figure 58: How do you contact someone that you know in your building

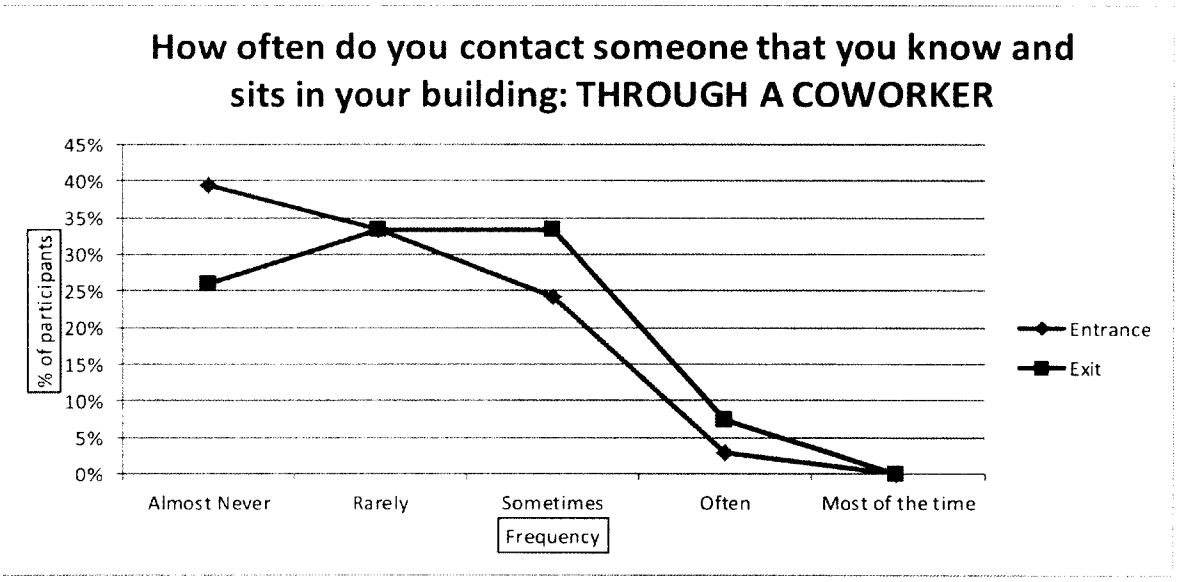


Figure 59: How do you contact someone that you know in your building

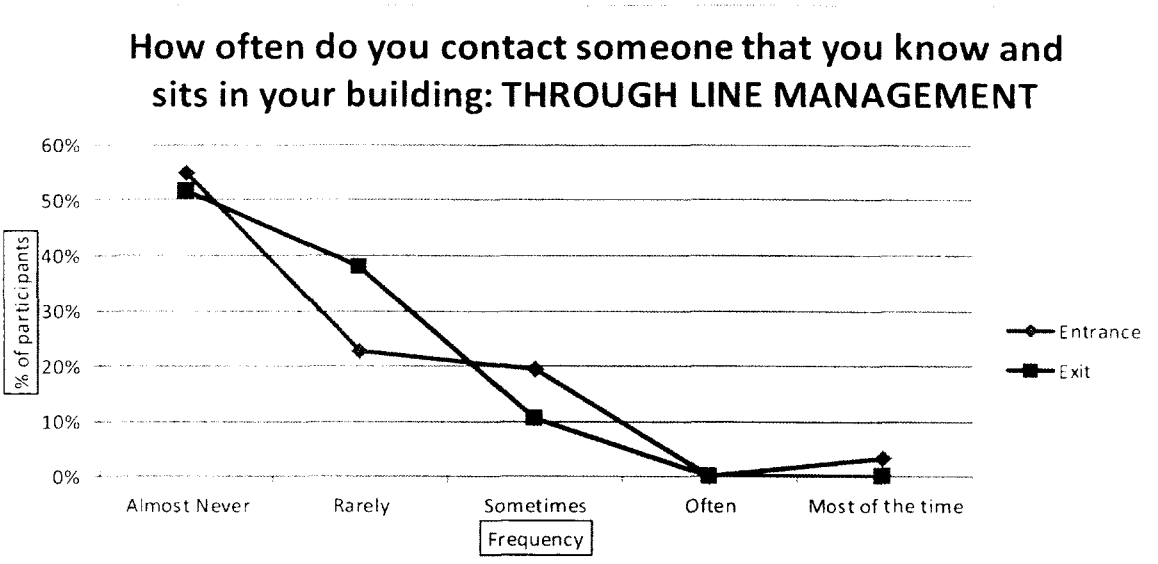


Figure 60: How do you contact someone that you know in your building

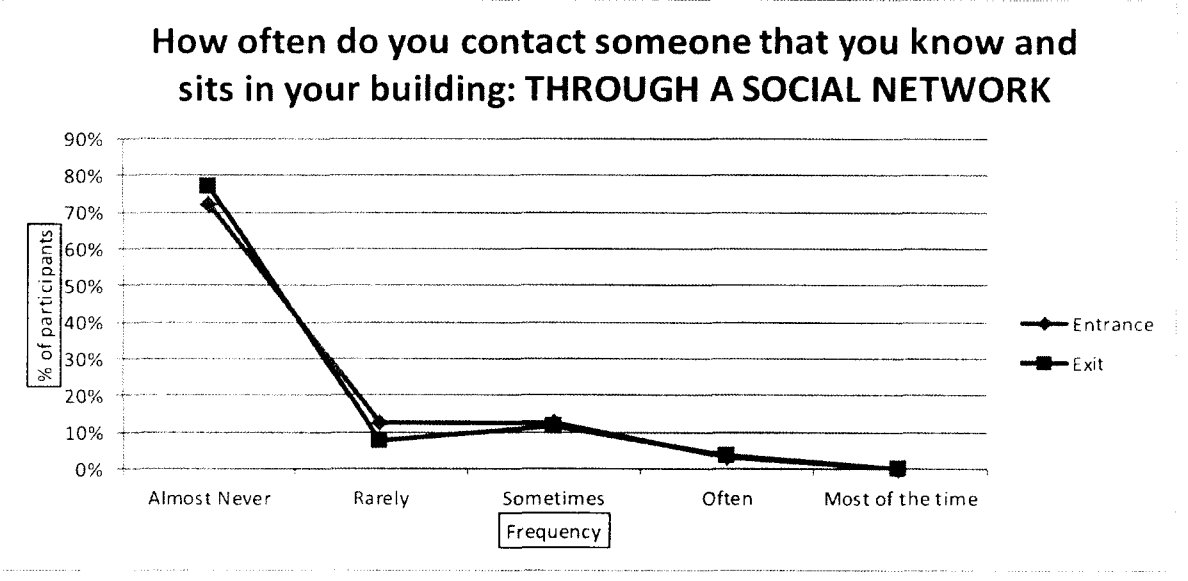


Figure 61: How do you contact someone that you know in your building

The second group of data corresponds to how people contact someone that they know who sits outside their building. This data is shown in Figure 62 - Figure 67. For phone communication the standard deviation was 4.00 (entrance was 4.03) and the standard deviation was 0.96 (entrance was 0.85). The graph shows relatively similar trends in the data with no more than a 5% change in the response except for a 10% decrease in the Often response.

For email communication the standard deviation was 4.48 (entrance was 4.43) and the standard deviation was 0.57 (entrance was 0.68). The graph shows relatively consistent trends in the data with no changes over 6%.

For Face-to-Face communication the standard deviation was 3.17 (entrance was 3.07) and the standard deviation was 0.60 (entrance was 0.78). The graph again appears to show consistent trends with a 11% increase in the sometimes response and a relatively small change in all other response fields.

For communication through a coworker the standard deviation was 2.48 (entrance was 2.27) and the standard deviation was 0.69 (entrance was 0.98). The graph shows relatively large differences in the data with a 16% decrease in the Almost Never response, a 25% increase in the Sometimes response, and a 10% decrease in the Often response.

For communication through line management the standard deviation was 1.79 (entrance was 1.73) and the standard deviation was 0.83 (entrance was 0.74). The graphs appear to show similar trends but show relatively small changes in the data with no responses seeing over a 4% change.

For communication through Social Network the average was 1.31 (entrance was 1.33) and the standard deviation was 0.66 (entrance was 0.55). The graphs show similar trends, but there is a 12% increase in the Almost Never response and a 20% decrease in the rarely response.

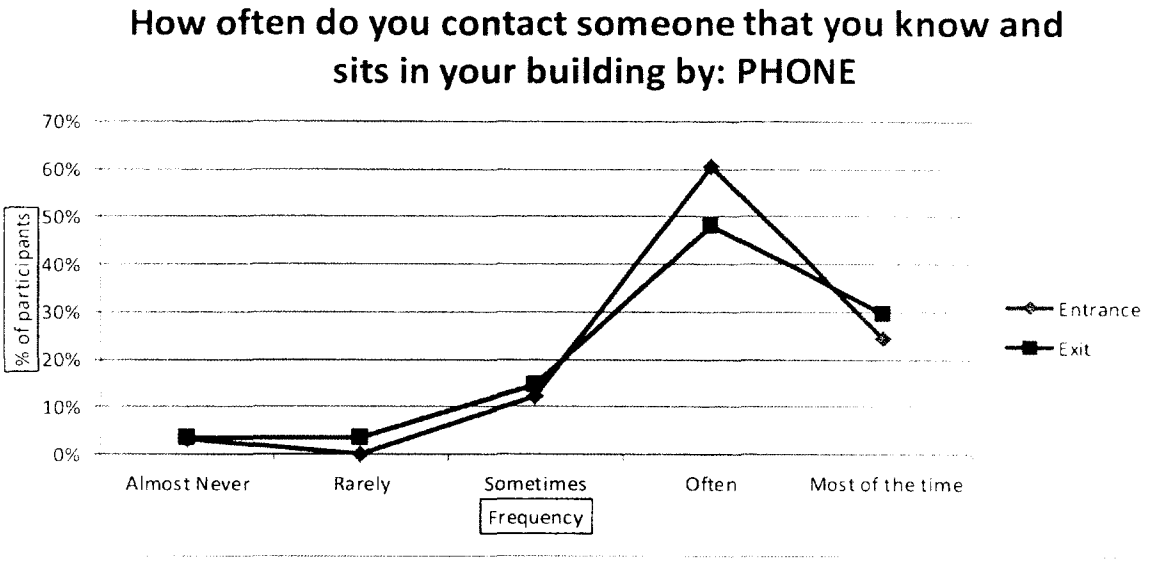


Figure 62: How do you contact someone that you know outside your building

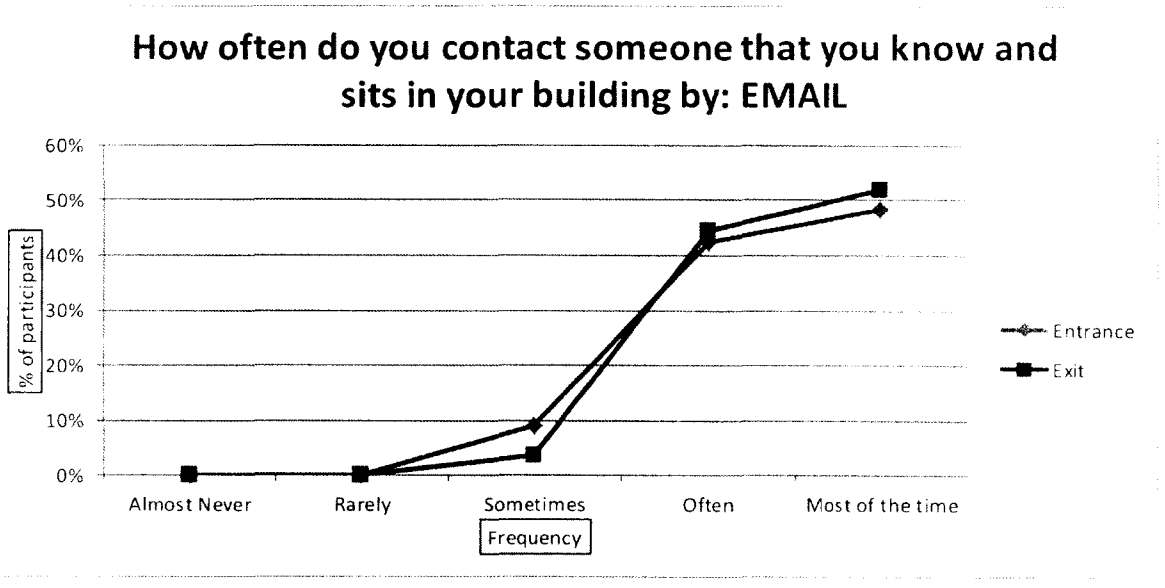


Figure 63: How do you contact someone that you know outside your building

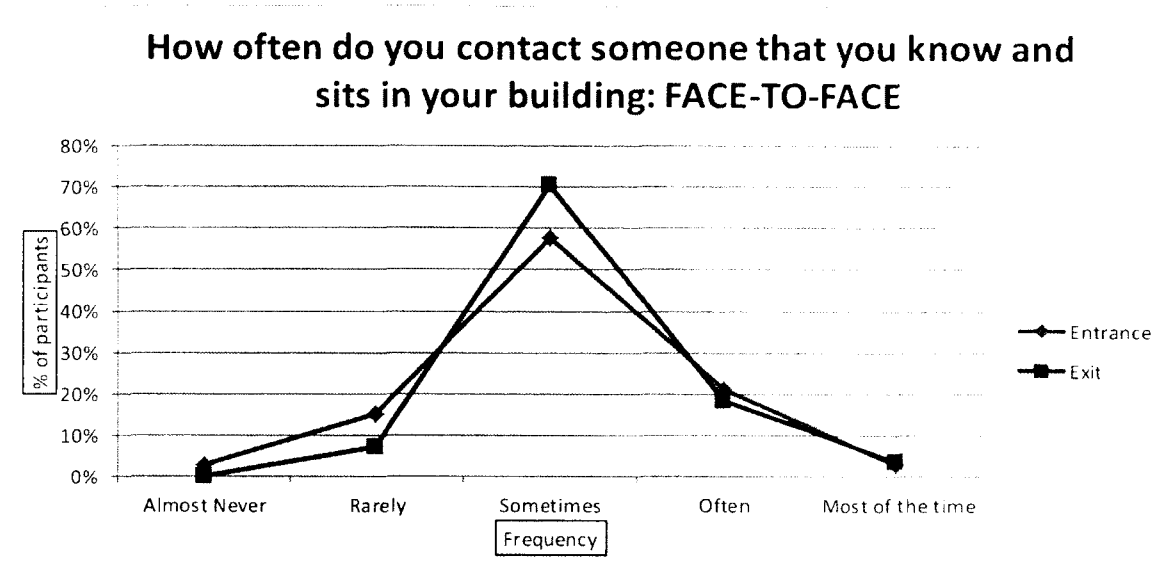


Figure 64: How do you contact someone that you know outside your building

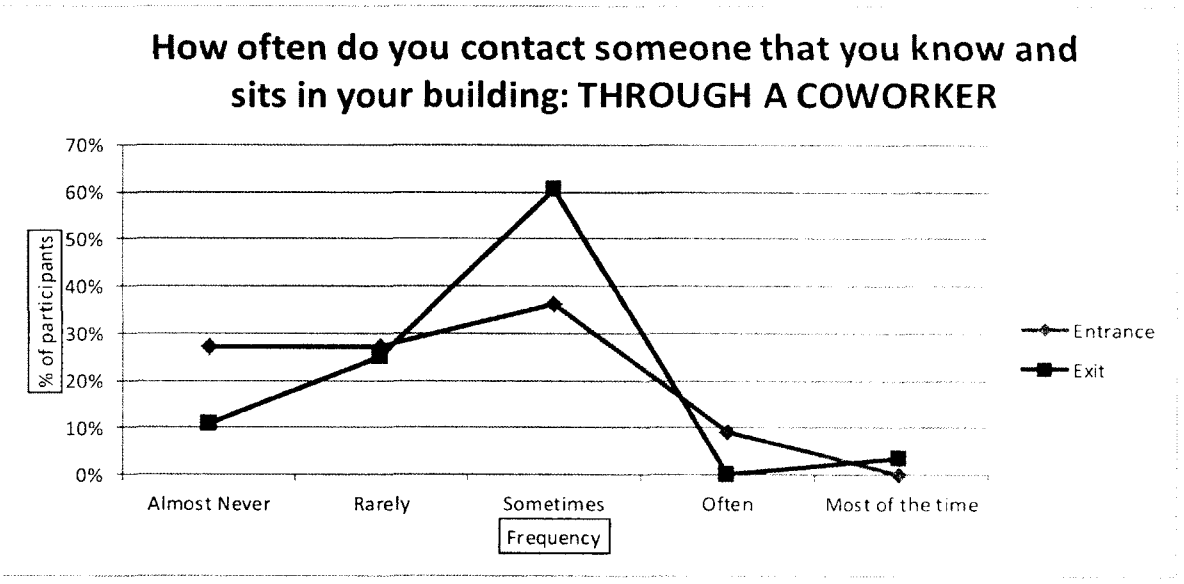


Figure 65: How do you contact someone that you know outside your building

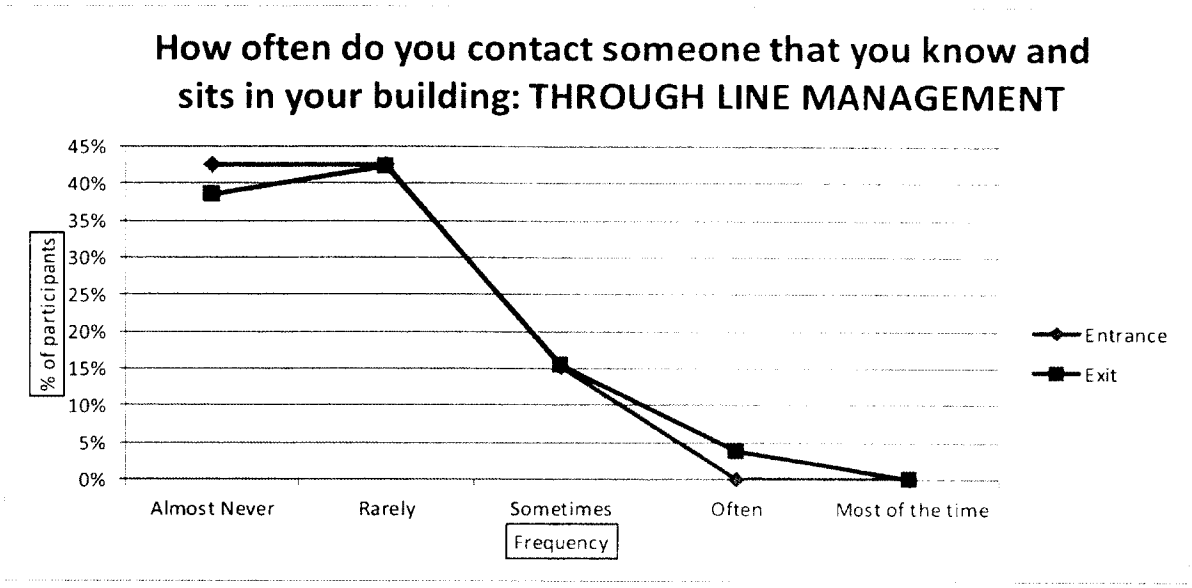


Figure 66: How do you contact someone that you know outside your building

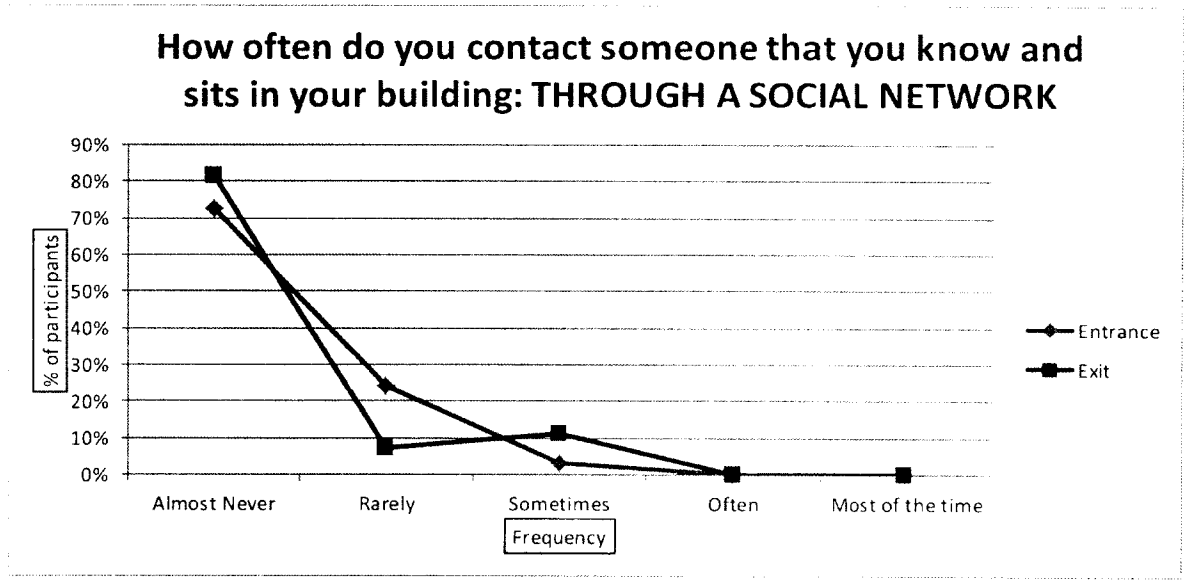


Figure 67: How do you contact someone that you know outside your building

The third group of data corresponds to how people contact someone that they do not know. This data is shown in Figure 68 - Figure 73. For phone communication the average was 3.82 (entrance was 3.97) and the standard deviation was 1.06 (entrance was 0.93). The graph shows relatively consistent trends in the data with no changes over 4%

For email communication the average was 4.32 (entrance was 4.40) and the standard deviation was 0.77 (entrance was 0.62). The graph shows similar trends with an equal change of a 19% decrease in the sometimes response and a 20% increase in the often response.

For Face-to-Face communication the average was 2.43 (entrance was 2.34) and the standard deviation was 0.74 (entrance was 0.77). The graph shows relatively consistent data with a 15% increase in the sometimes response and a 10% decrease in the Most of the Time response.

For communication through a coworker the average was 2.57 (entrance was 2.57) and the standard deviation was 0.69 (entrance was 0.82). The graphs appear to follow similar trends, but show changes in the data with a 13% decrease in the Sometimes response and all other responses changing less than 6%.

For communication through line management the average was 2.32 (entrance was 2.20) and the standard deviation was 0.90 (entrance was 0.92). There were a couple of relatively large changes in the data with a 12% decrease in the Almost Never response and a 15% increase in the Rarely response.

For communication through Social Network the average was 1.11 (entrance was 1.17 and the standard deviation was 0.42 (entrance was 0.46). The graphs appear to show nearly identical trends with no changes over 6%.

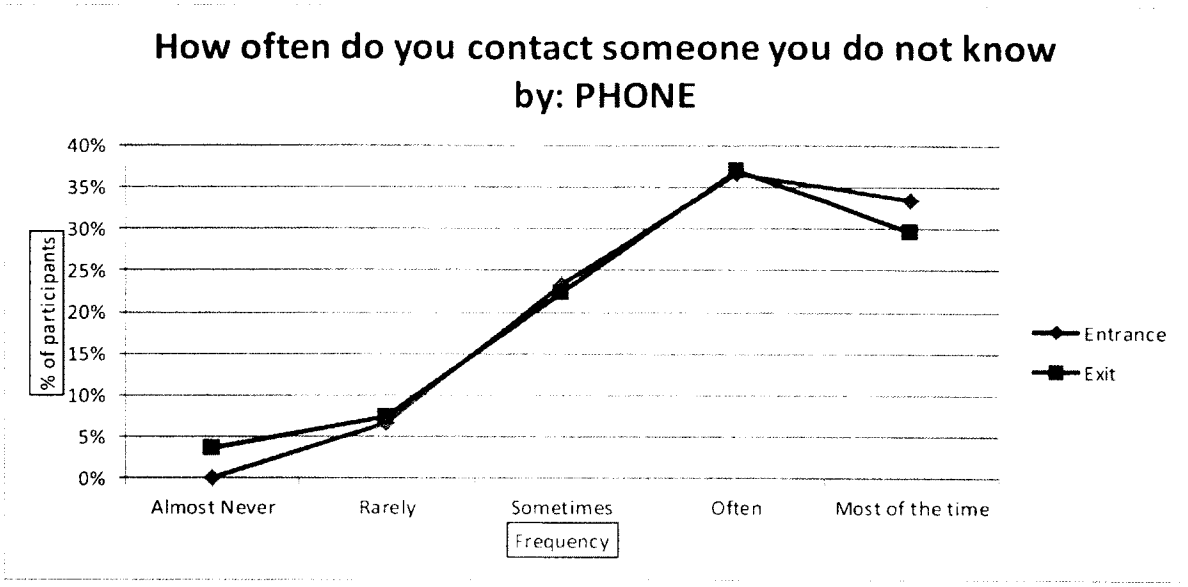


Figure 68: How do you contact someone that you do not know

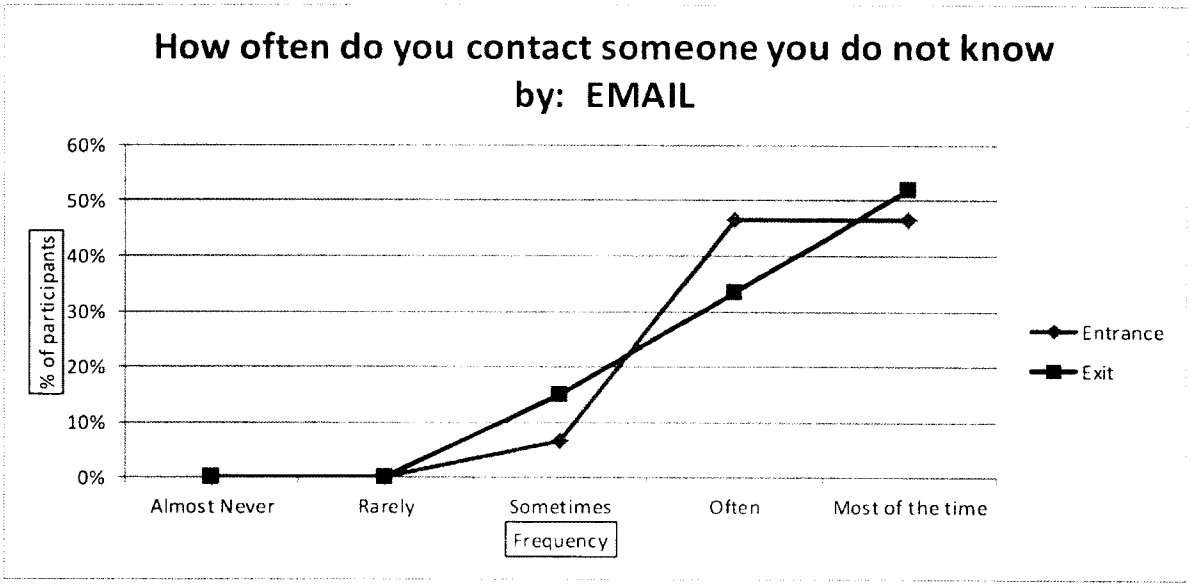


Figure 69: How do you contact someone that you do not know

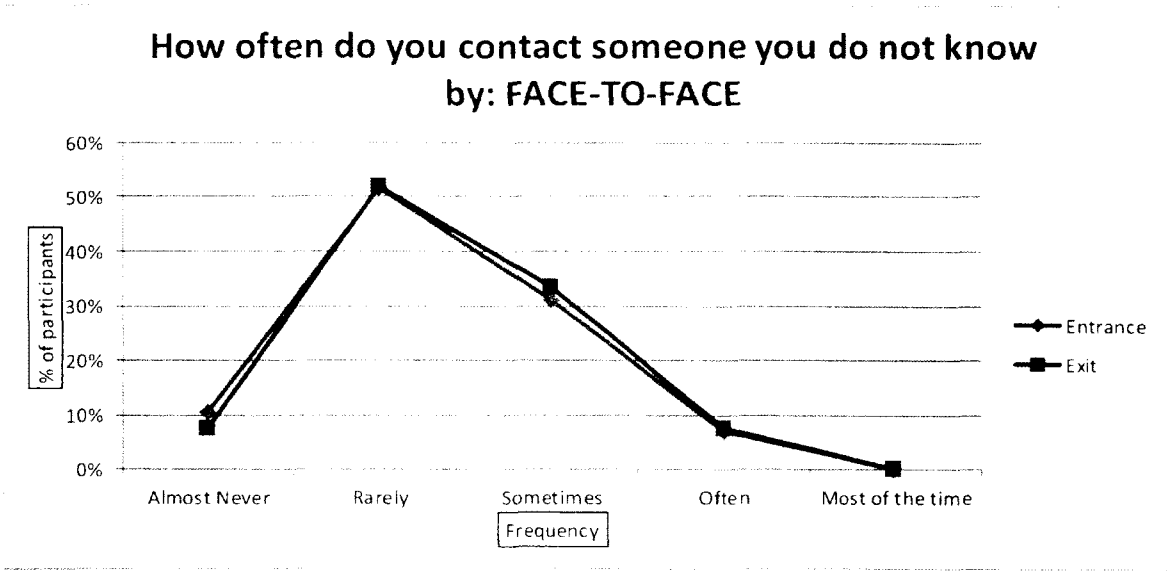


Figure 70: How do you contact someone that you do not know

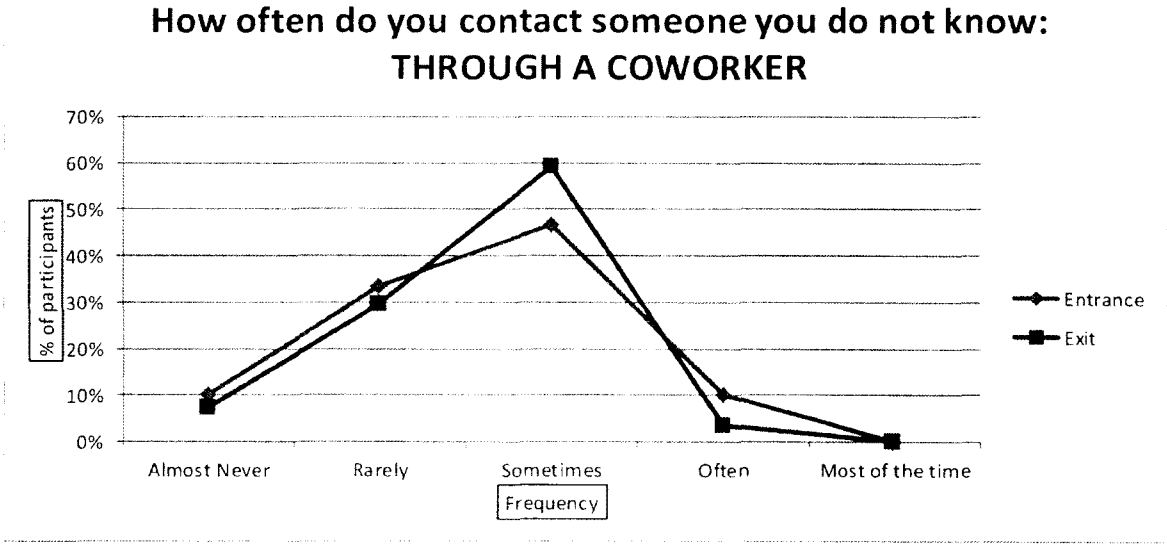


Figure 71: How do you contact someone that you do not know

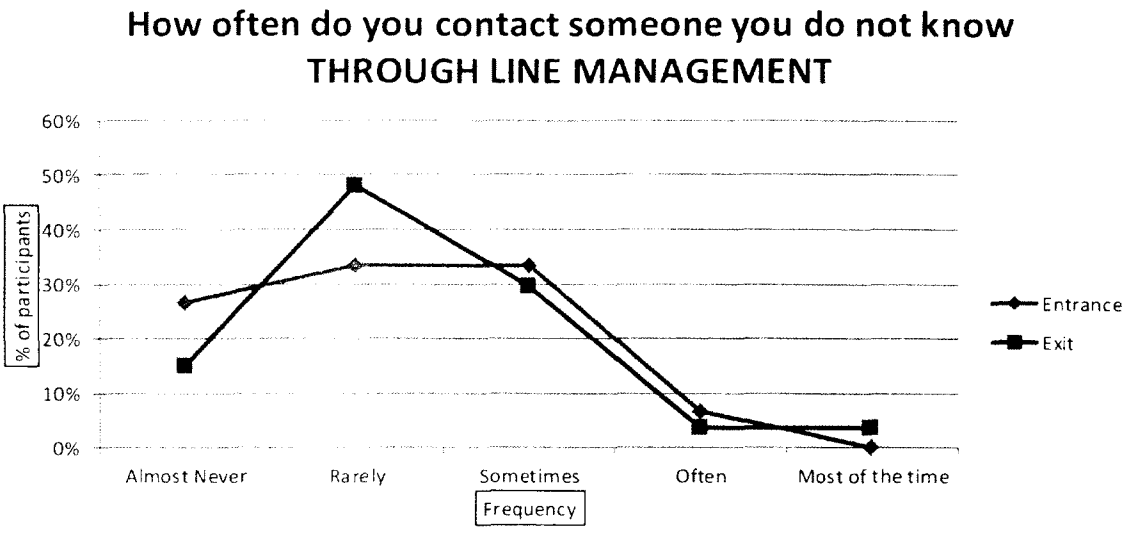


Figure 72: How do you contact someone that you do not know

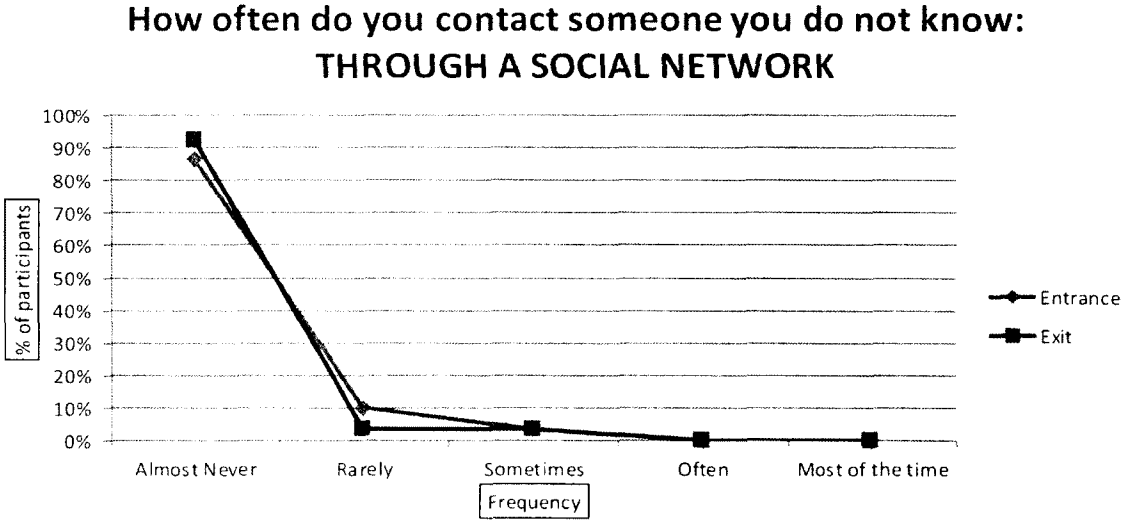


Figure 73: How do you contact someone that you do not know

Question #42c asked participants the open-ended question of how someone finds them. The most common answer in both the entrance and exit interviews was word-of mouth while some said that reports and documents were an avenue. The full set of responses for both the entrance and exit interviews can be found in Appendix F. Interestingly there were no instances of social networking reported in the exit interviews. In the exit interview the overwhelming majority of all participants said that phone or email would be the method used, with a handful of responses claiming face-to-face interaction.

The next set of questions capture participants' understanding and awareness of the programs and sponsors the branch was working on as well as the customers/users. Figure 74 shows the responses to Question #35, "Are you aware of the programs your branch is working on?" based on a scale of 1 (Just My Program) – 5 (Most Current and Future Programs). The average was 3.41 (entrance was 3.53) and the standard deviation was 0.91 (entrance was 1.11). The data showed some relatively moderate changes with decreases in A Few Programs (9%) and Most Current and Future (12%) and increases in Some Programs (13%) and Many (9%).

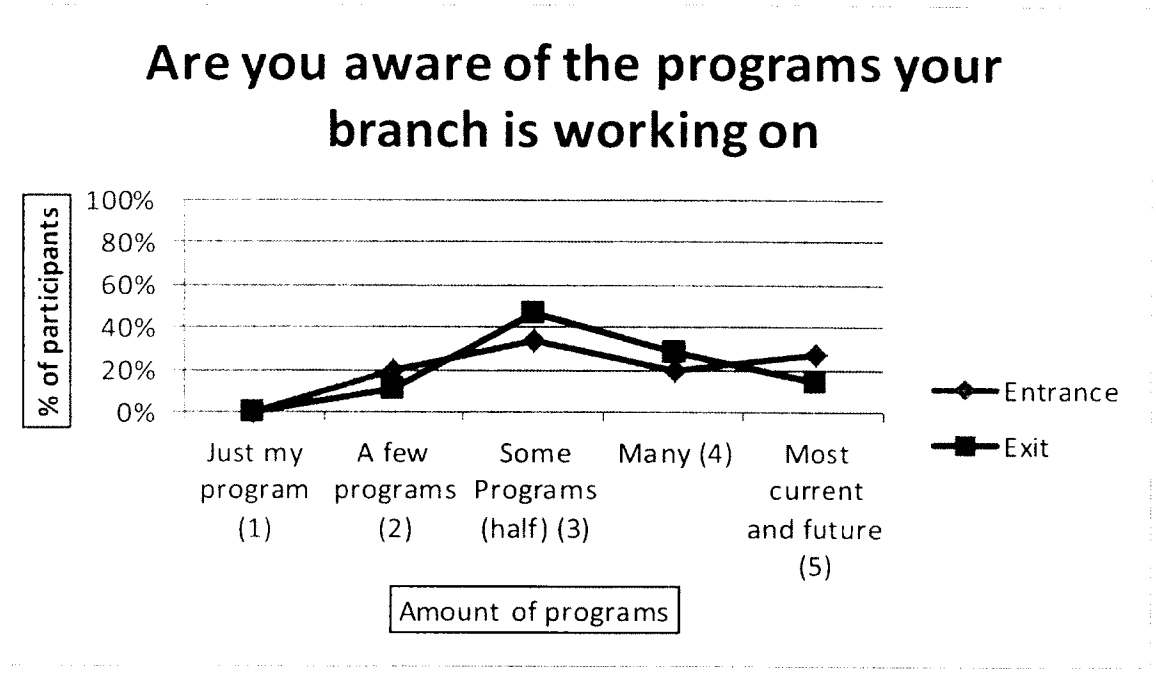


Figure 74: Are you aware of the programs your branch is working on?

Questions #36 - #38 address respondents' understanding of the sponsoring organizations in the branch as part of an overall understanding of the organization. Figure 75 shows the data for Question #36 which asked "Do you know who the sponsoring organizations in the branch are on a scale of 1 (just my program) to 5 (most current and future programs). The average was 2.79 (entrance was 3.03) and the standard deviation was 1.18 (entrance was 1.10). The largest change in the responses was an 11% increase for Just My Program with a 8% decrease in the A Few Programs response. The rest of the data was relatively the same.

Figure 76 shows the data for Question #37 which asked "Do you know who the sponsoring organization POCs are" on a scale of 1 (just my program) to 5 (most current and future programs). The average was 1.86 (entrance was 1.57) and the standard deviation was 0.93 (entrance was 0.82). The Just My Program responses had a 16% decrease with an equivalent increase of 16% in the Some Programs response

Figure 77 shows the data for Question #38 which asked "How familiar are you with your sponsoring organization's mission on the same scale as Question #37. The scale was from 1 (Not at All) to 5 (Very Familiar). The average was 3.28 (entrance was 3.41) and the standard deviation was 0.96 (entrance was 0.95). Trends in the data were relatively similar with a 15% increase in the Familiar response and a 10% decrease in the Very Familiar response.

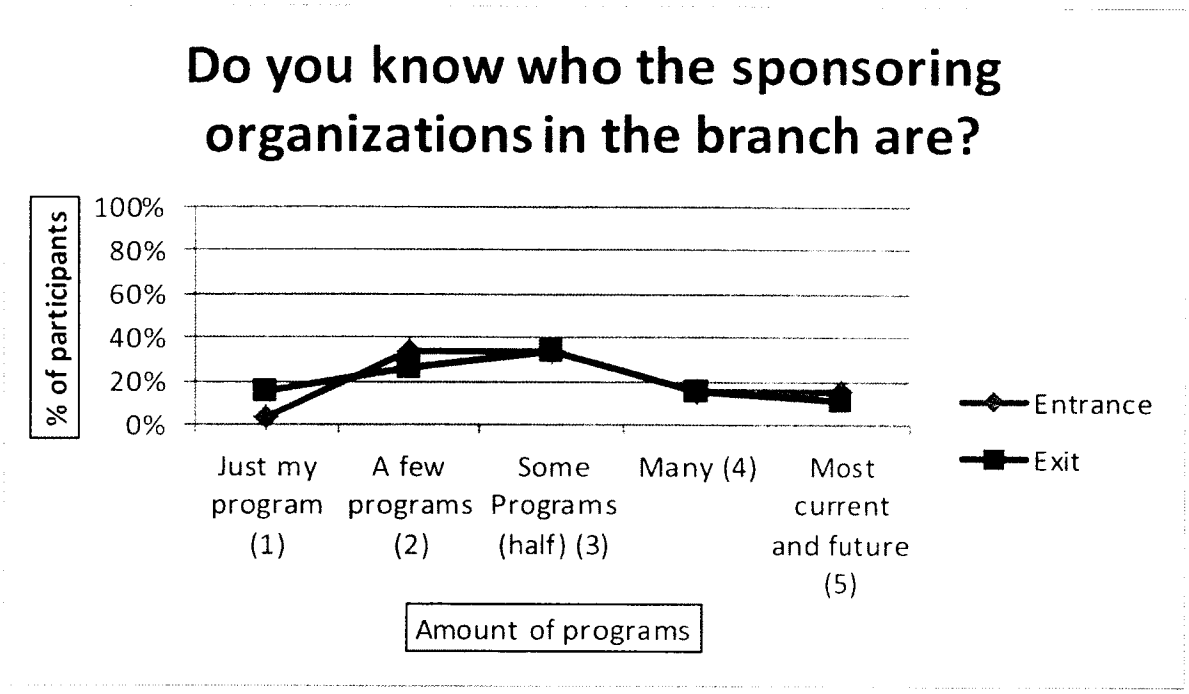


Figure 75: Do you know who the sponsoring organizations in the branch are?

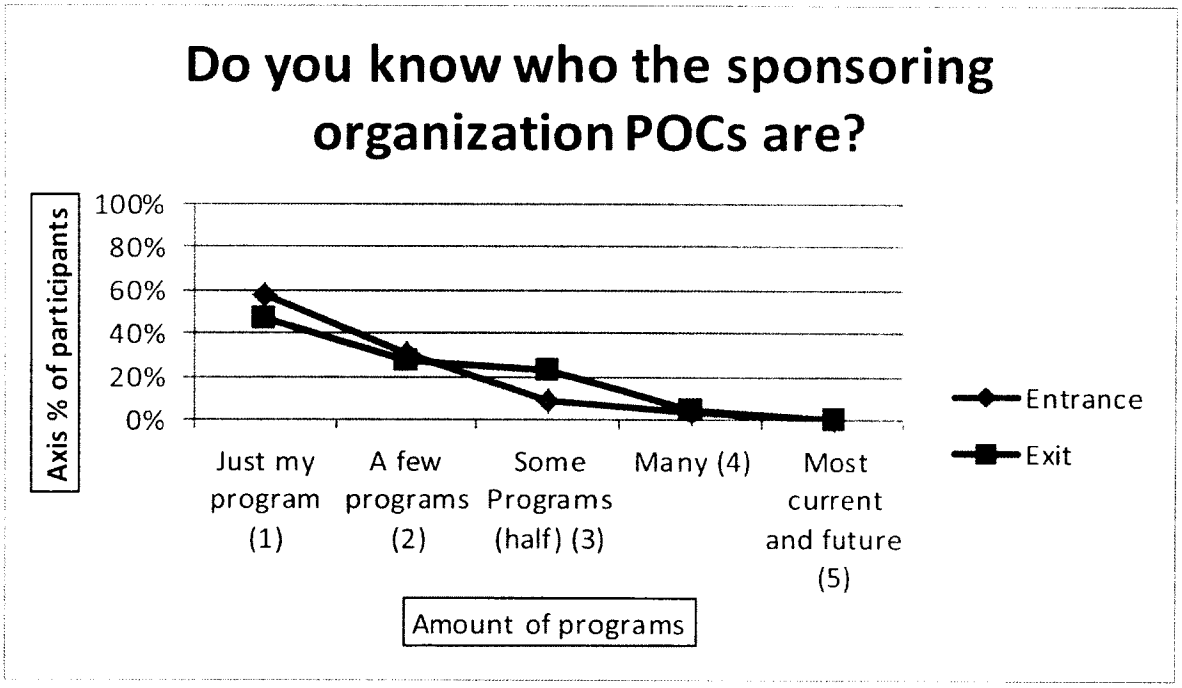


Figure 76: Do you know who the sponsoring organization POCs are?

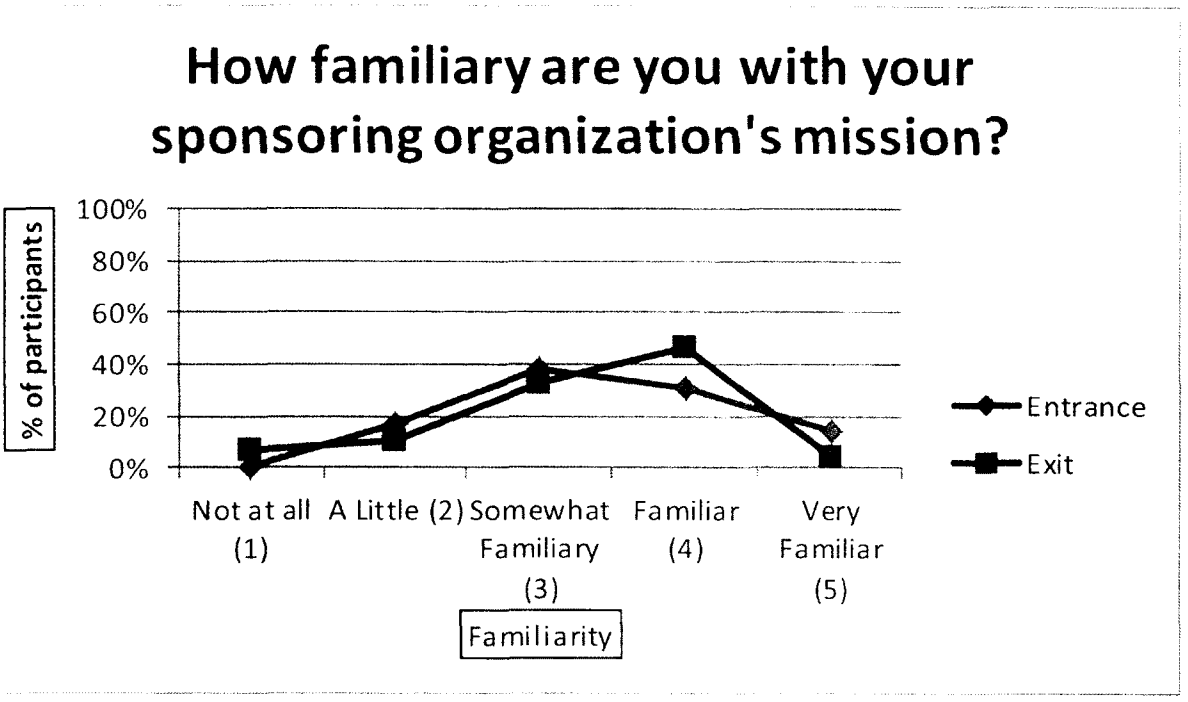


Figure 77: How familiar are you with your sponsoring organization's mission.

Figure 78 - Figure 80 show response data as it pertains to participants' understanding of the customer organizations in the branch. Question #39 asked participants to respond to the question "Do you know who the user organizations are for the branch" on a scale from 1 (just my program) to 5 (most current and future). The average was 2.83 (entrance was 3.07) with a standard deviation of 1.10 (entrance was 1.48). The figure shows a decrease in the outside responses of just my program (9%) and most current and future (20%) and an increase in a few programs (12%) and many (11%).

Question #40 asked participants to respond to the question "Do you know who the user points of contact (POCs) are" on the same scale as Question #39. The average was 1.93 (entrance was 1.96) and the standard deviation was 1.02 (entrance was 1.20). The entrance and exit response trends are relatively similar with a 10% decrease in the a few programs response and a 12% increase in the some programs response.

Question #41 asked participants to respond to the question "How familiar are you with what your customer organization does" on a scale of 1 (not at all) to 5 (very familiar). The average was 3.21 (entrance was 3.50) and the standard deviation was 1.07 (entrance was 1.07). The entrance and exit response trends again appear to be similar with a 12% increase in the somewhat familiar and an 11% decrease in the very familiar response.

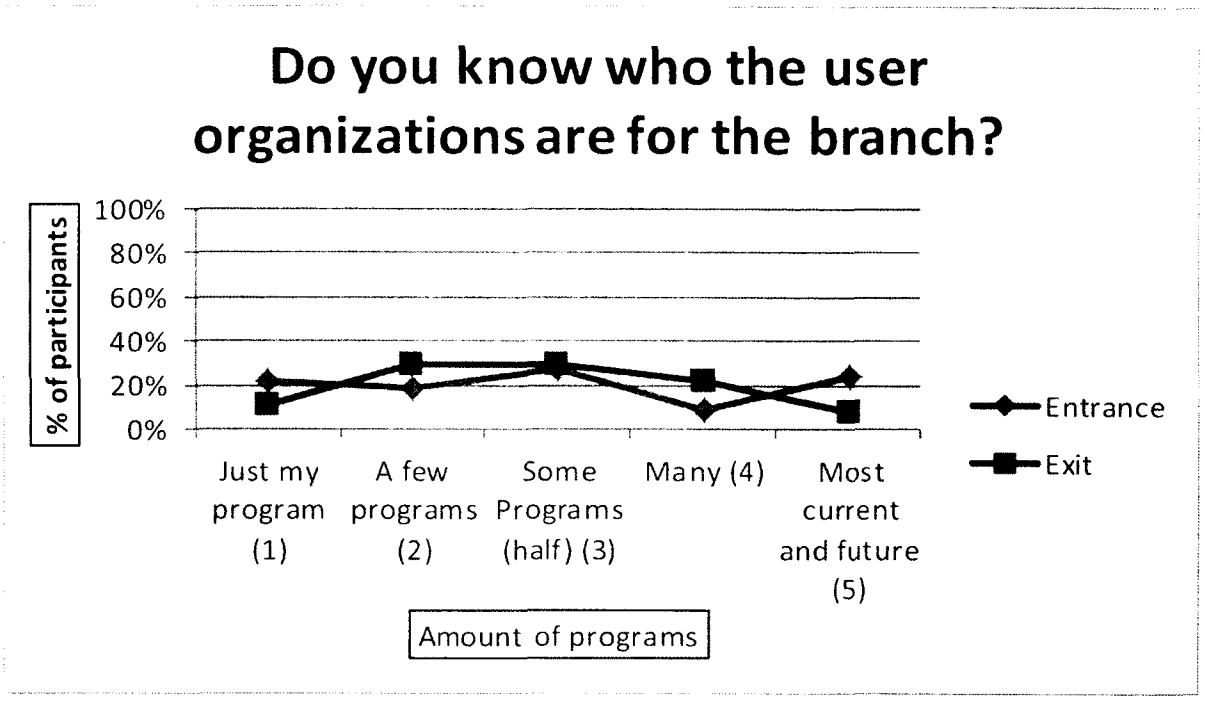


Figure 78: Do you know who the user organizations are for the branch?

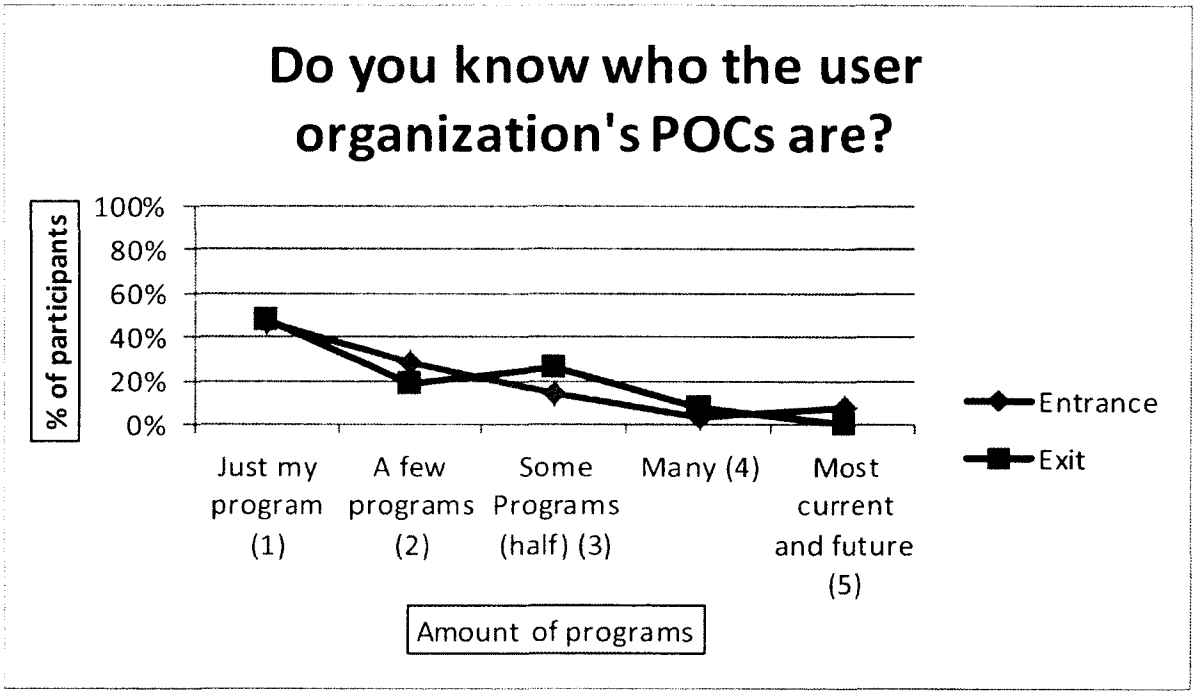


Figure 79: Do you know who the user organization's POCs are?

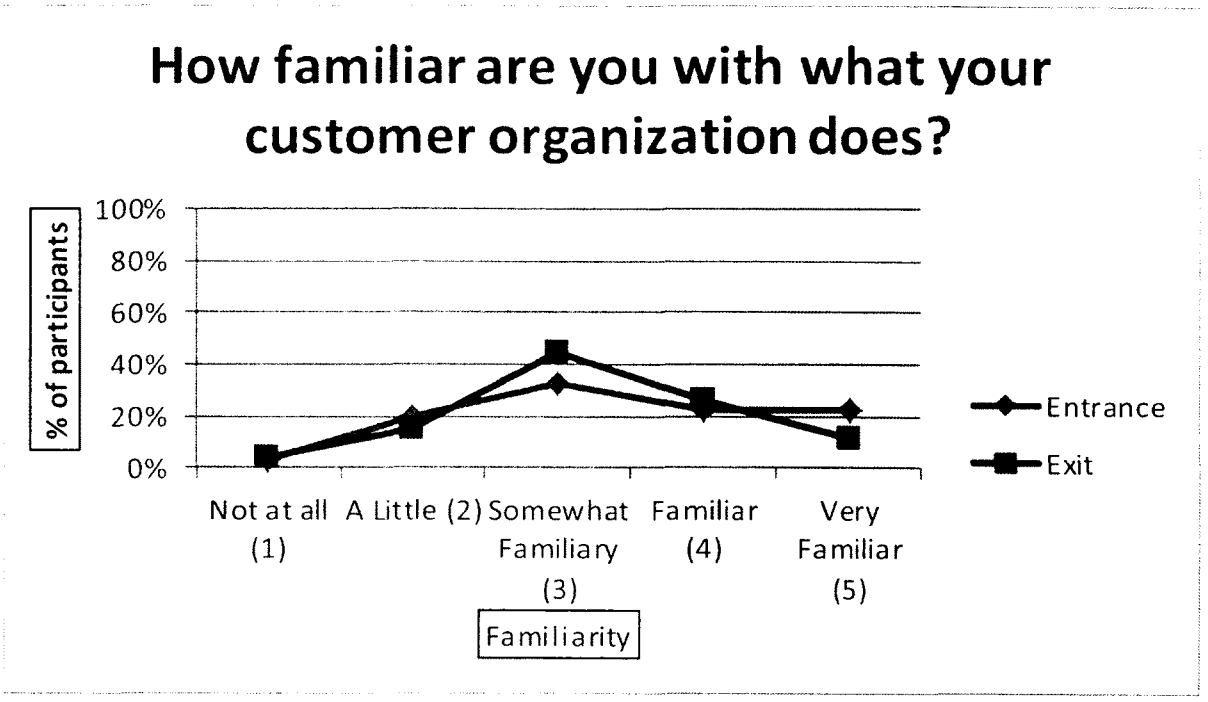


Figure 80: How familiar are you with what your customer organization does?

In addition to the comparison of questions which were consistent between the entrance and the exit interviews, a set of questions was included in the exit interview that focused directly on the participants' use and experience as it pertained to Aristotle. The first question inquired into their usage, both the number of times used and the duration per use. 60% (18/30) of the participants did not use Aristotle following the initial training. 27% (8/30) used it 2-3 times during the course of the 6 month assessment period while one person used it an estimated 6 times, two used it an estimated 5-10 times and one use it an estimated 10-15 times. They were also asked their duration of use when they did visit. When the training was given the participants were told that 30 minutes a week was authorized by management to support this research. Those who used it 2-3 times averaged approximately 78 minutes (standard deviation of 54) each for the 6 month study, which works out to 3.0 minutes per week. This was found by determining the total time reported by each participant (number of visits x estimated duration per visit) in that category and taking the average. Those who used it 4-15 times averaged 311 minutes for the 6 month study (standard deviation of 206) or about 12.1 minutes per week. The average was determined in the same manner. Additional questions included how it impacted the time to find an expert, the time it took to solve problems, their work, and their job satisfaction. Most of the responses were N/A due to the limited exposure the participants had to Aristotle. An in-depth discussion of failed deployment will be included in the conclusion section.

**Analysis**

This section covers the analysis of the research data and discusses the impact of the applied treatment on the organization. It will be argued that, due to a number of factors, that the tool itself was not used enough to have a significant impact on the organization. However, the organizational response to the overall treatment showed some signs of organizational change in the area of knowledge management. The statistical analysis of the applicable data suggests there was almost no change in the organization. However, a more qualitative discussion reveals more subtle changes. Summary critiques and suggestions for follow-up research will conclude this section.

Much of the research data was able to be codified and captured in an Excel document from which a low level of statistical analysis could be done. The primary purpose of the statistical analysis was to determine if any of the changes recorded between the entrance and exit interviews were statistically significant. There are multiple tests available to determine if something is statistically significant depending on the type of data collected. Paired T-tests, Wilcoxon signed-rank test and Mann-Whitney were all considered. Paired T-Tests were ruled out because the data was not normal. Wilcoxon was ruled out because although the entrance and exit interviews were conducted on the same population the data was recorded in aggregate as outlined in the proposed methodology which meant that the results could not be compared on an individual level, so although the two populations were the same the statistical analysis could not use a paired methodology. The Mann-Whitney was the best fit based on the data available because it is a non-parametric test of unpaired data. Unfortunately, the exact type of statistical analysis was not addressed in the proposal, so the resulting analysis used may not be the optimal method.

The software tool recommended by the committee to conduct the statistical analysis was SPSS. The data was entered into the tool and the statistics were generated. The output data is shown in Figure 81.

| | Q4_Organizations | Q5_PeerReview | Q5_PerfRev | Q5_IDPs | Q5_LineMgmtRev | Q5_NAVSEAInst | Q5_ProgComm | Q5_TechBriefs | Q5_FormalReport | Q6_Phone |
|---|---|---|---|---|---|---|---|---|---|---|
| Mann-Whitney U | 414.500 | 435.500 | 433.000 | 410.000 | 433.000 | 417.500 | 395.000 | 404.000 | 382.500 | 427.000 |
| Wilcoxon W | 879.500 | 900.500 | 898.000 | 875.000 | 898.000 | 882.500 | 860.000 | 869.000 | 847.500 | 892.000 |
| Z | -.527 | -.224 | -.270 | -.626 | -.272 | -.499 | -.897 | -.765 | -1.050 | -.397 |
| Asymp. Sig. (2-tailed) | .598 | .823 | .787 | .531 | .785 | .618 | .370 | .444 | .294 | .691 |

a. Grouping Variable:

| Q6_Email | Q6_FacetoFace | Q6_SharedWeb | Q6_Mail | Q6_Meetings | Q6_InformalRep | Q7_FamiliarSN | Q8_Facebook | Q8_Myspace | Q8_Linkedin | Q8_GooglePlus |
|---|---|---|---|---|---|---|---|---|---|---|
| 429.500 | 445.500 | 372.500 | 352.500 | 417.000 | 442.000 | 367.000 | 429.500 | 435.000 | 406.500 | 411.500 |
| 894.500 | 910.500 | 837.500 | 817.500 | 882.000 | 907.000 | 832.000 | 894.500 | 900.000 | 871.500 | 876.500 |
| -.358 | -.074 | -1.217 | -1.644 | -.570 | -.133 | -1.384 | -.315 | -1.000 | -.868 | -.658 |
| 0.720 | .941 | .224 | .100 | .569 | .894 | .166 | .753 | .317 | .385 | .511 |

| Q8_Aristotle | Q8_Twitter | Q8_Friendster | Q9_FamiliarKM | Q10_DTIC | Q10_DDWorkspace | Q10_NSWCDD | Q10_TechLib | Q10_NKO | Q10_DAU | Q10_IHS |
|---|---|---|---|---|---|---|---|---|---|---|
| 42.000 | 422.000 | 343.000 | 400.000 | 327.500 | 441.500 | 418.000 | 427.000 | 398.000 | 422.500 | 350.000 |
| 507.000 | 887.000 | 749.000 | 865.000 | 792.500 | 906.500 | 883.000 | 892.000 | 863.000 | 887.500 | 815.000 |
| -6.494 | -.701 | -1.455 | -.809 | -1.898 | -.132 | -.516 | -.125 | -.829 | -.436 | -1.720 |
| **0.000** | .483 | .146 | .418 | **.058** | .895 | .606 | .901 | .407 | .663 | **.085** |

| Q10_ASSIST | Q10_EBIS | Q10_MCEITS | Q10_AKO | Q10_SharePoint | Q10_MEARS | Q10_OutlookCal | Q10_MSProject | Q10_Mentorship | Q11 | Q12 |
|---|---|---|---|---|---|---|---|---|---|---|
| 435.000 | 443.000 | 378.000 | 414.500 | 412.000 | 426.000 | 427.500 | 422.000 | 288.000 | 429.500 | 396.500 |
| 900.000 | 908.000 | 843.000 | 879.500 | 877.000 | 891.000 | 892.500 | 887.000 | 694.000 | 864.500 | 831.500 |
| -1.000 | -.120 | -1.343 | -.550 | -.367 | -.435 | -.438 | -.205 | -2.175 | -.097 | -.698 |
| 0.317 | .904 | .179 | .582 | .714 | .664 | .661 | .837 | **.030** | .922 | .485 |

| Q13 | Q17b | Q18 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 |
|---|---|---|---|---|---|---|---|---|---|---|
| 415.000 | 298.000 | 423.500 | 403.000 | 376.500 | 365.000 | 374.000 | 386.000 | 366.500 | 393.000 | 378.000 |
| 850.000 | 623.000 | 858.500 | 868.000 | 841.500 | 830.000 | 839.000 | 792.000 | 772.500 | 828.000 | 843.000 |
| -.357 | -.043 | -.185 | -.289 | -.744 | -.972 | -.878 | -.337 | -.876 | -.679 | -1.159 |
| 0.721 | .966 | .854 | .772 | .457 | .331 | .380 | .736 | .381 | .497 | .246 |

| Q31 | Q32 | Q33 | Q34 | Q34b | Q35 | Q36 | Q37 | Q38 | Q39 | Q40 |
|---|---|---|---|---|---|---|---|---|---|---|
| 385.500 | 387.000 | 377.500 | 419.000 | 265.000 | 411.000 | 388.000 | 347.000 | 406.000 | 395.500 | 385.500 |
| 850.500 | 822.000 | 812.500 | 884.000 | 590.000 | 846.000 | 823.000 | 812.000 | 841.000 | 830.500 | 791.500 |
| -.787 | -.770 | -.919 | -.256 | -.232 | -.381 | -.740 | -1.251 | -.238 | -.614 | -.114 |
| 0.431 | .441 | .358 | .798 | .817 | .704 | .459 | .211 | .812 | .539 | .909 |

| Q41 | Q42a_Phone | Q42a_Email | Q42a_FacetoFace | Q42a_Coworker | Q42a_LineMgmt | Q42a_SocialNtwrk | Q42b_Phone | Q42b_Email | Q42b_FacetoFace | Q42b_Coworker |
|---|---|---|---|---|---|---|---|---|---|---|
| 371.000 | 414.000 | 362.000 | 364.500 | 353.500 | 427.500 | 382.500 | 433.500 | 428.000 | 410.500 | 371.500 |
| 777.000 | 879.000 | 827.000 | 799.500 | 818.500 | 862.500 | 788.500 | 898.500 | 893.000 | 875.500 | 836.500 |
| -.798 | -.545 | -1.160 | -1.186 | -1.300 | -.127 | -.498 | -.025 | -.120 | -.443 | -1.033 |
| 0.425 | .586 | .246 | .236 | .194 | .899 | .619 | .980 | .905 | .658 | .302 |

| Q42b_LineMgmt | Q42b_SocialNtwrk | Q42c_Phone | Q42c_Email | Q42c_FacetoFace | Q42c_Coworker | Q42c_LineMgmt | Q42c_SocialNtwrk |
|---|---|---|---|---|---|---|---|
| 413.000 | 405.000 | 394.500 | 408.000 | 381.000 | 416.500 | 399.000 | 405.000 |
| 878.000 | 840.000 | 800.500 | 814.000 | 816.000 | 881.500 | 864.000 | 840.000 |
| -.118 | -.598 | -.417 | -.206 | -.438 | -.060 | -.346 | -.598 |
| 0.906 | .550 | .676 | .837 | .661 | .952 | .729 | .550 |

Figure 81: SPSS Output Data

Out of approximately 85 sets of data presented, 2 sets of interest had a p-value of less than .050 meaning that there is a 95% probability of the change being significant. They were: Aristotle and Mentorship.

| | Q8_Aristotle | Q10_Mentorship |
|---|---|---|
| Mann-Whitney U | 42.000 | 288.000 |
| Wilcoxon W | 507.000 | 694.000 |
| Z | -6.494 | -2.175 |
| Asymp. Sig. (p-value) | **0.000** | **.030** |

Figure 82: SPSS Output Data Subset

The change in Aristotle use was primarily from respondents not knowing what it was (0) to respondents knowing what it was, but not using it (19) with a limited number using it yearly (8) and one person using it monthly and one using it weekly. That change is a direct result of the training received and not necessarily indicative of an overall impact on the organization. Although the use of Aristotle was limited this change does point to a shift in the organization's awareness of social networking tools. As a result of the study, mostly due to the training, employees have an understanding that social networking tools are allowed and encouraged by the organization, that these tools have the ability to impact how the organization does business, and that social networking plays an important role in knowledge management.

The change in mentorship was a large decrease (18%) in people not knowing what it was with an increase in people using it yearly (from 1 to 4 people) or daily (from 0 to 2 people). This does point to a small change in culture. Although this change is likely not associated with the tool itself, because mentorship programs at NSWC are not computer based, it could be assumed that the overall treatment did have an impact because it increased awareness of knowledge management of which mentorship plays an important role Using statistics to quantify the data from the study provides only 2 significant changes out of 85 applicable sets of data which is a relatively small percentage and points to almost no impact directly related to the use of the tool itself with some small changes that can be attributed to the overall treatment process.

Data was gathered on the demographics of the branch. It included time in service, age, and position in the organization. As would be expected the reported time in service and average did not change much over the course of the 6 month study. The average time in service went from 11.3 years (0.1 SD) to 12.2 years (0.1 SD). The average age went from 36.8 years (3.4 SD) to 38.4 years (2.9 SD). If the 6 month duration of the study period is factored in the numbers are relatively consistent. 15 participants identified themselves as mechanical engineers in the entrance interviews with 14 in the exit interview. The next most common response was project manager with 9 participants in the entrance interview and 3 in the exit interview. The rest of the positions in the organization had response rates of less than 3.

The qualitative analysis follows the same framework as the results presentation and will address the impact of the social networking technology treatment on the organization in the areas of computer facilitated social networking, knowledge management, responsiveness and performance, and understanding of the manned platform integration branch.

The area of "computer facilitated social networking" addressed the participants' understanding and use of both conventional networking and social networking technology. For conventional networking, participants were asked to identify organizations with whom they have worked and what types of communication they used both formal and informal. The average number of organizations with which the participants interacted did not change significantly going from 10 with a standard deviation of 6.6 to 9 with a standard deviation of 4.28 and for the most part the organizations with whom they worked stayed the same. This level of interaction using conventional networking shows that members of the organization engage in networking regularly without the aid of social networking. The participants were then asked to identify how they communicated with other people both informally and formally. Examples of formal processes included peer reviews, program lines of communication, and tech briefs. The responses to these questions did not change in any significant way between the entrance interviews and exit interviews with not even any subtle trends able to be identified. The complete set of responses is

included in Appendix F. It appears that the treatment did not have an impact on formal communication.

Informal lines of communication included phone, email, and meetings and again showed very close correlation between the entrance and exit interviews. Face-to-face interaction saw a relatively large change between "often" going from 43% to 72% and "most of the time" going from 27% to 7%. The decrease in face-to-face interaction could be a result of increased use of social networking tools and knowledge management with the idea being that if information is readily available then face-to-face interaction is not necessary. The average for face-to-face went from 3.87 (0.86 SD) to 3.83 (0.59 SD) and the Mann-Whitney analysis gave a value of .941, so according to the statistics the change was not significant, but through a qualitative assessment of the trends in the data, the open ended responses, and the observations of the organization throughout the study there is some change occurring. The frequency of use of shared websites saw an increase in the "sometimes" category from 33% to 55% and a decrease in "rarely" from 37% to 17% which is encouraging because shared use could be a corollary to social networking technology use. . Again, these two are adjacent, so the significance of the change in itself does not point to a change in the organization which is confirmed by the relatively small change in average from 2.70 (SD 1.06) to 2.93 (0.87 SD) and the p-value of .166. However, much like the changes in face-to-face interaction, a qualitative assessment of the data points to a slight change in the organization. Overall it is apparent that the tool itself may not have an impact on the informal lines of communication due to its limited use, but subtle changes in the organization are noticeable and are possibly a result of the overall treatment.

When asked the question of participants' familiarity with social networking a large number (26) of participants said that they were familiar with it. The pervasiveness of Facebook probably plays a major role in increasing awareness. A somewhat surprising change in the data was that agreement with the statement decreased from the entrance interviews to the exit interviews. The number of participants who strongly agreed with the statement decreased from 43% to 17% while an equivalent increase could be seen in the participants who agreed from 43% to 72%. Again

these two responses were adjacent, so subtle changes in participants' views could result in the swing and the relatively small change in the average from 4.27 (0.78 SD) to 4.07 (0.64 SD) and a p-score of .166 support that. The decrease could be that upon receiving instruction on Aristotle and using it over the course of the study, participants realized that there were a lot of aspects of social networking with which they were unfamiliar. With respect to the types of social networking participants were familiar with, Facebook was by far the most frequently used with 100% knowing what it was and 57% (17/30) using it at least weekly. Its use did not change between the entrance and exit interviews nor did most of the rest of the social networking technologies. The use of Aristotle did change significantly with most of the participants (90%) not knowing what it was prior to the treatment to everyone knowing what it was at the end of the treatment. Unfortunately only 2 participants reported using it more than once a year, which means that although the change in use was significant the impact of its use on the organization was probably inconsequential.

The area of "knowledge management processes" looked into how participants used knowledge management processes, what types of processes they used, and how they acquire new knowledge. Participant's familiarity with knowledge management was less than their familiarity with social networking. The change from the entrance interviews to the exit interviews, although not statistically significant according to the Mann-Whitney analysis (.418), did show an increase in familiarity from a combined 60% to 72% of participants agreeing or strongly agreeing. Participant familiarity with knowledge management plays a critical role in the ability of the organization to implement and benefit from KM processes. With additional education the organization could influence it significantly. It is clear that the organization sees the benefit and value in knowledge management systems and most participants agreed that if it met their needs they would use it. Those opinions were consistent for both interviews.

All of those responses are positive; however, none of them directly tie to use of the tool itself. Most of the knowledge management processes saw relatively consistent response rates between the entrance and exit interviews. The consistency in some of the responses over a 6

month period is remarkable. One of the knowledge management processes did see statistically significant changes. The use of mentorship programs saw a statistically significant change according to the Mann-Whitney analysis (.030) with the change in average from 1.68 (0.55 SD) to 2.24 (1.18 SD). The increase in mentorship participation is not believed to be a result of Aristotle itself but is possibly a result of the overall treatment and evaluation process raising awareness and understanding of Mentorship as a tool in the greater knowledge management picture.. In theory Aristotle could have provided a conduit or facilitate communication in a mentor-mentee relationship; however, there was no evidence of that found in the data collection so such a statement is only speculative. Some other KM processes showed a change that, although not statistically significant according to the process used in this study, did show some changes worth discussion. The first was IHS which is a tool used by the technical library to search for information. The trend in the data showed that more people knew what it was, and monthly, weekly, and daily use increased over the course of the study. This again shows an organizational increase in the use of knowledge management, which could be tied to the study although not directly associated with the tool. MCIETS was very similar being slightly over the cutoff to be statistically significant but still showing signs of change in the organization as a result of the process.

Knowledge acquisition identifies how participants gain and transfer knowledge, more specifically, where they find their information, where they store it, and how easily it is found and shared. The data did not appear change significantly between the entrance and exit interviews, but, looking at finding data and storing data, a critical gap is highlighted. To find technical data, the top resources were public domain internet and colleagues and, to find programmatic data, the top resources were consistently colleagues and subject matter experts. Respondents primarily store their data on individual computers, shared drives, and notebooks. Two of the top methods used to store data are inaccessible by others in the organization, so data transfer is completely reliant on personal interaction. This would be an acceptable method except that it requires members of the organization to know what others do and interact regularly. Also if someone leaves the organization her/his knowledge is difficult to maintain or becomes lost forever. Social

networking technology can support and promote a colleague and subject matter expert interaction and increase its efficiency. A couple of questions addressed the ability for members of the organization to exchange information. When asked about other members' ability to find information in a timely manner, the responses were relatively consistent between the entrance and exit interviews and were not biased one way or the other. The impression based on the interviews was of indifference toward agreeing or disagreeing. Additionally, the ability to find information others had created relied heavily on interaction between people as with statements such as "All they have to do is ask me for it." Entrance responses to the question of the ability to find information others have created were again ambivalent and agreement or disagreement depended greatly on people interacting with other people. The associated exit interview found a higher percentage (58% vs. 36%) of people disagreeing with the statement. The change was not statistically significant (.966) with averages of 2.68 (1.07 SD) for the entrance and 2.71 (0.91 SD) for the exit. No definite cause of the change is apparent. The next question found that, in both the entrance and exit interviews, a relatively high percentage, 50% and 46% respectively, of participants agreed that others would be able to find their information after they left the organization. More participants agreed with that statement that people could find information with them still in the organization. This is interesting since the majority of respondents stated that person-to-person interaction was the key to finding information. The reason for the increase is due to the fact that members of the organization believed that they would successfully store/archive their information prior to their departure so that the organization could use it. Traditionally that is not the case with many members leaving almost all of their information where it was traditionally stored, which rapidly becomes inaccessible by the organization. Those results lead directly into the next set of data which looks at the biggest challenges when trying to gain new knowledge. The data is again somewhat consistent across both interviews. The top challenges cited are people not knowing where it is (26 in entrance and 18 in exit), people not having time to find it (8 in entrance and 10 in exit), and people not sharing information (7 in entrance and 7 in exit). All of those challenges could benefit from a social networking or

knowledge management process; however, the treatment used for this research appeared to have no impact on this section.

The area "responsiveness and performance" is the area where the impact of the treatment on the organization would really be shown. Efficiency, quality, and job satisfaction are all metrics that could be used to demonstrate the benefit or detriment of the treatment. This is also an area where it is difficult to obtain hard numbers in the available timeframe, so a qualitative analysis is beneficial. Questions related to efficiency asked what aspects of the participants' jobs consume the most time and what tools are used to accomplish those tasks more rapidly. The responses from both interviews were consistent with no remarkable change in focus or scope. Response topics focused on conducting technical work, finding information, and program management with a lot of the comments addressing non-technical aspects of the job including email, training and administrative tasks. The full set of data can be found in Appendix F. The statistical analysis of the questions in this section also shows no remarkable changes. The lack of changes in this section could be due to a number of reasons. The first reason would be that the tool does not have an impact on the organization. This conclusion would be consistent with the rest of the data discussed so far and the overall usage of Aristotle as a tool. It is also possible that the tasks identified are staples of the organization and would not change regardless of external factors. Factors that relate to execution of technical work or established processes may fall into that category, but if the treatment was truly successful a reduction in areas relating to communication and finding subject matter experts would be expected.

The responses to the follow-up question of tools used to accomplish those tasks were relatively similar between the entrance and exit interviews. Social networking was mentioned once in the entrance interview; however, it was not mentioned at all in the exit interviews. Knowledge management practices were alluded to in both interviews although not specifically called out. The effective use of Aristotle would be manifested in the responses to this question and on some level would be expected as a result response bias. The lack of responses related to social networking or any increase in knowledge management responses support the argument

that the tool had no effect on the organization. The lack of social network responses is encouraging in that the response bias of the participants is minimal.

During the entrance interviews the participants identified what they would do to make their jobs easier. Many of their responses addressed reductions or streamlining processes they had to go through to do things such as purchasing, traveling and training. Some of their responses addressed knowledge management issues such as common databases, access to databases, and available storage. None cited social networking as something they would like to see more of. The exit interviews again addressed process and knowledge management resources with few changes from the entrance interviews. Social networking technologies were not mentioned; however, finding info on whom the experts are was discussed, which could be directly addressed with a program such as Aristotle. .

The quality of the data available was addressed by 4 questions. They asked if participants had confidence in the data available to them, if it was accurate, if it was relevant to their work, and if it was up to date. The change in these questions between the two interviews was negligible, indicating no change in participant's perceived quality of the information available to them. It is questionable if the timeframe used was long enough to allow for these opinions to be impacted.

Two questions addressed the performance of management in relation to this research. They asked if the methods used to collect and distribute information were perceived to be effective. Due to the limited participation of managers in the study, the impact of the treatment was expected to be insignificant and the data supports that. For both collection and distribution of data, the majority of the participants did not believe management's methods to be effective.

Many different aspects play into job satisfaction, but a few questions were asked specifically for that purpose. The first was if the availability of quality information makes the participants' job frustrating or easier. The responses were relatively normal and centered on the middle and they did not change significantly over the course of the research. If anything, there

was a slight decrease in this area. In the exit interview the participants were asked directly how the use of Aristotle impacted their job satisfaction. The majority of participants answered N/A since they did not use the program enough to make a decision and the few that did have a response said it had no impact on their job satisfaction. Another factor in job satisfaction is how burdensome employees view their jobs, so the question was asked what aspects of their jobs they feel are burdensome. The types of answers were consistent between the entrance and exit interviews and for the most part addressed process, training and administration, all of which would not generally be impacted by Aristotle. Some of the burdensome aspects discussed in the entrance interviews included performance reviews and yearly evaluations. These were not mentioned in the exit interviews; however, since management involvement was minimal, the change in response was probably due to the yearly cycle of reviews rather than the treatment. Discussions of communication being a burden also decreased in the exit interviews; however, based on the rest of the data it is most likely not a result of the treatment.

The last section discusses participants understanding of the organization itself and its personnel interactions. It was believed that the implementation of Aristotle may have an impact in participants' awareness of other employees, program sponsors and users/customers. One of the features of Aristotle is its ability to easily show all of the network connections between people and programs. Frequent use of Aristotle would in theory increase participants' understanding in all these areas. All of the data collected in this area was consistent from the entrance to exit interviews.

When it came to the culture of the organization, an interesting trend became apparent. The data shows that at every level of the organization the participants agreed less with the statement that knowledge management is supported in the exit interviews. Statistically those changes are not significant, but the trend across all three levels does raise some concern, especially when G81 was supporting and promoting the use of Aristotle. The culture of an organization plays a very significant role in the acceptance of new initiatives, so the decrease in a supporting environment may have been a factor in the limited acceptance of the treatment. This

change may be a direct result of the treatment. Prior to the study participants may not have considered what the culture of the organization towards social networking and knowledge management was and therefore made a less informed decision. Following the treatment they may have realized the possibilities and capabilities associated with knowledge management and realized that management did not do a good job of supporting or promoting its use.

# CHAPTER 5

## CONCLUSIONS AND RECOMMENDATIONS

After analysis of all of the data and observations throughout the study it is possible to address the research question:

"How does computer facilitated social networking, as part of a knowledge management process, influence the responsiveness and performance of the Manned Platform Integration Branch (G81) at the Naval Surface Warfare Center (NSWC) in Dahlgren Virginia?"

There are really two aspects of the study that need to be addressed. The first is the acceptance and use of the specific social networking tool. The second is the success and results of the overall treatment process. Analysis of each aspect provides valuable knowledge that can be applied to future work and projects

Within the scope of the study, which includes the sample population, method, and environment, it appears that the social networking tool Aristotle had little impact on the responsiveness and performance of the organization due to its limited acceptance and use by the organization. The overall treatment process, however, did appear to influence some of the areas that were studied. A review of all of the data collected and observations over the course of the study conclude that the treatment had significant effects (Mann-Whitney p-value $< .05$) on the organization by increasing awareness of Aristotle and increasing the use of mentorship programs. The treatment had no statistically significant impact on any other aspects of the organization that were observed; however, changes in some aspects can be seen when a more qualitative approach is taken. The treatment had a small impact on participants' computer based networking and knowledge management processes. It did not appear to impact their awareness and understanding of the organization and its partners. There was also no perceivable impact to efficiency, quality, or job satisfaction.

If the conclusion that that the implementation of the tool itself failed and therefore has no impact on the organization is accepted it presents a strong case to avoid repeating this process

verbatim. It is not worth investing the resources (time, money, and people) required to implement the process to not have a major component of it accepted. Without additional research that perspective is supported by this study and is the recommendation that will be provided to the organization.

There are multiple reasons for why the tool was not accepted. It may be that the training was not sufficient to provide the participants with the skills necessary to implement the tool. Another factor may be that participants were not made are of all the possible benefits of a social networking tool. Finally, it may have been that the Aristotle was not the best option for a social networking tool.

The training plan was generated based on the recommendations and training package of the Aristotle team and the precedence set by previous trainings within the organization. In discussions with participants over the course of the study period they often demonstrated a limited understanding of the capabilities that Aristotle provided. Had a different training plan been used there may have been more opportunity for participants to fully understand the tool. Some changes that could be implemented would be smaller classroom size, more personal interaction, multiple sessions throughout the course of the study period, homework assignments, or quick reference cards.

Another factor that impacts use is the perceived benefit of a social networking tool. The benefits are often conveyed through the training, personal use, and interaction with peers. Communicating the benefits of the tool was not specifically addressed in the training. If the participants do not see the benefits of the tool they are probably less likely to use it. Some of the comments received said that they would use it if they saw the benefit. This is a topic that could be highlighted better in the training.

Finally it may be that Aristotle was not the best tool to use. There may be other social networking tools that would provide an impact. What it really comes down to is identifying what features really engage users and promote use? Aristotle was selected for this study primarily

because it was secure for government use. It also had many of the common features associated with social networking. One of the assumptions for the research was that the organization would be impacted regardless of the specific software used and that assumption still holds true assuming it is actually used, but in order to get the necessary use the users need to like the features and the interfaces and see the value in the software. In the study there were some complaints with Aristotle regarding its features and interface that discouraged use; however, as with many new processes it takes time to get used to them. In addition to the features associated with a social networking tool there is also a time dependent variable in which acceptance by the population requires a certain amount of time to gain widespread recognition and a critical mass of users. Aristotle as a program has been around for approximately 3 years which could possibly be considered in its infancy. Being in its infancy also means that the percentage of the possible users is still below a theoretical critical mass. That, plus only having 6 months of exposure to the research population probably has a significant impact on its use. By comparison, Facebook has been around since 2004 (9 years) and did not start to see significant growth till 3-4 years later (Foster, 2013).

In lieu of increasing usage through features, time and critical mass, another option could be to make its use mandatory. Many times this is the only way to implement a new process within an organization; however, it often results in initial resentment towards the process. This could be a viable method in the future although the approach would need to be well researched.

As can be seen, there are many possible variables that impact usage. Some of the main reasons identified by participants for not using the tool included:

- Didn't have the time,
- Didn't have a need,
- Didn't see the value,
- Didn't trust the information.

Many of these could be addressed through training, mentorship, changes to the tool, or simply more time using the tool.

Although Aristotle was the major component of the treatment there were some changes in the organization that were seen that were not necessarily directly tied to the tool used but were likely a result of the overall treatment and evaluation process. The small increases in the use of programs such as the peer review process, shared websites, HIS, and MCIETS all likely result from the treatment. The more significant improvements in awareness of social networking tools such as Aristotle and the greater use of the mentorship program are excellent examples of how the overall treatment (not just the use of a tool) impacted the organization.

A valuable output of this study is that it can be used to manage expectation for similar research. The initial assumption when implementing this study was that everyone would use the tool. The result was that only about 40% used the tool following the training. This level of usage could be assumed in future implementation and, as such, will help to manage expectations. Some organizations may be satisfied with a 40% change. The other way this study can contribute is in demonstrating the effects of the organization's behavior based on the overall process. The results of the research show that the change in the organization based on a process like this one will be small. The low significance of change in the allowed period can inform the community that expectations for similar processes should be low and that assessments conducted after short evaluation periods may not produce significant results.

This research paper presented a sufficient discussion of knowledge management and social networking, but a couple questions could still benefit from additional research. The first is whether social networking a viable component of knowledge management within an organization. The research review for this study provides a strong connection that it is. The follow up to that is then would acceptance and use of a social networking process impact an organization in such a way that a study of its employees would reflect a change in the organization.

Lessons learned for Follow Up research

In any study there is value regardless of the outcome. Sometimes the lessons learned from a less successful study can be just as valuable as those gained from a hugely successful

one. Although the results of this study were limited there are a lot of lessons that can be taken from it to make possible follow up research more successful.

It is apparent from this 6 month study that a longer study period would be beneficial for two reasons. The first is that a longer duration would allow more time for participants to become familiar with the software and use it. The second is that the impact of the use would be more noticeable over a longer duration. Also with many organizations there is a cycle to how things are done which in the case of DoD organizations is yearly. At a minimum a future study should allow for at least one if not two cycles of the organization to occur in order for the impact to really be seen.

There are a couple of problems associated with longer cycles. The first is that over a longer timeframe outside factors can play an even bigger role in the outcome. A solution to that, regardless of the cycle would be to run a two-group test with one acting as the control. In theory if all factors are the same for both groups except for the treatment then any discrepancies will be the result of only the treatment. By having a two group test it is also possible to account for any response bias.

The other problem is that there can be a much larger turnover in the employees. On a small sample size turnover can have significant impacts. Over the course of this study there were 3 participants, roughly 10%, who were no longer in the branch for the exit interview. A solution to that problem, as well as a host of others is to increase the sample size. Losing 3 out of 30 versus 30 out of 300, although statistically the same, leaves a much smaller number from which to analyze data. Increasing the sample size and conducting a two group study greatly increases the burden on the researchers, but it does add value.

Another area of critique could be of the assessment instrument and the data collection methodology. The assessment instrument development in Appendix B lays out a very logical rational for the selection of the instrument questions with the assumption that it would be a mixed method approach. The limited ability of the study to identify an impact is not a result of poor

instrument development; however, there are always ways to improve. It would be prudent for follow up research to clearly identify specific areas in which changes would be seen.

Another suggestion for follow up research would be to have it be a quantitative study with hard numbers that can show change in the organization. The favorite hard number for many organizations is in terms of funding. Since NSWC is a working capital organization, meaning it gets money from sponsors to do work, it too can relate to funding statistics. The most significant one, and the one that is most easily tracked, would be the amount of funding executed by the organization. This, however, is not perfect because a large contract could skew the results. Other hard numbers that would be value added would include the number of publications, program execution time, or program transitions. The challenge with the hard numbers is that they are also somewhat dependent on a yearly cycle which would be another reason for follow up research to use a longer study period.

In addition to the hard numbers gathered from the interviews or the organization itself it would also be good to collect data usage from the software. That data was requested from Aristotle for this research study, but DTIC, the organization that manages the software, does not collect that data in a format that could provide useable data of a small subset of users.

The final lesson learned and possibly the most significant for follow up research would be to take the necessary steps to ensure that the social networking technologies selected are actually used. There are many ways to influence the use and no one can determine for certain what will make something take hold. One of the steps is to find a favorable program to use. Many participants use Facebook and questioned why that wasn't used for the research since it has many features that people like. The problem with using social networking technology that is already successful is that people are already using it, so it is challenging to introduce as a new capability. Ideally a social networking technology would be introduced that everyone in the organization would embrace but had not heard of before. Again even if it has great capabilities it sometimes takes a long time to reach significant levels of use.

Another option is to mandate its use by management. This happens often within the Navy and has limited success. A more successful implementation would be to provide a service within the program that the users need, but can't get anywhere else. An excellent suggestion was made in this study. Just about every Agency has its own address book that can be searched by members of the organization; however, the ability to search the address book from another organization is very difficult. An example is the Navy/Marine Corps Intranet (NMCI). For all intents and purposes it is the exact same system for both the Navy and the Marine Corps; however, as a USMC user it is not possible to look up a Navy phone number. If a program such as Aristotle made all federal address books available in one place that would be a huge resource that is currently not available anywhere and would draw users in.

## Conclusion

Within the scope of the study it appears that the research had a small impact on the organization. There was a significant increase (Mann-Whitney p-value $<.05$) in awareness of the social networking tool Aristotle as well as a significant increase in the use of mentorship programs. Other trends that were observed, although not statistically significant, included increased use of peer reviews, shared websites, and other knowledge management processes.

The tool itself was, for the most part, rejected which may be a result of a number of factors including training and utility. It is for this reason that future application of the methods outlined in this study are not recommended without reviewing the processes used, addressing the deficiencies, and revising the process.

Outside the scope of this study are a number of additional considerations, training, benefits, and type of tool and its usage, that could be taken into account in future research. This study will be used to inform the organization and additionally will hopefully be used as a precursor for further research that can build on the foundation and lessons learned contained within.

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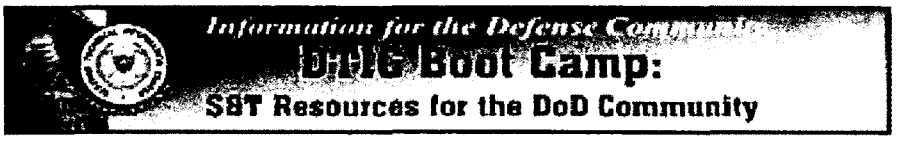
# Appendix A :

## Aristotle Training Documents




## Aristotle Overview




Information for the Defense Community DTIC®

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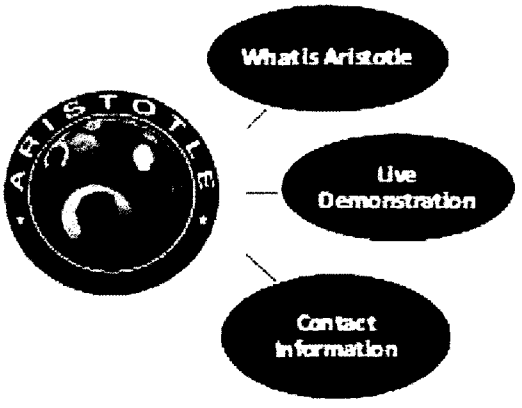


Information for the Defense Community DTIC®

## What is Aristotle?

- A Web-based professional networking tool along the lines of LinkedIn, MySpace or Facebook
- Unlike MySpace and Facebook, Aristotle is a "Professional" social networking tool AND is designed for the DoD Science and Technology (S&T) community
- Aristotle helps extend your professional network and provides situational awareness across the DoD S&T Community
- Aristotle is organized in the following categories: People, Projects, Topics and Documents

*Aristotle is part of DTIC's suite of products and services*

Information for the Defense Community DTIC

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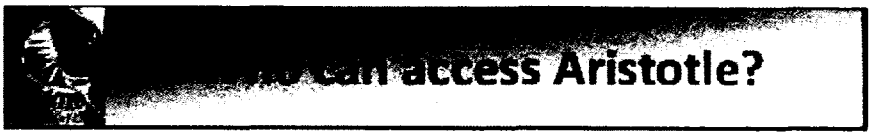
## Why Use Aristotle?

*You can use Aristotle to...*

- Find experts
- Find active projects
- Share your expertise, projects, and documents with the DoD community
- Share projects and documents with specific colleagues and teams
- Protect your information

Information for the Defense Community DTIC




- Active duty military
- DoD civilians
- DoD contractors
- U.S. Government employees
- U.S. Government contractors

Minimum access required: Distribution C
(U.S. Govt. and their Contractors)

Information for the Defense Community DTIC

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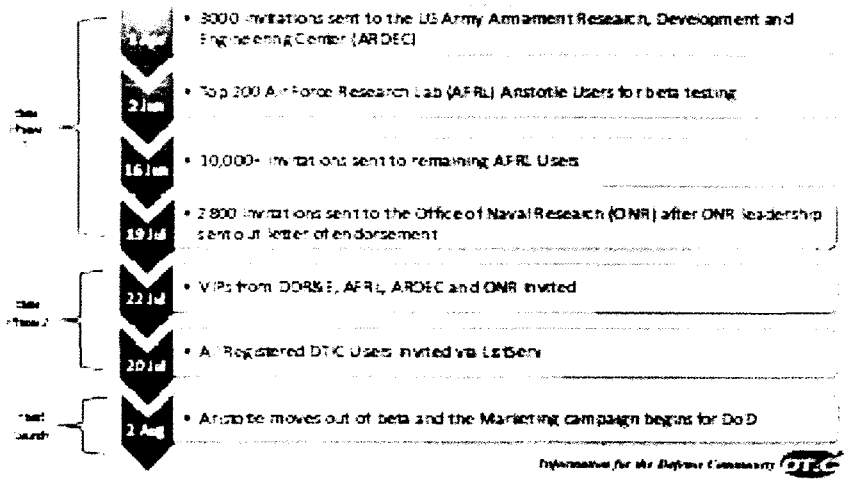
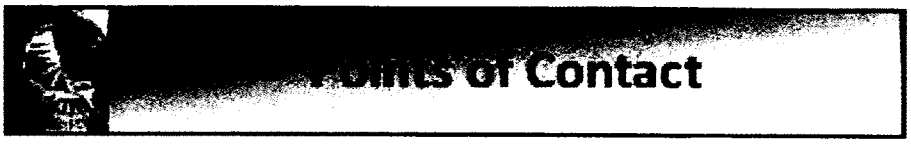



Information for the Defense Community DTIC

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Information for the Defense Community DTIC

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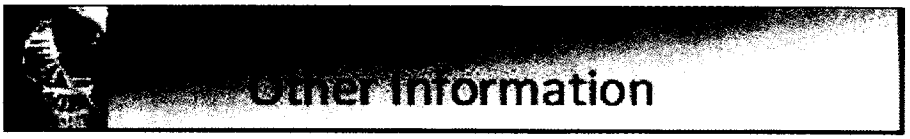


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Information for the Defense Community DTIC

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# Appendix B :

**Assessment Instrument Development**

## Introduction

This document will outline the methods and rationale used to develop the evaluation instruments for a Doctorate of Engineering research project. Resources used for the development include recent graduate coursework, textbooks, and other literature. Additional guidance has been provided by senior managers of the organization and other doctoral candidates working in similar fields. Following an outline of the proposed research this document will assess the population sample size and discuss the possible data collection methods of observations, surveys, and interviews. The plan for administration of the instruments will also be presented. This paper is intended to be a supplemental document to the research proposal with the resulting evaluation instruments to be used in the data collection process.

## Research Outline

The project will be based on an engineering management field of study with a focus on social networking and knowledge management. The proposed research project seeks to answer the question:

"How does computer facilitated social networking, as part of a knowledge management process, influence the responsiveness and performance of the Manned Platform Integration Branch (G81) at the Naval Surface Warfare Center (NSWC) in Dahlgren Virginia?"

It is a mixed method case study utilizing a one group pretest-posttest design to determine the impact of a specific treatment. The treatment will involve the introduction of new social networking software, Aristotle, within the branch and include training and time on the clock each week for the participants to utilize the software. Prior to the treatment the current state of the organization will be baselined. Upon completion of the evaluation period the organization will be reassessed so that the impact of the process can be determined. In addition to the qualitative

analysis there will be some supporting quantitative analysis because often when management reviews the results of a study more structured results are preferred.

The Manned Platform Integration Branch was chosen for this research because the primary researcher is a member and because the organization's management has agreed to support the research and make its employees available for evaluation and training.

In order to gauge the impact of the treatment the broad metrics of responsiveness and performance have been identified. The qualitative analysis will be conducted to address those metrics, but in order to gather quality data to support that analysis it is necessary to develop comprehensive assessment instruments and methods which is the purpose of this paper.

## Population/Sample Size and Selection

Determining the correct sample size is a critical step when conducting research. If the sample size is too large the time and costs associated with gathering the data can be excessive, but if the sample size is too small or poorly selected the results will not be representative of the identified population. The literature presents many different methods for determining the sample size as well as how to pick the participants.

The Naval Surface Warfare Center in Dahlgren, Virginia employs approximately 4000 scientists and engineers. They are organized into 6 departments, and each department is further divided into multiple divisions and then again into branches. Each branch is composed of between 20 and 100 people and has a unique and specific focus. Because of the size of the organization it would be impractical to sample the entire population. In addition because of the variety in branch focus, composition, and management a base wide study would result in conclusions that make sweeping generalizations about the organization but do not actually reflect the impact on any single branch. Because of this, the research population has been identified as the Manned Platform Integration Branch (G81).

G81 is composed of approximately 50 mechanical and electrical engineers. Their mission is to develop and integrate Intelligence, Surveillance and Reconnaissance (ISR) and scalable-effects engagement systems onto manned tactical platforms. The size and homogeneity of the branch makes its population a much better candidate for this study. Guidance from the literature (Gay 2009 p133, Edwards) recommends that for a population of this size (<100) the entire population should be surveyed since the time and costs associated with it are manageable.

The issue with focusing on G81 will be that the results of the study will not be broadly applicable across the base or the Navy. The study will very accurately reflect the impact on G81, but some additional consideration will need to be taken before the results can be generalized for other branches or organizations. The results may be applicable to other groups that have similar compositions, management and missions but could be totally incorrect if that is not the case. If the methodology used to conduct this research appears to be valid and the results are favorable, further research may be warranted across a broader population in order to develop more generalizable conclusions. It is almost impossible to conduct a study on a large population that is comprehensive, but as Schram (2003) says it is not necessary (or feasible) to reach some ultimate truth in order for a study to be credible and useful.

## Data Collection Methodology

The primary questions that need to be addressed when developing a data collection methodology are what data are needed, why are they needed and how will they be obtained?

The first step is determining what data are needed in order to effectively answer the research question. By identifying the key components of the research question it is possible to begin breaking the problem down into smaller and more manageable components. The key components are highlighted below in the research question.

How does computer facilitated social networking, as part of a knowledge management process, influence the responsiveness and performance of the Manned Platform Integration Branch (G81) at the Naval Surface Warfare Center (NSWC) in Dahlgren, Virginia?

The most significant component to collect data on will be the responsiveness and performance of the organization. Those are the dependent variables which will ultimately determine the impact of the process. In theory it would be possible to collect only data related to that component and make a determination. Since this study is unique and lacks sufficient historical data with which to structure the data collection it will be beneficial to gather data relating to the other components of the research question. For instance, it would be possible to measure the effect of the new process without knowing participants' familiarity with social networking technology, but there might be an underlying correlation between users' productivity and their familiarity. Because this is a first round qualitative study those types of relationships will be valuable when developing follow-up research.

Using each of those components as a guide it is then possible to list the sub-problems that make up that component. The first column in Figure 1 lists the 4 components and the sub-problems that have been identified.

While identifying the sub-problems it is important to also identify why they are relevant and how answering that sub-problem is relevant to the research. Making sure that the sub-problems are relevant helps to keep the volume of data manageable from both a participant perspective as well as from the researcher's perspective since excessive data will result in a greater investment of both time and money without a significant benefit. The relevance for each problem is in the second column of Figure 1.

Once the research sub-problems have been identified it is possible to determine what questions will need to be answered in order to gather the data which addresses the sub-problems. At this stage in the assessment instrument development the questions are not fully

formed with respect to the specific way they will be worded or how the information will be collected. These questions can be seen in column 3 of Figure 1. This step focuses on getting the basic concept down on paper and determining if the information is relevant and needed for the study. When developing the questions it is important to gather enough data to make the study viable but to not have so many questions that the amount of time it takes to gather the data is excessive which often leads to poor participation in the form of a lower response rate and less accurate and comprehensive data. In the following sections the method of data collection for each question will be identified which will allow the questions to be formalized to meet the appropriate format.

| Subtopic | Relevance | Questions |
|---|---|---|
| Computer facilitated social networking | | |
| Conventional Networking | Provides a baseline to which computer facilitated social networking can be compared | • Have you worked for other branches or organizations? Which ones?<br>• Do you regularly interact with organizations outside the branch? Which ones?<br>• What formal lines of communication do you use? In general? everyday?<br>• What informal lines of communication do you use? In general? everyday? |
| Social Networking Technology | Determines the users familiarity with social networking technology; provides qualitative usage information; identifies reasons employees use social networking technology | • Are you familiar with social networking?<br>• Are you a member of a social networking site? Which ones?<br>• How often to you use them? What do you use them for?<br>• What features do you like/dislike?<br>• Have you ever used Aristotle? What for?<br>• If so what was your impression of it?<br>• Would you recommend it to a friend/coworker? |
| Knowledge Management Process | | |
| Knowledge Management | Identifies KM processes within the organization; determines usage of those processes; | • Are you familiar with Knowledge Management?<br>• What Dahlgren KM resources are you aware of?<br>• How often do you use each<br>• How much time do you use them?<br>• Rate the quality of Dahlgren's KM resources.<br>• What Navy or DoD KM resources are you aware of?<br>• How often do you use them? same<br>• How much time do you use them? same<br>• Rate the quality of Navy/DoD KM resources.<br>• How likely are you to use KM if it meets your needs<br>• How beneficial is KM to your job?<br>• Can you tell us a story about a good thing that happened to you after doing KM? can you quantify the benefits? approximate?<br>• What is your perceived value of the content available on a KMS?<br>• What would you like to see in a KMS? |

| | | |
|---|---|---|
| Knowledge Acquisition | Identifies how employees gain and transfer knowledge; | • Where do you go for technical information?<br>• Where do you go for programmatic information such as funding documents, instructions, forms, and training.<br>• Where do you store your information?<br>• How can others obtain information on what you have done or learned?<br>• How can others obtain your information when you leave?<br>• What is your biggest challenge when trying to gain new knowledge?<br>• Have you ever used DTIC or the DoDTechapedia? |
| Responsiveness and Performance | | |
| Efficiency | How does the efficiency change | • What aspects of your job consume the most time?<br>• What tools do you use to accomplish those tasks more rapidly?<br>• If allowed what would you do to make performing your job easier<br>• How easily can you find information pertinent to your work |
| Quality | How does it impact quality | • Do you trust the data available to you?<br>• Please rate the accuracy of the data available to you<br>• Please rate the relevancy of the data available to you<br>• How recent is the data that is available to you? |
| Management | Impact on tasking related to management | • How is management kept aware of employees accomplishments/awards/tasking? Is it effective?<br>• How is information distributed through the organization? Is it effective? |
| Job Satisfaction | | • How does the current availability of quality information impact your work experience?<br>• What aspects of your job do you believe are burdensome?<br>• What recommendations would you make to improve your ability to do your job? |
| Manned Platform Integration Branch | | |
| Demographics | Identifies usage of KM and SN processes as a function of age; employment; or position | • Position: Manager, Lead Engineer, Engineer, Other<br>• NSWC Employment: 0-2 years, 3-5 years, 5-10 years, 11-20 years, 20+ years<br>• Age: 18-20, 20-25, 25-30, 30-35, 35-40, 40-45, 50+ |
| Organizational Culture | Identifies external factors that | • Do you feel like the Navy encourages knowledge |

| | | |
|---|---|---|
| | could influence the use of a KMS | management? Provide examples these are sensitive questions<br>• Do you feel like the G Department encourages KM? Provide examples<br>• Do you feel like the G81 encourages knowledge management? Provide examples |
| Familiarity with members of the organization | Demonstrates the connectivity of the employee to the other members of the organization | • Do you know what other members of the organization are working on?<br>• Do you know what expertise the members of your organization possess?<br>• How do you contact someone you do not know?<br>• How does someone you do not know contact you? |
| Familiarity with the work of the organization | Identifies interaction and understanding with outside organizations | • Do you know what programs G81 is working on?<br>• Do you know who G81s current sponsoring organizations are? Provide examples<br>• Do you know who the contacts are at the sponsoring organizations?<br>• How much do you know about the sponsoring organization and what they do?<br>• Do you know who G81s customers are? Provide examples<br>• Do you know who to contact within those examples?<br>• How much do you know about your customer and what they do? |

Figure 1: Question Development

## Observations

Since this study will be conducted within the researcher's own organization it affords the opportunity for the research to gather significant data through observation. There are many advantages associated with observation. In a qualitative study it allows for data to be collected in an unstructured and free-flowing format which will allow the researcher to take advantage of unforeseen data sources as they surface (Leedy, 2010). Also in terms of validity, observational research findings are considered strong assuming the observations are comprehensively documented.

Observation is not without its drawbacks. Because of the flexibility that it provides, a novice researcher may find themselves overlooking more essential data and wasting considerable time observing and recording trivialities (Leedy, 2010). In addition the amount of time required for observation can make its implementation challenging, however the structure of this study allows form ample time to observe the population. A point of debate associated with observation is the reactivity of the participants. The idea of reactivity states that the researcher's very presence will influence what people say and do. Participants may be more inclined to say or act in the manner that they believe the researcher wants to see rather than how they would act in their absence. One way to lessen this effect is to increase the duration of the observation. Even contrived behavior is difficult to maintain over time and a long term study will often catch a glimpse of natural behavior. (Brown, 2011)

For this study observation will be able to be done in two different ways. The first method for observation will be wholly unstructured and involved the researcher taking field notes over the course of the initial training and the 4-6 month implementation of the social networking process. During the researcher's regular work routine he will note any observations he makes with respect to how people are using and reacting to the new process. This will include, but is not limited to, comments and discussions made directly with the researcher as well as comments and discussions held between participants. Additionally, if the researcher comes across a situation in which he believes more information is necessary he will question the participant specifically. This

will in a sense be a continuous monitoring of the organization although the actual observation will be secondary to the researcher going about his normal routine.

The second way in which observations will be conducted will be through the social networking medium itself. The researcher will have access to each participant's profile and will be able to unobtrusively observe many aspects of the process. Observation of the social networking landscape will help the researcher observer trends within the organization and help determine what components and topics will lend themselves to future quantitative analysis. At a minimum the researcher's online observation will consist of him visiting all participants profile at least once a week and noting the participants activities and participation.

## Interviews

Interviews will provide a more structured approach to gathering data but will still allow for some level of flexibility. Interviews generally revolve around a few central questions and for this research study seeks to obtain data for those questions that would not be able to be accurately answered in a survey format or by observation alone. Information that can be gathered from interviews can include facts, peoples believes and perspectives about the facts, feelings, motives, present and past behaviors, standards for behavior (what people think should be done in certain situations), and conscious reasons for actions or feelings (Silverman, 1993). Interviews differ from observations in that they are scheduled and more structured. For this study an interview will be conducted both pre and post treatment. It will then be possible to compare the two to help determine the treatments impact.

Leedy (2010) provides guideline for conducting a productive interview which is based in part on guidance offered by experts in qualitative research (Eisner, 1998; Shank, 2002; Silverman, 1993; Creswell, 2009). This guidance will be used to develop the interview format.

Identify questions in advance. Although the interview will be semi structured and flexible, it is important to identify the questions in advance for multiple reasons. It will provide a good outline for the interview to follow so that at all identified topics are covered and each interview is

conducted in a similar manner. By identifying the questions in advance the researcher will have had the opportunity to make sure the questions he is asking are necessary and appropriate. In the design methodology section a number of questions were identified. Some of those questions will lend themselves to being answered in a survey, but for the ones that require a more open ended response an interview provides an excellent opportunity to accurately answer them. Table 2 below lists the questions identified earlier on the left. The right side is the list of interview topics that will be covered. Those questions that can be answered in a survey will not be part of the interview questions and have been struck for this section.

| Questions | |
|---|---|
| • ~~Have you worked for other branches or organizations? Which ones?~~<br>• ~~Do you regularly interact with organizations outside the branch? Which ones?~~<br>• What formal lines of communication do you use? In general? everyday?<br>• What informal lines of communication do you use? In general? everyday? | • In general what type of communication do you use and for what purpose?<br>○ Formal<br>○ Informal |
| • ~~Are you familiar with social networking?~~<br>• ~~Are you a member of a social networking site? Which ones?~~<br>• ~~How often to you use them?~~<br>• ~~How much time do you use them?~~<br>• What do you use them for?<br>• What features do you like/dislike?<br>• ~~Have you ever used Aristotle?~~ What for?<br>• If so what was your impression of it?<br>• ~~Would you recommend it to a friend/coworker?~~ | • Please describe the social networking technologies you use:<br>○ In general what do you use them for?<br>○ What features do you like?<br>○ What features do you dislike? |
| | |
| • ~~Are you familiar with Knowledge Management?~~<br>• ~~What Dahlgren KM resources are you aware of?~~<br>• How often do you use each?<br>• How much time do you use them?<br>• Rate the quality of Dahlgren's KM resources.<br>• What Navy or DoD KM resources are you aware of?<br>• How often do you use them? same<br>• How much time do you use them? same | • What is your familiarity of Knowledge Management and how do you use it and see it used at Dahlgren and across the Navy?<br>○ Frequency of use<br>○ Duration of use<br>○ Quality of KM resources<br>○ Impact on your job<br>○ Perceived value of the content<br>○ What's missing<br>○ Provide a story of a good thing that happened as a result of doing KM. |

| | |
|---|---|
| • Rate the quality of Navy/DoD KM resources.<br>• How likely are you to use KM if it meets your needs<br>• How beneficial is KM to your job?<br>• Can you tell us a story about a good thing that happened to you after doing KM? can you quantify the benefits? approximate?<br>• What is your perceived value of the content available on a KMS?<br>• What would you like to see in a KMS? | • Can you quantify the benefits? |
| • Where do you go for technical information?<br>• Where do you go for programmatic information? they need to know what you mean about programmatic information, I do not know.<br>• Where do you store your information?<br>• How can others obtain information on what you have done or learned?<br>• How can others obtain your information when you leave?<br>• What is your biggest challenge when trying to gain new knowledge?<br>• ~~Have you ever used DTIC or the DoDTechapedia?~~ | • How do you and your organization currently manage technical and programmatic information?<br>○ Where do you go to get it?<br>○ Where do you store it?<br>○ How can others get it now?<br>○ How can they get it when you leave?<br>○ What is your biggest challenge when trying to gain new knowledge? |
| | |
| • What aspects of your job consume the most time?<br>• What tools do you use to accomplish those tasks more rapidly?<br>• If allowed what would you do to make performing your job easier<br>• How easily can you find information pertinent to your work | • What are the biggest challenges to completing your tasking in timely manner?<br>○ What wastes the most time?<br>○ What tools to you use to overcome those challenges?<br>○ What changes would you make?<br>○ How easily can you find information pertinent to your work? |
| • Do you trust the data available to you?<br>• Please rate the accuracy of the data available to you<br>• Please rate the relevancy of the data available to you<br>• How recent is the data that is available to you? | • Please describe the data that is available to you.<br>○ For the most part do you trust that the data is accurate?<br>○ For the most part is the data relevant?<br>○ For the most part is the data recent? |
| • How is management kept aware of employees accomplishments/awards/tasking? Is it effective?<br>• How is information distributed through the organization? Is it effective? | • What methods does management use to distribute and gather information?<br>○ Are they effective? |
| • How does the current availability of quality information impact your work experience?<br>• What aspects of your job do you believe are burdensome?<br>• What recommendations would you make to improve your ability to do your job? | • Does the current availability of quality information impact your work experience?<br>○ What aspects are burdensome<br>○ What improvements would your recommend? |
| | |

| | |
|---|---|
| • ~~Position: Manager, Lead Engineer, Engineer, Other~~<br>• ~~NSWC Employment: 0-2 years, 3-5 years, 5-10 years, 11-20 years, 20+ years~~<br>• ~~Age: 18-20, 20-25, 25-30, 30-35, 35-40, 40-45, 50+~~ | |
| • Do you feel like the Navy encourages knowledge management? Provide examples these are sensitive questions<br>• Do you feel like the G Department encourages KM? Provide examples<br>• Do you feel like the G81 encourages knowledge management? Provide examples | • Do you believe that knowledge management is encouraged? Provide examples |
| • Do you know what other members of the organization are working on?<br>• Do you know what expertise the members of your organization possess?<br>• How do you contact someone you do not know?<br>• How does someone you do not know contact you? | • How well do you know the members of the branch?<br>○ What are they working on?<br>○ What is their expertise<br>○ How do you contact someone you don't know<br>○ How do they contact you |
| • Do you know what programs G81 is working on?<br>• Do you know who G81s current sponsoring organizations are? Provide examples<br>• Do you know who the contacts are at the sponsoring organizations?<br>• How much do you know about the sponsoring organization and what they do?<br>• Do you know who G81s customers are? Provide examples<br>• Do you know who to contact within those examples?<br>• How much do you know about your customer and what they do? | • How well do you know the business of the branch?<br>○ What programs are being worked?<br>○ Who are the sponsors?<br>▪ Organization<br>▪ People<br>○ What do the sponsors do?<br>○ Who are the customers?<br>▪ Organization<br>▪ People<br>○ What do the customers do? |

Figure 2: Interview Questions

**Make sure your interviewees are representative of the group.** Because of the size of the group all members will be interviewed.

**Find a suitable location**. The interviews will be conducted in two locations based on the two buildings in which the employees work. The interview rooms will be quiet and free from distractions while at the same time be comfortable and inviting so that the participants feel welcome and willing to openly share information.

**Get written permission**. The consent form in Appendix D was developed per Old Dominion University format and will be given to each subject prior to participation.

**Establish and maintain a rapport.** It is important to establish a rapport with the interview subjects so that they feel comfortable about being open and honest when answering the questions. Since the researcher is a member of the organization a rapport has already been developed with the majority of the employees in the years he has worked with them. Additional ways to promote general feelings of trust and openness are to smile, maintain eye contact, show genuine interest in what the person has to say and be accepting and encouraging of all answers. It is this social aspect of a research study that can make the difference between merely checking the box versus really gaining insight into the heart of the issues.

**Focus on the actual rather than the abstract or hypothetical.** The purpose of this research is to gather information about how the organizational actually works and what the true impact of the treatment is. It does little good to ask questions based on what-ifs because they will have no value in the final report.

**Don't put words in people's mouth**. There are multiple ways in which an interviewer can "put words" in a participant's mouth. The first starts with how the questions are phrased. Questions should be written in such a way that they do not indicate a preference for any particular answer. Additionally, the researcher needs to give the impression of impartiality and acceptance of any answer. The interviewer must also be patient and allow the participant to fully answer each question on their own without the researcher trying to guide their answer or call out possible inconsistencies.

**Record responses verbatim.** In addition to notes that will be taken by the researcher the entire interview will be recorded. Having an accurate record can save a lot of time down the road, especially after conducting tens of interviews.

**Keep your reactions to yourself.** The researcher is supposed to be a neutral participant in the study and therefore should not react to answers given by the participants. This, however, does not mean that the researcher needs to be emotionless. The researcher should maintain a level of rapport within reason.

**Remember that you are not necessarily getting the facts**. Unless the participant is reading from a factual document (which they will not be) it is important to remember that everything they tell you is based on their recollection and therefore should be considered their perception.

## Survey

In addition to observations and the interview a survey will be given to each participant. Developing a quality survey is a science in itself. There are numerous guidelines and rules to follow when developing a survey and more than enough books on the subject.

To start, a survey a question can either be closed or open ended. Open ended questions allow the participant to answer the questions in their own words by filling in a blank. Because this research is utilizing a survey and an interview all of the possible open ended questions will be answered in the interview format. That leaves only the closed-ended questions which ask respondents to choose from a fixed set of response alternatives. A common criticism of closed-ended questions is that they force people to choose among response alternatives that may not reflect their real feelings about the topic or may not include their true answer (Edwards, 1997). The pairing with interview questions should address that issue. The benefit of the survey is that it will allow much of the more basic and mundane questions to be answered in a format that will allow for easier analysis and processing.

Each closed-ended question can be broken down into two parts: the question and the answer. For each part there are many guidelines to follow and pitfalls to avoid.

When developing the question there are some good basic rules to follow (Edwards, 1997; Leedy, 2010; Grooves, 2004). Below is a list of some of the more prominent rules that will help to guide the process of taking the raw questions identified above and cleaning them up to be quality survey questions.

- Ask what you want to know
- Keep items simple and short

- Ask about only one topic per item
- Avoid ambiguous or vague questions
- Use simple, clear, unambiguous language
- Be specific
- Avoid double negatives
- Avoid biased items
- Take care with sensitive items
- Provide clear instructions
- Give a rational for any items whose purpose may be unclear
- Check for unwarranted assumptions implicit in your questions
- Word your questions in ways that do not give clues about preferred or more desirable responses
- Conduct a pilot test to determine the validity of your questionnaire
- Make the questionnaire attractive and professional looking
- When forgetting is possible use aided recall
- In measuring change over time, ask the same questions each time

Figure 3 below shows the initial survey questions which were created by following the guidelines above. The specific wording of the questions may change in the next section based on the desired answer schema. Often in a study the researcher is inclined to ask as many questions, but most questionnaires are too long, rather than too short, in that many of the items are found to contribute little or nothing to the analysis (Sheatsley, 1983). So far 40 survey questions have been identified which is a manageable number.

| Questions | |
|---|---|
| • Have you worked for other branches or organizations? Which ones?<br>• Do you regularly interact with organizations outside the branch? Which ones?<br>• What formal lines of communication do you use? In general? everyday?<br>• What informal lines of communication do you use? In general? everyday? | 1. Identify what braches of the organization you have worked with.<br>2. Identify which organizations you regularly work with outside the organization.<br>3. What formal lines of communication do you use?<br>4. What informal lines of communication do you use? |
| • Are you familiar with social networking?<br>• Are you a member of a social networking site? Which ones?<br>• How often to you use them?<br>• How much time do you use them?<br>• What do you use them for?<br>~~• What features do you like/dislike?~~<br>~~• Have you ever used Aristotle? What for?~~<br>~~• If so what was your impression of it?~~<br>• Would you recommend it to a friend/coworker? | 5. How familiar are you with social networking?<br>6. Identify which social networking programs you are a member of.<br>7. How frequently do you use it?<br>8. How much time do you spend using it?<br>9. What is your main purpose for using it?<br>10. How likely are you to recommend it to a friend/coworker? |

| | |
|---|---|
| • Are you familiar with Knowledge Management?<br>• What Dahlgren KM resources are you aware of?<br>• How often do you use each?<br>• How much time do you use them?<br>• Rate the quality of Dahlgren's KM resources.<br>• What Navy or DoD KM resources are you aware of?<br>• How often do you use them? Same<br>• How much time do you use them? Same<br>• Rate the quality of Navy/DoD KM resources.<br>• How likely are you to use KM if it meets your needs<br>• How beneficial is KM to your job?<br>• ~~Can you tell us a story about a good thing that happened to you after doing KM? can you quantify the benefits? Approximate?~~<br>• What is your perceived value of the content available on a KMS?<br>• ~~What would you like to see in a KMS?~~ | 11. How familiar are you with Knowledge Management<br>12. Identify what Dahlgren KM resources you are aware of.<br>13. How frequently do you use it?<br>14. How much time do you spend using it?<br>15. Rate the quality of Dahlgren's KM resources<br>16. Identify what Navy/DOD KM resources you are aware of.<br>17. How frequently do you use it?<br>18. How much time do you spend using it?<br>19. Rate the quality of Navy/DOD KM resources<br>20. If KM met your needs you would use it...<br>21. What is your perceived value of the content available on a KMS? |
| • Where do you go for technical information?<br>• Where do you go for programmatic information? They need to know what you mean about programmatic information, I do not know.<br>• Where do you store your information?<br>• How can others obtain information on what you have done or learned?<br>• How can others obtain your information when you leave?<br>• What is your biggest challenge when trying to gain new knowledge?<br>• ~~Have you ever used DTIC or the DoDTechapedia?~~ | 22. Where do you go for technical information?<br>23. Where do you go for programmatic information?<br>24. Where do you store your information?<br>25. How can others obtain information on what you have done or learned?<br>26. How can others obtain that information when you leave? |
| | |
| • What aspects of your job consume the most time?<br>• What tools do you use to accomplish those tasks more rapidly?<br>• If allowed what would you do to make performing your job easier<br>• How easily can you find information pertinent to your work | 27. What aspects of your job consume the most time?<br>28. What tools do you use to accomplish those tasks more rapidly?<br>29. If allowed, what would you do to make performing your job easier?<br>30. How easily can you find information pertinent to your work? |
| • Do you trust the data available to you?<br>• Please rate the accuracy of the data available to you<br>• Please rate the relevancy of the data available to you | 31. Rate your confidence in the data available to you?<br>32. Rate the accuracy of the data available to you?<br>33. Rate the relevance of the data available to |

| | |
|---|---|
| • How recent is the data that is available to you? | you?<br>34. How up to date is the data that is available to you? |
| • ~~How is management kept aware of employees accomplishments/awards/tasking? Is it effective?~~<br>• ~~How is information distributed through the organization? Is it effective?~~ | |
| • ~~How does the current availability of quality information impact your work experience?~~<br>• ~~What aspects of your job do you believe are burdensome?~~<br>• ~~What recommendations would you make to improve your ability to do your job?~~ | |
| | |
| • Position: Manager, Lead Engineer, Engineer, Other<br>• NSWC Employment: 0-2 years, 3-5 years, 5-10 years, 11-20 years, 20+ years<br>• Age: 18-20, 20-25, 25-30, 30-35, 35-40, 40-45, 50+ | 35. What is your position in the organization?<br>36. How long have you been employed at NSWC DD<br>37. What is your age? |
| • Do you feel like the Navy encourages knowledge management? ~~Provide examples~~<br>• Do you feel like the G Department encourages KM? ~~Provide examples~~<br>• Do you feel like the G81 encourages knowledge management? ~~Provide examples~~ | 38. In your opinion does the Navy encourage KM?<br>39. In your opinion does G Department encourage KM?<br>40. In your opinion does G81 encourage KM? |
| • ~~Do you know what other members of the organization are working on?~~<br>• ~~Do you know what expertise the members of your organization possess?~~<br>• ~~How do you contact someone you do not know?~~<br>• ~~How does someone you do not know contact you?~~ | |
| • ~~Do you know what programs G81 is working on?~~<br>• ~~Do you know who G81s current sponsoring organizations are? Provide examples~~<br>• ~~Do you know who the contacts are at the sponsoring organizations?~~<br>• ~~How much do you know about the sponsoring organization and what they do?~~<br>• ~~Do you know who G81s customers are? Provide examples~~<br>• ~~Do you know who to contact within those examples?~~<br>• ~~How much do you know about your customer and what they do?~~ | |

Figure 3: Survey Questions

Once the questions have been crafted the next step is to develop the closed-ended answers. There are typically 4 types of answer schemes that can be employed; yes-no/true-false and Likert rating scales, and the less prevalent Thurstone scaling, and Semantic Differential scaling.

The yes-no/true false scheme is fairly basic. It allows the participant to either agree or disagree with the statement. In some cases there will be an additional option along the lines of 'does not apply'. It has been found that action-oriented managers really like the easy to understand results of these types of questions which give a percentage of people who marked yes or no (or true or false) (Leedy, 2010). The simplicity of these questions though makes it difficult to ascertain the reasons behind the answers so often they are paired with more descriptive follow-up questions. Because of the lack of fidelity provided by these questions all of the survey questions have been crafted to follow a more descriptive schema.

Probably the most familiar and most commonly used scale is the Likert rating scale. Likert scales use ratings to indicate how strongly they feel positively or negatively on an issue. A typical Likert scale is show in Figure 4.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree |

Figure 4: Example Likert Scale

There is no set number of options for a Likert scale, but most surveys employ scales using 5 to 11 points (Bradburn, 1993). In another study on how many stratum to use Cochran (1961) found that the most gains were obtained with six or fewer. It was determined that after a certain point the fidelity of the scale was more than the participant could/would be able to discern.

An additional point of contention when developing the strata is whether or not to use an even or odd number of responses. When an odd number of responses are used it provides a neutral midpoint which in some cases is a benefit when the participant truly has no opinion one

way or the other. Often times though management is not satisfied with a neutral answer because that does not help them make a decision. This study will use an odd number of responses so that a neutral response can be given. There are multiple reasons for this including avoiding bias introduced by the lack of a median answer as well as the fact that if the average response is computed it is possible for values to be located at the midpoint of the scale.

Because of the familiarity and pervasiveness of the Likert scale, combined with the labor intensiveness of the Thurston Scale and the similarity of the semantic differential scale to the Likert scale, this study will use the Likert scale for most of the identified questions. Some of the questions can be answered using a basic multiple choice table. In addition to the guidance provided by the Likert scale there are some additional guidelines to follow when creating the answer stratum.

- Start with the end of the scale that is least popular
- Switching between response formats can be confusing
- When using multiple choice options be exhaustive or allow space for other
- Response options should be mutually exclusive
- Skip patterns or branching can cause errors in responses

The completed survey instrument is located in Appendix E. It combines the survey questions with the appropriate answer layout as per the guidelines found in the related documentation. Many of the questions are more applicable to an interview format and do not make effective survey questions. They are still included in the survey, however, because although the answers may not be as descriptive or accurate as possible it will still provide data which will be easily processed.

A couple of the questions took on a more nonstandard format due to the scope of the information they are designed to capture. The questions could have been laid out in a more standard format but can be conducted more efficiently as they are currently structured.

## Bias

In the research environment, the researcher cannot avoid having data contaminated by bias of one sort or another (Leedy, 2010). Bias comes from countless sources and it is important to try and limit it whenever possible. It is important to acknowledge that just like any study there will be bias present in this study. Out of the many influences there are a couple main components where bias could be introduced and therefore must be addressed.

One of the major sources of bias that needs to be overcome is the bias that the researcher may have. It would be foolish to assume that when a study is started the researcher has no opinion of how they believe the results should turn out. It is imperative that all bias the researcher has is kept to themselves during the observations and interviews. The underlying assumed impact of the treatment is that it will have a positive impact on the organization, but if that information is highlighted or reiterated by the researcher during interactions with the participants then their answers may be biased. Even things such as the researcher's tone of voice or the inflection or emphasis within the sentence may influence how a respondent replies (Leedy, 2010).

Bias can also be present in the written survey instrument. It is important to carefully scrutinize the questionnaire for items that might be influenced by one's education level, interest in the topic, or personal history (Rogelberg, 1998). Even something as simple as the order of the answer options or the layout of the survey can introduce bias.

Two types of bias that will most likely be able to be avoided will be sampling bias and respondent bias. Sampling bias is introduced when the selection of the sample population is done in an inconsistent or incorrect manner. In just about any study it would be possible to find a possibility of bias being introduced. Since this study is sampling the entire population of G81 that is not an issue. Even if the entire population is being sampled there is another type of bias that can be introduced when the response rate is less than 100%. The reason for participants to not respond to the survey all introduce the possibility of bias. The response rate for this study is

anticipated to be 100% due to the interest of the branch, the ease of participation, and the fact that the researcher is a coworker. A response rate of less than 100% will be discussed in the final analysis.

## Administration and Fielding

Because of the pre-test post-test design the interviews and surveys will be given twice, once before beginning the treatment and once after. The interviews will be conducted by the researcher in locations convenient for the participants. Each interview is estimated to last one hour. The interview questions developed in this paper will be used as an outline for the discussion.

The administration can be done two ways. The original plan for conducting the surveys was to have them be delivered through an internet based assessment program. Administering a survey this way provides the participant with a sense of anonymity which may make them more honest in their answers. The self-assessment also allows for the participant to complete the survey on their own time and without tying up the researcher's time. Not needing the researcher to be involved allows for a larger population to be sampled but also presents a better opportunity for the participant to not respond. Upon completion of the assessment instruments, however, the decision has been made to have the researcher administer the survey at the time of the interview. The reasons for this include the fact that self-administered questionnaires often have a higher rate of missing data than interviewer administered questions do (Grooves, 2004), many of the survey questions will not be able to provide comprehensive data, and many of the topics on the survey are similar to the interview questions.

## Conclusion

In order to effectively address the research question proposed for this study it will be necessary to utilize multiple assessment instruments. By combining data gathered through

observations, interviews, and surveys while minimizing the associated biases an accurate picture of the impact of social networking technology on G81 can be created.

Probably the most critical information will be gathered from the one on one interview. It will allow a semi-structured approach which will provide participants the opportunity to discuss the related topics without the ridged structure of surveys.

The survey which was developed through this process will allow for a more structured data collection process that will be easily processed and provide some more quantitative numbers which many managers like to see. The length of the survey is approximately 50 questions although some of the questions take into account multiple responses. This length falls within the suggested 80-100 items and a completion time of about 30 minutes is appropriate for most employee surveys (Paul, 1995).

The third method of data collection is observation of the researcher. This is the least structured method of data collection which makes it the most flexible. Although no questions have been identified the observation will provide good insights when doing the analysis and identify areas that might not have been considered for this study.

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# Appendix C :

## Human Subject Testing IRB

OLD DOMINION UNIVERSITY

HUMAN SUBJECT RESEARCH REVIEW APPLICATION FORM

| **Responsible Project Investigator (RPI)** | | |
|---|---|---|
| **Responsible Project Investigator: The RPI must be a member of ODU faculty or staff who will serve as the project supervisor and be held accountable for all aspects of the project. Students cannot be listed as RPIs.** | | |
| **First Name:** Rafael | **Middle Initial:** | **Last Name:** Landaeta |
| **Telephone:** 757.683.6224 | **Fax Number:** 757.683.5640 | **E-mail:** rlandaet@odu.edu |
| **Office Address:** 241 Kaufman Hall | | |
| **City:** Norfolk | **State:** Virginia | **Zip:** 23529 |
| **Department:** Engineering Mgmt. & Systems Engineering | **College:** Engineering and Technology | |
| **Complete Title of Research Project:** The influence of social networking technology on an engineering organization | | **Code Name (one word):** SocNetTech |
| **Investigators**<br>If more investigators exist than lines provide, please attach a separate list. | | |
| **Investigator(s): Individuals who are directly responsible for any of the following: the project's design, implementation, consent process, data collection, and/or data analysis.** | | |
| **First Name:** Derrick | **Middle Initial:** Marcus | **Last Name:** Tepaske |
| **Telephone:** 540-239-7973 | **Fax Number:** 540-653-4273 | **Email:**derrick.tepaske@gmail.com derrick.tepaske@navy.mil |
| **Office Address:** 18106 Phalanx Drive | | |
| **City:** Dahlgren | **State:** Virginia | **Zip:** 22448 |
| **Department:** Engineering Mgmt. & Systems Engineering | **College:** Engineering and Technology | |
| **Affiliation:** __Faculty _X_ Graduate Student __ Undergraduate Student<br>__Staff __Other_____ | | |
| | | |

| First Name: | Middle Initial: | Last Name: |
|---|---|---|
| Telephone: | Fax Number: | Email: |
| Office Address: | | |
| City: | State: | Zip: |
| Department: | College: | |

**Affiliation**: __Faculty __Graduate Student __ Undergraduate Student
__Staff __Other_____

List all information for additional investigators on attachment and check here: __

Type of Research

**1. This study is being conducted as part of (check all that apply):**

__Faculty Research
_X_ Doctoral Dissertation
__Masters Thesis
__Non-Thesis Graduate Student Research
__Honors or Individual Problems Project
__Other_____

Funding

**2. How is the research project funded?**

_X_ Research is **not funded (go to 3)**
__Research is **funded (go to 2a)**
__**Funding decision is pending** (funding decision has not been made) **(go to 2a)**

**2a. What is the type of funding source? (Check all that apply)**
__Federal Grant or Contract
Agency Proposal
Number_____
Grant Start Date (MM/DD/YY) _____ Grant End Date (MM/DD/YY)
_____
__State or Municipal Grant or Contract
__Private Foundation
__Corporate contract
__Other (specify):_____

**2b. Who is the point of contact at the funding source?**
**Name:**
**Mailing Address:**

**Telephone:** **Email:**

Research Dates

**3a. Date you wish to start research (MM/DD/YY): ___08___/__07___/__2011___**
**3b. Date you plan to end research (MM/DD/YY): ___04___/__07___/__2011___ (End date for data collection and analysis)**
Note: Protocols are approved for a maximum of 1 year. If a proposed project is intended to last beyond the approval period, continuing review and reapproval are necessary.

Research Location

**4. Where will the experiment be conducted? (Check all that apply)**

__ On Campus (Building and Room Number)

_X_ Off-Campus (Street Address): Research will be conducted at the Naval Surface Warfare Center in Dahlgren Virginia. Participants sit primarily in buildings 198 and 218.

Human Subjects Review

**5. Has this project been reviewed by any other committee (university, governmental, private sector) for the protection of human research subjects?**

_X_ Yes – It was reviewed by representatives of the NSWC DD IRB who recommended ODU conduct the review.
__No **(If no, go to 6)**

**5a. If yes, is ODU conducting the "primary" review?**

_X_ Yes
__No **(If no, go to 5b)**

**5b. Who is conducting the primary review?**

Study Purpose

**6. Describe the rationale for the research project.**

Over the last decade the growth of social networking websites and software has led to many initiatives within the Department of Defense and the Department of the Navy that attempt to capitalize on the new technology. The investment in these new technologies has been met with mix reviews as to their effectiveness on the organization, but to date an objective study has not been conducted to quantitatively or qualitatively determine the impact.

As a follow up to a previous paper (Justification of a Lessons Learned/Knowledge Management Process) and other reviewed literature it was proposed to G81 and G80 management that the organization should evaluate the possible benefits of a knowledge management/social networking process to determine if such processes should be adopted. It is the goal of this research to qualitatively determine the impact of a social networking process on an engineering organization as represented by G81 at NSWCDD.

Subjects

**7. What will be the maximum number of subjects in the study? ____50_____**

**7a. Indicate the approximate number of: Males ____25_____**
**Females____25_____**

**7b. What is the age of subjects? (Check all that apply)**
__Children (1-17 years old) _X_ Adults (18-65 years old)
__Elderly (64-years and older)

**7c. Will students be enrolled in the study? ( Check all that apply)**

___Undergraduate students(dept)* _____ ___Advanced students (dept)_____
*If students are under 18 years old, parental consent must be obtained

**7d. Provide rationale for the choice of subjects. Enumerate any additional defining characteristics, including age, of the subject population. (e.g., symptomatology, history, socio-economic status).**

All members of the study population, G81at NSWC, will be asked to participate.

## Vulnerable Subjects

**8. Are research subjects being used whose ability to give informed voluntary consent may be in question? (e.g., children, persons with AIDS, mentally disabled, psychiatric patients, prisoners.)**

__Yes (**If yes, explain the procedures to be employed to enroll them and to ensure their protection**).
_X_ No

**8b. What type of vulnerable subjects are being enrolled? (check all that apply)**

__Critically Ill Patients
__Mentally Disabled or Cognitively Impaired Individuals
__Prisoners
__Physically Handicapped
__Pregnant Women
__Children
__Other_____

## Recruitment

**9. How will participants be recruited? (Please submit a copy of the sign-up sheet, newspaper advertisement, or any other protocol or procedure which will be used to recruit subjects.)**

__Internet
__Newspaper/radio/television advertising
__Posters/brochures/letters
_X_ Other___ All members of the study population (G81) are being asked to participate per the request of the organization's management_____

Comments:

Employees of the branch are being given time on the clock to participate in the data collection

## Inclusion and Exclusion Criteria

**10. Are subjects equitably chosen for participation in the study? (no one group is excluded without justification)**

_X_ Yes
__No (**If no, specify criteria and justify in detail below.**)

**10a. Does the study require special evaluation and screening of potential subjects to determine their appropriateness for inclusion in the study?**

__Yes (**If yes, briefly elaborate on the screening process and attach the screening questionnaire.**)
_X_ No

## Experimental Procedures

**11. Describe the experimental procedures that will be followed. (Include a succinct, but comprehensive statement of the methodology relating to the human subjects. You are encouraged to include a discussion of statistical procedures used to determine the sample size.)**

The experimental design chosen for this case study methodology will be a One-Group Pretest-Posttest Design. It will involve a pre-implementation analysis of the organization to determine a baseline. This analysis will involve a survey and brief interview for each participant. Once the baseline is established the participants will attend a 3 hour training session for the social networking program Aristotle. The training will be conducted by instructors from the Defense Technical Information Center (DTIC) as per their standard training package. Following the training participants will be encouraged by the Branch to use Aristotle as a part of their daily work routine. 30 minutes of use per week is suggested although actual usage is left to the discretion of the participant. After 4-6 months of use the participants will be reassessed using the same assessment instruments provided during the baseline assessment with a few additional survey questions. In addition to the data gathered from the participants data will also be collected from Aristotle such as usage time, frequency and volume of data. Following the posttest data collection a qualitative analysis will be conducted to determine the impact of Aristotle on the branch. All data collected will be kept confidential and the final report will contain only aggregate data and anonymous comments when appropriate.

Because of the size of the branch (>100) people it is possible to include the entire population in the research.

**11a. Will any aversive or painful procedures be employed (e.g., shock, the threat of shock or punishment, experimentally induced stress?)**

__Yes (If yes, specify and justify in detail below.)
_X_ No

**11b. Will the deliberate deception of research participants be involved as part of the experimental procedure?**

__Yes (If yes, explain the nature of the deception, why it is necessary, any possible risks that may result from the deception, and the nature of the debriefing with specific reference to the deception.)
_X_ No

**Attach copies of the following items:**

___Research Protocol(s)
___Questionnaire
___Copies of any instructions or debriefings given
___If the research is part of a research proposal submitted for federal, state or external funding, submit a copy of the FULL proposal

Compensation

**12. How much time will be required of each subject?**

Approximately 30 minutes to complete a survey and 30-60 minutes for an interview for both the pre-treatment and post-treatment assessment. An additional 3 hours of training will be required and a suggested 30 minutes per week using the program.

**12a. Will research subjects receive course credit for participating in the study?**

__Yes (If yes, please explain in comments section.)
_X_ No
Comments:

**12b. Are there any other forms of compensation that may be used? (e.g. Money)**

__Yes (If yes, please explain in comments section.)
_X_ No
Comments:
Participants will be encouraged to spend approximately 30 minutes on the clock a week using the social networking program, but this is considered to be part of their regular work routine.

**12c. Are there any penalties for subjects who do not show up for a research session?**

__Yes (If yes, please explain in comments section.)
_X_ No
Comments:

Informed Consent

**13. Do you intend to obtain informed consent from subjects?**
_X_ Yes (please answer question 13a)

__No (please complete Appendix F: Request for Waiver of Consent Form)

**13a. Describe the procedures that will be used to obtain Informed Consent and attach the Informed Consent Document (follow the guidelines for preparation of the University Informed Consent Form).**

Note: Subjects MUST be given a description of the procedures and rationale for the study to the extent possible. The benefits and ANY risks associated with participating in the study MUST be enumerated. The subjects MUST be informed of their right to terminate the experiment at any time. If there is no risk associated with the study and participants' signature on the informed consent sheet is the only identifying information about the name of the subject, then the subjects' signature may not be necessary.

G81 holds monthly branch meetings at which the Informed Consent documents will be passed out. The information on the document will be presented and all members of the branch will have the opportunity to ask questions. All forms will be collected and kept confidential.

If any identified participants are not able to attend the branch meeting the researcher will meet with them individually to review the consent forms.

Risks

**14. What are potential risks of the research? (Check all that apply)**

__physical harm
__psychological harm
_X_ Release of confidential information
__Other_____

**14a. Describe any potential risks to subjects for the activities proposed and describe the steps that will be taken to minimize the risks. Include any risks to the subject's physical well being, privacy, dignity, emotions, employability, and criminal and legal status. A detailed, comparative statement of the risk (harm or likelihood) must also be described in the consent form.**

Participants will be asked to provide data which they may desire to keep confidential. The researcher will reduce these risks by maintaining confidentiality of all data collected and presenting only aggregate data or anonymous comments. All data collected will be disposed of properly following the completion of the study. Additional risks may include frustration, loss of time, or decreased productivity due to the learning curve associated with implementing a new technology or process. Part of the purpose of this research is to determine the significance of these factors in order to provide recommendations for further implementation. Management has been made aware of, and accepted, the loss of time and decreased productivity risks. As with any research, there is some possibility that you may be subject to risks that have not yet been identified.

Please attach the following (if you have developed them)

__The script by the experimenter to disclose potential harm and likelihood (risk) prior to the subject's choice to participate. – The disclosure script will be identical to the risk identification in the Informed Consent Form

a) Benefits

**15. Assess the potential benefits that may accrue to the individual subject as well as to others as a result of the proposed study. Do the potential benefits justify the possible risks involved? Although you may mention general benefits to society, such speculative benefits should not be presented to a subject as a direct benefit for informed consent.**

The main benefit of participating in this study is to provide the organization with a qualitative analysis of the impact of social networking technology on the organization. Based on this research it will be possible to determine the path forward for the organization with respect to said technology. Others may benefit by gaining access to and utilizing a program and process that is intended to have a positive impact on the participant's job.

Protection of Anonymity

**16. Describe in detail the procedures for protecting the anonymity (meaning that no one will ever be able to know the names) of the research subjects. If anonymity is impossible, then describe in detail the procedures for safeguarding data and confidential records. These procedures relate to how well you reduce the risk that a subject may be exposed or associated with the data.**

The researcher acknowledges the fact that it is not possible to maintain complete anonymity of the provided data. All surveys and interviews will be conducted in private and the raw data collected will be available only to the researchers. The researchers will not share confidential information with any party unless required to by law. Only aggregate data and anonymous comments will be included in the report. All raw data collected will be destroyed following the completion of the research.

Drugs or Devices

**17. Will any drugs, devices, or chemical biological agents be used with the subjects?**

__Yes
_x_ No

**Biological Materials**

**18. Will this research involve the collection, analysis, or banking of human biological materials (cells, tissues, fluids, DNA?)**

__Yes
_x_ No

**Training**

**19. Briefly explain the nature of the training and supervision of anyone who is involved in the actual data collection, research design, or in conducting the research. This information should be sufficient for the IRB to determine that the RPI and investigators possess the necessary skills or qualifications to conduct the study.**

**Dr. Rafael Landaeta** ..... [please fill in your information]

**Derrick Tepaske** has completed a Master's Degree in Engineering Management and has completed all coursework required for a Doctorate in Engineering. Recent research related coursework includes; Methods for Advanced Engineering Projects, Robust Engineering Design, and Engineering Ethics. He has also been under the supervision of his advisor, Dr. Landaeta, since December of 2010 as part of his Doctor of Engineering project.

He has completed the National Institutes of Health (NIH) Web-based training course "Protecting Human Research Participants". Date of completion: 07/05/2011. Certification Number: 712571

**Human Subjects and HIPPA Training**

**20. A. The RPI must document completion of NIH Training.** (Attach a copy of the RPI's NIH Certificate for Human Participants Protections Education for Research Teams.) **Date RPI completed NIH Training:**_____

**B. RPI's who propose studies with patient populations must document HIPPA training by accessing the NIH booklet entitled "Protecting Personal Health Information in Research: Understanding the HIPPA Privacy Rule" at: http://privacyruleandresearch.nih.gov/pr_02.asp. and must submit an attachment to the review application stating that the material has been read and will be adhered to in the proposed research. The attachment must include the date the material was read, which must be within the 12 months prior to the application.** (If you are submitting this attachment with your application the RPI must initial here:_____

**PLEASE NOTE:**

- You may begin research when the University Human Subjects Review Board gives you final WRITTEN notice of its approval.
- You MUST inform the committee of ANY adverse event, changes in the method, personnel, funding, or procedure.
- At any time the committee reserves the right to re-review a research project, to request additional information, to monitor the research for compliance, to inspect the data and consent forms, to interview subjects that have participated in the research, and if necessary to terminate a research investigation.

Responsible Project Investigator (Must be original signature)
Date

# Appendix D :

**Informed Consent Document**

OLD DOMINION UNIVERSITY

**PROJECT TITLE:** The influence of social networking technology on an engineering organization

**INTRODUCTION**
The purposes of this form are to give you information that may affect your decision whether to say YES or NO to participation in this research, and to record the consent of those who say YES. The research is being conducted to determine the influence of social networking technology on an engineering organization, specifically the Manned Platform Integration Branch (G81) at the Naval Surface Warfare Center (NSWC) in Dahlgren, Virginia.

**RESEARCHERS**
**Responsible Principle Investigator**:
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**Investigator**:
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College of Engineering and Technology - Engineering Management and Systems Engineering Department
Phone: 540-239-7973 Email: derrick.tepaske@navy.mil

**DESCRIPTION OF RESEARCH STUDY**
Over the last decade the growth of social networking websites and software has led to many initiatives within the Department of Defense and the Department of the Navy that attempt to capitalize on the new technology. The investment in these new technologies has been met with mix reviews as to their effectiveness on the organization, but to date an objective study has not been conducted to quantitatively or qualitatively determine the impact.

As a follow up to a previous paper (Justification of a Lessons Learned/Knowledge Management Process) and other reviewed literature it was proposed to G81 and G80 management that the organization should evaluate the possible benefits of a knowledge management/social networking process to determine if such processes should be adopted. It is the goal of this research to qualitatively determine the impact of a social networking process on an engineering organization as represented by G81 at NSWCDD.

If you decide to participate, then you will join a qualitative study to research the impact of the social networking program Aristotle on G81. The experimental design chosen for this case study methodology will be a One-Group Pretest-Posttest Design. It will involve a pre-implementation analysis of the organization to determine a baseline. This analysis will involve a survey and brief interview for each participant. Once the baseline is established the participants will attend a 3 hour training session for Aristotle. The training will be conducted by instructors from the Defense Technical Information Center (DTIC) as per their approved training package. Following the training participants will be encouraged by the Branch to use Aristotle as a part of their daily work

routine. 30 minutes of use per week is suggested although actual usage is left to the discretion of the participant. After 4-6 months of use the participants will be reassessed using the same assessment instruments provided during the baseline assessment with a few additional survey questions. In addition to the data gathered from the participants data will also be collected from Aristotle such as usage time, frequency and volume of data. Following the posttest data collection a qualitative analysis will be conducted to determine the impact of Aristotle on the branch. All data collected will be kept confidential and the final report will contain only aggregate data and anonymous comments when appropriate.

If you say YES, then your participation will last for no less than 4 and no more than 6 months at NSWC Dahlgren.

Approximately 50 subjects (encompassing all members of G81) will be participating in this study.

**EXCLUSIONARY CRITERIA**
As a member of G81 at NSWC you have been identified as meeting all criteria to participate in this study. Currently there has been no criteria identified that would exclude you from participating

**RISKS AND BENEFITS**
RISKS: If you decide to participate in this study, then you will be asked to provide data which you may desire to keep confidential. The researcher will reduce these risks by maintaining confidentiality of all data collected and presenting only aggregate data or anonymous comments. All data collected will be disposed of properly following the completion of the study. Additional risks may include frustration, loss of time, or decreased productivity due to the learning curve associated with implementing a new technology or process. Part of the purpose of this research is to determine the significance of these factors in order to provide recommendations for further implementation. Management has been made aware of, and accepted, the loss of time and decreased productivity risks. And, as with any research, there is some possibility that you may be subject to risks that have not yet been identified.

BENEFITS: The main benefit to you for participating in this study is to provide the organization with a qualitative analysis of the impact of social networking technology on the organization. Based on this research it will be possible to determine the path forward for the organization with respect to said technology. Others may benefit by gaining access to and utilizing a program and process that is intended to have a positive impact on the participant's job.

**COMPENSATION**
No compensation will be provided

**NEW INFORMATION**
If the researchers find new information during this study that would reasonably change your decision about participating it will be provided.

**CONFIDENTIALITY**
All information obtained about you in this study is strictly confidential unless disclosure is required by law. The results of this study may be used in reports, presentations and publications, but the researcher will not identify you.

**WITHDRAWAL PRIVILEGE**
It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and walk away or withdraw from the study -- at any time. Your decision will not affect your relationship with NSWC, Old Dominion University, or otherwise cause a loss of benefits to which you might otherwise be entitled

**VOLUNTARY CONSENT**

By signing this form, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied that you understand this form, the research study, and its risks and benefits. The researchers should have answered any questions you may have had about the research. If you have any questions later on, then the researchers identified about should be able to answer them.

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call Dr. David Swain, the current IRB chair, at 757-683-6028, or the Old Dominion University Office of Research, at 757-683-3460.

And importantly, by signing below, you are telling the researcher YES, that you agree to participate in this study. The researcher should give you a copy of this form for your records.

| | |
|---|---|
| **Subjects Printed Name & Signature** | **Date** |

**INVESTIGATOR'S STATEMENT**

I certify that I have explained to this subject the nature and purpose of this research, including benefits, risks, costs, and any experimental procedures. I have described the rights and protections afforded to human subjects and have done nothing to pressure, coerce, or falsely entice this subject into participating. I am aware of my obligations under state and federal laws, and promise compliance. I have answered the subject's questions and have encouraged him/her to ask additional questions at any time during the course of this study. I have witnessed the above signature(s) on this consent form.

| | |
|---|---|
| **Investigator's Printed Name & Signature** | **Date** |

## Appendix E : **Survey Instrument**

1 How long have you been employed at NSWC DD?

| | |
|---|---|
| Under 5 | 20 to 29 |
| 5 to 9 | 30 to 34 |
| 10 to 14 | 35 to 39 |
| 15 to 19 | Over 40 |

2 What is your age?

| | |
|---|---|
| Under 25 | 45 to 49 |
| 25 to 29 | 50 to 54 |
| 30 to 34 | 55 to 59 |
| 35 to 39 | 60 to 64 |
| 40 to 44 | 65 and above |

3 What is your primary position in the organization? (Select one)

| | |
|---|---|
| Line Manager | Mathematician |
| Program Manager | Scientist |
| Project Manager | Safety Engineer |
| System Engineer | Aerospace Engineer |
| Mechanical Engineer | Financial |
| Electrical Engineer | Test Engineer |
| Software Engineer | Drafter |
| Computer Scientist | Mechanical Technician |
| Statistician | Machinist |
| Electrical Technician | |

4 Identify what braches of the organization you have worked with. (Select all that apply)

| Z | W | K | Q | C | Z Department | W Department | K Department | Q Department | C Department |
|---|---|---|---|---|---|---|---|---|---|
| G01-9 | G30 | G60 | G70 | G80 | NSWCIHD | NSWC PHD | NSWC PCD | NSWC CD | NSWC Crane |
| G20 | G31 | G61 | G71 | G81 | DOD | ONR | NRL | DOE | ARL |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| G21 | G32 | G65 | G72 | G82 | CD&I | MCSC | NASA | US Navy | Coast Guard |
| G24 | G33 | G67 | G73 | G83 | USMC | USAF | US Army | DDR&E | DHS |
| G25 | G34 | | | G84 | SPAWAR | TARDEC | | | |

5 What formal lines of communication do you use, and how do you rate the process;

| | Almost Never | Rarely | Sometimes | Often | Most of the Time | | No Value added | Some Value Added | High Value Added |
|---|---|---|---|---|---|---|---|---|---|
| Peer Review | | | | | | | | | |
| Performance Reviews | | | | | | | | | |
| IDPs | | | | | | | | | |
| Line Management Review | | | | | | | | | |
| NAVSEA Instructions | | | | | | | | | |
| Program Lines of communication | | | | | | | | | |
| Tech Briefs | | | | | | | | | |
| Formal Reports | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

6 What informal lines of communication do you use?

| | Almost Never | Rarely | Sometimes | Often | Most of the Time | | No Value added | Some Value Added | High Value Added |
|---|---|---|---|---|---|---|---|---|---|
| Phone | | | | | | | | | |
| Email | | | | | | | | | |
| Face to Face | | | | | | | | | |
| Shared Website | | | | | | | | | |
| Mail | | | | | | | | | |
| Meetings | | | | | | | | | |
| Reports | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

7 You are familiar with social networking.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

8 For each **Social Networking** process listed below please identify you frequency of use, duration of use per visit and your recommendation. Add any additional KM processed you use that are not listed.

| | | Frequency of use | | | | | | Duration of use per visit | | | | Would you recommend it to a friend/coworker? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | I don't know what it is | I know it, but never use it | I use it once a year | I use it once a month | I use it once a week | I use it daily | < 5 minutes | 5-30 minutes | 30-60 minutes | > 60 minutes | No |
| Facebook | | | | | | | | | | | | |
| Myspace | | | | | | | | | | | | |
| Linkedin | | | | | | | | | | | | |
| Google+ | | | | | | | | | | | | |
| Aristotle | | | | | | | | | | | | |
| Twitter | | | | | | | | | | | | |
| Friendster | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |

9 You are familiar with knowledge management.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

10 For each Dahlgren/Navy/DoD Knowledge Management process listed below please identify you frequency of use, duration of use per visit and your recommendation. Add any additional KM processed you use that are not listed.

| | Frequency of use | | | | | | Duration of use per visit | | | | Would you recommend it to a friend/coworker? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | I don't know what it is | I know it, but never use it | I use it once a year | I use it once a month | I use it once a week | I use it daily | < 5 minutes | 5-30 minutes | 30-60 minutes | > 60 minutes | No |
| DTIC | | | | | | | | | | | |
| DD Workspace | | | | | | | | | | | |
| NSWCDD Homepage | | | | | | | | | | | |
| Technical Library | | | | | | | | | | | |
| Navy Knowledge Online (NKO) | | | | | | | | | | | |
| DAU | | | | | | | | | | | |
| HIS | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASSIST | | | | | | | | | | | | | | |
| EBIS | | | | | | | | | | | | | | |
| MCEITS | | | | | | | | | | | | | | |
| Army Knowledge Online (AKO) | | | | | | | | | | | | | | |
| SharePoint | | | | | | | | | | | | | | |
| MEARS | | | | | | | | | | | | | | |
| Outlook Calendars | | | | | | | | | | | | | | |
| MS Project | | | | | | | | | | | | | | |
| Mentorship Program | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

11 If KM met your needs you would use it.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

12 KM is beneficial to my job.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

13 There is value in the information available in KMS.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

14 Where do you go for technical information? (Rank your top 3 choices)

| | |
|---|---|
| Internet Public Domain (Google, Wikipedia, etc) | Individual Computer |
| Internet Gov. (NKO, Dahlgren Website, DTIC, etc) | File Cabinet |
| Colleague | Personal Memory |
| Subject Matter Expert | Notebooks |
| Database (IHS, ASSIST, | Online Databases |
| DD workspace | Presentations |
| Library | Conferences |
| Tech Briefs | Share website/share drive |
| Mentor | Academia |
| Text books | Removable Media |
| Reports, Instruction Manuals | Line Management |
| Journals | |

15 Where do you go for programmatic information?

| | |
|---|---|
| Internet Public Domain (Google, Wikipedia, etc) | Individual Computer |
| Internet Gov. (NKO, Dahlgren Website, DTIC, etc) | File Cabinet |
| Colleague | Personal Memory |
| Subject Matter Expert | Notebooks |
| Database (IHS, ASSIST, | Online Databases |
| DD workspace | Presentations |
| Library | Conferences |
| Tech Briefs | Share website/share drive |
| Mentor | Academia |
| Text books | Removable Media |
| Reports, Instruction Manuals | Line Management |
| Journals | |

16 Where do you store your information?

| | |
|---|---|
| Internet Public Domain (Google, Wikipedia, etc) | Individual Computer |
| Internet Gov. (NKO, Dahlgren Website, DTIC, etc) | File Cabinet |
| Colleague | Personal Memory |
| Subject Matter Expert | Notebooks |
| Database (IHS, ASSIST, | Online Databases |
| DD workspace | Presentations |
| Library | Conferences |
| Tech Briefs | Share website/share drive |
| Mentor | Academia |
| Text books | Removable Media |
| Reports, Instruction Manuals | Line Management |
| Journals | |

17 Other members of the organization area able to find and access information you created in a timely manner.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

18 Other members of the organization will be able to find and access information you created after you leave the organization.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

19 Select top challenges when trying to gain new knowledge? (rank top 3 answers)

| | | |
|---|---|---|
| Do not know where it is | Information complexity | People not sharing knowledge |
| No Subject Matter Expert Available | Lack of motivation to learn | Lack of funding |
| Hard to understand new information | Good enough mentality | Out of your branch knowledge area |
| Do not have access to databases | Organizational culture | |
| Do not have time | Poor quality information available | |

20 What aspects of your job consume the most time?

| | | |
|---|---|---|
| | | |
| | | |
| | | |

21 What tools do you use to accomplish those tasks more rapidly?

| | | |
|---|---|---|
| | | |
| | | |
| | | |

22 If allowed, what would you do to make performing your job easier?

| | | |
|---|---|---|
| | | |
| | | |
| | | |

23 You can easily find information pertinent to your work.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

24 You have confidence in the data available to you.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

25 The data available to you is accurate.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

26 The data available to you is relevant to your work.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

27 The information available to do your job is up to date.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

28 The Navy encourages KM.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

29 G Department encourages KM.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

30 G81 encourages KM.

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither agree / disagree | Agree | Strongly Agree |

31 The current method used by management to maintain awareness of what employees are doing is

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Very Ineffective | Ineffective | Neither effective/ineffective | Effective | Very Effective |

32 The current method used by management to distribute information is:

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Very Ineffective | Ineffective | Neither effective/ineffective | Effective | Very Effective |

33 The current availability of quality information makes your job:

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Very Frustrating | Frustrating | No Impact | Easier | A Lot Easier |

34 Do you know what expertise the members of your organization possess

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| No | Just my team members | Some | Many | Most of them |

35 Are you aware of the programs your branch is working on

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Just my program | A few programs | Some Programs (half) | Many | Most current and future |

36 Do you know who the sponsoring organizations are?

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Just my program | A few programs | Some Programs (half) | Many | Most current and future |

37 Do you know who the sponsoring organizations POCs are?

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Just my program | A few programs | Some Programs (half) | Many | Most current and future |

38 How familiar are you with your sponsor organization's mission?

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Not at all | A little Familiar | Somewhat familiar | Familiar | Very familiar |

39 Do you know who the user organizations are?

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Just my program | A few programs | Some Programs (half) | Many | Most current and future |

40 Do you know who the user organizations POCs are?

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Just my program | A few programs | Some Programs (half) | Many | Most current and future |

41 How familiar are you with what your customer organization does?

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| Not at all | A little Familiar | Somewhat familiar | Familiar | Very familiar |

42 How do you contact someone:

That you know (in your building)?

| | Almost Never | Rarely | Sometimes | Often | Most of the Time |
|---|---|---|---|---|---|
| Phone | | | | | |
| Email | | | | | |
| Face to face | | | | | |
| Through a coworker | | | | | |
| Through line management | | | | | |
| Social Network | | | | | |
| | | | | | |

That you know (outside your building)?

| | Almost Never | Rarely | Sometimes | Often | Most of the Time |
|---|---|---|---|---|---|
| Phone | | | | | |
| Email | | | | | |
| Face to face | | | | | |
| Through a coworker | | | | | |
| Through line management | | | | | |
| Social Network | | | | | |
| | | | | | |

That you do not know?

| | Almost Never | Rarely | Sometimes | Often | Most of the Time |
|---|---|---|---|---|---|
| Phone | | | | | |
| Email | | | | | |
| Face to face | | | | | |
| Through a coworker | | | | | |
| Through line management | | | | | |
| Social Network | | | | | |
| | | | | | |

43 What aspects of your job do you believe are burdensome?

| | | |
|---|---|---|
| | | |
| | | |
| | | |

44 How did your use of Aristotle impact the time it took to solve problems?

45 How did it impact the time it took to find an expert?

46 Will you continue to use the program in the future?

47 What could be improved?

48 How much time a week did you spend on Aristotle?

49 How did it impact your work?

50 How did it impact your job satisfaction?

# Appendix F :

## Consolidated Comments

| 21. What tools do you use to accomplish those tasks more rapidly? | | |
|---|---|---|
| COMPUTER | | |
| Computer | Software - MS Office, Project | Touch things only once |
| computer | Project, PPT, Excel | Stay longer |
| computer | MS Office - PPT & Project | Cheat Sheets |
| Computer | Office Products | templates - make your own |
| computer | Excel, project, email | Schedule time effectively. |
| Computer | Data Acquisition software | Agendas |
| | | tech writer |
| Email, Outlook., | PPT, CAD to demonstrate | |
| Outlook task manager. | solidworks | G-server |
| Outlook | Solid Modeling tools | G-server |
| Email | CAD | RDT&E Server |
| email filters - separate mailboxes | | |
| outlook features | Internet | Tech Library |
| filter out highlights | Dogpile - Compilations of engines | Library |
| | Google | Databases |
| | internet | Sharepoint |
| Window gadgets. | internet/website | Sharepoint |
| Search program in windows | lings to websites | DD Workspace |
| | NSWC Homepage | Sharepoint |
| Tech Manuals | TWMS, KNO, NSWC Info Tool | Team Foundation Studio |
| | DORRS - Software | |
| | dawia | Coworkers |
| | | peers |
| | Phone | SMEs |
| Would like to use outlook, cant | face to face | Lessons learned - talking to people vs google |
| not really available | walking down the hall | 0 |
| | Lines of communication | 0 |
| DCO | Telephone - helps clear up email | 0 |
| DCO Chat, Teleworking & working off hours | Follow up phone calls and email | |
| DCO Live Meeting | effective comms | |
| | Meetings/phone cons | |
| | mouth | |
| | 0 | 0 |
| | | 0 |
| #VALUE! | #VALUE! | #VALUE! |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |

| 21. What tools do you use to accomplish those tasks more rapidly? | | |
|---|---|---|
| computer | Excel, word, project | |
| computer | MS Office | |
| computer | MS Word, Powerpoint | |
| computer - 3d software/cad, ppt, word, visio, MS Office | MS Office, Project and Outlook | NMCI Portal |
| | powerpoint | |
| email | | |
| features of outlook, sorting | documenting & putting in email for traceability | Research |
| email | solidworks | |
| Email - Filters & Prioritization | CAD/Solidworks | personal interaction |
| email filters | CAD | ask around |
| inbox methodology | solidworks - simulator, FEA | ask coworkers |
| | pro-E | SMEs |
| | software | smes |
| | | secretary |
| meetings to facilitate project planning | | driving around |
| MTGS - Multitask | | travel |
| multi-tasking | phone | |
| | phone | |
| | phone | PDM Vault |
| | , telcons, | |

| | 22. If allowed what would you do to make performing your job easier? |
|---|---|
| Access to databases | Order [procure] things easier |
| everyone used same database | Improve contracting process |
| Get rid of security that restricts sharing of info | Purchasing system - own credit card |
| more broadly used accepted sharepoint | central contracts location for contracts |
| Access to more resources readily | |
| Readily available info & ready access | |
| | |
| Unlimited storage | Better colocated |
| general computer issues Less hurdles | opening lines of communication - proximity, getting responses |
| Unlimited acces to SW in a timely manner | More frequent communication. |
| get rid of guardian edge | |
| faster computer - more memory | Easy access to program info |
| Better computing network | Posting vs Sending. |
| Tablet Something portable | |
| | |
| NMCI:IT | reduce reviews - fewer and less frequent |
| No NMCI | Process fo rmeetings |
| no NMCI & ERP | Arms around meetings |
| | |
| get rid of DORRS | Knowing if other people have done the work we are doing |
| PDM to expedite workflow | Templates |
| Better tool than MS Project | |
| | |
| | functional phone bookw: functions |
| Connected outlook | |
| Install outlook on RDT&E & connect to Server | oversite |
| | |
| | less redundancy |
| be involved in requirements process, open communication up the levels | |
| break down engineering design structure | |
| | |
| Reduce approval and justification processess, line management approvals | |
| onestop shop | |
| | |
| 0 | #VALUE! |
| #VALUE! | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | #VALUE! |

| | 22. If allowed what would you do to make performing your job easier? |
|---|---|
| More accessible databases | purchase equipement in a timely manner |
| easier info sharing | all purchasing |
| | eliminate IT purchase requests |
| install sw&hw in a timely manner | Buy stuff easier - Constraints (machine shop, 3k) |
| Autobackup of info with accessability | contracts tracker |
| faster computer | cut red tape - contracting |
| computer hurdles - Sharing & access | cut through red tape |
| Tablet - Portable way to share information | |
| Individual Expertise | less hoops to jump through |
| stronger IT support wrt network connections | common polocies & documented processes |
| huge touch screen | not create new work flows |
| | reduce proposal generation |
| don't know | reduce processes |
| Nothing | |
| know know | |
| | less word of mout |
| | |
| teleport!. . | |
| | chat |
| More teleworking | |

| 42b | | | |
|---|---|---|---|
| 0 N/A | | | 0 |
| 0 N/A | | | 0 |
| Ask line management and coworkers, networking | coworkers, GAL - Phone or email - sometimes stop by | | 0 |
| Coworkers | | 0 | 0 |
| internet - Public - Coworkers | | 0 | 0 |
| Coworkers & Management | | 0 | 0 |
| Coworkers or line management | | 0 | 0 |
| Coworker | line management | | 0 |
| Ask somebody that kay know somebody | | 0 | 0 |
| look at the field - assiciate w/ org on base | google | | call someone |
| Ask Someone | | 0 | 0 |
| Colleagues | Phon call or email | | 0 |
| talk to people face to face | | 0 | 0 |
| google | | 0 | 0 |
| Referals | internet search | | 0 |
| word of mouth, report on i.hs | | 0 | 0 |
| coworker/manager | | 0 | 0 |
| coworker | | 0 | 0 |
| coworkers | | 0 | 0 |
| Word or mouth | | 0 | 0 |
| ask people | | 0 | 0 |
| Lead Engineer | | 0 | 0 |
| coworker, sponsor | | 0 | 0 |
| Coworkers | | 0 | 0 |
| contact other people in that field | | 0 | 0 |
| call someone I know | | 0 | 0 |
| line management | | 0 | 0 |
| Ask around - coworkers | contact because of positive work | | 0 |
| Google | | 0 | 0 |
| #VALUE! | #VALUE! | | #VALUE! |

| 42c. How does someone who does not know you or what you do find you. | | |
|---|---|---|
| 0 N/A | | 0 |
| 0 N/A | | phone or email |
| Coworkers - Email | | 0 email |
| Word or mouth - coworkers - internet Social media - GA | | 0 Phone/email |
| coworker - line management - tech report | | 0 phone or email |
| coworkers give out info | published papers/public litterature | email |
| | dtic/report/papers | phone |
| | | phone, email, f2f, coworker |
| word of mout | work I have done or contact | email or phoen |
| Emails | | email, maybe phone |
| personal contact | | email |
| coworker | | cell phone |
| know someone | | phone |
| word of mouth | | email/phone |
| word of mouth | | phone/email |
| same | they cant | phone, email, face to face |
| coworker | No idea | emails |
| referred by coworker or acquataince | they wouldn't | phone/email |
| | don't know | phone , email |
| ask around, reports, program office | probably don't - coworkers, robin | emails or phone |
| | no mechanism yes-email&phone | Email |
| | | phone/email |
| coworkers | | 0 |
| talk to others | Group Leads | Face to Face |
| know someone who knows you | sponsors | 0 |
| | line management | contact cowoker & line management |
| | | 0 |
| | | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| #VALUE! | #VALUE! | #VALUE! |
| through coworkers | | |
| Mutual coworkers | conferences | call/email |
| people - coworkers | | phone/email |
| coworkers/line management | search internet or coworker | email/call |
| coworkers | shared info - program review/program highlights | phone, email |
| referal from coworker | journals- author, conference presentations | phone/email |
| coworkers | tech reports | email |
| word of mouth | reports, conferences | email or phone |
| word of mouth, through a coworker | | email, second phone |
| line management | | coworkers |
| line management or other management | | phone or email |
| sponsoring org | | phone |
| coworkers | | email/phone |
| program or line management, team members | | email and phone |
| word of mouth | | email |
| colleagues | | email, F2F, phone |
| similar projects | | contact though emails, stop by |
| team leads | | face to face, email & phone |
| line management | | |
| word of mouth | | |
| phone calls & emails | | |
| don't know | | |
| they don't | | |

| 43. What aspects of your job do you believe are burdensome? | | |
|---|---|---|
| Training - Unneeded | Finding the right person for guidance. | IT |
| training | Tracking down relevant information to do the job. | Computer issues |
| Training | access to tools to do your job in a timely manner | Computer woes |
| mandatory trainings - it is what it is | # of places I need to go to get info | computer systems/setup |
| training | | |
| training | YOE & IDP | |
| Training - not very valuable but time consuming | midyears | Writing tech report - getting used to the process. |
| training required | Performance appraisal process | reports |
| repetative training | | Paperwork |
| Mandatory Training - no new content | Purchasing | presentation |
| Mandatory training, | purchase anything | |
| | purchasing things | not keeping up with technology, cant push the envelope |
| DOD Policy. | ordering" | |
| Process & procedues | Ordering to buy and build | Doing new research |
| Procedures- department & base wide - Changing Rules | procurement - Office conditions (HVAC, Mold) | |
| process & regs that don't add value | | Varrying direction |
| NAVSEA Processes with no point | All communication | |
| process - not all jobs fit | on your own for everything | Line management tasks |
| process | Communications | ERP, NMCI, Conference Approval |
| processes, | Lack of communication - don't find out till the last mir | oversite and approval |
| processes - contracting, approval for travel, WAW | Lack of sharing | |
| | | Politics |
| Unproductive meetings | moving money and procuring things | travel |
| meetings - too many i.e systems engineering scrum 20 min every morning | financial | Travel |
| | funding issues | DTS. |
| keeping up w/ admin email | NWA - Begging for work | |
| email | ERP - Financial Management | building conditions |
| reading all email | Funding | |
| email | | finding time to do my work |
| email - overwhelming - too much! | Collateral stuff | |
| | Timecard, | tracability - automated test tools |
| | Timecard - tight schedule | |
| | | None, its work, that's why I get paid |
| | | Just a job |

| 43. What aspects of your job do you believe are burdensome? | | |
|---|---|---|
| #VALUE! | #VALUE! | #VALUE! |
| Training | | |
| mandatory training | finding knowledge or SME | |
| trainings, | finding info | |
| training - CC, IA | finding POCs | |
| all the training - do it all in one place at one time | | Computer |
| annual training | Procurement | Updating NFAS |
| training, | purchasing | DTS |
| training, | purchasing, hazmat, safety approval chain | NMCI |
| excessive training, | ordering, | , IT |
| | purchasing process, sole source justification | IR |
| | procurement, | IT |
| process in general | | |
| process - understandign and following appropriate processes | | |
| process and regulations | Documentation - TRs for everything | |
| developing new processes | | 0 0 |
| process churn | | 0 |
| | | |
| worthless empty meetings | | 0 admin duties |
| extraneous meetings | approvals | action items - data calls |
| | | 0 admin paperwork |
| | communication | admin stuff - primarily IT, Purchase and IA |
| reiteration of rapid prototype process due to lack of info/requirements | | non-productive admin |
| | chrun | 0 |

| 44 | 44b |
|---|---|
| Not at all since training | 0 |
| 0 | 0 |
| 10 min, 5-10 times total, 1 hour each time | used it to help me out, used it for research at beginning of program |
| 0 | 0 |
| 10-20 MIN, 20 | 0 |
| 0 | 0 |
| 0, 2-3 | initial setup - filling out proviflle |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 1 | 0 |
| 0, one visit | 0 |
| 0 | 0 |
| 0, one visit | 0 |
| 1 | 0 |
| 1, one visit | 0 |
| 1 | 0 |
| one visit | 0 |
| 0 | 0 |
| 0, 2 visits | 0 |
| 0 | 0 |
| 2 visits | 0 |
| 0 | 0 |
| o0, 1 visit | no training |
| 3 | 0 |
| 2-3 times at 30 minutes per | just got training |
| 3 | 0 |
| 3 times 30-60 min | used it because it was encouraged |
| 2 | 0 |
| 1-2 15 min per | checking it out, looking up people on other bases - out of date |
| 2 | 0 |
| 1-2 30 min | introducing it to others and discussing relevance |
| 0 | 0 |
| 0 | 0 |
| 2 | 0 |
| 1-2 within the first month for 30 min | 0 |
| 0 | 0 |
| 0 | 0 |
| 10 | to find out if similar workw as there. Other projects? |
| 10, 30 min | 0 |
| 0 | Not |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 1 | 0 |
| 1, 10 min | got an email |
| 6 | 0 |
| 6, 20 min | exploring - see who else is out there |
| 0 | 0 |
| 0 | 0 |
| 15 | 0 |
| 10-15, 5-10min | trying it out, seeing if its useful |
| 0 | 0 |
| 0,1 | 0 |

| 45 | 45b |
|---|---|
| Nothing worked | too many categories - need to group |
| 0 | 0 |
| could find peoples area of expertise | didn't feel like there was a whole lot on there |
| 0 | 0 |
| user interface works well | more users |
| 0 | 0 |
| support static relationships | not much on the side of active interactions |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | Issues with sharing - not confident in safety of info. Skeptical about how well groups worked. Spent a lot of time searching |
| 0 | 0 |
| 0 | Opt out vs opt in, incentive to stay engaged |
| 0 | 0 |
| 0 | better if you could get notificiation, reminder of possible connections, calendar functions, games? |
| 0 | 0 |
| 0 | restricted use/user groups |
| 0 | 0 |
| searching for people with skill set was useful | browse skill sets |
| 0 | 0 |
| na | na |
| 0 | 0 |
| na | na |
| 0 | 0 |
| don't know | don't know |
| 0 | 0 |
| 0 | user interface could be better. Didn't use it enough to have much feedback |
| 0 | 0 |
| 0 | struggled to get profile up to date - more user friendly, get more people on it |
| 0 | 0 |
| structure and organization works well | needs larger community |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| file sharing | larger memory |
| na | na |
| 0 | 0 |
| tag words, lots of results | filtering |
| 0 | 0 |
| simple procedures. | How to create models or drawings |
| 0 | 0 |
| User interface intutitive | no |
| 0 | 0 |
| 0 | 0 |
| interface worked pretty well | 0 |
| 0 | 0 |
| linked infor was good, seachr interests & Credentials | group ownership, publications issues, recommend some logic |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| na | 0 |
| 0 | 0 |
| na | na |

| 47 | 48 | 49 | 50 |
|---|---|---|---|
| n/a | n/a | n/a | n/a |
| 0 | 0 | 0 | 0 |
| made it easeir | n/a | little impact, wouldn't miss it | none |
| 0 | 0 | 0 | 0 |
| na | increased a little | no impact | na |
| 0 | 0 | 0 | 0 |
| na | na | little if any | none |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| pretty quick | na | another tool to share info. Use it to capture lessons learned, huge impact possible | na |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| helped find people quicker - branch divison, found POC | saved tiem | saved time | I don't know |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| na | na | na | na |
| 0 | 0 | 0 | 0 |
| na | na | na | na |

| S1 | S2 |
|---|---|
| more encouraged, more mainstream, required | yes, ive training more bennificial |
| 0 | 1 |
| more users | yes, up to speed |
| 0 | 0 |
| more users. Someone managing it. Too many random categories | yes, simple system , covered well. Didn't have questions when doen |
| 0 | 1 |
| more dynamic content to promote new info | yes, covered most of the features |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 1 |
| mandatory | yes, hit all the subcategories. Appeared to function well |
| 0 | 1 |
| Opt out vs opt in, incentive to stay engaged | yes, touched on importatn parts. Highlight email alerts |
| 0 | 1 |
| draw me in and remined me. More users. Better interfaces. Copy facebook | yes. Explained everything |
| 0 | 1 |
| more people on it - require buy in | yes |
| 0 | 1 |
| more reminders. Messages about whats going on | yes |
| 0 | 0 |
| clearly see the benefit | yes |
| 0 | 0 |
| provide training. Large well connected network. User friendly itnerface | n/a |
| 0 | 0 |
| feil useful quickly - where's the value in 30 min | yes, trained wll but tool inadequate |
| 0 | 1 |
| more knowledge of what type of contacts I can make. If others were using it | yes |
| 0 | 0 |
| more users - up to date | yes, touched on basics, appropriate length |
| 0 | 0 |
| more usters, force it with policy on some level | yes, good sense of how to use it |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| larger file sizes | yes, but forget things after not using it |
| provide training | no - did not receive |
| 0 | 0 |
| filtering - more documents displayed at at time, scroll | yes |
| 0 | 0 |
| more time - no encouragement | yes, learned a lot |
| 0 | 0 |
| More people used it, more info | yes |
| 0 | 0 |
| 0 | 0 |
| more people, more a part of corporate culture | yes, thought it was really good. Good Q&a |
| 0 | 0 |
| forums & user groups focued on topic, critical mass | yes |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| more people | yes |
| 0 | 0 |
| mandatory - required for performance review | yes, good to have computers there to log on to |

| Additional Comments |
| --- |
| 0 |
| |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| on the pile of things to do. |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| good try :( |
| 0 |
| good thing |
| 0 |
| 0 |
| 0 |
| none |
| 0 |
| none |
| 0 |
| no comments |
| 0 |
| 0 |
| 0 |
| no comments |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| no comments |
| 0 |
| 0 |
| no comments |
| 0 |
| no additional |
| 0 |
| 0 |
| 0 |
| 0 |
| no comments |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| stigma about putting out information, avaliable on blackberry |
| 0 |
| cool notebook & pad |

# VITA

**Derrick Marcus Tepaske**
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Fredericksburg, Virginia 22401

## Education

Doctorate of Engineering, Old Dominion University, Norfolk, VA (Summer 2012 Completion)
Master in Engineering Management, Old Dominion University, Norfolk, VA (2007)
Bachelor in Mechanical Engineering, Virginia Tech, Blacksburg, VA (2003)

## Professional Experience

Naval Surface Warfare Center (G21) Dahlgren, Virginia 2012 - Present
Deputy PM and Ship Integration lead for the Patrol Costal Griffin Missile System (PC GMS)

Managed funding planning & execution and schedule for FY12, FY13, and FY14 program execution. Oversaw integration designs, coordinated ship change documents and ship installation drawings, planned and executed a 3 week shipboard prototype installation acting as the technical lead for the program.

Naval Surface Warfare Center/ONR Dahlgren, Virginia 2011 - 2012

Chief Engineer for ONR Code 30 Fires Technical Direction Agent (TDA)
Provide technical and management assistance to the TDA in the three Fires technology investment areas; Targeting and Engagement, Advanced Ammunition and Energetics, and Advanced Weapons. Lead technical representative in planning and executing ONR's Participation at Modern Day Marine.

Office of Naval Research Code 30 Arlington, Virginia 2010 - 2011

Deputy Manager – ONR Code 30 Fires Thrust
Worked with the PM to develop, expand, and manage the ONR 30 Fires S&T portfolio containing approximately 15 active programs executing $20 million in funding. Provided programmatic oversight with respect to cost, schedule and technical performance.

NSWC Adv. Platform Integration Branch (G81) Dahlgren, Virginia 2004 - 2010
Program Manager for the USMC M1A1 Shot Detection System integration, testing, and evaluation program

Generated proposal and funding package, managed the budget, allocated resources and provided oversight. Senior Engineer for Mine Resistant Ambush Protected (MRAP) Vehicle In-service Upgrades. Collaborated with the Joint Program Office and other organizations to address and correct vehicle shortfalls. Senior Engineer for the Full Spectrum Effects Platform (FSEP) Spiral II upgrade. Designed, built, tested, patented and deployed a system to mount a shotgun in a remote weapon station

Lead Mechanical Engineer for the Naval Expeditionary Overwatch (NEO) Program

Coordinated all mechanical engineering efforts to integrate a USV, UAV, HMMWV with an RWS, and a land based control station demonstrating over the horizon data coms with collaborative engagements. Represented the program at events including Fleet Week, S&T Conferences and Modern Day Marine.

Lead Mechanical Engineer and System Integrator for the Gunslinger Shot Detection and Counter-fire System

Designed, built, tested, and fielded a vehicle to Iraq for a 7 month deployment. Participated in month long USMC training events including Desert Talon and Mojave Viper.