The Write Stuff
Purdue University
West Lafayette, Indiana 47907

April 30, 2007

Ms. Debra Dillman-Crowell and Ms. Amy Clawson
Purdue University
West Lafayette, Indiana 47907

Dear Ms. Dillman-Crowell and Ms. Clawson:

Team Write Stuff is enclosing a copy of our report on usability and user manuals for the Employee Self Service (ESS) online financial service.

For several months, we have been researching user-centered design. Using this research, we have evaluated the usability of the ESS online tutorial. Although there are some user-centered features of the tutorial, there is plenty of room for improvement. The release of the new ESS version in July is an excellent opportunity to improve the usability of ESS help documents.

Our main recommendation is the creation of a user-centered, task-oriented guide. We have included a prototype guide which explains the common task of checking payroll information. The usability of this guide can serve as a model for future development of ESS help documents.

User testing is an effective way to gain knowledge to help with the design of a user-centered guide. Therefore, our second recommendation is to perform user testing. We provide a user-testing plan which spans over two generations. The difference between the first and the second generation is the availability of the user guide during the test.

If you have any questions, feel free to contact us. Our contact information is as follows:
- Brett Bavar: bbavar@gmail.com
- John Carney: jpcarney@purdue.edu
- Wes Moore: wamoore@purdue.edu

Sincerely,

The Write Stuff

Encl: Problem-Solution Report

User-Centered Design
And
Purdue Employee Self Service

Written By: The Write Stuff

Wes Moore
John Carney
Brett Bavar

English 421

April 30, 2007

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<u>The Write Stuff</u>

"I pledge on my honor that I have not given or received any unauthorized assistance in the completion of this assignment. All work contained herein is my own. All referenced work is cited correctly."
(4/30/2007)

Brett Bavar
John Carney
Wes Moore

Executive Summary (John Carney, Brett Bavar)

A new version of Purdue Employee Self Service (ESS) will be released soon. The transition to the new version could be problematic for users with less technical skill. In this document, we recommend methods to identify users' problems and to support the users regarding these problems.

Our first recommendation is to perform empirical user testing. First of all, user testing will help identify the struggles that Purdue employees have when using ESS. Secondly, user testing will help determine the most common tasks of the users. The information gained through user testing can help make the user-centered document more effective. The document may be adapted to focus on the most common tasks of the users and to address the most common problems that users experience when performing these tasks.

Our second recommendation is to create a user-centered, task-oriented guide for users of ESS. We have performed exploratory research on user-centered design in help documents, and our findings have helped us identify ways to improve upon the existing ESS help documents. We also believe that the results of user testing will offer valuable information for the creation of user-centered help documents.

In order to help the ESS staff administer effective user testing, this document includes a user-testing plan. The plan explains methods of user testing which should help to assess the usability of ESS. In addition, this paper includes a prototype task-oriented guide for the new version of ESS. The guide explains the common task of viewing payroll information on ESS. We hope that this guide will serve as a model for future development of user-centered help documents for ESS.

Table of Contents (Brett Bavar, John Carney)

List of Appendices (Brett Bavar, John Carney)

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Introduction (John Carney, Brett Bavar)

Purdue is preparing to release a new version of its web-based financial service, Purdue Employee Self Service (ESS). The change from the old ESS system affects a variety of Purdue employees, with varying levels of technical ability. Some Purdue employees may have a difficult time transitioning from the old version. User testing on the new version is important to determine problems users may have with the new system. If usability problems are discovered, user-centered help documents are important to help users complete their tasks quickly and effectively.

The purpose of this paper is to propose solutions for the lack of user-centered help documentation for ESS. We have researched user-centered design and user testing, and we have surveyed Purdue employees regarding the current ESS. Our methods and results are included in this paper. We then provide a plan for user testing and a prototype task-oriented guide to serve as a model for future help documentation. We believe these solutions will help the ESS staff make a smooth transition from the old version of ESS to the new one.

One benefit of our solutions is that they are relatively inexpensive. The only cost involved in writing a user manual is the labor cost of writing. The cost of user testing varies, depending on the incentives given to participants. Our plan can also be implemented fairly quickly, which is important, since the second version of ESS is set to be released in July 2007. We suggest an eight week plan, consisting of two generations of user testing and two drafting periods for the task-oriented guide.

Our paper begins with background information on help documents and empirical research. We then explain our exploratory and empirical research methods, and we discuss the results of this research. Using our research findings as a foundation, we present our recommendations for the ESS staff. We then discuss the costs and timeline to implement our solutions. Finally, we conclude with information about the authors of this document.

We begin with a brief discussion of user-centered help documents and empirical research.

Background (John Carney, Brett Bavar)

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. 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.

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, Inc.* 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). To create help documents which are truly user centered, it is important to know the interaction between the user and the service. This can only be objectively determined through empirical research.

Empirical Research

Empirical research is very important to be user-centered. The data is very important because of the amount of information it provides. 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 (Welsh et al., 2003). Methods of empirical research include usability testing and surveys.

Usability testing analyzes the users' interaction with the software. Researchers can watch the user interact with their service in a natural way. For example, usability testing for a website 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.

Surveys simply ask the users questions, such as "How helpful is this document?" or "Does this document make sense?" Users can also leave comments and suggestions, which may enlighten document creators on concerns which were not expressed in the survey. We employed these and other methods for our research, which is explained in the next section.

Research Methods (John Carney, Brett Bavar)

Exploratory Research

Our first task for this report was to conduct exploratory research on user-centered design, especially in user-centered help manuals. Our exploratory research came primarily from two types of sources—a technical communication textbook, <u>Technical Communication: A Reader-Centered Approach</u> by Paul Anderson, and several academic articles. Paul Anderson's textbook showed the basic principles of usability and user-centered design. The academic articles contained unique insights into the usability of help documents.

After our research on user-centered design, we analyzed the usability of the existing help documents for the current ESS system. This assessment was based upon principles we gained from out exploratory research on user-centered help manuals. The details of this assessment are explained in the Findings section below.

We also met with ESS staff members Debbie Dillman-Crowell and Amy Clawson to gain more information. In our first meeting, we discussed the new version of ESS, our project timeline, and the current stage of ESS development. In our second meeting, we were given the opportunity to use the new version of ESS. This enabled us to take screenshots of the new version for our prototype task-oriented guide. In the process, we identified a few potential areas of confusion that could be clarified in our guide.

We also explored ways to effectively conduct empirical user testing. Our primary resource was a report entitled <u>Purdue Online Writing Lab (OWL) Usability Report</u>. This report explains the user testing process employed by the OWL team, and the results which they achieved. The report can be viewed on the website of Allen Brizee, our instructor and a co-author of the presentation. Besides exploratory research, we also conducted empirical research.

Empirical Research

Our empirical research is a survey of 25 Purdue employees. Our data set is small due to the limitations of our resources and short project time. Therefore, our results may not accurately represent the wider population of Purdue employees. The survey consists mostly of residence hall employees and other non-faculty employees. This survey can be found in Appendix 2. Using this survey and the research methods described above, we found some interesting results which are summarized in the next section.

Findings (John Carney, Brett Bavar)

Evaluation of ESS Online Tutorial

The current ESS system offers an online tutorial, the "Self Help Training Manual," which is located on the ESS website. This tutorial consists of a menu of links to several pages, with screenshots and explanations of ESS. Although the tutorial contains some helpful information, there are a few issues which hinder its effectiveness.

The first page of the tutorial is a long description of the purpose and features of ESS. Most users will avoid reading a general information page like this (Grayling, 1998). 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 very relevant to ESS.

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 ESS website.
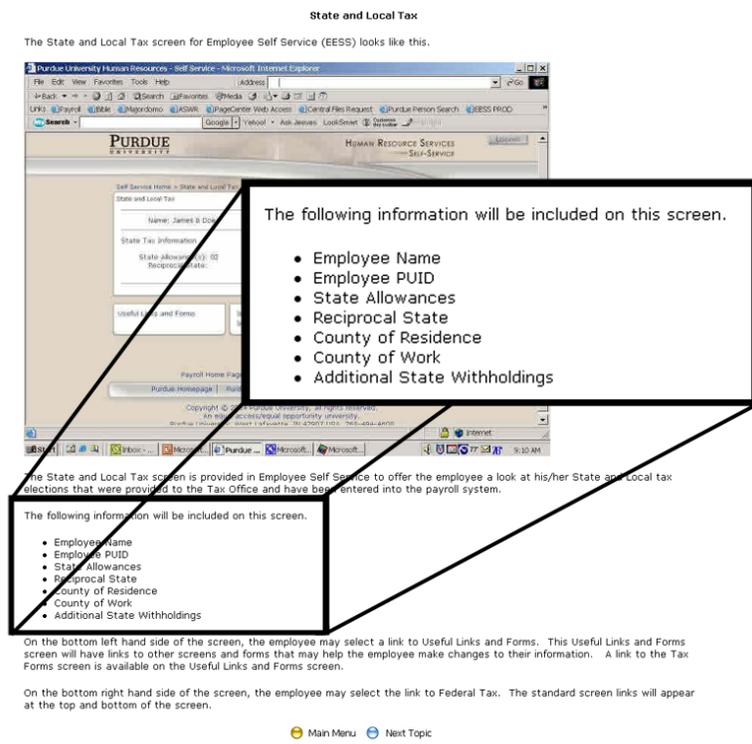

Figure 1: Unnecessary text in the online tutorial

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.

Most of the language in the ESS 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. Similarly, definitions could pop-up when the mouse hovers over the word. 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 ESS. 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. In addition, 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 2 depicts this problem. The screenshot should complement the text, not overtake it.
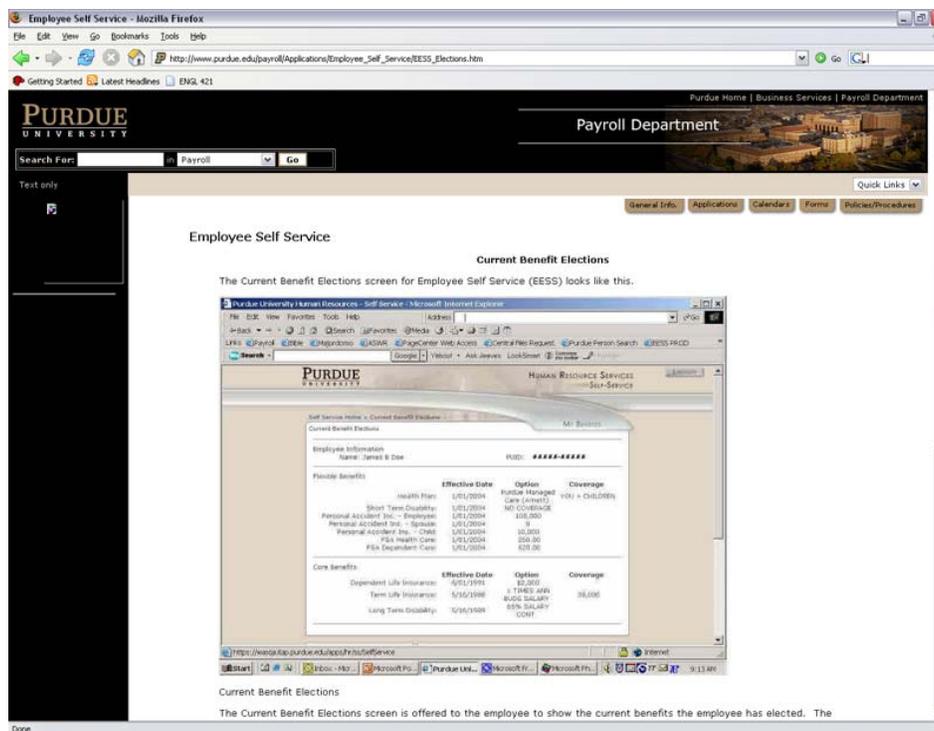

Figure 2: Large screenshots hide text in online tutorial

There is also no link between the text and the screenshot. 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. A central theme of user-centered design is that users do not like to search for information (Grayling,

1998). Therefore, images that do not complement the text are simply a distraction for users.

The organization of the ESS online tutorial mirrors the organization of the ESS 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 ESS interface. This organization helps users find information about specific page on the ESS interface, since the navigation of the tutorial is almost 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 ESS, then a help document with the same navigation structure could pose the same problem.

Overall, knowing the users is important to create user-centered help documents; it should contain the most common tasks of the users. Empirical research is a way to determine the most common tasks of workers. Therefore, a survey was created for the current ESS version to determine the views of Purdue employees.

Survey of Purdue Employees

We surveyed 25 Purdue employees from a variety of professions and backgrounds (see Appendix 2 for survey questions). Thirteen responded that they use ESS. The employees were asked, "What do you use Purdue ESS for?" The responses to this question are summarized in Figure 3. Our results show clearly that the majority of responders use ESS to check pay stub information, while other uses are not so common.
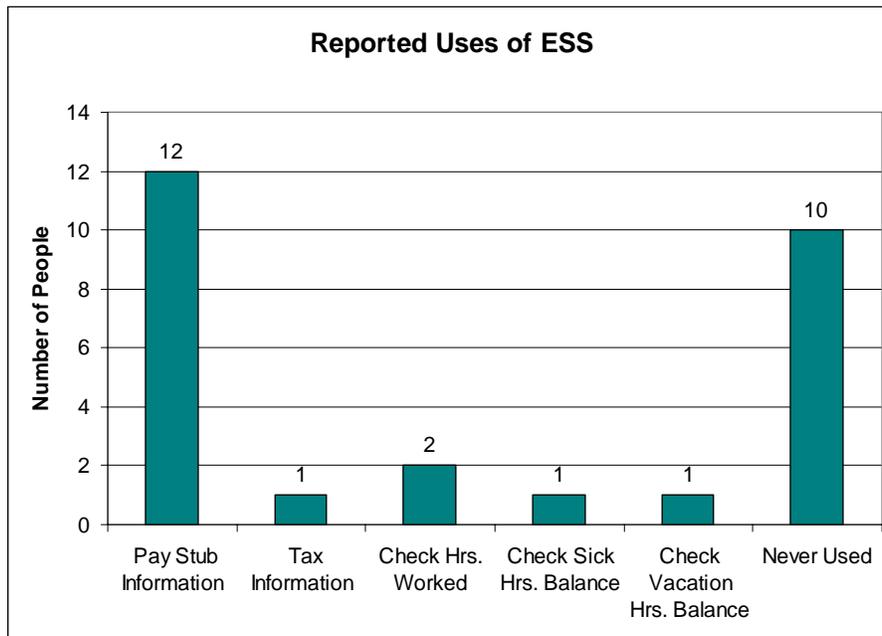

Figure 3: Reported uses from our survey

Recommendations

User Testing (Wes Moore, Brett Bavar)

In order to design a user-centered help document, it is important to understand the actual interactions that will occur between the users and the ESS system. This can be evaluated through empirical user testing. We recommend the following plan for user testing, which is inspired by the Purdue OWL usability tests (Salvo et al., 2007).

Our plan includes two generations of user testing. In the first generation, the testers observe users without the aid of an ESS help document. In the second generation, the users are given a draft of the task-oriented guide to help them as they work. During each generation of testing, the participant pool should include a diverse range of Purdue employees. This should include student employees, faculty, administrative staff, and more.

Both generations of user testing consist of the following three phases:
- Demographic survey
- Scenario-based test
- Feedback survey

The purpose of the demographic survey is to identify traits of the user which may impact his/her opinions or proficiency level. Common demographic questions may ask about gender, age, profession, and level of technical expertise. It may be helpful to include a few questions to determine the user's level of technical expertise empirically, instead of relying on the user's impression of him/herself.

The scenario-based test is the heart of the user testing process. The user is given a series of tasks to perform while the tester observes. The tester records the amount of time taken to complete each task, and the number of mouse clicks used in the process. Those tasks which take more time and/or more clicks may be difficult tasks for the user.

When the first two phases are complete, the user should be given a feedback survey. The purpose of this survey is to gather the user's thoughts shortly after using ESS. Particularly, the survey should ask for the user's assessment of the usability of the ESS system. For instance, the survey could ask the user to explain what problems s/he experienced while using ESS.

Once the first generation of user testing is complete, the first draft of the task-oriented guide can be created according to the data gathered from the tests. The second generation will then be performed with a completely different set of individuals.

The second generation of tests should be administered in the same way as the first generation, except that the task-oriented guide is made available to the users during the scenario-based test. Then, the feedback survey may include questions regarding the usefulness of the task-oriented guide.

Task-Oriented User Guide (Brett Bavar)

Our primary recommendation is the creation of a user-centered guide for the new version of ESS. This would be a task-oriented guide, focusing on the most common and crucial tasks of the users of ESS. This guide should be designed using the knowledge gained from the user testing process described above.

We have created a prototype guide for the most common task mentioned by our survey respondents—checking payroll information. We also included instructions for logging on to OnePurdue, since this task must be completed every time the user accesses ESS. The complete prototype guide can be found in Appendix 1.

To the best of our ability, we created this prototype guide according to the principles of user-centered design. We prioritized the user's goals by focusing on the tasks that matter to the users of ESS. We spoke the user's language by complementing text with images and avoiding technical jargon. Also, we organized to help the user by enumerating clear step-by-step instructions that can be quickly understood.

Budget (John Carney, Brett Bavar)

One benefit of our recommendations is the low cost. Our first recommendation is to create a user-centered, task oriented guide for the new version of ESS. There are not a lot of costs associated with creating a user-centered help document. The only cost is the labor cost for the ESS staff that will create the document.

There may be more costs to implement user testing. However, this cost depends on the incentives given to testing participants. If participation is completely voluntary, the only cost is the labor cost of testing. If participants are given money or other material incentives, the cost will increase. Assuming that the incentives for each individual cost no more than $20 and that the number of participants is no more than 50, the cost will not exceed $1,000.

Timeline (John Carney, Brett Bavar)

Figure 4 depicts a possible timeline for the implementation of our recommendations. Since the second version of ESS is set to be released in July 2007, we suggest an eight week plan. The first week consists of the first generation of user testing as described above. Using the data from these tests, the first draft of the task-oriented guide may be completed in within the next four weeks. This guide can then be given to participants of the second generation of user testing, which would be performed on week 6. Finally, the information from this test could be used to create the final draft of the guide in weeks 7 and 8.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Generation 1 Testing	███							
First Draft of Guide		██████████████████						
Generation 2 Testing						███		
Final Draft of Guide							████████	

Figure 4: Recommended timeline

Staffing (John Carney)

Our group members are Brett Bavar, John Carney, and Wes Moore. Our team is diverse because we all come from different majors and we all have different interests. The diversity is an advantage because of the variety of ideas brought to the project. Brett Bavar is a graduating senior in Computer Science and Mathematics. Due to interest in software systems, Brett was designated as team leader. His knowledge of computers has also helped with the project. John Carney is a senior in Environmental Health. John's task was organize the document, and he also assisted with research and writing the document. Wes Moore is majoring in Biology and Building Construction Management. Wes's main job was research on user testing and creating a user-testing plan.

Conclusion (Brett Bavar, John Carney)

ESS is an online financial service that serves Purdue employees. One of the primary uses of ESS is checking payroll information. There is an online tutorial for this current version. The document implements some user-centered principles, but still has room for improvement.

A new version of ESS is set to be released in the near future. The transition may cause a problem for some users. 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 ESS users.

We offer two recommendations to the ESS staff: empirical user testing and creating a task-oriented user guide. Empirical user testing will give the staff helpful knowledge to create a user-centered guide. In turn, the user guide will help users adapt to the new ESS.

If you have any questions or concerns, feel free to contact us at:
- Brett Bavar: bbavar@gmail.com
- John Carney: jpcarney@purdue.edu
- Wes Moore: wamoore@purdue.edu

Works Cited (John Carney)

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

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

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

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

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Salvo, Michael, et al. "Purdue Online Writing Lab (OWL) Usability Report." Retrieved April 30, 2007, from The OWL at Purdue website: http://owl.english.purdue.edu/research/OWLreport.pdf

Welsh, Elizabeth, et al. "E-Learning: emerging uses, empirical results and future directions." International Journal of Training and Development 7:4 (2003).

Logging On to OnePurdue

1. Type http://www.purdue.edu/onepurdue into your web browser, and press enter.

> A web browser is a program like Internet Explorer, Firefox, or Safari. These programs feature a box similar to the one below for web addresses.
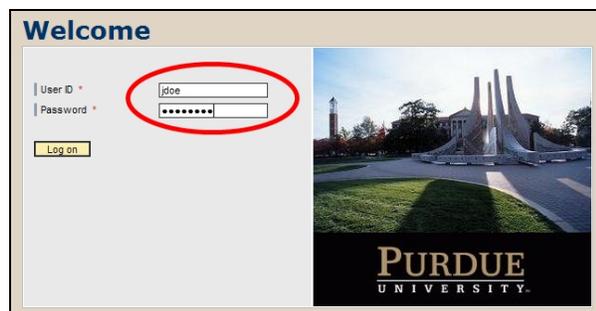

2. Click on

> The *OnePurdue Portal Login* button is located in the left-hand menu.

3. Type your *User ID* and *Password*, and press enter.

> The *User ID* and *Password* should be the same as your Purdue career account.
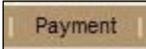
Viewing Your Salary Statement

1. Start at the OnePurdue portal.

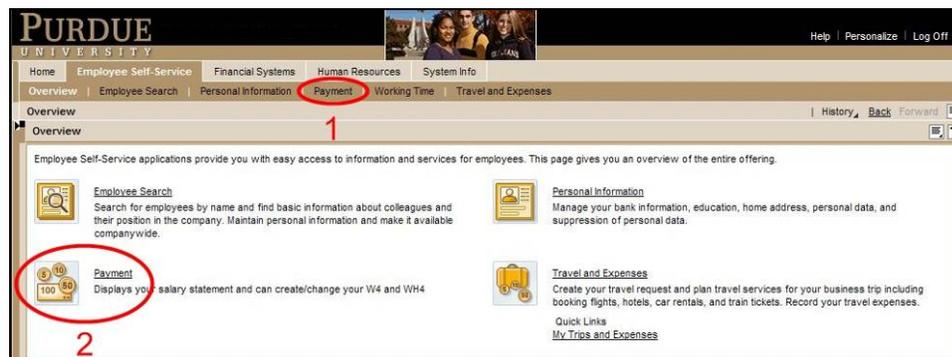   See *Logging On to OnePurdue* above for more details.

2. Click on   Employee Self-Service

   The *Employee Self Service* tab is located below the Purdue University logo.
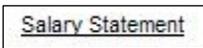

3. Click on   Payment

   You may access the payment page in either of two ways:
   (1) The *Payment* link under the navigation tabs.
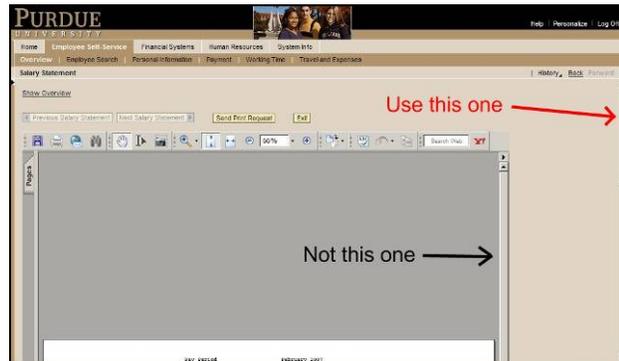   (2) The *Payment* icon on the ESS Overview page.
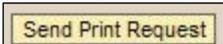

4. Click on   Salary Statement

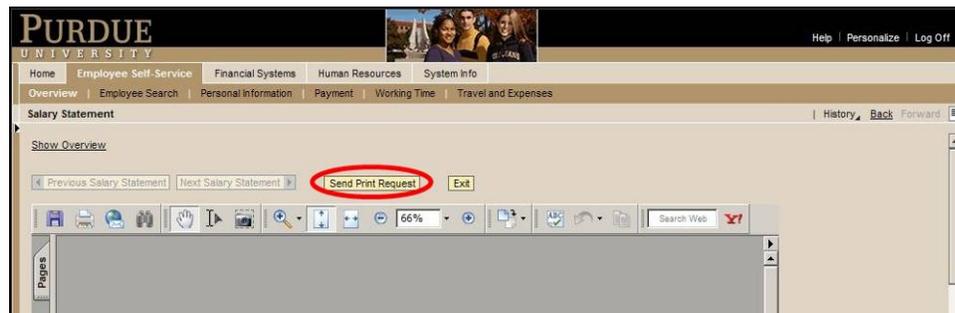   The *Salary Statement* link is in the left-hand column of the payment page.

NOTE: You may need to scroll down to see the salary statement. If so, make sure to use the outermost scroll bar on the right-hand side.

Printing the salary statement

Click on Send Print Request to print the statement.

The *Send Print Request* button is located directly above the salary statement.

Understanding the salary statement

We suggest adding an explanation of the salary statement here. This would keep the financial details separate from the sections explaining the tasks. In this way, the document can accommodate employees who understand the statement but are not tech savvy and also accommodate employees who are tech savvy but do not understand the statement. This section could include:

- Definitions of financial terms
- Images to help the user locate the information on the statement

The design of this section, as with all other aspects of the guide, should be motivated by an understanding of the unique characteristics and needs of the users of ESS.

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:
_____
_____
_____
_____
_____