Knowledge Documentation - From Text to Graphics:
Can this improve help desk knowledge transfer?

Master’s Thesis

Presented to

School of Arts and Sciences
State University of New York
Institute of Technology

Utica, New York

In Partial Fulfillment
of the Requirements for the
Master of Science Degree
by Teresa J. Gage

August 2007

Teresa J. Gage 2007
APPROVALS

SUNYIT

DEPARTMENT OF INFORMATION DESIGN TECHNOLOGY
CERTIFICATE OF APPROVAL

Approved and recommended for acceptance as a thesis in partial fulfillment of the requirements for the degree of Master of Science in Information Design Technology

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ACKNOWLEDGEMENTS

Two special acknowledgements: one to my journalism colleague Sue Ulrich for her timely and accurate support for the fine details of the English language and to Jean K. for her support in literary phrasing that helped this case study move forward in a timely manner. All in all, this was a fruitful exercise. And I am also appreciative of the experts who participated with such thoroughness.
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ABSTRACT

This thesis was designed to find out if graphics could improve help desk knowledge transfer. Four Web prototype presentation styles were analyzed via the Delphi Method (Michalski 2003) utilizing a panel of experts. The elements tested included the use of text and increasing amounts of graphics presented with different navigation systems. The results proved that graphics could improve knowledge transfer but that a combination of text and graphic may be more effective in a team-centric solution to help desk knowledge transfer.
KNOWLEDGE DOCUMENTATION - FROM TEXT TO GRAPHICS: CAN THIS IMPROVE HELP DESK KNOWLEDGE TRANSFER?

Ah, a new day on a large aerospace company’s Passport Help Desk and Pete, a new team member, opens the Help Desk Mail box. Yeaks! There are 10 unread emails; this is going to be a long morning. Well let’s see what he can get some resolved. The first email is from Tina Timble, “I can not get into Passport.”

![Image of Opening the Morning Mail]

Figure 1 Opening the Morning Mail

[This Passport is a Web portal for employee to access company business activities. For example, they can record time worked, reach human resources, read company news, etc.]

Pete now has to figure out what to do to solve this customer’s problem the first time with a correct and swift help desk solution.

Pete needs to open the Remedy Tracking System and create a record for Tina’s incident. Being new to the process, he has to follow the text instructions on how to proceed. Each step requires that he locate the correct data location and match it to the word titles in the instructions. If he has followed the text correctly, found all the data entries, and clicked all the correct buttons, the tracking system will produce the Problem Ticket he needs to continue.

With the Problem Ticket in place, Pete must now confirm that he has obtained the correct information identifying her Business Unit. He returns to the process document to find
out that the next step is to cross-referencing another source. By entering her name into a Web employee search, he found out that her Business Unit is Jet Flyer and her user identification is tin006. This does not match her information in the Remedy Tracking System. He will have to find out how to get the information updated and will do that later but right now, if possible, he needs to get Tina into Passport.

Not all Business Units use Passport and some are still in the development stage. Now he needs to continue reading in the process document and find where to obtain information about Jet Flyer status. The process document refers to a spreadsheet in the team’s shared document space where he can find out if Jet Flyer is active in Passport. In this case Jet Flyer is in a pilot stage. This means that there are a limited number of employees that has access. Is Tina among those that have access? Pete returns to the document and pages through to find out how to find an answer to this. He finds that he needs to ask a team member find out if Tina has the roles that allow her access to the live system. Now back to the process document to find out what type of team member would have this information. By referring to another text spreadsheet he will be able to identify the technical lead programmer who can find out who has access for Jet Flyers. He finds out that Tina in not among those who has access to the live production Passport system.

Back to the process document to find out which team member can provide schedule information. He reads on and learns that he needs to use a different spreadsheet – one which identifies that it is the deployment lead team member that can provide this information. Pete contacted this team member and found out that there will be three stages of roll out for adding Jet Flyer. It will be six months before the entire business unit will be up and has access. Pete’s help desk team member Mary had a problem like this yesterday and he sure wished she had left notes somewhere. He will catch up with her later but it’s not much help here.

Now he has to get back to Tina and find out more information. It turns out that Tina has just transferred to Jet Flyer and had access when she was in her prior business unit, CommSat. She is working with clients in her
old unit and still needs access. How can he get Tina up and running? Pete has to go back to the process document to read and find out what to do for exceptions. He was directed back to the deployment lead to place a request to the Jet Flyer customer if Tina can be added.

While Pete was waiting for permission to give access to Tina, he needed to get back to her and let her know her problem is being worked on. This was a good time to update her contact information in the Remedy Tracking System. He tries to call her but he was redirected to a voicemail system. What should he say? How much does one say? What is proprietary or controlled information? Yesterday he overheard fellow team member Mary leaving a voice message, so he tries to duplicate her technique. At least he could leave a phone number so Tina can get back to him.

It was several hours later before Pete got an email giving the OK for Tina.

Now he needs to email Tina and give her the details.

![Email Response](image)

**Figure 2 Email Response**

Yes, Pete has Tina headed for access but he is not done yet. He needs to find out how to update her information. He also needs to record all the details in the Problem Ticket, then return to the process document to line up the text, locate the data fields and figure what belongs in each. With these steps complete he can set this issue aside. He will then check with Tina next week to see if she has access. On to the next email…
Introduction

The field of Knowledge Management (KM) has been a recognized challenge for many years. An effective explanation of Knowledge Management is described as:

“In an organizational setting, knowledge management must, at the very least, be about how knowledge is acquired, constructed, transferred, and otherwise shared with other members of the organization, in a way that seeks to achieve the organization's objectives. Put another way, knowledge management seeks to harness the power of individuals by supporting them with information technologies and other tools, with the broad aim of enhancing the learning capability of individuals, groups, and, in turn, organizations.” (Khosrow-Pour 2005)

It is not just the data that makes up an industry. Knowledge management extends not just to the hard facts and figures but to the everyday interactions of peoples. These two types of knowledge are described as propositional or conceptual knowledge and procedural knowledge (Billett 1996). In many cases the procedural knowledge is in place and it is the conceptual knowledge the help desk needs to capture. This combination of knowledge allows the production of a commodity in the most ideal method for the consumer. These consumers need to not only be satisfied with this event but must be overwhelmingly satisfied to return for additional products. No longer can a company just produce a superior product but they must be proactive to capture the consumer for the next product as well.

While all industry works to address this issue, Information Technology is very sensitive to KM. New information is accumulating fast, changes are constantly accelerating, and
consumers have increasing expectations. Where do they turn when they need help? They turn to a call center or help desk.

*My Introduction to Knowledge Management*

Help Desk KM is something I work with everyday. I work for Lockheed Martin’s Enterprise Information Systems as a Senior Help Desk Specialist. This work includes leading a newly formed Help Desk team that will resolve technical issues for a number of corporate-wide software driven processes. The team will provide technical assistance to customers working with activities that include:

- An Intranet WEB electronic catalog for office supplies
- Large-scale database systems which track and report manufacturing purchases
- Systems that track materials and labor
- Complex secure finance systems
- Newly added - Intranet WEB portal/dashboard (Passport) that will soon support all of Lockheed Martin.

When I worked as single person and was the whole “team”, I had the knowledge and notes in a single location. As the “I” became a “we”, this way no longer served effectively for the location and dispensing of help desk knowledge. The challenge was to find a method and resources to successfully capture new knowledge and dispense accumulated knowledge for a whole team.
Over the five years of working a technical help desk, I had many changes in staff. Even in my small team of four, I faced many KM challenges. There were challenges of capturing details about the technical systems as well as the business knowledge. Details about of how and with whom to communicate were vital necessities. With such information, our team would resolve each type of event with maximum efficiency.

Details of how to store, share and add to what should be a “living” document continues to expose these struggles. A vision of perfection would be to have the right information at the right time, in the right place, to insure that we exceed our customers’ requirements.

At any moment, we will have clients requesting assistance on a host of complex issues. The client just wants to get a job done, “Just Fix it!” To the help desk team, “Just Fix” is often a complicated solution. The solution requires knowledge of extensive technical details, business processes, policy standards, timing issues, security, network connections, and training know-how.

Working with such a small team would seem a simple task. Yet there are layers of difficulty for even a simple task. Unlike teams in the past, my new team is completely virtual. Team members are from four states, have different work patterns and different degrees of network availability. Their differing levels of skill and knowledge identified additional needs that had to be addressed to fuse a team into a value-added feature for the clients.

There are team members with which there has been no interpersonal interaction. No longer can I just pop out of the cubicle to demonstrate or point out details. This barrier
alone makes KM a formidable challenge. This case study will identify one feature that might make a significant difference in the outcome of KM for a virtual help desk team.

Our current supported applications include technology that was familiar to the team. They had the general concepts of both inside the organization (buying pencils) and outside work (shopping on the internet.) The use of traditional hierarchical support documentation provided a means to capture and share the core details of how to proceed and who to contact.

The extent of the team’s coverage is about to change. We have acquired the responsibility to support an additional large help application. The help desk will need to scale up support. The size of the team’s depth and breadth of support needs to match this additional application. Now the team’s ability must grow to include grasping layers of complexity. Information about new technology, new design elements, numerous business and technical contacts must be captured and shared. No longer could a linear document secure the transfer of KM needed. The present form of documentation takes time to read and does not meet the team’s time constraints to acquire knowledge fast enough. This approach to documentation is time consuming to construct, maintain and worst of all, it fails to capture the nuances needed to work with multiple business and their points of contact.

An additional concern that needs addressing is the assessment of the team members. What I am seeing is mature members (50+ years old) taking on new technology. They are
eager to learn but they may need a different approach. Team members (<30 years old) have had extensive exposure to WEB activity and are savvy on how to navigate, manipulate and function in the on-line world. The new designs for documentation will need to be an approach that could enable the entire team to take control rather then feel controlled.

Another issue for the new team is how the team will react with its partners. The past help desk support was provided by one fully dedicated person. No sharing was needed, no bookmarking of process- oh yes, no processes either. The former employee left suddenly and data including contacts, business knowledge and mapping skill, was lost. This is a virtual world and the connections must be established and shared quickly. There are now always two shifts working with the same information. Could graphics change or improve what is now a team effort?

*Case Study*

When looking into the possible solutions, it was clear that a help desk team needed a different approach to knowledge management that would allow them to be up and running quickly. It is imperative that the help desk team have the advantage of an effective means to utilize soft knowledge combined with hard documentation. Some sort of effective conversational tool is needed to capture and dispense this knowledge.
This case study was completed to explore one facet of the knowledge management. The decision was to focus on graphics and if the way they were presented could provide a solution to the documentation bottleneck.

To explore if graphics could improve KM for the help desk team by capturing and transferring knowledge, this case study needed a method to review and compare one of the tools of a KMS system, documentation. The present linear model of documentation will provide a baseline. The present documentation could be converted to a Web scrolling-text page for the base line and the first approach. The final approach would be to produce informatics presentations- converting words to graphic forms. Detailed information organized using wayfinding symbols and presented in graphic form will provide the last form as a WEB hyperlink-graphic. Transitions between the scrolling-text
and the hyperlink-graphic models will provide for two additional approaches and a transitional scale.

There is maturing Web 2.0 technology that could provide an additional method to test graphic use. Technology such as a wiki might provide a combination of both the linear and the graphics information. It can be graphic and show only what is needed. New information can be added at any location and still be accessed with hypertext navigation. Eager as I was to use this form of KM, it was not available yet in a manner that could be used for this case study. Security issues could not be risked on company servers.

By bringing together input from multiple experts, I believe this case study will result in clues toward a real world solution. It will further the application of knowledge management. Discovering if graphics can be brought to bear on the challenges of capturing knowledge and will provide value to numerous virtual teams working through similar issues.

Background Studies

Knowledge Management (KM) systems are dynamic and changing activities. A more narrow definition of KM can be described as:

“How an organization identifies, creates, captures, acquires, shares, and leverages knowledge. Systematic processes support these activities, also enabling replication of successes.” (Rumizen 2001)
The functions of capture and share are being explored in this study. A more refined and effective systematic process can be constructed by identifying the best techniques to execute these functions.

A Knowledge Management multi-case study in 2002 looked at past research and identified three research areas: design, matching and organization (Lindgren, Hardless et al. 2002). The design shows how systems are created (Ackerman and McDonald 1996; Lin 2007). The matching research addressed how different approaches are matched to the business systems (Rygielski, Wang et al. 2002). The last group, organization research, studies the environments of knowledge and institutes in which they work (Pirolli and Wilson 1998; Kwon, Yoo et al. 2005; Nuckles and Ertelt 2006).

This classification leaves out one area of study, the actual evolution of a Knowledge Management System (KMS). KMS needs to be responsive to changes in its environment to be able to continue capturing and dispensing knowledge. One of the recent changes in technology is now allows for the additional use of graphics in these activities. How the design of KMS can better function with the use of graphics is the detail with which this study will work.

As the realization that a help desk had unique issues, KMS were developed to answer these challenges. The KMS provides a help desk the facility to realize a high level of execution by providing “better knowledge bases and tools to facilitate on-the-spot call resolution.” (Info-Tech 2005). Different forms of KMS were applied to the various help
desk business models. Tools such Case-based reasoning (Chang, Raman et al. 1996), Web-based integrated systems (Thibeault 1997; Foo, Hui et al. 2002) and even the use of spreadsheets (Burgess and Schauder 2003) were used at various stages in the development of help desk KMS.

By 2005, help desk KMS were being built that also reflected the challenges of globalization, not just internal business requirements. Singh points out “the amount of information produced by an organization each day is growing far quicker than the ability of organization to absorb it in a timely fashion.” (Singh 2005) The help desk capture function can become vast storage of data which usefulness can be doubtful. It is necessary for help desk KMS to move from the “capture” types of KMS to ones that can “create an environment for more analytical and insightful employee dialogue to take place”. (Singh 2005)

This dialogue view is also reflected in what is captured. A help desk KMS needs to capture three forms of knowledge: explicit, tacit and implicit. These are identified by Khosrow-Pour in his list of key terms (Khosrow-Pour 2005): Explicit – “Knowledge that has been captured and codified into manuals, procedures, and rules, and is easy to disseminate” ; Tacit – “Knowledge that can be expressed in verbal, symbolic, or written form but has yet to be expressed” which include such items as customer insight, perceptions, or second-guesses; and Implicit – “Knowledge that cannot be easily articulated, and thus only exists in people's minds, and is manifested through their actions”. Although most KMS can capture explicit knowledge, both the tacit and implicit
can present additional layers of complexity to help desk KMS. One example that has been identified is the ability to work knowledge issues across cultures, adding to KM details like “explicit knowledge does not exist in the minds of most North Americans and Europeans - for the Japanese, it does.” (Kennedy 2004)

To understand the influence and details for setting up and running this case study, it was necessary to explore several KMS issues. Each places a premium on how KMS function and how the addition of graphics might change the dynamics of their function in a help desk application. The three KMS issues that will provide background for this case study are transition in methodology, virtual collaboration and conversational technology. It will work to address how best to capture knowledge during a help desk’s evolution of methodology.

In many of the Information Technology (IT) departments, knowledge management was the skill and expertise that a single person brought to the help desk. This knowledge was rarely recorded in a manner that could easily be searched or shared. The drawback of such a system is that knowledge has no means to be shared. When a person left their knowledge is lost to the help desk. This is described as an agent-centric methodology (Gonzalez, Guacgetti et al. 2005). Definition of this is when an agent refers their personal resources as the “collection the requisite information and knowledge to solve a problem is the responsibility of the agent.” (Gonzalez, Giachetti et al. 2005). Where to get information is locked up in one person’s head. The mind map to obtain information from various resources such as data bases, contacts or outside sources is not shared or accessed by others. It relies on each person working out the solutions just from what they know.
A different knowledge Management System (KMS) is needed to work with a team. One solution is a knowledge management-centric methodology. Here the information is collected in a reservoir and can be accessed by multiple agents to resolve issues. It has to be kept up to be current. The ideal knowledge management would be “integrating the technology, peoples and process for improved help desk performance” (Gonzalez, Giachetti et al. 2005).
In this participant case study, it is just this transition that the system is in the process of making. What was a single agent-centric help desk operation is transitioning to a virtual team using a knowledge management-centric concept. It is the reservoir that is being sought. In this case a single document or tool is needed for a small team.

Help desks are in many ways like the research organizations. In the past they have been hierarchical with a theme of centralization. The broadening of knowledge acquisition started with an expert’s knowledge and moved through several processes. As these expand to include the view that “knowledge-creating activities” both the customer and outsourced support have been recognized as part of the community of knowledge (Yakhlef 2002).

In this study, the team members are in three locations and have varied backgrounds and skills. The key to allowing these experts to pool their skills, time and flexibility is the support for a virtual community. The company is providing for an “Alternative Workspace” by providing not only e-mail and audio-conferencing but joint calendars, shared document space, IM and common tools (Malhotra and Majchrzak 2005).

One of the unique features of virtual collaboration is the skill of the community’s members to build connections as to where and who has the expertise to resolve issues. The ability to share knowledge requires a help desk KMS that can function in a virtual world. One of the ways that a virtual community collects knowledge is by collaborative
sharing and discussions. Some of the newer technology provides the mediums to capture these interactions. These technologies identified as *conversational* are defined as: “to reflect that much of the knowledge creation and sharing is carried out through a process of discussion with questions and answers (discussion forum), collaborative editing (wikis), or through a process of *storytelling* (weblogs)” (Wagner and Bolloju 2005).

Wagner and Bolloju concluded “conversational technologies provided have the advantages of being lightweight and relatively inexpensive”. This would seem to make their application to this case a good match. The KMS for help desk transfer might find that these technologies could be incorporated to accomplish knowledge transfer without long development time, big budgets, and on a shoestring of a file space.
Method

The object of this study is to attempt to and forecast which style documentation will best support the help desk information transfer. The transfer knowledge requirement has the additional need that the technology must speedily capture and share that knowledge. In order to gain some insight from actual team members and other experts within the help desk process I selected the Delphi method. This technique started in the 1950’s (Okoli and Pawlowski 2004). The RAND think tank out of California extended its use for forecasting technology and political issues in the 1960s (Gordon 1994). By the mid-1970s the Delphi method had been used in sufficient applications that a handbook for basic principles was produced (Linstone and Turoff 1975).

A renewed interest in the Delphi Method in the 1990s, led to its use in social and medical fields. With the advent of the computer and software, the Delphi method has provided an additional tool for collecting input over distance and time. It allows input from experts who would have been unlikely to participate in a decision analysis due to time and expense.

As a tool, careful “design choices” and “appropriate experts” along with “systematic approach” are needed to conduct a valid study (Okoli and Pawlowski 2004). The time needed to complete the formal process has been addressed by the streamlining the process with software that instantly returns the feedback to the experts. This refinement produced the RT Delphi (Real-Time) (Gordon and Pease 2006) thus demonstrating that the basic principles of the Delphi method is still lively 50 years down the road:
“The technique and its application are in a period of evolution, both with respect to how it is applied and to what it is applied. It is the objective of this book to expose the richness of that may be viewed as an evolving field of human endeavor. The reader will encounter in these pages many different perspectives on the Delphi method and an exceedingly diverse range of applications” (Gordon 1994).

Landeta concluded in his study about the validity of the Delphi method that even in 2005 that it “continues to be used and is a valid instrument for forecasting and supporting decision-making.” (Landeta 2006).

The object of the Delphi method is to build a consensus from a group of experts.

In Sigma Tool Navigator: the Master Guide for Teams Delphi is described as:

“The Delphi method is a very structured approach used to acquire written opinion or to receive feedback about a problem on detailed questionnaires sent to experts. Used by the Rand Corporation during the 1950s, the use of questionnaires prevents interpersonal interaction that can often stifle individual contribution whenever some participants dominate the discussion. Participants' anonymous responses are shared, and each participant can revise his or her response on the basis of reading other opinions. After repeating this process several times, the convergence of opinion will lead to team consensus.” (Michalski 2003)

This study will use the Delphi method to explore yet another field. This time the method will be applied to determine if graphics can improve the technique for the transfer of knowledge in a changing help desk.

I used the Delphi Method to query a set of experts about the use of text and increasing amounts of graphics presented with different navigation systems. In this case study, the experts are far apart in location, time zones, and available time. Their expertise would be difficult to collect in any single meeting or location. With this method none of these factors interfered with the expert’s ability to respond. The anonymity of this technique
also permitted a freedom of expression that actually encouraged opinions to be expressed in an active manner.

To assess if graphics could improve help desk knowledge transfer required that the experts have proto-type sample documents to compare. Using one document presented in four different ways that were built with specific elements included to test the use of text and increasing amounts of graphics presented with different navigation systems.

The four styles of information were presented via a WEB platform. The coding was completed in straight Hyper Text Markup Language (HTML). The HTML was chosen because this language provided the broadest coverage of browser used without any specific security or access issues. The experts could see the same results across platforms and networks by insuring that no additional scripts or software were included. Keeping in mind possible reuse or reproduction of any of the styles, HTML is available for the help desk team to easily edit the information on the pages to provide updated or more precise details. The tools are already present on the company-provided desktop such as Microsoft WORD, Notepad, Xemacs or any text editor.

The document chosen was one actually in use and is a description of three processes that are common to many activities of the help desk: Help Desk Problem Ticket Procedure, Help Desk Down Time Notification and Help Desk Batch Ticket Procedure. The original is a text document kept in on a shared file space. Each time a help desk person accesses it, they need to go there and open it or have printed a hard copy. The names, phone
numbers, project titles all have been changed to insure the information presented was not connected real world entities.

The content in the style is same but the presentations are different.

1) Log into Mars Remedy and click on “Report a Problem” button.

**Figure 6 Example of the Same Content**

By confining the differences between each style to notable features, the experts will be able to comment on the specific details of style. The styles consist of two differences: Text vs. Graphic and Linear vs. Hypertext.

**Figure 7 Text vs. Graphic**

**Figure 8 Linear vs. Hypertext**
It is important to understand how each expert feels about the different styles. The navigation of a Web page might strongly influence the usefulness of a graphic.

The numbers and names that identified the four styles: Style 1 – Scrolling; Style 2 - Paged-text; Style 3 - Paged-graphic; and Style 4 - Linked-graphic. Each style is a progression that differs from the previous one by a single feature.

**Style 1: Scrolling**

The scrolling style is designed to present simple text to a Web page. Each help desk process detail is spelled out in outline format. Enough text was included that it is necessary to scroll to see the entire document. There are no links on the Web page and no graphics.

![Figure 9 Sample of Style 1 - Scrolling](image)
Style 2: Paged-text

The paged-text style maintains the Web text presentation but it is now split up into several pages. Each page has limited navigation details. There are links to connect the Web pages. The expert now has two choices of movement: click text link Next or text link Previous to move one page at a time forward/ backward or click text link Start or text link Last to go to first/last page of document.

![Figure 10 Sample of Style 2- Paged-text](image)

Style 3: Paged-graphic

In the paged-graphic style each step in the paged-text document is illustrated with a graphic image. The linear navigation of the Web pages is the same as the paged-text style. The expert still has only two choices of movement: move one page at a time forward/ backward or go to first/last page of document. The only difference is that there are arrow images in place of the text links.
Style 4: Linked-graphic

The linked-graphic style has added the ability to move to/from any page. Using wayfinding symbols as pathways, the experts can navigate to a specific part of the Web document. Major divisions are on the left side and minor options below the main image.
The four styles are listed in the Style Features table:

```
<table>
<thead>
<tr>
<th>STYLE # - FEATURE</th>
<th>STYLE CHANGE PROGRESSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style 1- Scrolling</td>
<td>Scrolling</td>
</tr>
<tr>
<td></td>
<td>Text</td>
</tr>
<tr>
<td>Style 2- Paged-text</td>
<td>Text</td>
</tr>
<tr>
<td></td>
<td>Linked pages</td>
</tr>
<tr>
<td>Style 3- Paged-graphic</td>
<td>Linked pages</td>
</tr>
<tr>
<td></td>
<td>Graphic</td>
</tr>
<tr>
<td>Style 4- Linked-graphic</td>
<td>Linked pages</td>
</tr>
<tr>
<td></td>
<td>Graphic</td>
</tr>
<tr>
<td></td>
<td>Hyperlinks</td>
</tr>
</tbody>
</table>
```

Table 1 Style Features

With the four document styles in place, it was time to obtain the input of the experts.
The five steps for the Delphi Method (Schniederjans, Hamaker et al. 2004) have been followed:

1) Select group of experts
2) Stage I Questionnaire - send to each expert in group
3) Collect questionnaires, document results
4) Stage II Revised Questionnaire - send to experts
5) Recompile results

Experts Identified
The experts were identified from fellow employees. Invitations to participate were made to help desk team members, process engineers, document experts, training specialists, as well as other customer care experts. These experts were selected carefully because I wanted to include different skills, different ages and perceptions to the process of help desk activities.

Sixteen invitations were made. Since there was no funding and this was by the generosity of their own time, I was very careful to make the prototype style samples as short and precise as possible. The Delphi method was explained to each expert. Only after they were comfortable and indicated their willingness to participate were formal invites sent. This Delphi method was set up with one feedback loop due to resource constraints. The major constraints include that of time of the experts and dates for the completion of the case study.
Stage I - Questionnaire

Stage I questionnaire was sent via email along with consent form. The email held the instructions and links to the four styles to review. Each expert had been contacted and the Delphi method explained in one-on-one interviews at the start of this case study. An email was sent that identified: the two Questionnaire Stages for the data collection, explain what order to proceed, the links to the four Web Documents to review and the questionnaire to fill with their input. Sample email below is Stage I Email Invite/Questionnaire figure.

Figure 14 Stage I Email Invite/Questionnaire

After the experts have been asked to review the four Web documents, they are requested to fill out the questionnaire. The object is to obtain a consensus of opinion whether graphics could improve knowledge transfer. This questionnaire captured their
impressions and permitted them to voice their thoughts about the Web documents. The questionnaire has three sections: Section 1 - Demographic data information is to collect information about the expert, Section 2 - Review Styles Information is for rating and comments and Section 3 – Validation study is a scaled opinion response.

Section 1 is used to collect demographic information to produce a general concept of the overall expert’s background of skills and time in job, gender and age. These attributes are important to the results by providing an understanding what each expert brings to the table.

Each expert was requested to identify their past job experiences skills in number of years in specific skills or areas of expertise. I wanted to know if any expert had actually had Help Desk experience. The Application Development skill will demonstrate how much general technical coding expertise was present. The Data Base Support brings to the expert pool a specific logical organizational perspective. The Instructional Services experience will bring presentation and learning processes skills. The Documentation or Process skills will provide insight to progression and categorize aspects of the Web styles. To insure any special aspect of an expert’s past job activities is not overlooked an Other category was included.
A person who has changed jobs will be acutely aware of the need to access new material quickly. This is similar to the position that a member of a help desk experiences when locating or following an unfamiliar help desk process. It is important to this case study to see if there were experts that had encountered a job change within two, four or longer than four years.

Since the perception of graphics or the navigation technique might have been influenced by age or gender, these general demographics were also collected.
Section 2 was built with two response components. One component is a rating function and the second component is a comment section. Each of four selected features were placed on the second page of the Stage I questionnaire. The four features that were selected directly related to how graphics presented with different navigation systems could improve help desk knowledge transfer. The four features selected were: Ease of navigation, Amount of detail, Time to read and Clarity of how to proceed.

Knowledge transfer requires documentation have the capacity to follow process and move through information to obtain the details needed to proceed. The B1 - Ease of navigation feature allows the experts to provide input into how movements around each of the documents are better matched for graphics.

The purpose of the four Web documents was to provide the same detail in process but in different presentations: text vs. graphic. The B2- Amount of detail feature is to determine if there was a perceived difference in detail when graphics were used. Although the
processes were the same, the graphic did provide additional information as to precisely where the data entry is on the page. This is not in the written description of the three processes.

One of the goals of the graphics is to convey information quickly. It was important to have the experts provide input about the time the reading process took. The B3 -Time to read allowed the experts to compare and provide input as to additional speed gained using the graphics.

Since this study is to address transfer knowledge, this includes the how to complete the three processes in the help desk document. The B4 -Clarity of how to proceed encouraged the experts to focus on whether graphics or the way they are presented would still be understandable for each help desk process.

The experts were asked to order each style for B1-B4 features. The styles were rated from best to least for these specific attributes. Following the ratings, the experts were also asked to comment on why they selected a style for best and why they selected a style for least. It was the comments that provided the most direct input by the experts.
Figure 18 Section 2 - Rating/Comment

Section 3 was designed to ask for validation on statements about each of the four prototype Web styles. The general form of a validation survey comes from a German version of the questionnaire (Simon, Schorr et al. 2006). Each style has four statements for the expert to validate their input about. The last statement of each style is “I like this style.” This gave the experts a point to place their overall impression of the styles form and function.

Style 1 - Scrolling had specific baseline questions about text documentations. I wanted to determine if the expert had a bias for or against scrolling by acquiring validations about “Scrolling is a nuisance.” Then an expert could weigh in with their input if documentation is better without graphic in the “Text only style provides for clear details.” The scrolling style is the only style with no links. By asking validation on “No links is an efficient style,” the experts have an opportunity to champion against the use of links.
Style 1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrolling</td>
<td>is a nuisance.</td>
</tr>
<tr>
<td>Text only style</td>
<td>provides for clear details.</td>
</tr>
<tr>
<td>No links</td>
<td>is an efficient style.</td>
</tr>
<tr>
<td>I like this style</td>
<td></td>
</tr>
</tbody>
</table>

Figure 19 Section 3 - Scrolling Validation

Style 2 – Paged-text presents links and small pages with no graphics. The paged-text style navigation was restrictive permitting only paging one forward/back or going to Start or End page. Since this style is the first appearance of link, experts had an opportunity to comment on “Linking pages is a good way to break up a long document.” Now without scrolling the pages were smaller but did that improve presentation? For this the experts had the statement “Smaller pages are easy to read.” The experts will already have seen the graphic in the following styles and “The lack of graphics makes this style exasperating.” validation will gather input about text vs. graphic.

Style 2

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Linking pages is a</td>
<td>good way to break up a long document.</td>
</tr>
<tr>
<td>Small pages are easy to</td>
<td>read.</td>
</tr>
<tr>
<td>The lack of graphics</td>
<td>makes this style exasperating.</td>
</tr>
<tr>
<td>I like this style</td>
<td></td>
</tr>
</tbody>
</table>

Figure 20 Section 3 - Paged-text Validation
Style 3 – Paged-graphic introduces images. The navigation system is still restrictive but even the links are now arrows instead of text. Would the experts see this navigation system still useful with the graphics? They were asked to validate “Linear navigation is good for beginners.” This input will establish if the experts felt beginners need a different presentation even with the use of graphics. The object of transferring knowledge on the help desk is to provide more information quickly. “Graphics provide information quicker than text” when validated will provide input if graphics improved speed. Since the paged-graphic style is using paged navigation “Linear navigation is frustrating.” will validate if the experts feel the graphics alone does not improve the ability to transfer knowledge.

<table>
<thead>
<tr>
<th>Style 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear navigation is good for beginners.</td>
</tr>
<tr>
<td>Graphics provide information quicker than text.</td>
</tr>
<tr>
<td>Linear navigation is frustrating.</td>
</tr>
<tr>
<td>I like this style.</td>
</tr>
</tbody>
</table>

*Figure 21 Section 3 - Paged-graphic Validation*

Style 4 –Linked-graphic style has added links to enable full movement to any page from any page. The links are presented as symbols, images of data entry buttons or field names. The symbols are identified on the lead page for help desk process but are without further explanation off the lead page. To validate that graphic symbols were functional is what “The navigation symbols are easy to follow.” statement will do. The transfer of help desk knowledge might get lost in the hyperlink-graphic style is why the experts were presented with “This style is effective for beginners” statement to validate. The flip side
of beginners is experienced users that no longer need step-by-step process instruction by access to specific details quickly. Could the linked-graphic style provide a smooth transfer of help desk knowledge? Here the experts were given “Experienced users will find this style efficient.” statement to validate.

<table>
<thead>
<tr>
<th>Style 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>The navigation symbols are easy to follow.</td>
</tr>
<tr>
<td>This style is effective for beginners.</td>
</tr>
<tr>
<td>Experienced users will find this style efficient.</td>
</tr>
<tr>
<td>I like this style.</td>
</tr>
</tbody>
</table>

*Figure 22 Section 4 - Linked-graphic Validation*

Summary of the Section in the Stage I questionnaire is in the table below.

<table>
<thead>
<tr>
<th>Section</th>
<th>INFORMATION</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>Demographic data information</td>
<td>Skills, time in job, gender, age</td>
</tr>
<tr>
<td>Section 2</td>
<td>Review styles information</td>
<td>Rating features</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comments on best and least liked features</td>
</tr>
<tr>
<td>Section 3</td>
<td>Statements about each style</td>
<td>Validation survey</td>
</tr>
</tbody>
</table>

*Table 2 Contents of Stage I Questionnaire*

*Compile Data*

Data from the 13 returned questionnaires was compiled in a spreadsheet. Each expert’s information was coded with an entry number so no name would be attached to the input. Then each section from the questionnaire had the data entered in the spreadsheet and totaled. The comments from Section 2 were separated by feature and then grouped by Best and Least. Each of these eight groups of comments was then sorted by Web style within the grouping.
Stage II - Questionnaire

After the return of the Stage I questionnaires and the compilation of the data, it was time to create the second questionnaire. Using the questionnaire from Stage I the Stage II questionnaire built. Section 1 was removed. Section 2 was modified to include the comments. This was the form of feedback being provided to the experts. Section 3 was also included. All ratings and validations had been removed to permit the experts to express changes in the results they provided. Stage II questionnaire was sent only to those experts that responded to Stage I.

---

```plaintext
To: Teresa Jean Gage
Subject: Document - Stage II
Importance: High

Hello Expert,

This is stage II. Please return by Friday 25May07. This will give me time to analyze.

If you have already received this email, please disregard.
Since I did not have a subject the last time I sent this,
I suspect that it was filtered from many folks' mailbox.

Stage II: This is the easy one. I added the input from everyone.
There are two parts to this exercise:

1) Review the responses from other experts.

2) Rate and add additional comments. Feel free to change or add to your previous responses.

3) Return file to me.

Thank you so much for your input!

Your responses were insightful and rich with excellent comments. I was impressed and grateful for such skillful returns.

Eager to analysis,

Teresa :-)```

---

*Figure 23 Stage II Feedback/Questionnaire Email*
Recompile Results

Stage II is the Delphi Method feedback loop. This captured changes from the prior opinions after reading fellow experts comments. Any additional comments were included in the data. The second set of rating and validations were compiled.
Results

For each of the five steps for the Delphi Method (Schniederjans, Hamaker et al. 2004) there are results. Not all are in the form of data and are listed below:

1) Select group of experts: Expert Response

2) Stage I Questionnaire Data - Send each expert in group questionnaire:

3) Collect questionnaires, document results: Compiled Comments

4) Stage II Questionnaire Data - Send revised questionnaire to experts

5) Recompile results: Consensus Data

The experts replied providing input. Their comments and validation gave several views to the effectiveness of the use of text and increasing amounts of graphics presented with different navigation systems. They reviewed, commented and reviewed again the four proto-type Web styles in the case study.

Experts Respond

I interviewed 25 experts and explained the both the object of the case study and the Delphi Method to them. Experts that were willing and able to contribute were identified. They were then asked to participate. The first round of email invites were then sent out to the 16 selected experts. Three experts failed to return their questionnaires.
Figure 24 Expert Selection

There were 13 returns for the Stage I questionnaire. This was a return rate was 81 percent. This is above the anticipated acceptance rate described by Gordon as “between 35 and 75 percent” (Gordon 1994). This also sets the base number of experts below Gordon’s average window of panel members for most studies of 15 – 35 people (Gordon 1994).

Stage I Questionnaire Data

Section 1 - Demographics

The first question for the experts was on their past job activities. The Past Job Activities totaled 357 years of experience. The totals do not identify concurrences of skills, only the total of years reported. There was a heavy representation of coding experts with the 154 years in Application Development. There was strong showing of expert’s skill in Documentation and Process with 103 years. There was strength in the 42 years of Help Desk experience. That insured that this skill was represented among the experts. The
experts brought additional job experiences in: Instructional Services; 23 years, Data Base Support; 19 years and Other; 16 years.

Figure 25 Past Skill Demographics

The inquiry into how long the expert was at their present job indicated that more than two thirds have not changed jobs in more than four years. There were 15 percent of the experts who have had to sharpen their skills with a new job or have to work through major changes in the past two years. There were 15 percent of the experts that dealt with such a change in the last two to four years. This does not account for changes that experts in the same job may have undertaken. The experts that have not changed jobs in greater than four years were identified as 70 percent of experts.
The gender demographics turned out to be nearly evenly split with seven female and six male. This is not reflective of the general IT industry where males outnumber females (Riemenschneider, Armstrong et al. 2006).

The age demographics reflect the critical age issue that the skilled field is now facing (Leonard 2005). The graying of our team is seen clearly in the weight of members that are headed for the retirement marker (55 years here if you have enough years in.).
Section 2

There are two parts in Section 2 - Review Styles Information of the questionnaire for the experts to provide input. In the first part, they ranked the Web proto-types styles by the four specific features: Ease of navigation, Amount of detail, Time to read and Clarity of how to proceed. The rankings were collected and each placing given a value: least = 0, low=1, med=2 and best = 3. The points tallied to produce an aggregated value that allowed comparison between styles. The ranges for ranking are in the Stage I Ranking Ranges for Features table.

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>AGGREGATED VALUE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lowest Score</td>
</tr>
<tr>
<td>Ease of navigation</td>
<td>16</td>
</tr>
<tr>
<td>Amount of detail</td>
<td>10</td>
</tr>
<tr>
<td>Time to read</td>
<td>16</td>
</tr>
<tr>
<td>Clarity of how to proceed</td>
<td>15</td>
</tr>
</tbody>
</table>

*Table 4 Stage I Ranking Ranges for Features*

Style 1 - Scrolling ranked 16 points for navigation. This placed scrolling style bottom in the ranking of navigation for the three styles having 16 points. This text only style had a low ranking for amount of detail with only 10 points. For the time to read value the scrolling style fell in top of the range with 21 points. For clarity the scrolling text had 19 points. This sets this style in middle in the clarity range.
Style 2 – Paged-text ranked 21 points for navigation. This was the highest ranking for navigation. The paged-text style matched the scrolling style with the low ranking of 10 points for amount of detail. This style ranked for time to read with 17 points. This time ranking was the in the middle ranking in the questionnaire results. This style received the lowest rating for clarity with the ranking of 15 points.

Style 3 – Paged-graphic ranked 16 points for navigation. This ranking placed the paged-graphic style as the low ranking for navigation. This paged-graphic style ranked highest with 31 points for the amount of detail. This was the highest single ranking in the questionnaire results. The page-graphic style for the Time to read feature ranked 16 points. This placed this style in the bottom of the time rankings. Clarity to proceed for this style was 24 points. This is the highest in the clarity ranking range.

Style 4 – Linked-graphic ranked 16 points for navigation. This ranking placed this style in the low range for navigation. The linked-graphic style ranked 17 points for amount of detail. This ranking placed this style second highest in the range for detail. The ranking for time to read placed 21 points. The linked-graphic ranked 17 points for clarity to proceed. This placed this style in the middle range for ranking in clarity.
The second part of Section 2 input was the added comments by the experts on Best and the Least liked feature. The full sets of comments were included in the Stage II and can be seen in Appendix D: Stage II Questionnaire. A summary of the comments for each prototype is listed below.

Style 1 – Scrolling is all text with no links. Those experts who had consensus that this style was best included comments that described positive attributes that included the information being on one page and that text is clear and concise. Other comments addressed that the process was clearly described and sequential. Some of the experts were clearly advocates for scrolling and negative about using links. The experts whose consensus on the strolling style as least identified issues such as being lengthy, less
efficient and taking more time to read everything. Scrolling was identified as problem for losing one’s place in a long document and the inclusion of list of details created confusion.

<table>
<thead>
<tr>
<th>Best</th>
<th>Least</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All in one page</td>
<td>• Too lengthy</td>
</tr>
<tr>
<td>• Sequential</td>
<td>• scrolling causes one to lose one’s place</td>
</tr>
<tr>
<td>• No need to click</td>
<td>• detail of lists confused the process</td>
</tr>
<tr>
<td>• Clear &amp; concise</td>
<td>• read everything</td>
</tr>
<tr>
<td>• Scrolling takes less time</td>
<td>• Takes a long time</td>
</tr>
<tr>
<td>• clearest description of process</td>
<td>• Less efficient</td>
</tr>
</tbody>
</table>

*Table 5 Style 1 - Scrolling Summary Comments*

Style 2 – Paged-text was not often selected as best or least so had few comments collected for it. This style has only text but was displayed on several pages using links to permit limited single page forward and backward paging. Those experts who had consensus that this style was best included comments that described positive attributes that included being clean, uncluttered and straight forward. The experts whose consensus on the paged-text style as least identified issues like having to page through, for it taking longer to read and having no graphic sample screen to review.

<table>
<thead>
<tr>
<th>Best</th>
<th>Least</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All data available</td>
<td>• having to page through to try to find what you want</td>
</tr>
<tr>
<td>• Clean</td>
<td>• no sample screens</td>
</tr>
<tr>
<td>• Uncluttered</td>
<td>• takes longer to read</td>
</tr>
<tr>
<td>• straight forward</td>
<td></td>
</tr>
</tbody>
</table>

*Table 6 Style 2 - Paged-text Summary Comments*
Style 3 – Paged-graphic has graphics displayed on several pages using links to permit limited single page forward and backward paging. Those experts who had consensus that this style was best included comments that described positive attributes that included details about being the most detailed, having included graphic sample screens and pictorial and written details. The experts also commented on the paged-graphic for being clear for following process. The experts whose consensus on the paged-graphic style as least identified issues like too many graphics and being too busy. Additional comments included navigation issues such unlabeled arrows, hard to navigate and progression being very linear.

<table>
<thead>
<tr>
<th>Best</th>
<th>Least</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All data available</td>
<td>• need to label navigation arrows</td>
</tr>
<tr>
<td>• detailed sample screens with notes</td>
<td>• very hard to navigate</td>
</tr>
<tr>
<td>• proceed with written &amp; pictorial</td>
<td>• Too many graphics</td>
</tr>
<tr>
<td>• best for understanding</td>
<td>• Too Busy</td>
</tr>
<tr>
<td>• most detail</td>
<td>• Can not jump around easily</td>
</tr>
<tr>
<td>• arrow to proceed to the next step</td>
<td>• progression is very linear</td>
</tr>
</tbody>
</table>

*Table 7 Style 3 - Paged-graphic Summary Comments*

Style 4 – Linked-graphic has graphics displayed on several pages using hyperlinks to permit movement to any page from any page. Those experts who had consensus that this style was best included comments that described positive attributes that included details about having the easiest to read pages, intuitive graphics, and having lots of graphical hints. The experts also commented on being able to select any page and having access to specific areas of interest. The experts whose consensus on the linked-graphic style as
least identified issues like being least efficient by being too busy, process is unclear with no number and no alt tags to provide guidance. For some experts the symbols were confusing.

<table>
<thead>
<tr>
<th>Best</th>
<th>Least</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Can access specific areas of interest</td>
<td>• multiple branches</td>
</tr>
<tr>
<td>• Intuitive with graphic – quick to click</td>
<td>• least efficient - too busy</td>
</tr>
<tr>
<td>• Can select any step from one page</td>
<td>• Process not clear - Steps not numbered</td>
</tr>
<tr>
<td>• lots of graphical hints</td>
<td>• the graphics isn’t intuitive - no alt tags needed</td>
</tr>
<tr>
<td>• No reading involved</td>
<td>• Needed verbiage</td>
</tr>
<tr>
<td>• Easiest to read pages</td>
<td>• Didn’t understand symbols</td>
</tr>
</tbody>
</table>

*Table 8 Style 4 Linked-graphic Summary Comments*

Section 3 – Validation Data

This section allowed scaled opinions. This provided more degrees of expression than yes/no and to explore responses to specific statements. The agree value is an aggregate of strongly agree and agree totals and disagree values are an aggregate of strongly disagree and disagree totals.
The Style 1- Scrolling text expert validation results for the statement “Scrolling is a nuisance.” was split evenly for three agrees and three disagree but the majority were neutral with seven entries. The statement “Text only style provides for clear details.” had three agrees, two neutral but six experts who disagreed. The statement “No links is an efficient style.” had the strong disagreement with 11 entries, only one that is neutral and four that agree. There were four experts that liked this style, three that were neutral and six who did not.

![Figure 29 Validation: Style 1 - Scrolling](image)

The Style 2- Paged-text expert validation results for the statement “Linking pages is a good way to break up a long document.” brought no disagreement. There were nine that registered agree and one neutral. For the statement “Smaller pages are easy to read.” also brought strong 1000 agree with two neutral and two disagree. The statement “The lack of graphics makes this style exasperating.” validated that the text of this style resulted with
six agrees, three neutral and four disagree. The paged-text style had few experts that liked it. Eight experts did not like this style, three were neutral and one liked it.

![Graph showing validation results]

Figure 30 Validation: Style 2 – Paged-text

The Style 3- Paged-graphic expert validation results for the statement “Linear navigation is good for beginners.” had six agree, five neutral and two disagree. The statement “Graphics provide information quicker then text.” had strong nine agree with only three neutral and only one disagree. The paged-graphic style had little navigation options but the validation of the statement “Linear navigation is frustrating.” brought but six agree, five neutral and three disagree. The style had even like, neutral and dislike with four experts each.
The Style 4- Linked-graphic expert validation results for the statement “The navigation symbols are easy to follow.” was clearly a contested issue. There were eight that registered agree and five disagree with no one being neutral for this statement. For the statement “This style is effective for beginners.” had an even split with six agree, six disagree and only one neutral. The statement “Experienced users will find this style efficient.” validated resulted with eight agrees, one neutral and four disagree. The Linked-graphic style had eight experts that liked it. Five experts did not like this style, one was neutral.

Figure 31 Validation: Style 3 - Paged-graphic
Compiled Comments

In this step of the Delphi method, the comments were collected into a spreadsheet. They were grouped by features: Ease of navigation, Amount of detail; Time to read; and Clarity of how to proceed. Each grouping was split into the two comment entries of Best and Least. Each of the eight groups was then sorted by style. The resulting comments were placed back into Stage I Questionnaire and saved as Stage II Questionnaire.

Stage II Questionnaire Data

This is the feedback loop of the Delphi method. The experts get to read the comments from the entire expert group. The Stage II Questionnaire, now with past comments, were sent to experts. The experts were requested to fill Section 2 and 3 a second time. This
gave them opportunities to change or modify their original input after reading additional comments. This was only sent to experts that returned Stage I. There were 12 returns for Stage II (92% return rate.) The returns consisted of five who returned the survey with no changes. Seven returned the Stage II Questionnaire and of those returns only four had any further comments. All 12 provided Ranking and Validation data.

Stage II Questionnaire Ranking

In Ranking only the ranking was presented for input. There were few comments so none were included in these results. The experts again ranked the Web proto-types styles by the four specific features: Ease of navigation, Amount of detail, Time to read and Clarity of how to proceed. Again the rankings were collected and each placing given a value: least = 0, low=1, med=2 and best = 3. The points tallied to produce an aggregated value that allowed comparison between styles. The ranges for ranking in stage are in the Stage II Ranking Ranges for Features table.

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>AGGREGATED VALUE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lowest Score</td>
</tr>
<tr>
<td>Ease of navigation</td>
<td>14</td>
</tr>
<tr>
<td>Amount of detail</td>
<td>14</td>
</tr>
<tr>
<td>Time to read</td>
<td>16</td>
</tr>
<tr>
<td>Clarity of how to proceed</td>
<td>15</td>
</tr>
</tbody>
</table>

*Table 9 Stage II - Ranking Ranges for Features*

Style 1 - Scrolling continued to ranked 17 points for navigation and was still midway in the ranking of navigation. The text only style retained low ranking for amount of detail
with 14 points. The time to read value remained at the top of the range with 20 points. For clarity the scrolling text had 20 points which is still in middle in the clarity range.

Style 2 – Paged-text ranked 23 points for navigation and remained the highest ranking for navigation. The paged-text style became the lowest ranking of 11 points for amount of detail. This style ranked second highest for time to read with 19 points. This style moved up from the lowest for clarity with the ranking of 16 points.

Style 3 – Paged-graphic ranked 18 points for navigation. This ranking placed the paged-graph style as the second highest ranking for navigation. This paged-graphic style remained the highest with 26 points for the amount of detail. The page-graphic style ranked in the middle for the Time to read with 17 points. Clarity to proceed for this style was 21 points and it remained the highest in the clarity ranking range.

Style 4 – Linked-Graphic ranked 14 points for navigation. This placed this style as the lowest for navigation. The linked-graphic style ranked 21 points for amount of detail and kept its place at the second highest in the range for amount of detail. This style ranked 16 points for time to read which placed it at the lowest ranking for time. The linked-graphic style ranked 15 points for clarity to proceed. This placed this style in the bottom of range for ranking in clarity.
Stage II Validation Data

This section allowed scaled opinions and was presented in Stage II. The agree value is an aggregate of strongly agree and agree totals and disagree values are an aggregate of strongly disagree and disagree totals.

The Style 1-Scrolling text expert validation results for the statement “Scrolling is a nuisance.” was four agree, three disagree but the majority were neutral with five entries. The statement “Text only style provides for clear details.” had six agree, three neutral but five experts who disagree. The statement “No links is an efficient style.” had strong
disagreement with nine entries, two neutral and one agree. There were three experts that liked this style, three that were neutral and four who did not.

Figure 34 Stage II Validation: Style 1 - Scrolling

The Style 2- Paged-text expert validation results for the statement “Linking pages is a good way to break up a long document.” brought no disagreement. There were 10 that registered agree and two neutral. For the statement “Smaller pages are easy to read.” also brought strong 10 agree with one neutral and one disagree. The statement “The lack of graphics makes this style exasperating.” validated that the text of this style resulted with five agree, three neutral and four disagree. The paged-text style had few experts that liked it. Eight experts did not like this style, one was neutral and three liked it.
The Style 3- Paged-graphic expert validation results for the statement “Linear navigation is good for beginners.” had five agree, four neutral and two disagree. The statement “Graphics provide information quicker than text.” had strong 10 agree with only two neutral and two disagree. The paged-graphic style had few navigation options but the validation of the statement “Linear navigation is frustrating.” brought but six agree, four neutral and two disagree. The style had even four who liked, three neutral and three dislikes.
Figure 36 Stage II Validation: Style 3 - Paged-graphic

The Style 4- Linked-graphic expert validation results for the statement “The navigation symbols are easy to follow.” was clearly a sided issue. There were five that registered agree and five disagree with two neutral for this statement. For the statement “This style is effective for beginners.” had a change with six agree, four disagree and two neutral. The statement “Experienced users will find this style efficient.” validation resulted with six agrees, one neutral and five disagree. The linked-graphic style had six experts that liked it. Five experts did not like this style, one was neutral.
Consensus Data

The one piece of information to be gleaned from the Delphi Method is the possibility of consensus building. With the small number of experts, losing one return makes direct comparison inaccurate. There was some movement in Stage II.

The ranking values for Stage II were subtracted from Stage I to identify any changes. Those with negative values had fewer experts selecting that style for that ranking. Those with positive values gained in ranking for a style. Those with zero showed no movement.

The Ease of navigation feature had little movement. There was a slight shift away from ranking paged-text style in the least position.
The Amount of detail feature had movement toward ranking the paged-graph style in the best position and lowering the linked-graphic to lower positions.

The Time to read feature saw movement toward lowering the scrolling style to the lowest position. There was also a small movement to improve the linked-graphic for a higher position.
The Clarity of how to proceed feature saw movement away from ranking paged-graphic away from the bottom rank and linked-graphic moved to bottom rank.

<table>
<thead>
<tr>
<th>CLARITY</th>
<th>LEAST</th>
<th>LOW</th>
<th>MED</th>
<th>BEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>scrolling</td>
<td>0</td>
<td>1</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>paged text</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>paged-graph</td>
<td>-2</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>linked-graph</td>
<td>2</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

*Table 13 Clarity Consensus*

Section 3 validations saw little in change. The experts changed their options only slightly but often soften their validations toward neutral.

The Style 1- Scrolling text expert validation for “Scrolling is a nuisance.” moved away from neutral toward agree. The statement “Text only style provides for clear details.” had movement toward agree and away from disagree. The statement “No links is an efficient style.” had movement toward neutral, losing strength on both sides of the validation. The style lost disagree counts and gained neutral.

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>AGREE</th>
<th>NEUTRAL</th>
<th>DISAGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrolling is a nuisance.</td>
<td>0</td>
<td>1</td>
<td>-2</td>
</tr>
<tr>
<td>Text only style provides for clear details.</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>No links is an efficient style.</td>
<td>-1</td>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>I like this style.</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

*Table 14 Style 1 - Scrolling Consensus*

The Style 2- Paged-text validation for the statement “Linking pages is a good way to break up a long document.” had a movement toward agree. For the statement “Smaller
pages are easy to read.” also brought slight movement away from neutral. The statement
“The lack of graphics makes this style exasperating.” saw no notable change. The paged-
text style movement from neutral toward agrees.

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>AGREE</th>
<th>NEUTRAL</th>
<th>DISAGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linking pages is a good way to break up a long document.</td>
<td>-1</td>
<td>2</td>
<td>0 0 0</td>
</tr>
<tr>
<td>Smaller pages are easy to read.</td>
<td>1</td>
<td>-1</td>
<td>-1 -1 0</td>
</tr>
<tr>
<td>The lack of graphics makes this style exasperating.</td>
<td>0</td>
<td>-1</td>
<td>0 0 0</td>
</tr>
<tr>
<td>I like this style.</td>
<td>0</td>
<td>2</td>
<td>-2 -1 1</td>
</tr>
</tbody>
</table>

*Table 15 Style 2 - Paged-text Consensus*

The Style 3- Paged-graphic validation for “Linear navigation is good for beginners.” appears to have polarized some experts who moves away from neutral. The statement “Graphics provide information quicker then text.” had a little movement away from neutral. The statement “Linear navigation is frustrating.” gained neutral and lost agree. The style lost support on both sides.

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>AGREE</th>
<th>NEUTRAL</th>
<th>DISAGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear navigation is good for beginners.</td>
<td>1</td>
<td>-2</td>
<td>-1 0 1</td>
</tr>
<tr>
<td>Graphics provide information quicker then text.</td>
<td>0</td>
<td>1</td>
<td>-1 1 0</td>
</tr>
<tr>
<td>Linear navigation is frustrating.</td>
<td>0</td>
<td>-2</td>
<td>1 0 -1</td>
</tr>
<tr>
<td>I like this style.</td>
<td>-1</td>
<td>1</td>
<td>-1 0 -1</td>
</tr>
</tbody>
</table>

*Table 16 Style 3 - Paged-graphic Consensus*

The Style 4- Linked-graphic validation for the statement “The navigation symbols are easy to follow.” lost agreement and saw movement toward neutral. For the statement “This style is effective for beginners.” saw a clear movement away from agree toward
neutral and disagree. The statement “Experienced users will find this style efficient.” saw movement toward increased agreement. The linked-graphic lost ground in the agree but also in disagree.

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>AGREE</th>
<th>NEUTRAL</th>
<th>DISAGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The navigation symbols are easy to follow.</td>
<td>0</td>
<td>-3</td>
<td>2</td>
</tr>
<tr>
<td>This style is effective for beginners.</td>
<td>0</td>
<td>-2</td>
<td>1</td>
</tr>
<tr>
<td>Experienced users will find this style efficient.</td>
<td>2</td>
<td>-4</td>
<td>0</td>
</tr>
<tr>
<td>I like this style.</td>
<td>-1</td>
<td>-1</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 17 Style 4 - Linked-graphic Consensus

Another piece of information was obtained from Questionnaire. The leading indicator of preference for or against text/graphic for each return was the answer to Section 1 B1 Ease of Navigation. To see if this preference was correlated to age or sex, each was match to the data from the demographic section. There does appear to be strong preferences but age and gender did not appear to be the factors. As seen below the split was strong but relatively even for both age and gender.

Figure 38 Age or Gender vs. Navigation Preference by Style
Discussion

The four styles were designed much like cartoons. The features were exaggerated with the plan to polarize the responses with distinct feelings of like or dislike. The four styles presented challenges for construction. Careful choices were made to insure the Web pages were platform compatible across browsers. This made it difficult to size the pages uniformly. The use of HTML frames would have stabilized the presentation but is not used well in some browsers. To capture links within graphics required the use of mapping which was a technical challenge that was worked out.

The Scrolling style was made long enough to insure that an expert had to scroll several times to access the whole page. Even if the screen was set to very high resolution, it would still require scrolling. I thought this would be a discouragement and that only senior experts would like or prefer it. Much to my surprise, age had no reference to scrolling as an issue.

Nor did gender appear to be a factor in selecting text styles. Excellent comments provided some insight as to why the scrolling text had any favor. Items like: “like to read text,” “sequential numbers indicated navigation path,” “clearest description of process,” “uncluttered” and “get my answers efficiently” are responses that addressed how the expert’s preferences are important to how the documents are presented.

The paged-text style was a bridge away from scrolling and was not expected to find any favor. This did not happen as expected. Even though it was not picked as best, it was not
picked frequently as least either. In the Ease of Navigation, paged-text style actually had
a greater percentage of agreement in favor than text scrolling or graphic hyperlinks.

The paged-graphic style introduced graphics. The navigation was not changed and was
generally quite restrictive. The thought here was to maintain the procedural aspect of the
document. The reception for the graphics was one of the strongest agreements by the
experts. It out-shown all the styles in Amount of Detail ranking and it even placed a
strong second in the Time to Read and Clarity of How to Proceed rankings.

When I got to linked-graphic style, I was most challenged to think out of the box and
create this style. The prior designs had used a procedural fashion. This style now needed
to have hyperlink style navigation. This style would allow a person to go anywhere in the
document from anywhere in the document. Using wayfinding systems, I built symbols to
expedite this navigation concept.

After much design work, symbols were created to work as signposts in the hyperlink
navigation. This was one disappointment that the symbols clearly did not work well for
everyone. Some experts sailed through but others provided feedback such as: “Don’t
understand the symbols,” “Didn’t understand the sun and lightning symbols,” and
“meaning of the graphics isn’t intuitive.” Valuable feedback included the use of the “alt”
tag should have been used for additional clues. This is clearly an excellent HTML
practice that had been overlooked.
Another surprise was how evenly split the comments were on Linked-graphic style. I thought it would be a favorite but not so. Excellent comments as to why not to include items such as “multiple branches,” “too busy,” and “difficult to determine how to navigate.”

The experts retained a sense of humor. A concern that Web surfing might become an issue was commented as “Too much clicking and reading and temptation to click ‘and see what it says.’” Another comment included concerns about navigation with “you need GPS to keep from getting lost.”
CONCLUSION

The answer to the question posed about capturing knowledge documentation by the use of graphics to improve help desk knowledge transfer turned out not to be a simple yes or no. Through the Delphi Method, it became clear that there were additional factors that also lay bearing on this solution.

Would graphics help? Generally the experts agreed that graphics provided more detail. It was accepted as an excellent supportive tool. Many experts felt graphics were faster in providing information 10 points to two during Stage II Validation (figure 36.) What was not so clear was that different expert’s processing styles did not always make graphics the best choice for everyone as shown in Stage II Validation (figure 37.) The addition of graphics with full freedom of navigational movement made following a process more complex and not simpler as noted in Stage II Validation agreement that this would not be for beginners (figure 37.)

The KMS that only uses text are challenged by the time needed to read knowledge details. The experts had consensus that graphics provided more detail as shown in both Stage I and Stage II rankings highest for detail (figures 28 and 33.) The system that can hold graphics will be better able to capture more knowledge and provide more detailed information. Those systems with the technology to hold graphics will have a clear advantage for the transfer of help desk knowledge.

The use of graphics would expand the reservoir of knowledge for the application of a KM-centric methodology. The reservoir would have more detail available if graphics were used. This expansion of the reservoir’s details will enable the virtual help desk team to capture more
specific knowledge and improve the quality of the information to share with team. The reservoir with more details will advance the activities of the transfer of knowledge in a more efficient and effective manner.

The addition of graphics to a KMS would make a better fit for virtual collaboration. A community can better build connections and share knowledge by being inclusive for all help desk members. The changing dynamics of a help desk team can be better addressed with the understanding of how team members function. After reviewing the age and gender information, the experts have provided information about how different people acquire knowledge. The survey results proved that in this case neither age nor gender weighed the preference for or against graphics as shown in Figure 38 Age /Gender vs. Navigation Preferences. The inclusion of graphics will improve detail knowledge for all help desk team members. To move entirely to graphics would not be as effective as a combination of text and graphics. If the KMS was entirely graphic it would become less effective for knowledge transfer for those members that found text most effective such as the experts that ranked scrolling style as high in clarity (figure 33.) A combination of text and graphics would extend the usefulness of the knowledge captured and shared. With a better understanding of each team member’s processing preferences a system will produce better KM transfer results.

Where to go from here? The use of graphics would foster participation in conversational technology. Use WEB 2.0 technologies to merge text and graphic for better capture and share techniques. The details provided by graphics would be captured and used to enrich discussion forums. The collaborative editing of a wiki would encourage team members to capture and share
graphic information. These activities would permit help desk members to input graphic or text in the format that is most efficient for each member. Possibly it would identify transition tools that recognize individual processing preferences and can respond by converting knowledge captured into both text and graphics. It would continue to exploit the validation that age and gender should not be a bias for selecting help desk team members but to actively support diversity that discourage bias for age and gender.

By being inclusive and using graphics and text, a virtual help desk team will be able to capture and transfer the right information, at the right time, at the right place and truly exceed a customer’s best hope for “Just Fix It!” In place of having one long document, numerous databases, contacts, spreadsheets, and the like, the knowledge is accessed through one interface. The knowledge collected from each incident is captured and shared with the help desk team. Now if the team has in place an effective Knowledge Management System using graphics and text the next time help is requested:

Ah, a new day on Passport Help Desk and Pete, a new team member, opens the Help Desk Mail box. Yeaks! There are 10 unread emails; this is going to be a long morning. Well let’s see what he can get some resolved. The first email is from Tina Timble, “I can not get into Passport.”
Pete now has to figure out what to do to solve this customer’s problem the first time with a correct and swift help desk solution.

Pete opens the Passport Help Desk Web service KMS. With the KM-centric reservoir for support, he points to the process link for how to process an incident and has graphic and text process check list open.

Pete proceeds to identify the application as Passport and he can check if anyone else has issues in the recent events search. Since the help desk team worked with Tina before, there was an incident that identified she recently transferred and a snapshot of the error she had received trying to access Passport. He can see from the error snapshot, the issue has to do with the way Passport is looking at her business unit. With another point, he has Tina’s information. Point to her Business unit and the status of Tina’s business unit is revealed in the production schedule. Within this screen, a graphic map identifies her business unit’s physical location and shows time zones.

Now Pete knows where she is and what time it is there. He rolls over Tina’s contact information and he finds out that she is in a meeting for the next two hours. This way he knows that to get back to her quickly, he needs to send an email and not leave a voice message that may not be accessed for hours.

Quickly, Pete is able to contact Tina. By selecting her contact information and request more information selection, an email is generated that includes her request and Pete’s information automatically in the correct format and sends it. He found out she still needs access for the customers she is working with. Using the customer’s business units that were identified, he is able to point at...
each and a window will open with the point of contact for requests for access.

The replies from the business units identify that Tina has been given access. Pete can verify with function to insure that Tina’s issue is resolved and then points to her notes and a reply is generated so that Tina is informed that she has access and can proceed. He points to the retrieve data and as each window closes with the information he has collected and generates entries for the KMS system. He selects which entries to retain, adds his impressions, comments, additional information, and closes the record. Now Pete is on to the next email. Within 15 minutes he had Tina up and logged in. He remembers when this would take hours or even days to complete and it pleased to have such an effective KMS to get the job done.
REFERENCES


APPENDICES
Title and Number of Research:
Knowledge Documentation - From Text to Graphics: Can this improve help-desk knowledge transfer?

Submitted by: Teresa Gage

Date: 26FEB2007 (revised 23APR07)

1. Objectives of Research Study

   A. A summary statement of the proposal including the generic problem or question to which the study is addressed (not specific hypothesis or procedures) written in language understandable to a layperson.

   SUMMARY STATEMENT:
   To analyze multiple presentation styles on information, looking for specific attributes such as:
   - ease of use
   - speed of capturing business or technical directions
   - capacity to transfer needed help desk knowledge between team members

   Present document style consists of lengthy text documents and complex spreadsheets. These are difficult to keep current, to access information quickly, and are not effective in a team environment.
As new technologies have been developed, I am hopeful there is a better means to capture and share information. The goal is to present several possible styles that may prove to do the job better.

The experts include folks the will be using or otherwise involved:
- upkeep
- use
- storage
- security

New technology often comes with strong advocates for or against some technologies. By using the Delphi Method everyone will have a fair chance for input without the ridicule or direct influence of strong opinions.

B. For training grant proposals, indicate who (other than the trainees) will be responsible for contacting and informing subjects.

Response:
N/A

2. Subjects

Describe the requirements for a subject population, including age range, sex, and number. Explain the rationale for using in this population any special groups such as prisoners, children, the mentally disabled, or groups whose ability to give voluntary informed consent may be in question. It should also be understood that investigators must indicate what measure they will take to protect the right of minors, (persons who are 17 or younger), e.g. parental consent, approval by school administrators, etc.

A. Response:
   a. subject population: Subject experts
   b. age range: 26-55
   c. sex: male and female
   d. number: 4 groups of 2-3 experts

B. Rationale for using this population:
   Subject experts can provide experienced and insightful input on rational for different presentation styles.

C. Measures to be taken to protect human rights of subject:
   Withholding identification of individual subjects to provide confidentially

3. Describe Procedures.
A. A general description of the procedures of the proposal including the experimental tests or manipulations to be used.

Using the Delphi Method as the tool, solicit input from the subject experts.
A general description of the Delphi method as described from *Six Sigma Tool Navigator: the Master Guide for Teams:*
“The Delphi method is a very structured approach used to acquire written opinion or to receive feedback about a problem on detailed questionnaires sent to experts. Used by the Rand Corporation during the 1950s, the use of questionnaires prevents interpersonal interaction that can often stifle individual contribution whenever some participants dominate the discussion. Participants' anonymous responses are shared, and each participant can revise his or her response on the basis of reading other opinions. After repeating this process several times, the convergence of opinion will lead to team consensus.” (Michalski 2003)

The process will work with small groups of experts. There will be a demonstration of different proto-types of documentation.

Independently and privately, the experts will be given a questionnaire to provide feedback. This input is designed to try and predict the effectiveness of each style.

The questionnaire results will be compiled. The results will be then added the questionnaire. The input is anomalous and no expert will be identified for the resultant input.

The modified questionnaire will be provided to the experts, who will be asked to review the results. They will be asked to review their comments in relation to the results. In this manner a form of consensuses can be developed.

This can repeated several times if needed. I will do this cycle one time, do to resource constraints.

B. A statement of what happens to subjects during participation in the experiment, including instructions given to subjects, the nature of the tasks they are required to perform, informational or interpersonal feedback which subjects receive, the total time required for participation and the locale of the experiment.

1. What happens to subject during participation in the experiment:
Meeting will present several proto-type styles of knowledge collection for consideration by subjects. The subjects will have a short questionnaire (10-20 questions) to respond to and including a self assessment of their degree of knowledge (i.e. high, medium, or basic) for each question. After one round the responses will be collected anonymously.
The second round will provide the subjects the varied responses and they will be allowed to revise their input after reading the input from the other participants.

2. Instructions given to subjects:
   After short review and study method instructions, subjects will be guided through a discussion of a series of specific attributes and then given the questionnaire to complete.

3. The nature of the tasks they are required to perform:
   The subjects will provide input on the attributes for each of the styles of help desk information and complete questionnaire. In the second round they will be able and encouraged to revise their input if they wish after they have read the replies of fellow experts.

4. Informational or interpersonal feedback which subjects receive:
   Feedback will be limited to encouraging participation and answering questions about process or results. Some of the results may be incorporated in active service.

5. Total time required for participation:
   Approximately 2 hr per subject

6. Locale of the experiment
   The meetings will be in a local office, in conference room to provide privacy and non-interference. Some virtual meetings will be held and others will also be convened in conference room for face-to-face activities.

C. This section should also include an explicit description of the procedures for maintaining confidentiality and debriefing procedures [*].
   Consent forms will be kept under lock and separate from thesis material. Any audio will be kept only as long as necessary to complete thesis and then will be archived or deleted as project requires. All subjects and subject matter will have substitute name identification. No real names will be used in documentation.

( * Note: The committee operates under the assumption that NO research involving ANY risk to the welfare of subjects can be performed by student researchers. Research involving risks to subjects may be performed by faculty, but only when the committee is convinced that the benefits warrant the level of risk involved.)

D. Describe necessary procedures for protecting against or minimizing potential risks to subjects with an assessment of their likely effectiveness.
Subject experts may be able to identify members of team: request them to maintain anonymity of team members. This will be effective to provide privacy of subjects and maintaining isolation between members.

4. Consent

A. Describe consent procedures to be followed, including how and where informed consent will be obtained.

1. Informed consent procedure to be followed:
   a. Verbal explanation.
   b. Written presentation/signature.
   c. Verbal reinforcement before start and at conclusion.

2. How and where informed consent will be obtained:
   a. In fashion available:
   b. handout
   c. fax
   d. electronic signature
   e. Prior to Meetings:
   f. In a local office and/or
   g. Prior to virtual meeting

B. Consent form. A copy of the consent form given to each subject must be attached. The consent form must contain the following pieces of information.

   (1) Name and number of the experiment:
       MS Thesis: Knowledge Documentation - From Text to Graphics:
       Can this improve help-desk knowledge transfer?

   (2) Objectives of experiment. This section may resemble #3 above, but need not reveal information which would undermine the validity or obviate the effectiveness of the experimental procedures.

       Looking at how Knowledge Documentation styles can improve help-desk knowledge transfer. The styles of documentation are designed help a new person perform three activities needed for a Help Desk person:
       ➢ to be effective as a resource
       ➢ for troubleshooting problems with software
       ➢ Provide various services.
       Your comments and input will provide insight into how the different styles might be effective.

   (3) Procedures: a general description of the types of tasks and experiences the person can expect during his or her participation in the experiment.
Ask questions about your skills and ask you to make assessments of the different styles of documentation. You will get a chance to add comments on the comments made by others who are answering the questions.

(4) Risks and Benefits: a statement of the level and nature of positive and negative incentives associated with participation in the experiment.
1. Since the questions focus on your thoughts and use local material where you work and provide daily input, it is unlikely that your participation will cause you any social, psychological or physical harm.
2. Taking part in this activity is also unlikely to cause tremendous social, physical, or psychological benefit.
3. In no way will your participation or choice not to participate be reflected in your job or be reported to your boss, team lead, or fellow co-workers.

(5) Withdrawal Option: a statement to the effect that the subject is free to withdraw his or her consent and to discontinue participation in the experiment at any time.
1. You have the right to refuse to answer any question and you may stop the interview at any time. If you have any questions during the interview, you may ask them as they arise.
2. Your information will not be published or otherwise released unless you specifically notify me at the time of the interview that you grant your permission.

(6) Date and signature of the subject:
1. Interviewer (first name/last initial) _______________
2. Signature/date:________________

5. Assess the potential benefits to be gained by the individual subject, as well as benefits which may accrue to society in general, as a result of the planned research.

The assessment by sets of subject experts that may produce, not a consensus of opinion but a plausible forecast to efficient means of help desk knowledge transfer that can come from documentation.

6. Describe and assess any potential risks -- physical, psychological, social, legal or other -- and assess the likelihood and seriousness of such risk. If methods of research create potential risks, describe other methods, if any, that were considered and why they will not be used.

Potential physical risk: **None**

Potential psychological risk: **None**

Potential social risk: **None**

Potential legal risk: **Little as names of actual product will be changed for test**
Other potential risks:

1. Exceeding time permitted
2. Provide material in advance to start evaluation process

7. Analyze the risk-benefit ratio.
   For low to no risk, extremely useful and insightful information may be able to provide input to the design of help desk knowledge transfer documentation. This may provide clues to how to produce such documentation to greater efficiency and effectiveness.

8. Anticipate report to the committee. An indication of the expected nature of a brief report of the outcome of the experiment (e.g., abstract from a standard research report) to be submitted to the committee upon completion of the research.
APPENDIX B: DISCUSSION AND SURVEY CONSENT FORM

Discussion and Survey Consent Form

Department of Arts and Science SUNY-Institute of Technology

Thank you for taking the time to participate in this discussion and survey. This discourse is part of a course project exploring the nature of transferring knowledge. I am interested how the different presentations of the same information may help new personal to grasp information needed to service customers.

All research projects that focus on people are required to provide a few important pieces of information to the participants. I will take a minute to review this information with you now.

**Topics:** During the discussion and survey, I will ask you questions about yourself, including how you feel about a set of your skills, the sorts of tasks you do at work, and some basic items like gender and age. I will then ask you to review several short web presentations of information. These are designed help a new person perform three activities needed for a Help Desk person to be effective as a resource for troubleshooting problems with software and service. Your comments and input will provide insight into how the different styles might be effective.

**Privacy:** Please note that this discussion and survey is anonymous, meaning that I will not be writing down your name with your answers. All other potentially identifying information will be removed before the data is shared with others working on this project. Thus, your privacy will be protected. Since your name will not be gathered as part of the discussion and survey, a different name such as “Roger” or “Nancy” will be attached to your data. If you like, you can select the name that will be attached to your answers. Would you like to select a name?

**Participant Rights:** As a participant in the study, you have several rights. You have the right to refuse to answer any question and you may stop the discussion and survey at any time. If you have any questions during the discussion and survey, you may ask them as they arise: If you have questions after the discussion and survey you may contact the individual listed below.

**Potential Risks and Benefits:** Finally, I will review the potential risks and benefits associated with your participation in this interview. Since the questions focus on your basic thoughts and feelings about daily life, it is unlikely that your participation will cause you any social, psychological, or physical harm. Taking part in the interview is also unlikely to cause tremendous social, physical, or psychological benefit. You will, however, be the recipient of a significant amount of gratitude from me, who is required to conduct this discussion and survey as part of my coursework at SUNY's Institute of Technology. In fact, I would like to thank you profusely for your participation. Thank you.

If you don’t have any immediate questions, I can begin the discussion and survey. (If you have questions later, you may either interrupt the interview or contact the individual listed below).
Thank you. __Name:_______________________________________________

For more information on this project or the use of your data, please feel free to contact

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Interim Chair SUNYIT IRB

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Dept of Arts and Science
SUNY Institute of Technology steve@sunyit.edu 315.792.7331
Thesis Advisor
## APPENDIX C: STAGE I QUESTIONNAIRE

### Stage I Questions: Selected name__________________

### Questions:

<table>
<thead>
<tr>
<th>Section 1 Demographic data information:</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is to help access what strengths you bring to this discussion.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A1: Your past job activities (select all that apply):</th>
<th>years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Help Desk</td>
<td></td>
</tr>
<tr>
<td>2 = Application Development</td>
<td></td>
</tr>
<tr>
<td>3 = Data Base Support</td>
<td></td>
</tr>
<tr>
<td>4 = Instructional Services</td>
<td></td>
</tr>
<tr>
<td>5 = Documentation or Process skills</td>
<td></td>
</tr>
<tr>
<td>6 = Other (comment)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A2: Years in present job (check one)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Less then 2 years</td>
<td></td>
</tr>
<tr>
<td>2 = 2-4 years</td>
<td></td>
</tr>
<tr>
<td>3 = Over 4 years</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A3: Gender (check one)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Female</td>
<td></td>
</tr>
<tr>
<td>2 = Male</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A4: Age Range (check one)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = less 25 year</td>
<td></td>
</tr>
<tr>
<td>2 = 25-35</td>
<td></td>
</tr>
<tr>
<td>3 = 36-45</td>
<td></td>
</tr>
<tr>
<td>4 = 46-56</td>
<td></td>
</tr>
<tr>
<td>5 = 57 or greater</td>
<td></td>
</tr>
</tbody>
</table>
### SECTION 2 REVIEW STYLES INFORMATION:

This is the Rating and comment section. Please order each style for the features below and then comment on why you selected Best and Least.

<table>
<thead>
<tr>
<th>Example:</th>
<th>Best</th>
<th>Least</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color use</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

**Best:** Graphic provide color

**Least:** Text in one color: could have used color to set off sections.

- **B1: Ease of navigation**
  - Best:
  - Least:

- **B2: Amount of detail**
  - Best:
  - Least:

- **B3: Time to read**
  - Best:
  - Least:

- **B4: Clarity of how to proceed**
  - Best:
  - Least:
### SECTION 3 AGREE/DISAGREE:

This section allows you to agree or disagree with statements about each of the styles.

<table>
<thead>
<tr>
<th>Example:</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+2</td>
<td>+1</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
<td></td>
</tr>
<tr>
<td>Style 1 is linear text</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Style 2 has graphics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Style 1</td>
<td>+2</td>
<td>+1</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
<td></td>
</tr>
</tbody>
</table>

Scrolling is a nuisance.

Text only style provides for clear details.

No links is an efficient style.

I like this style.

<table>
<thead>
<tr>
<th>Style 2</th>
<th>+2</th>
<th>+1</th>
<th>0</th>
<th>-1</th>
<th>-2</th>
</tr>
</thead>
</table>

Linking pages is a good way to break up a long document.

Smaller pages are easy to read.

The lack of graphics makes this style exasperating.

I like this style.

<table>
<thead>
<tr>
<th>Style 3</th>
<th>+2</th>
<th>+1</th>
<th>0</th>
<th>-1</th>
<th>-2</th>
</tr>
</thead>
</table>

Linear navigation is good for beginners.

Graphics provide information quicker than text.

Linear navigation is frustrating.

I like this style.

<table>
<thead>
<tr>
<th>Style 4</th>
<th>+2</th>
<th>+1</th>
<th>0</th>
<th>-1</th>
<th>-2</th>
</tr>
</thead>
</table>

The navigation symbols are easy to follow.
<table>
<thead>
<tr>
<th>This style is effective for beginners.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced users will find this style efficient.</td>
</tr>
<tr>
<td>I like this style.</td>
</tr>
</tbody>
</table>
APPENDIX D: STAGE II QUESTIONNAIRE
**Stage II Comments:** name__________________

### Responses:

**Section 2 Comments From other experts:**
This is discussion from other experts. Note that some have been shortened or modified slightly due to space constraints.

#### B1: Ease of navigation - Best

<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENT</th>
</tr>
</thead>
</table>
| 1     | All on one report  
Almost all information on one page. Information is there.  
I like to read text.  
Everything on one page, no need to jump around  
Straight forward – sequential numbers indicated navigation path  
The user only has to scroll to find things, adding a menu with links to the sections in the lower part of the page would make it better. |
| 3     | Intuitive with graphic – quick to click and move on  
ability to go directly to where you want to go  
Can select any step from one page  
Table of contents with information stored in related section. Can access specific areas of interest (task presently working on) with a couple clicks of the mouse – without having to scroll thru several pages of a manual/or word document.  
Each task is explained  
2 choices of navigation |
| 4     | |

<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| 1     | Too lengthy, scrolling causes one to lose one’s place.  
Must scroll through entire document |
| 2     | Lots of information listed together – not sure what task needed to be completed first and detail of lists confused the process  
You have to scroll and read everything  
Scroll up & down |
| 3     | Can not jump to desired page, need to label navigation arrows  
Can become very boring and a little cluttered |
| 4     | There were multiple branches  
Not the way I work – least efficient for me too busy.  
Didn’t understand the sun and lightning symbols.  
It was difficult to determine how to navigate the instructions… you need GPS to keep from getting lost.  
The meaning of the graphics isn’t intuitive, there are not alt tags on graphics to give hints to what they are for. Links jump around too much. |

#### B2: Amount of detail: - Best

<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Least**

<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

---

88
<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Detail all in one place. No need to click.</td>
</tr>
<tr>
<td>3</td>
<td>There were detailed sample screens with notes, circled “Table of Contents”, organized proceed with written and pictorial – good explanation for anyone. Pictures tell the whole story with the comments Screen prints and associated instructions made it easy to follow and understand where information should be entered Good procedural approach The graphics may help new users, even though navigation isn’t the easiest.</td>
</tr>
<tr>
<td>4</td>
<td>Graphics eliminate the need for wordy detail A picture is worth a thousand words Has lots of graphical hints All probably had the same amount of details – just organized differently Graphics and words to explain what is available Best use of graphics for detail</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>For a first time user, could take much longer to complete. Detail not presented efficiently</td>
</tr>
<tr>
<td>2</td>
<td>1 and 2 were close, as there were no sample screens contains no graphics Not very clear</td>
</tr>
<tr>
<td>3</td>
<td>Can’t put much more data in there or it would become very hard to navigate Might be deceiving is it really detail or just more graphics, color, activity, etc. Don’t understand the symbols so getting to the detail was difficult</td>
</tr>
<tr>
<td>4</td>
<td>Has a lot of detail but needs more detail explanation of options, at least with the graphical icons you can guess the meaning of the functions The initial menu seemed cluttered and confusing Too much detail, confusing.</td>
</tr>
</tbody>
</table>

B3: Time to read: - Best Least
<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Takes too long to read through line by line</td>
</tr>
<tr>
<td></td>
<td>Takes a long time</td>
</tr>
<tr>
<td></td>
<td>I’m used to typing up instructions in Style#1 format. This would be readable if done by putting the distinct tasks on a separate page using different fonts to highlight or bold critical steps.</td>
</tr>
<tr>
<td></td>
<td>All text</td>
</tr>
<tr>
<td></td>
<td>Scrolling and wordiness take away from efficiency</td>
</tr>
<tr>
<td>2</td>
<td>It takes longer to read through page to page than seeing a graphic</td>
</tr>
<tr>
<td></td>
<td>Have to go through every page to find what you want. No way to skip to certain section.</td>
</tr>
<tr>
<td>3</td>
<td>Too many graphics. Too colorful. Too Busy. Difficult to read.</td>
</tr>
<tr>
<td></td>
<td>Can not jump around easily, progression is very linear</td>
</tr>
<tr>
<td>4</td>
<td>There were branches to explore</td>
</tr>
<tr>
<td></td>
<td>Too much clicking and reading and temptation to click “and see what it says.”</td>
</tr>
<tr>
<td></td>
<td>2, 3 and 4 all require paging through or selecting a button. Takes more time to read.</td>
</tr>
<tr>
<td></td>
<td>Too many clicks to read all the content. It was hard to determine where you were or what you needed to cover.</td>
</tr>
</tbody>
</table>

B4: Clarity of how to proceed: - Best  Least
<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Step by step instructions on one page are clear and concise.</td>
</tr>
<tr>
<td></td>
<td>Everything is there available, you can look at what you want by just scrolling. Works for me!</td>
</tr>
<tr>
<td></td>
<td>Gave the clearest description of process</td>
</tr>
<tr>
<td>2</td>
<td>I like it even if it may not be the best overall.</td>
</tr>
<tr>
<td></td>
<td>There was the most detail, although 4 had nice navigation features</td>
</tr>
<tr>
<td></td>
<td>I like the pictures and the arrow to proceed to the next step</td>
</tr>
<tr>
<td></td>
<td>The combination of text and screen prints make this style the best for understanding how to complete the form.</td>
</tr>
<tr>
<td>3</td>
<td>Again, the graphic makes for quicker decision</td>
</tr>
<tr>
<td></td>
<td>graphics show you exactly what to expect and where to go</td>
</tr>
<tr>
<td></td>
<td>Info anywhere at anytime</td>
</tr>
<tr>
<td></td>
<td>Table of contents with descriptions of tasks is helpful</td>
</tr>
<tr>
<td></td>
<td>Graphics and words to tell you how to proceed</td>
</tr>
<tr>
<td>4</td>
<td>Not a link person. Can take too much time loading. Links &quot;break&quot;.</td>
</tr>
<tr>
<td></td>
<td>Since I didn’t understand the symbols; I can’t proceed.</td>
</tr>
<tr>
<td></td>
<td>Need to explain what the navigation symbols are on all the pages</td>
</tr>
<tr>
<td></td>
<td>All steps are on one page but it is not numbered so the order of how to proceed is not clear.</td>
</tr>
<tr>
<td></td>
<td>Symbols only seemed to clutter the pages and cause confusion.</td>
</tr>
<tr>
<td></td>
<td>The meaning of the graphics isn’t intuitive, there are not alt tags on graphics to give hints to what they are for</td>
</tr>
<tr>
<td></td>
<td>Needed more verbiage to explain process</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STYLE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>You were forced to read the whole document and there were no sample screens to clarify</td>
</tr>
<tr>
<td></td>
<td>Not clear unless all information is read through</td>
</tr>
<tr>
<td></td>
<td>Unless I missed it somewhere I didn’t see a definition of what the difference is between the Help Desk “Problem” Ticket and the Help Desk “Batch” ticket – Not sure which procedure to follow - maybe it is described in each procedure itself - maybe it needs a glossary?</td>
</tr>
<tr>
<td>2</td>
<td>Graphics show you exactly what to expect and where to go</td>
</tr>
<tr>
<td></td>
<td>Very little instruction</td>
</tr>
<tr>
<td>4</td>
<td>All steps are on one page but it is not numbered so the order of how to proceed is not clear.</td>
</tr>
<tr>
<td></td>
<td>Symbols only seemed to clutter the pages and cause confusion.</td>
</tr>
<tr>
<td></td>
<td>The meaning of the graphics isn’t intuitive, there are not alt tags on graphics to give hints to what they are for</td>
</tr>
<tr>
<td></td>
<td>Needed more verbiage to explain process</td>
</tr>
</tbody>
</table>
### Stage II Questions

#### SECTION 2 REVIEW STYLES INFORMATION:
Rating again and add additional comments if you would like.

<table>
<thead>
<tr>
<th>Example:</th>
<th>Best</th>
<th></th>
<th></th>
<th>Least</th>
<th>Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color use</strong></td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>B1: Ease of navigation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Comment:</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B2: Amount of detail</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Comment:</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B3: Time to read</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Comment:</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B4: Clarity of how to proceed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Comment:</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**SECTION 3 AGREE/DISAGREE:**

This is section allows you to agree or disagree with statements about each of the styles. This will allow you to keep or change your thoughts on the below statements.

<table>
<thead>
<tr>
<th>Style 1</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrolling is a nuisance.</td>
<td>+2</td>
<td>+1</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>Text only style provides for clear details.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No links is an efficient style.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like this style.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Style 2</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linking pages is a good way to break up a long document.</td>
<td>+2</td>
<td>+1</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>Smaller pages are easy to read.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The lack of graphics makes this style exasperating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like this style.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Style 3</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear navigation is good for beginners.</td>
<td>+2</td>
<td>+1</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>Graphics provide information quicker then text.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear navigation is frustrating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like this style.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Style 4</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The navigation symbols are easy to follow.</td>
<td>+2</td>
<td>+1</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>This style is effective for beginners.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experienced users will find this style efficient.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like this style.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GSCM Help Desk Quick Notes

Help Desk Phone:
- Dial 812-455-0000
- Press #
- Enter 7943
- Enter PW: 915509

Help Desk Problem Ticket Procedure:
1) Log into Max Remedy and click on “Report a Problem” button.
2) Copy Subject Heading of email into the “Problem Summary” box.
3) In “Work Log” box, cut and paste the email and make sure you use the forward selection on the email to get the sender’s name and date.
4) Client name should be the person who sent the email.
5) Application should be as follows:
   - **APPLE** -> Only has one option.
   - **DOCFINDER** -> Use the selection that has “sspdl = SUN”.
   - **TUSKS** -> Only has one option.
   - **MAMS** -> Only has one option.
   - **PA OFFICES (POE)** -> Only has one option.
   - **DAS** -> Use the selection that has “UNIX, ssspdl, sun”.
   - **WINGS** -> Use the selection that has “sspdl, Oracle, Primary”.
   - **TIMES** -> Use the selection that has “BCUE, Oracle, Primary”.
6) Select the “Assignment and Closure” tab.
7) Use the pull down and select the appropriate “Suggested Assignment Group” (i.e. APP-TUSKS).
   - **APPLE** -> APPNEAPPLE
   - **DOCFINDER** -> APP...DOCFINDER
   - **TUSKS** -> APP...TUSKS
   - **MAMS** -> APPMAMS
   - **PA OFFICES (POE)** -> APPNEPOE.
   - **DAS** -> APPNEADAS.
   - **WINGS** -> APPNEWINGS.
8) Click on the "Submit as Self Assigned" button.

9) Close out the PT and then re-open it, reassign it to:
   - APPLE -> 911174 - Scott A. Carwaller
   - EDOCS -> 005543 - Michael Rovereccc
   - TUSKS -> 096521 - Donald Z. Klineman
   - MAMS -> 777890 - Jeffrey Gagette
   - PA OFFICES (POF) -> 911174 - Scott A. Carwaller
   - DAS -> 657898 - Val O'Mally
   - WINGS -> 554477 - Laura Swinfest
   - TIMES -> 220045 - Phil Topman

10) Save the PT and copy the PT number.

11) Send an email to the person reporting the problem and also to the Help Desk (Refer to email message document) and include PT number.

12) Forward email to assigned EIS person if there is an attachment (ie. screen shot, text file, email attachment.)

**Help Desk Down Time Notification:**

1) Customer notice Need to include:
   - PT number
   - SEV status
   - Remedy Client last name
   - If known Estimated Up Time (EUT)

2) Who gets notices:

<table>
<thead>
<tr>
<th>PRIMARY</th>
<th>SECONDARY</th>
<th>Distribution list</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUSKS</td>
<td>Help desk, TUSKS, dl-SSS, S&amp;SM TUSKS,CCB</td>
<td></td>
</tr>
<tr>
<td>STREETFINDER</td>
<td>Singer Web Outage Singer Operations Center</td>
<td><a href="mailto:Singer.support@lmco.com">Singer.support@lmco.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOCFINDER</td>
<td>dl-DOF, CCB. Please note that buyers can still access</td>
<td>DOCFinder directly via <a href="http://docfinder.lss.lmco.com">http://docfinder.lss.lmco.com</a>.</td>
</tr>
<tr>
<td>(external)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application</td>
<td>When to take Action</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>DOCFINDER</td>
<td>As soon as possible!</td>
<td></td>
</tr>
<tr>
<td>TUSKS</td>
<td>Exceeds 15 mm</td>
<td></td>
</tr>
<tr>
<td>STREETFINDER</td>
<td>As soon as possible!</td>
<td></td>
</tr>
<tr>
<td>TIMES</td>
<td>As soon as possible!</td>
<td></td>
</tr>
<tr>
<td>APPLE</td>
<td>Check from test site, allow for several bounces</td>
<td></td>
</tr>
</tbody>
</table>

3) When to send notices:

All applications Above - dl-SSS, S&SM SiteLeads
If Application Group POC (PAGE 10) is not available, check Remedy for next in line. Keep working it till someone in apps team signs on!

4) Who to ask: refer to #9 to reassign PT. If not available check Remedy for next in line. Keep working it till someone in apps team signs on.

5) What to say: Use customer care mode!
4) Who to ask: refer to #9 to reassign PT. If not available check Remedy for next in line. Keep working it till someone in apps team signs on.

5) What to say: Use customer care mode!

- We realize this is difficult
- We will let you know of progress as soon as we are aware of any information for you...
- Sorry for the for any inconvenience this activity may cause...

Example: SupplierNet production is currently down. Ticket #2663587 Client: JOHNSON has been opened as a Sev 2. Currently there is no estimated up time. We will communicate further status as we get it.

Help Desk Batch Ticket Procedure

1) Identify if a batch problem ticket is open in production

- If the email indicates Valley Forge, or PSC & C or a remedy email then it is a batch job failure
- For a remedy email if the number is < 200000, for example B0000061782005, it's a batch

2) If no remedy email then send an Email to PS&C and ask if one will be generated

- PSC, Valley Forge (UNKNOWN)
- PSC, Denver (UNKNOWN)

3) Log into Mars Remedy and click on "Batch Problem Management" tab

- Search by ticket number or
- assignment group

4) Assign ticket to someone

- TUSKS -> 096521 - Donald E Kline
- DAS -> 657898 - Val OMally
- WINGS -> 554477 - Laura Swinflast
- TIMES -> rotational, check help desk calendar

Help Desk Phone:
Help Desk: 096521
Donald E Kline
Val OMally
Laura Swinflast

Please check calendar for available times.

<li>Dial 812-455-0000</li>
<li>Press #</li>
<li>Enter 7943</li>
<li>Enter PW: 915509</li>

</ul>

<!-- Help Desk Problem Ticket Procedure -->
<table width="90%" border="0" align="center" cellpadding="4" cellspacing="2">
<tr> <td colspan="2"><p><font size="+1"> Help Desk Problem Ticket Procedure:</font></p></td></tr>
<tr align="left" valign="top">
<td width="5%" valign="top"><font size="+1"> 1)</font></p></td>
<td width="95%">Log into Mars Remedy and click on &ldquo;Report a Problem&rdquo; button.</td></tr>
<tr align="left" valign="top">
<td width="5%" valign="top"><font size="+1"> 2)</font></p></td>
<td width="95%">Copy Subject Heading of email into the &ldquo;Problem Summary&rdquo; box.</td></tr>
<tr align="left" valign="top">
<td width="5%" valign="top"><font size="+1"> 3)</font></p></td>
<td width="95%">In &ldquo;Work Log&rdquo; box, cut and paste the email and make sure you use the forward selection on the email to get the sender&rsquo;s name and date.</td></tr>
<tr align="left" valign="top">
<td width="5%" valign="top"><font size="+1"> 4)</font></p></td>
<td width="95%">Client name should be the person who sent the email.</td></tr>
<tr align="left" valign="top">
<td width="5%" valign="top"><font size="+1"> 5)</font></p></td>
<td width="95%">Application should be as follows: </td></tr>
<ul>
<li>APPLE -&gt; Only has one option.</li>
<li>DOCFINDER -&gt; Use the selection that has &ldquo;ssprd1 &ndash; SUN&rdquo;.</li>
<li>TUSKS -&gt; Only has one option.</li>
<li>MAMS -&gt; Only has one option.</li>
<li>PA OFFICES (POF) -&gt; Only has one option.</li>
<li>DAS -&gt; Use the selection that has &ldquo;UNIX, ssprd1, sun&rdquo;.</li>
<li>WINGS -&gt; Use the selection that has &ldquo;ssprd1, Oracle, Primary&rdquo;.</li>
<li>TIMES -&gt; Use the selection that has &ldquo;ECUE, Oracle, Primary&rdquo;.</li>
</ul>
<tr align="left" valign="top">
<td width="5%" valign="top"><font size="+1"> 6)</font></p></td>
<td width="95%">Select the &ldquo;Assignment and Closure&rdquo; tab.</td></tr>
<tr align="left" valign="top">
<td width="5%" valign="top"><font size="+1"> 7)</font></p></td>
<td width="95%">Use the pull down and select the appropriate &ldquo;Suggested Assignment Group&rdquo; (i.e APP-TUSKS).</td></tr>
</table>
8) Click on the &ldquo;Submit as Self Assigned&rdquo; button.

9) Close out the PT and then re-open it, reassign it to:

   - APPLE -&gt; 911174 - Scott A. Catwallar
   - EDOCS -&gt; 005543 - Michael Rivercreek
   - TUSKS -&gt; 096521 &ndash; Donald Z Klimer
   - MAMS -&gt; 777690 - Jeffrey Galette
   - PA OFFICES (POF) -&gt; 911174 - Scott A. Catwallar
   - DAS -&gt; &ndash; 657898 - Val OMally
   - WINGS -&gt; 554477 - Laura Swimfast
   - TIMES -&gt; 220045 - Phill Topman

10) Save the PT and copy the PT number.

11) Send an email to the person reporting the problem and also to the Help Desk (Refer to email message document) and include PT number.

12) Forward email to assigned EIS person if there is an attachment (ie screen shot, text file, email attachment.)
<table>
<thead>
<tr>
<th>Application Group</th>
<th>POC</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flystar: Supply Chain: SupplyPass &amp; MachineLink</td>
<td>Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKSCCB</td>
<td></td>
</tr>
<tr>
<td>TUSKS</td>
<td>Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKSCCB</td>
<td></td>
</tr>
<tr>
<td>STREETFINDER</td>
<td>SingerWeb Outage Singer Operations Center (<a href="mailto:singer.support@lmco.com">singer.support@lmco.com</a>)</td>
<td></td>
</tr>
<tr>
<td>DOCFINDER</td>
<td>dl-DOF, CCB: Please note that buyers can still access DOCFinder directly via <a href="http://docfinder.lsss.lmco.com">http://docfinder.lsss.lmco.com</a>.</td>
<td></td>
</tr>
<tr>
<td>TIMES</td>
<td>Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKSCCB</td>
<td></td>
</tr>
<tr>
<td>Flystar: Supply Chain: SupplyPass &amp; MachineLink</td>
<td>Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKSCCB</td>
<td></td>
</tr>
<tr>
<td>TUSKS</td>
<td>Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKSCCB</td>
<td></td>
</tr>
<tr>
<td>APPLE</td>
<td>Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKSCCB</td>
<td></td>
</tr>
</tbody>
</table>

All applications Above - dl-SSS, S&amp;SM SiteLeads<br>
If Application Group POC (PAGE 12) is not available, check Remedy for next in line. <br>
Keep working it till someone in apps team signs on!
<table width="100%" height="370" border="2" cellpadding="0" cellspacing="0">
<tr>
<th width="177" valign="top"><p><strong> Application </strong></p></th>
<th valign="top"><p><strong> When to take Action </strong></p></th></tr>
<tr>
<td width="177" height="61" valign="top"><p> APPLE</p></td>
<td width="390" valign="top"><p> Check from test site; allow for several bounces </p></td></tr>
<tr>
<td width="177" valign="top"><p> DOCFINDER</p></td>
<td width="390" valign="top"><p> As soon as possible!</p></td></tr>
<tr>
<td width="177" valign="top"><p> TUSKS </p></td>
<td width="390" valign="top"><p>Exceeds 15 min.</p></td></tr>
<tr>
<td width="177" valign="top"><p> STREETFINDER</p></td>
<td width="390" valign="top"><p>As soon as possible!</p></td></tr>
<tr>
<td width="177" valign="top"><p> TIMES</p></td>
<td width="390" valign="top"><p>As soon as possible!</p></td></tr>
</table>

<font size="+1"> 4)</font><p>
Who to ask: refer to #9 to reassign PT.
If not available check Remedy for next in line.
Keep working it till someone in apps team signs on. </p>

<font size="+1"> 5)</font><p>
What to say: <font size="+1"> Use customer care mode!</font>
<ul>
<li> We realize this is difficult </li>
<li> We will let you know of progress as soon as we are aware of any information for you... </li>
<li> Sorry for the for any inconvenience this activity may cause... </li>
</ul>
</p>

<p>
Example: SupplierNet produ ction is currently down.&nbsp; Ticket #2663587 Client: JONES has been opened as a Sev 2. &nbsp; Currently there is no estimated up time. &nbsp; We will communicate further status as we get it. </p>

</body>
</html>
2) If no remedy email then send an Email to PS&C and ask if one will be generated.

- PSC, Valley Forge (UNKNOWN)
- PSC, Denver (UNKNOWN)

3) Log into Mars Remedy and click on “Batch Problem Management” tab.

   - Search by ticket number or assignment group

4) Assign ticket to someone

   - TUSKS -&gt; 096521 - Donald Z Klimer
   - DAS -&gt; 657898 - Val OMally
   - WINGS -&gt; 554477 - Laura Swimfast
   - TIMES -&amp;gt; rotational, check help desk calendar
APPENDIX F: PAGED-TEXT STYLE SAMPLE SCREENS AND CODE

Style 2: There are 12 pages for this prototype HTML pages: Images and Code below.
WEB Presentation: Can been seen at: Style 2
(http://people.sunyit.edu/~gaget/idt599/02TextLinkedPages/01-HDTextLinked.htm).

Page 1:

<html>
<head>
<!-- Author: Teresa J Gage -->
<!-- Date: 11APR2007 -->
<title>GSCM Help Desk Quick Notes</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">

<htmldocument>
<head>
<title>GSCM Help Desk Quick Notes</title>
</head>
<body>

GSCM Help Desk Quick Notes

Help Desk Phone:

- Dial 812-455-0000
- Press #
- Enter 7943
- Enter PW 915909

Global Supply Chain Management Help Desk Quick Notes

</body>
</htmldocument>
GSCM Help Desk Quick Notes

Help Desk Phone:
- Dial 812-455-0000
- Press #
- Enter 7943
- Enter PW: 915509
Help Desk Down Time Notification:

2) Who gets notices:

<table>
<thead>
<tr>
<th>PRIMARY</th>
<th>SECONDARY</th>
<th>Distribution list</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUSKS</td>
<td>Helpdesk, TUSKS, dli-SSS, S&amp;SM</td>
<td>TUSKSCGB</td>
</tr>
<tr>
<td>STREETFINDER</td>
<td>SingerWeb Outage Singer Operations Center (<a href="mailto:singer_support@linc.com">singer_support@linc.com</a>)</td>
<td></td>
</tr>
<tr>
<td>DOCFINDER</td>
<td>dli-DOF, CCB. Please note that buyers can still access DOCFinder directly via <a href="http://docfinder.linc.henco.com">http://docfinder.linc.henco.com</a></td>
<td></td>
</tr>
<tr>
<td>(external)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIMES</td>
<td>dli-SSS, TIMES SiteLeads</td>
<td></td>
</tr>
<tr>
<td>Fyter: Supply</td>
<td>LM TUSKS</td>
<td>Helpdesk, TUSKS, dli-SSS, S&amp;SM TUSKSCGB</td>
</tr>
<tr>
<td>Chain: SupplyPass &amp; MachineLink</td>
<td>DOCFINDER</td>
<td>dli-DOF, CCB. Please note that buyers can still access DOCFinder directly via <a href="http://docfinder.linc.henco.com">http://docfinder.linc.henco.com</a></td>
</tr>
<tr>
<td>(external)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWX</td>
<td>DOCFINDER</td>
<td>dli-DOF, CCB</td>
</tr>
<tr>
<td>TUSKS</td>
<td>Helpdesk, TUSKS, dli-SSS, S&amp;SM TUSKSCGB</td>
<td></td>
</tr>
<tr>
<td>APPLE</td>
<td>TUSKS</td>
<td>Helpdesk, TUSKS, dli-SSS, S&amp;SM TUSKSCGB</td>
</tr>
</tbody>
</table>

All applications Above - dli-SSS, S&SM SiteLeads
If Application Group POC (PAGE 12) is not available, check Remedy for next in line.

Keep working it till someone in apps team signs on!
<table>
<thead>
<tr>
<th>PRIMARY</th>
<th>SECONDARY</th>
<th>Distribution list</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUSKS</td>
<td></td>
<td>Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKSCCB</td>
</tr>
<tr>
<td>STREETFINDER</td>
<td></td>
<td>SingerWeb Outage Singer Operations Center (<a href="mailto:singer.support@lmco.com">singer.support@lmco.com</a>)</td>
</tr>
<tr>
<td>TIMES</td>
<td></td>
<td>dl-SSS, TIMES SiteLeads</td>
</tr>
<tr>
<td>Flystar: Supply Chain: SupplyPass &amp; MachineLink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LM TUSKS</td>
<td></td>
<td>Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKSCCB</td>
</tr>
<tr>
<td>TIMES</td>
<td></td>
<td>dl-DOF, CCB: Please note that buyers can still access DOCFinder directly via <a href="http://docfinder.lsss.lmco.com">http://docfinder.lsss.lmco.com</a>.</td>
</tr>
<tr>
<td>GWX</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>dl-DOF, CCB: Please note that buyers can still access DOCFinder directly via <a href="http://docfinder.lsss.lmco.com">http://docfinder.lsss.lmco.com</a>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dl-DOF, CCB</td>
</tr>
<tr>
<td>APPLE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>dl-DOF, CCB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TUSKS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TUSKS</td>
</tr>
</tbody>
</table>
Helpdesk, TUSKS; dl-SSS, S&amp;SM TUSKCCB

If Application Group POC (PAGE 12) is not available, check Remedy for next in line. <br>
Keep working it till someone in apps team signs on! <br>

All applications Above - dl-SSS, S&amp;SM SiteLeads <br>

Keep working it till someone in apps team signs on!
APPENDIX G: PAGED-GRAPHIC STYLE SAMPLE SCREENS AND CODE

Paged-graphic style: There are 22 pages for this prototype HTML pages: Images and Code below.
WEB Presentation: Can been seen at: Style 3 (http://people.sunyit.edu/~gaget/idt599/03GraphicLinkedPages/01-HD-Graph-Page.html)
Page 1:

<table>
<thead>
<tr>
<th>Process</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td>GSCM Help Desk Phone Page 2</td>
</tr>
<tr>
<td>Problem Ticket</td>
<td>Help Desk Problem Ticket Procedure Page 3</td>
</tr>
<tr>
<td>Down Time</td>
<td>What, Who, When for Notices: Page 14</td>
</tr>
<tr>
<td>Batch Ticket</td>
<td>Help Desk Batch Ticket Procedure: Page 19</td>
</tr>
</tbody>
</table>

<html><head>
<!-- Author: Teresa J Gage --> <!-- Date: 10APR2007 -->
<title>Help Desk Problem Ticket Procedure - Page 1</title>
<!-- Page 1 of GSCM Help Desk Help Document -->
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
</head><body bgcolor="#FFFFFF" marginwidth="0" marginheight="0" leftmargin="0" topmargin="0">
<table width="90%" border="0" cellspacing="4" cellpadding="4" align="center">
<tr>
<td width="72" align="center">Global Supply Chain Management Help Desk</td>
<td width="72" align="center">Quick Notes</td>
</tr>
</table>
</body></html>
<table>
<thead>
<tr>
<th>Process</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td>Contact</td>
</tr>
<tr>
<td>GSCM Help Desk Phone:</td>
<td>Help Desk Problem Ticket procedure:</td>
</tr>
<tr>
<td>Page 2</td>
<td>Page 3</td>
</tr>
<tr>
<td>Down Time</td>
<td>Down Time</td>
</tr>
<tr>
<td>What, Who, When for Notices:</td>
<td>Page 14</td>
</tr>
<tr>
<td>Batch Ticket</td>
<td>Batch Ticket</td>
</tr>
<tr>
<td>Help Desk Batch Ticket procedure:</td>
<td>Page 19</td>
</tr>
</tbody>
</table>

Global Supply Chain Management Help Desk Quick Notes.
Log into Mars Remedy

Click on "Report a Problem" button

Help Desk Problem Ticket Procedure
Include PT number

Send an email to the person reporting the problem

Cc : Help Desk

Forward email to assigned person if there is an attachment
APPENDIX H: LINKED-GRAPHIC STYLE SAMPLE SCREENS AND CODE

Style 2: There are 12 pages for this prototype HTML pages: Images and Code below. WEB Presentation: Can been seen at: Style 4 (http://people.sunyit.edu/~gaget/idt599/04GraphicHyperLinks/01-HD-GraphHyperLinks.html)

Home Page 1:

Global Supply Chain Management
Help Desk Quick Notes Home

Contact
GSCM Help Desk Phone

Problem Ticket
Help Desk Problem Ticket Procedure (PT)

Down Time
Want, Who, When for Hotfix

Batch Ticket
Help Desk Batch Ticket procedure (PT)
<table>
<thead>
<tr>
<th>Contact</th>
<th>GSCM Help Desk Phone</th>
<th><img src="graphics/phone.gif" alt="Phone Icon" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Ticket</td>
<td><a href="03-HD-GraphHyperLinks.html">Help Desk Problem Ticket Procedure (PT)</a></td>
<td><img src="graphics/Problem.gif" alt="Problem Icon" /></td>
</tr>
<tr>
<td>Down Time</td>
<td><a href="14-HD-GraphHyperLinks.html">What, Who, When for Notices</a></td>
<td><img src="graphics/downtime.gif" alt="Downtime Icon" /></td>
</tr>
<tr>
<td>Batch Ticket</td>
<td><a href="19-HD-GraphHyperLinks.html">Help Desk Batch Ticket procedure (BT)</a></td>
<td><img src="graphics/batch.gif" alt="Batch Icon" /></td>
</tr>
</tbody>
</table>
Click on "Report a Problem" button
**PROBLEM TICKET ASSIGNMENT GROUPS**

<table>
<thead>
<tr>
<th>Application</th>
<th>Assignment Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPLE</td>
<td>APPNEAPPLE</td>
</tr>
<tr>
<td>DOCFINDER</td>
<td>APP--DOCFINDER</td>
</tr>
<tr>
<td>TSKS</td>
<td>APP--TSKS</td>
</tr>
<tr>
<td>MAMS</td>
<td>APPMAMS</td>
</tr>
<tr>
<td>PA. OFFICES (PAP)</td>
<td>APPNEPAP</td>
</tr>
<tr>
<td>DAS</td>
<td>APPNEDAS</td>
</tr>
<tr>
<td>WINGS</td>
<td>APPNEWINGS</td>
</tr>
<tr>
<td>TIMES</td>
<td>APPNETIMES</td>
</tr>
</tbody>
</table>
Down Time Page:

Help Desk Down Time Notification.

- Customer Notices
- What
- Who
- When

Details to Include
What to Say
Point of Contact
Time or Action

<!-- Graphic/table for page -->

<!-- Graphic/table for information -->
<table>
<thead>
<tr>
<th>Customer Notices</th>
<th>Details to Include</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What</td>
<td>What to Say</td>
<td></td>
</tr>
<tr>
<td>Who</td>
<td>Point of Contacts</td>
<td></td>
</tr>
<tr>
<td>When</td>
<td>Time or Action</td>
<td></td>
</tr>
</tbody>
</table>
### NEED TO INCLUDE

<table>
<thead>
<tr>
<th>PT Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity Status: SEV 1 Or 2</td>
</tr>
<tr>
<td>Remedy Client Last Name</td>
</tr>
<tr>
<td>If Known Estimated Up Time (ECU)</td>
</tr>
</tbody>
</table>

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#### Graphic/table for page

<table>
<thead>
<tr>
<th>Graphic/Link</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="graphics/phone.gif" alt="Image 1" /></td>
</tr>
<tr>
<td><img src="graphics/Problem.gif" alt="Image 2" /></td>
</tr>
<tr>
<td><img src="graphics/downtime.gif" alt="Image 3" /></td>
</tr>
<tr>
<td><img src="graphics/batch.gif" alt="Image 4" /></td>
</tr>
</tbody>
</table>

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**Customer Notices Page:**

<table>
<thead>
<tr>
<th>Graphic/Link</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="graphics/home.gif" alt="Image 5" /></td>
</tr>
</tbody>
</table>

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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Experience

• Technical Specialties Help Desk Sr Lead
  • Technical Help Desk Lead
  • Customer Care: Follow-up insured closure, reduced carry-overs 90%
  • Virtual training: Built team provided flexibility, shared skills
  • Built Unified Horizontal Support: Integration 10 technical teams
  • Streamline and standardize processes for 10 applications
  • Provided System/Problem Analysis and Solutions

• System Integration Analyst
  1999—2006
  • Technical Help Desk Lead: Customer Care and Training
  • Extended Desk support from 1 application to 7 applications
  • Provided monthly Remedy Metrics using MARS client software.
  • Produced 24-Month graphic chart to identify positive results
  • Integration Developer: Develop UAT Test Documentation
  • Integrated HTML COTS online Help to reflect customization
  • Test documentation for Remedy Critical Conditions Radial buttons.

• Financial Computer Analyst
  1997—1999
  • US Air Force Financial ORACLE Database Support
  • Legacy Oracle Report: repaired older forms and completed modifications to update forms
  • Imports/Exports: performed between IBM systems to Oracle Databases
  • Reverse Engineering: acted on legacy systems to convert to stable relational databases

• Industrial Instructor
  1993—1995
  • Maintenance and Operations Instructor for Multi-phase Radar
  • Developed Training material and test scenarios for Simulator
  • Multi-phase Long Range Radar Operations Technical Support

• Technical Writer
  1991—1993
  • Infrared Target System
  • Intermediate Level Maintenance Manual
  • Depot Level Maintenance Manual

• Field System Engineer
  1988—1991
  • Airborne Radar System Engineer
  • COMMNET Database System Coordinator: Customer Logistics
  • Low Level Light TV Modification Team: Updated of C130

Education

• MS, Information Design and Technology
• BS, Computer and Information Science
• BT, Electrical Engineering Technology