

**User-Centered Design
And
Purdue Employee Self Service**

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Executive Summary

User-centered design is a philosophy that makes the user's needs, wants, and limitations a priority in designing a document. User-centered design accomplishes this through three basic principles: (1) prioritize the user's goals, (2) speak the user's language, and (3) organize the document to help the user.

User-centered design is important in help documents, such as user manuals and online tutorials. The purpose of a help document is to provide quick instructions to help users complete their tasks. Therefore, create help documents with the user in mind.

Our main purpose for this white paper is to explore user-centered design for help documents, particularly Purdue Employee Self Service (EESS). Research has led to the conclusion that existing documentation for EESS is insufficient and the creation of user-centered help documentation is necessary.

Introduction

The Purdue Employee Self Service (EESS) is a web-based financial service for Purdue University employees. Employees access and update personal and financial information through the EESS website. This includes information regarding pay stubs, taxes, employee benefits, and other services. Unfortunately, the current version of EESS lacks sufficient help documentation.

The purpose of this white paper is to explore user-centered design for help documents, particularly EESS. Our research comes from the published works of technical communication scholars in academic journals and texts. In addition, help documents for services similar to EESS are excellent sources. The paper also includes empirical data on EESS. We accomplish this through surveying various Purdue employees for their usage patterns and opinions of EESS. More information on the sources is located at the end of this document.

We have organized the paper in a clear manner. The paper begins with general concepts of usability and user-centered design. Next, the focus is on user-centered design for help documents. We then apply user-centered design specifically to help documents for EESS. Finally, we will draw some conclusions from our research results.

Usability and User-Centered Design

In user-centered design, the focus of documents is the users, not the author. Ideas included in documents should fit the audience. Therefore, it is important to analyze your audience and determine the purpose of your writing. It is also important to design a user-centered document. A scholar on user-centered design is Paul V. Anderson, author of "Technical Communication-A Reader Centered Approach." Usability, according to Anderson, refers to a communication's ability to help readers accomplish the goal of the document (Anderson, 2007).

In order to make the document usable, some principles for user-centered design are:

- Prioritize the user's goals 
- Speak the user's language
- Organize to help the user

These principles are discussed in detail below.

Prioritize the User's Goals

User-centered design is a philosophy that considers the wants, needs, and limitations of the user (Corry et al., 1997). This is important because users read documents with a specific goal in mind. User-centered documents should include information the audience needs. In order to determine the needs, it is important to complete an audience analysis. Analyzing the audience involves assessing the user  goals, characteristics, and situation. The characteristics and situation of the user help determine the most effective language to use. For example, it is ineffective to write a document with complex text if the audience is a third grade class.

An audience analysis is important because different users have different goals. The audience analysis helps the author address all the reader  goals, not just one or their own. In addition to addressing the reader's goal, it also helps address the reader's questions and concerns.

Similar to an audience analysis, empirical research is very important to be user-centered. Empirical data includes surveys and usability testing, which both help creators determine the effectiveness of their product or service. 

Surveys ask questions such as, "How helpful is the document?", and "Does this document make sense?" The answers to these types of question yield a lot of information. One type of user may find the document very simple and easy to read, whereas, the next may find it complex and confusing. Users can also leave comments and suggestions, which will enlighten document creators on the concerns not expressed in the survey.

Usability testing takes a different approach to empirical research.  Instead of a questionnaire, usability testing involves the user directly. Researchers watch the user use their document to complete a task. For example, usability testing for a help document of a computer program may include counting the mouse clicks and time to navigate the site. In addition, they may test how long it takes to understand a complex concept or how effective instructions are. 

Empirical data is very important because of the amount of information it gives. A limited data set can give a lot of information. Creators learn new problems with their existing service. Alternately, they learn new uses for their service as well. Overall, the information gained from empirical data helps make documents, programs, and services more user-centered.

In addition to addressing the user's goal, a user must understand the document. Users want to find their information quickly. The amount of information and organization is very important in user-centered design. The excess information may distract readers from reaching their goal. Therefore, it is important the document speaks the user's language.

Speak the User's Language

User-centered documents communicate clearly to the readers. The language of a document helps determine its effectiveness. Ways of choosing effective language include avoiding jargon, linking new information to familiar ideas, and complementing text with images.

One common mistake in documents is including jargon, or terms readers do not understand. It is important to notice the definition of jargon includes the phrase, "readers do not understand." Therefore, jargon is not a predefined set of words to avoid. Instead, the knowledge and comfort level of the readers determine jargon terms. For example, the average reader of a newspaper article may not understand the terms in scientific journals. Again, the audience analysis is the key to identifying jargon. It would be foolish to write a document in Spanish, if the readers only understand English. Similarly, a user-centered help document should not contain jargon, which is like a foreign language to the readers.

On the other hand, some situations require help documents to introduce unfamiliar concepts. User-centered documents explain these new concepts without the use of jargon. The document explains the concept in a language understandable by the readers, avoiding the unnecessary jargon. However, if the document includes jargon, accompany it with an explanation to teach the unfamiliar language to the reader. In either case, the explanation of a new concept should be formulated using familiar ideas easily understood by the reader.

One way to explain complex concepts is through images. Images communicate information in a clear and concise manner. When paired with textual explanations, images can complement difficult language (Anderson, 2007).

A document that speaks the user's language and makes the user a priority may still not be user-centered. If a user cannot find important information quickly, s/he may give up on the document. Therefore, the organization of the document is very important.

Organize to Help the User

User-centered documents help the user find their information quickly. Therefore, the organization of a document is very important. Readers do not have the time to analyze a document full of jargon and excessive detail. For this reason, it is important to make the document as accessible as possible. Accessibility, according to Anderson, is an essential quality of a usable document (Anderson, 2007). There are many ways of accomplishing this goal of user-centered documents.



One way is to place the most important information up front. This is known as the “Bottom Line Up Front” (BLUF) method. The reader locates important information quickly without reading through excessive details and jargon (Anderson, 2007).

In addition to the BLUF method, organize your document into sections. This is important because of the variety of readers and their goals. For example, an accountant does not want to read engineering plans to get to the “Costs” section. By organizing your document in a modular fashion, users go straight to the section important to them (Anderson, 2007). Their important information is located in one area and readers avoid the unnecessary details. Modular organization also helps eliminate long, wordy paragraphs, which may distract the user. 

In addition to organizing text, there are key organizational tools that can assist the user. A table of contents, index, and glossary, should be included to help the user locate relevant information. However, these aids are insufficient when the section topics are so broad that each section contains excessively long blocks of text.

The organization and the two principles described above help create user-centered documents. One specific type of document that requires usability is a help document. Without usability, the document is ineffective.

User-Centered Design for Help Documents

Help documents support the user of a certain product or service. User manuals and online tutorials are examples of help documents. Unfortunately, many help documents are not very helpful because they do not follow simple user-centered design principles. Each of the principles explained above applies specifically to help documents.

Prioritize the User's Goals

Researchers of *Human-Computer Interaction International*, have identified that “users seem to be mainly concerned with achieving the tasks which motivate their interaction with the software; mastering its use does not rank among their motivations or goals” (Capobianco, 2001). Users rarely approach help documents intending to learn general principles to help use the software. Instead, users read help documents on a case-by-case basis to complete their tasks. Thus, user-centered help documents help the users perform their tasks.

Users of help documents tend to overlook general information, which does not apply to their task (Grayling, 1998). Most users will never sit down with a help document to read it from beginning to end, mastering the service it complements. ead, they will turn to the portion of the document they believe will help them accomplish their task. As such, users ignore any long overviews, introductions, and summaries. Unnecessary general information only clutters the document, making the truly helpful information harder to find. User-centered help documents omit overviews, summaries, or other general information unless absolutely needed.

A help document will be especially helpful if it features the most common tasks of its users. Some common tasks may be apparent based on user knowledge and the purpose of the software. For instance, consider a help document for a retail point-of-sale and inventory system. Clearly, common tasks for this system include selling items and adding new inventory. However, a survey may reveal some other common uses, which are not immediately apparent. This shows the importance of empirical research.

Knowing the tasks of the users is not enough to make the help document user-centered. They must understand the document as well. The author's writing style and technical vocabulary do not impress users of help documents. In fact, they would rather not use the help document at all. Therefore, a user-centered help document must get to the point quickly and help the user move on to his/her next task.

Speak the User's Language

A common problem with the language in help documents is the use of technical jargon. Rachael Naismith and Joan Stein, two librarians at University of California-Berkley, completed empirical testing on terminology found in the library's help documents. They accomplished this by quizzing students over the terms.  Their study found that the average student was unfamiliar with 50 percent of the terms (Nahl, 1999). The help documents would not help these students because the technical jargon is unfamiliar to them. Similarly, a user-centered help document does not use technical terms without clearly explaining them.

When new terms are introduced in a help document, they must be explained clearly. However, the text of a user-centered help document should not contain too many definitions. This may make it difficult to sort through all the excess information. One way to avoid this problem is to explain technical terms in a glossary, and distinguish the terms to indicate a definition is available. You could also place definitions in the side-columns of pages when a jargon term is introduced. In this instance, the user does not need to flip back to a glossary.

Images are a great way to communicate complicated ideas. In the context of help documents for software, screenshots are particularly useful. A screenshot allows the user to immediately relate information in the text, with the software. This eliminates the user's need to search for features mentioned in the text.

When users have to search the text, they often get frustrated and give up on the task. Therefore, methods, such as screenshots, are very important to help users find their information. The organization of help documents is another way to help users find information quickly.

Organize to Help the User

The users of help documents do not read for pleasure. Most users are not enthusiastic about reading a help document, no matter how brilliantly written it may have been. A study at *MDL Information Systems, Incorporated* revealed the real attitudes users have toward help documents. Users read help documents quickly, sometimes misreading even the simplest information. Reading quickly causes the user to overlook general information that does not apply to their task.

The users are also impatient. They give up early when they do not find the information that interests them. Overall, users seem to have an “I don't want to be here!” attitude when reading help documents (Grayling, 1998). 

Although this attitude toward help documents may be discouraging to the authors, it should come as no surprise. Help documents do not exist for their own sake. Help documents serve to complement a particular product or service, allowing users to perform their desired tasks effectively. Therefore, if the document does not help the reader find relevant information quickly, then it does not fulfill  purpose

When users read help documents, they usually have specific tasks in mind. For instance, “How do I print a balance sheet?” or “How do I change the font size?” Therefore, organizing a help document by tasks will simplify the user's search for answers. If a user finds a brief section in the help document devoted specifically to his/her task, s/he can carefully study the section, without needing to sift through irrelevant information.

However, a help document with task-oriented organization will still be difficult to use if the text of each section is wordy and disorganized. Step-by-step instructions for each task help eliminate the problem. This allows the user to process the information in small pieces and try them out one by one. Of course, there may be cases where some users need more detail than others. In these situations, it may be worthwhile to include a separate section with more detail for those who need it.

Overall, the organization of a help document assists users complete their tasks. In addition, a help document must be written in the language of the user and it must fulfill its purpose. According to the EESS website, the goal of EESS is to, “offer our employees more access to their personal information and to make it easy for them to keep the information up-to-date” (EESS website, 2007). An excellent way to accomplish this goal is through user-centered help documents.

User-Centered Design for Purdue EESS

EESS offers two help documents for its users, an online tutorial and a paper manual. The online tutorial, or “Self Help Training Manual,” is located directly on the EESS website. This tutorial consists of a menu of links to several pages with screenshots and explanations of EESS.

Unfortunately, the paper manual is for a different version of EESS, used by the Commonwealth of Pennsylvania. The features described in this document do not match Purdue EESS, and there seems to be little connection between the two, except for the name, “Employee Self Service.” For this reason, we will not analyze the paper manual any further. stead, we will consider the usability of the online tutorial based on the user-centered principles presented above.

Prioritize the User's Goals

A user-centered help document reduces unnecessary general information and emphasizes the user's most important tasks. Unfortunately, the online tutorial for EESS does not accomplish these goals. Excess general information clutters the tutorial and hides important information about common tasks.

The first page of the tutorial is a long description of the purpose and features of EESS. As previously noted, most users will avoid reading a general information page like this. Therefore, the page serves mainly to clutter the menu and to make the search for relevant information slightly more difficult. Similarly, the second page contains a lengthy discussion of Purdue IDs, which is not relevant to EESS.

In addition to these unnecessary pages, the text includes only a screenshot and list of labels appearing on the screen. There is little information to assist the user. For example, Figure 1 shows part of the text on the State and Local Tax page. This page is simply a bulleted list of what is seen in the screenshot. This text adds nothing to the user's knowledge, since s/he could gain the same information by looking at the EESS website.

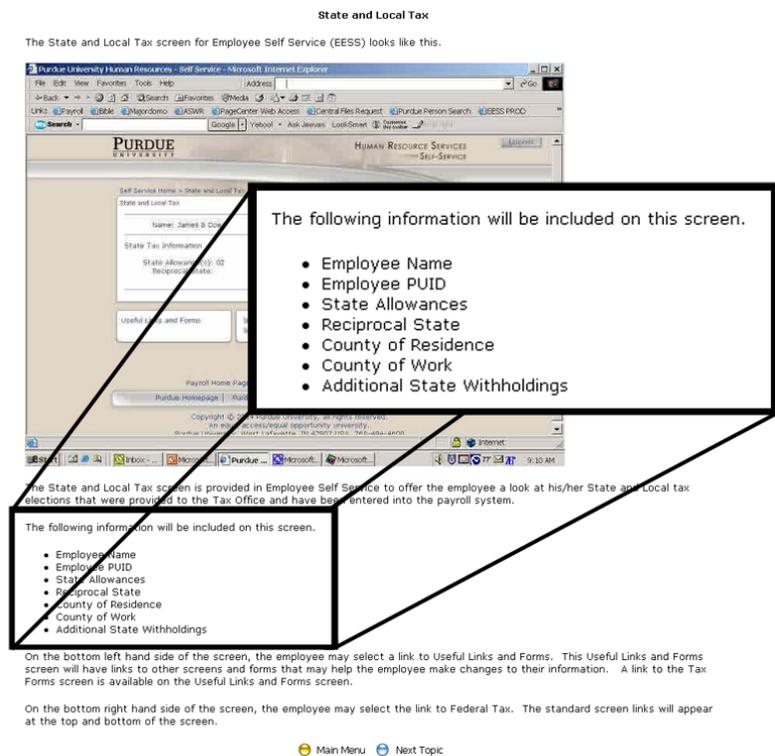


Figure 1: Unnecessary text in the online tutorial

The unnecessary clutter would cause fewer problems if the tutorial featured the most common tasks of the users. This would allow the users to directly access relevant information and bypass the rest.

To determine the most common tasks of the users, we conducted preliminary empirical research. We surveyed 18 Purdue employees from a variety of professions and backgrounds (see Appendix for survey questions). Thirteen responded that they use EESS. The employees were asked, “What do you use Purdue EESS for?”

The responses to this question are summarized in Figure 2. Our results show clearly that the majority of responders use EESS to check pay stub information, while other uses are not so common.

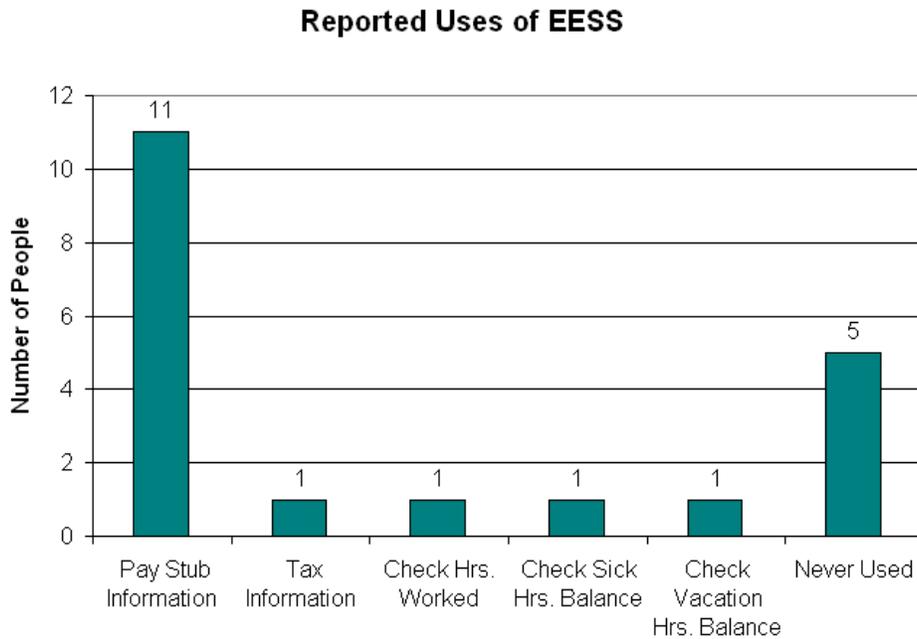


Figure 2: Reported uses from our survey

Our data set is small due to the limitations of our resources and short project time. Therefore, our results may not represent the wider population of Purdue employees. Further research may increase the significance of our results, showing pay stub information is an important task to the user. We trust that future studies with more resources and time could reveal further helpful empirical data on the users. 

The online tutorial for EESS should help all employees complete their tasks, such as checking their pay stubs.  Fortunately, Purdue employees are quite diverse. Some employees know financial terms and others do not. The user manual should help both types of employees, not just some users. This is accomplished through the language of the document.

Speak the User's Language

Most of the language in the EESS online tutorial is straightforward and clear. However, some of the financial terms may confuse the users. The tutorial should explain these terms clearly. One solution is to make the jargon term a hyperlink that takes the user to a definition. This would keep the definitions out of the way for users familiar with financial jargon, but still help the unfamiliar users.

The online tutorial also communicates through screenshots of each page of EESS. These images are a positive feature of the tutorial, but there is room for improvement. First, the images are low resolution, causing the text to be fuzzy and hard to read. Also, the screenshots are large and placed at the top of the page, causing the text of the tutorial to be pushed out of sight. Figure 3 depicts this problem. The screenshot should complement the text, not overtake it.

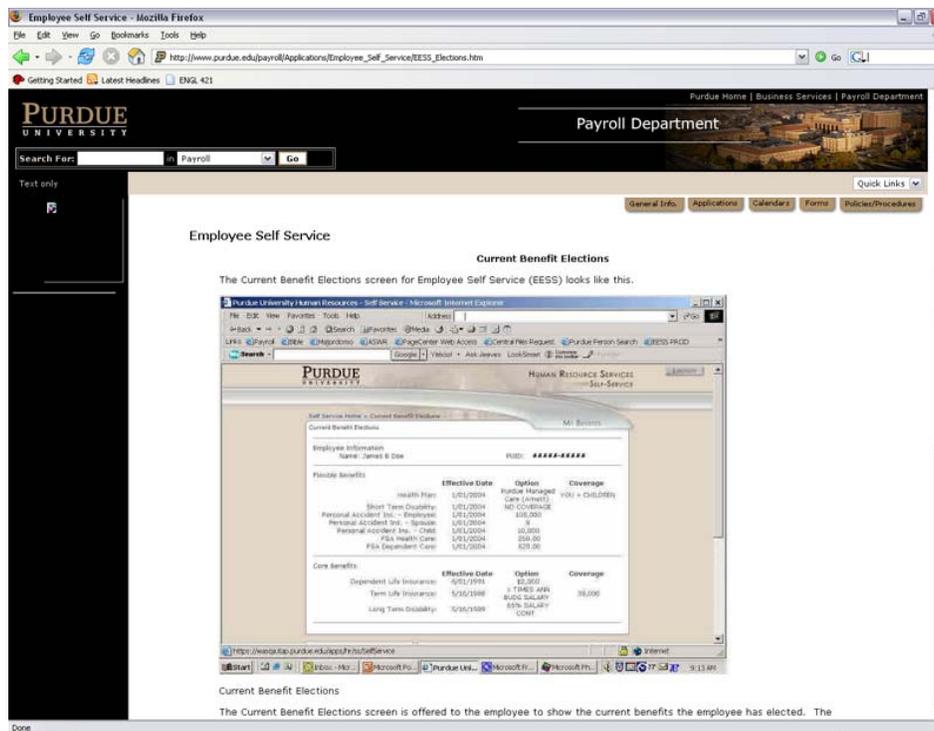


Figure 3: Large screenshots hide text in online tutorial

Another way the screenshots could be improved is highlighting important features of the image. The key is to clearly link the text with relevant portions of the image. A way to create a link between the two is highlighting features in the image, pointing to areas of the image with arrows, or other simple methods of emphasizing specific features of the image.

Since the screenshots are large, users have to scroll down to view the text. A central theme of user-centered design is users do not like to search for information.  Therefore, it is a distraction for users. The organization of the tutorial also affects user's ability to find information.

Organize to Help the User

The organization of the EESS online tutorial mirrors the organization of the EESS interface. This helps users locate information on the tutorial while looking at the interface. Each menu item on the front page of the tutorial corresponds to a menu item on the front page of the EESS interface. This organization helps users find information about specific page on the EESS interface, since the navigation of the tutorial is basically identical to the navigation that brought the user to the page in question.

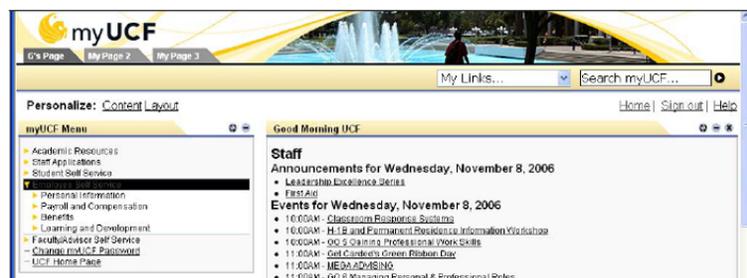
However, as noted above, most users approach help documents with questions about tasks, not specific sections of the software. If the user wants to perform a certain task and cannot find the page on EESS, then a help document with the same navigation structure  the same problem.

An organization based on common tasks of EESS users would be more user-centered. For example, Figure 4 shows a page of the user manual for the employee self service system of the University of Central Florida (Human Resources, 2007). Notice that the section heading at the top of this page is a question regarding a common task of the users, "How do I access Employee Self Service?"

How do I access Employee Self Service?



Go to  myUCF located at <http://my.ucf.edu> and login using your myUCF PID and password.



Once you have logged on to myUCF, you will notice the Employee Self Service links on the left hand side of the main page. You can view your personal data such as Name, Address, Phone.

Figure 4: Task-oriented organization in a help document

The online tutorial for Purdue's EESS could use a similar organization to help users find relevant answers quickly. For instance, the question "How do I check my pay stubs?" would be a very helpful section heading for the EESS users we surveyed.

In general, a task-oriented organization ld help users find information they need more quickly. More empirical research may be done to discover a definitive list of the most common tasks of EESS users. This list could then become the primary means of organizing the answers presented in the online tutorial.

Conclusions

User-centered design is extremely important in help documents. Without it, help documents do not fulfill their purpose. User-centered design helps the user understand presented material in three ways. First, the focus of the document is the user; therefore  will be able to fulfill their task. Next, user-centered help documents speak the user's language.  If the document contains confusing jargon, the document explains them in a clear manner. Finally, the help document is organized with the user in mind.

Unfortunately  the help documents for EESS do not sufficiently follow the basic principles of user-centered design. Empirical research, such as usability testing and surveys, can help make the document more user-centered.

A new version of EESS is set to be released in the near future. This is a golden opportunity to devise user-centered help documents that will smooth the transition to the new version and help solve the problems of EESS users. 



Annotated Bibliography

Anderson, Paul V. Technical Communication: A Reader-Centered Approach. Boston: Thomson Wadsworth, 2007.

This book shows the basic principles of usability and user-centered design in documents. The book also describes how to analyze the audience in order to determine the appropriate rhetoric used in a user-centered document.

Capobianco, Antonio, Noelle Carbone. "Contextual online help: elicitation of human experts' strategies." HCI International 2001 (2001): 824-828.

This article describes how users use help documents to achieve their tasks and goals. The users do not want to master the whole software, but just perform essential functions. The article also describes how help messages on the content of the software help users achieve the goal of using the software.

Corry, Michael D., Theodore W. Frick, Lisa Hansen. "User-centered design and usability testing of a web site: An illustrative case study." Educational Technology Research and Development (1997): 65-76.

This article helps define user-centered design. It also shows the importance of knowing user characteristics when creating user-centered documents.

Grayling, Trevor. "Fear and loathing of the help menu: A usability test of online help." Technical Communication 45 (1998): 168-180.

This journal entry shows users often go to great lengths to avoid using help menus. The article states the different strategies users use to avoid using help menus. The journal also shows different ways help documents could be made more appealing to users.

Human Resources, University of Central Florida. "People Soft 8.9: Employee Self Service User Guide." Orlando: UCF Human Resources, 2007.

The University of Central Florida Guide is an example of a user-centered user manual. The user manual helps show ways to improve Purdue EESS.

Nahl, Diane. "Creating user-centered instructions for novice end-users." Reference Services Review 27 (1999): 280.

The journal entry shows how a majority of users find online and printed instructions difficult to access. Users want to access information easily and to interpret with ease. The journal entry enumerates the most common difficulties users find with instructions, and then gives some possible recommendations to make instructions more user-centered.

Purdue Employee Self Service Website. Retrieved March 23, 2007, from Purdue Employee Self Service Website: http://www.purdue.edu/payroll/Applications/Employee_Self_Service/

The EESS website is an excellent source for information on EESS. The site provides screenshots that can be incorporated into the paper.

Appendix

Purdue Employee Self Service Questionnaire

1. I am _____ years old.
2. I am M___ F___
3. What is your job title with the university? _____
4. What department are you in? _____
5. Rank yourself on your computer literacy (5 being the best, 1 being the worst)
5___ 4___ 3___ 2___ 1___
6. How often do you use Purdue Employee Self Service (ESS)?
Several times a week_____
Once a week _____
Once every other week_____
Once a month_____
Rarely_____
Never_____
7. What do you use Purdue ESS for?

8. How would you rate the usability of the Purdue ESS?
Excellent_____
Above Average_____
Average_____
Below Average_____
Unusable_____
9. How would you rate the visual presentation of the Purdue ESS?
Excellent_____
Above Average_____
Average_____
Below Average_____
Poor_____

Suggestions:
