

A Usability Analysis of the LionPath System

Abstract

The LionPath system, which is used by students, faculty, and staff of the Pennsylvania State University to perform tasks such as registering for classes, making payments to the university, checking academic documents such as transcripts, and displaying relevant academic information such as grades and schedules, is frequently commented upon by the individuals that make use of the system as being very unusable. Many users of this system are unaware of how to perform seemingly simple tasks on the system. As a result, a hidden frustration is present in the minds of these users. The only way to improve the functionality of the LionPath system would be to perform a usability analysis of the system and, from the results of that analysis, provide suggestions for improvement. In this study, a Hierarchical Task Analysis will be conducted on three important functions of the LionPath system: registering for classes, checking one's class schedule, and ordering a transcript. The experimenter will perform these Hierarchical Task Analyses by performing these functions on her LionPath student account and taking note of the tasks and sub-tasks involved in the completion of these functions. After this tabulation, the experimenter will present solutions to the problem of the unneeded complexity of the series of steps which need to be taken to perform these common and very important functions. Sample Hierarchical Task Analyses of these proposed solutions will then be provided and be compared to the Hierarchical Task Analyses of the current functionalities of the LionPath system. The advantages of the proposed solutions will then be stated with regards to the amount of time and effort saved on the part of the user.

Introduction

In the present day, with the increasing complexity of employee resources on the part of companies, it is becoming increasingly common for employers to utilize web interfaces for the purposes of enabling their employees to manage resources such as scheduling, pay, insurance, and other relevant functions related to employment (Yen et al, 2002). Despite the purported advantages of transitioning from a paper-based system of employee management to a digital system of employee management, it is often the case that these new web interfaces are lacking in many basic aspects of user design. As a result of this dearth of attention which is given to the potential end users when designing the websites which these end users are forced to use for necessary functions such as applying for benefits and receiving paychecks, these potential end users, the employees, may not know how to use these very important websites which are essential for their employment. If these websites and their interfaces are not changed to put the user instead of the system first, it will be the case that users will commit mistakes while using the system, become frustrated while using the system, and may, as a result, not use the system at all. Therefore, it is of the utmost importance that usable systems be created, and this project will analyze such a system with regards to its usability and provide potential improvements on the system in question.

The system which is to be analyzed in this study is the LionPath system, which is used by the Pennsylvania State University to provide students and employees pertinent functions related to their academic and financial needs. This website provides students with options to register for their classes, view their class schedules, view their grades and transcripts, and pay their tuition fees and view any financial aid which they are receiving. This website is very important to students since most of the functions which are necessary for their enrollment at the university,

such as registering for classes and making tuition payments, are only able to be completed using this website. In a survey conducted on twelve graduate students of the Pennsylvania State University in the departments of Information Sciences and Technology and Computer Science, it was found that all twelve students experienced frustration when using the LionPath system. Since such frustration is so prevalent among students, who are the most important users of the system, it is necessary to change the system to be more usable. In addition, as a result of the great importance of the LionPath website to the functioning of the student body of the Pennsylvania State University, it is also of great, or even greater importance, that the website in question be targeted towards these end users with regards to the ease of its use on the part of students.

Methods

In order to evaluate the usability of the LionPath system, the author, who is a student of the Pennsylvania State University and, therefore, has access to the system, conducted a Hierarchical Task Analysis of three important functions of the LionPath system. These three functions are: registering for courses, checking one's schedule, and ordering a transcript. The author logged on to her LionPath account and completed these three functions using the system, while encoding the actions which had to be taken to complete these three functions into a Hierarchical Task Analysis. After this, the author created new Hierarchical Task Analyses of these three functions which are more appropriate for usage since they are more in tune with acceptable usability of the system.

Results

The three Hierarchical Task Analyses which were conducted are presented in Appendix A. The tasks being analyzed are presented in bold font, task steps are encoded as numbers and

subtask steps which are embedded within these task steps are encoded as letters which are indented to be within the section pertaining to the numbered task steps. Optional task steps are coded as such. The three proposed Hierarchical Task Analyses are presented in Appendix B and are coded in the same manner as the Hierarchical Task Analyses in Appendix A. Mouse clicks, selection from menus, typing, scrolling, and selection of radio buttons were included as tasks.

With regards to the task of registering for courses, it was found that this task contains twenty task steps and eleven subtask steps. Most of these task steps were mouse clicks and selection from drop down menus. This task was the most complicated task in terms of the number of task steps and subtask steps which had to be completed on the part of the user.

With regards for the task of checking one's schedule, it was found that this task contains ten task steps and five subtask steps. Most of these task steps were the selection of radio buttons. This task was the least complicated task in terms of the number of task steps and subtask steps which had to be completed on the part of the user.

With regards to the task of ordering a transcript, it was found that this task contains twelve task steps and five subtask steps. Most of these task steps were the selection of radio buttons. This task was of a complexity between the two aforementioned tasks in terms of number of task steps and subtask steps which had to be completed on the part of the user.

The proposed modifications of the three tasks, which are presented in Appendix B, reduce the number of task steps and subtask steps which must be completed by the user to a significant degree. With regards to the task of registering for courses, the number of task steps which are necessary in the proposed new system are seventeen, as opposed to twenty. This is a reduction of 15% and a reduction of nine seconds in terms of time. The number of subtask steps

embedded within this task are eleven, which is the same number of subtask steps as the actual function as it currently is. With regards to the task of checking one's schedule, the number of task steps which are necessary in the proposed new system are nine, as opposed to ten. This is a reduction of 10% and a reduction of one second in terms of time. The number of subtask steps embedded within this task are five, which is the same number of subtask steps as the actual function as it currently is. With regards to the task of ordering a transcript, the number of task steps which are necessary in the proposed new system are eleven, as opposed to twelve. This is a reduction of 8.3% and a reduction of three seconds in terms of time. The number of subtask steps embedded within this task are five, which is the same number of subtask steps as the actual function as it currently is. Screenshots of the current function steps present in the LionPath system and screenshots of the improved function steps which should be present in the LionPath system with regards to the three tasks examined are presented in Appendices C, D, and E.

Discussion

From the results of this study, it is clear that the number of task steps needed to complete the three pertinent functions of registering for classes, checking one's schedule, and ordering a transcript, can be reduced to some extent and still contain the inherent features of these functions. This finding reveals that there is much unnecessary and repetitive action which is currently being taken on the part of students who are using the LionPath system to perform these functions. If these actions are removed from the tasks being studied, much time, effort, and frustration will be saved on the part of those who use this system.

With regards to the task of registering for classes, it is suggested to remove the task step of clicking on the Academics section of the LionPath website. This is the case since the task of registering for classes is a very important step, and, as such, should be embedded within the

landing page of the LionPath website. It is also the case that this step is performed about once every semester, and, therefore, is not the type of task which a student would perform in an automatic fashion, as would be the case with a task which a student performs on a daily basis. As a result of the infrequency of the conduction of this task, it would be better to embed this task on the landing page since the student could save much time in remembering which tab to click on to access this functionality. In addition, the selection of the proceeding to another step which is currently the case when registering for courses should be removed since the only functionality left in this task step is to click on the “Finish Enrolling” button, which can easily be placed in the current step instead of having to add an unnecessary step to the already complicated process of registering for courses.

With regards to the task of viewing one’s schedule, it is suggested to remove the task step of clicking the “Continue” button after selecting the semester which one would like to view one’s class schedule for. It would be much easier if one can automatically view one’s schedule without having the delay of pressing this button. In addition, the default view should be the “Weekly Calendar View” instead of the current default view of “List View” since the former viewing method is much easier to comprehend in a more rapid fashion. This is the case since previous research has found that visual information, which in this case is a view of one’s schedule as a visual calendar, is more readily processed than textual information, which in this case is a view of one’s schedule as a verbal list with no visualizations (Mayer & Moreno, 2010).

With regards to the task of ordering a transcript, it is suggested that the task step of selecting a button to view one’s transcript, which is currently repeated twice, be changed to only be conducted once. This is the case since this repeated pushing of a button is unnecessary and frustrating on the part of the user. Therefore, in order to reduce the complexity of this already

complicated task, the “View Transcript” button should be clicked once, after which one’s transcript will be immediately presented on the screen.

Conclusion

This study, which used the human factors method of Hierarchical Task Analysis to analyze the user interface of the LionPath website, has revealed that this system currently forces users to engage in many non-essential task steps. These task steps increase the amount of time needed to complete very simple tasks and lead to frustration on the part of the user, who initially thinks that the task which is to be completed will be very simple and fast, but, when completing the task, realizes how much time and cognitive effort is being wasted on the completion of a task which could have taken much less time indeed. If the recommendations enumerated herein are taken into account by relevant officials, the LionPath system will become easier to use by students and staff of the Pennsylvania State University, which will lead to a more satisfied student body and staff. If these recommendations are heeded, students and staff will be more likely to use the LionPath system to the full capacity of its functionality, leading to a more informed student body and staff.

In conclusion, through the accurate and precise implementation of human factors and usability methods, such as Hierarchical Task Analysis, it is possible for individuals to perform their essential job functions with less frustration and more efficiency. A more efficient and clear-minded student body and staff will increase the amount of work completed by the university, which will lead to its ever-lasting success and increased prestige. This goal can only be attained by minor steps, and one such minor step is the increased usability of the LionPath system, which is the system which connects students and staff to the university itself.

Limitations & Further Research

Although this analysis has revealed many instances of human factors errors within the LionPath system with regards to three important tasks, not all of the tasks which are able to be performed using the system were analyzed since this type of analysis is beyond the scope and time limitations of this particular study. In the future, this study can be expanded to include all of the possible tasks which can be conducted using the LionPath system with regards to their usability, as determined via the method of Hierarchical Task Analysis. Proposed Hierarchical Task Analyses will also be conducted on the entirety of the functions which can be performed using this system.

In addition to the LionPath system of the Pennsylvania State University, this methodology of conducting Hierarchical Task Analyses on both current tasks embedded within a system and an improvement of the functionality and efficiency of those tasks can also be conducted on similar employee and student management software systems in other universities. By so doing, students and employees at college campuses throughout the United States will have a much better experience and a much greater intuitive understanding of the systems which they have to use on a daily basis.

Appendix A: The Hierarchical Task Analyses

Hierarchical Task Analysis: Registering for Courses

1. Turn on computer
 - a. Press “on” button
2. Enter Password
 - a. Type password in password text box
3. Click on web browser icon of choice
 - a. Click on “Google Chrome” icon
4. Enter website into website text box
 - a. Type “lionpath.psu.edu”
 - b. Press enter key
5. Type in Username and Password
6. Press “Log In”
7. Click “Academics”
8. Click “Enrollment Shopping Cart”
9. Press radio button for the term for which classes would like to be registered
10. Press “Continue”
11. Press “Search”
12. Enter search terms (at least 2)
 - a. Select Campus from drop down box
 - b. Select Location from drop down box
 - c. Select Subject from drop down box

- d. Select criterion (contains, greater than or equal to, is exactly, less than or equal to) from drop down box
 - e. Select course career
 - f. Select session
13. Check the check box if you would like to only have open classes revealed
 14. (Optional) Select additional course criteria
 15. Click “Search”
 16. Scroll through course selections
 17. Click the “Select” button for the course which you would like to enroll in
 18. Click “Next”
 19. Click “Proceed to Step 2 of 3”
 20. Click “Finish Enrolling”

Hierarchical Task Analysis: Checking One's Schedule

1. Turn on computer
 - a. Press "on" button
2. Enter Password
 - a. Type password in password text box
3. Click on web browser icon of choice
 - a. Click on "Google Chrome" icon
4. Enter website into website text box
 - a. Type "lionpath.psu.edu"
 - b. Press enter key
5. Type in Username and Password
6. Press "Log In"
7. Click "Class Schedule Details" on landing page
8. Press radio button for the semester for which you would like to view your schedule
9. Click "Continue"
10. Select "List View" or "Weekly Calendar View" (default is "List View")

Hierarchical Task Analysis: Ordering Transcript

1. Turn on computer
 - a. Press “on” button
2. Enter Password
 - a. Type password in password text box
3. Click on web browser icon of choice
 - a. Click on “Google Chrome” icon
4. Enter website into website text box
 - a. Type “lionpath.psu.edu”
 - b. Press enter key
5. Type in Username and Password
6. Press “Log In”
7. Click “Academics”
8. Click “Academic Records”
9. Click “View Unofficial Transcript”
10. Select “Report Type” from drop down menu
11. Click “View Report”
12. Click “View Report”

Appendix B: Proposed Hierarchical Task Analyses

Proposed Hierarchical Task Analysis: Registering for Courses

1. Turn on computer
 - a. Press “on” button
2. Enter Password
 - b. Type password in password text box
3. Click on web browser icon of choice
 - c. Click on “Google Chrome” icon
4. Enter website into website text box
 - d. Type “lionpath.psu.edu”
 - e. Press enter key
5. Type in Username and Password
6. Press “Log In”
7. Click “Enrollment Shopping Cart”
8. Press radio button for the term for which classes would like to be registered
9. Press “Continue”
10. Enter search terms (at least 2)
 - f. Select Campus from drop down box
 - g. Select Location from drop down box

- h. Select Subject from drop down box
 - i. Select criterion (contains, greater than or equal to, is exactly, less than or equal to) from drop down box
 - j. Select course career
 - k. Select session
11. Check the check box if you would like to only have open classes revealed
 12. (Optional) Select additional course criteria
 13. Click “Search”
 14. Scroll through course selections
 15. Click the “Select” button for the course which you would like to enroll in
 16. Click “Next”
 17. Click “Finish Enrolling”

Proposed Hierarchical Task Analysis: Checking One's Schedule

1. Turn on computer
 - a. Press "on" button
2. Enter Password
 - b. Type password in password text box
3. Click on web browser icon of choice
 - c. Click on "Google Chrome" icon
4. Enter website into website text box
 - d. Type "lionpath.psu.edu"
 - e. Press enter key
5. Type in Username and Password
6. Press "Log In"
7. Click "Class Schedule Details" on landing page
8. Press radio button for the semester for which you would like to view your schedule
9. Get "Weekly Calendar View" immediately

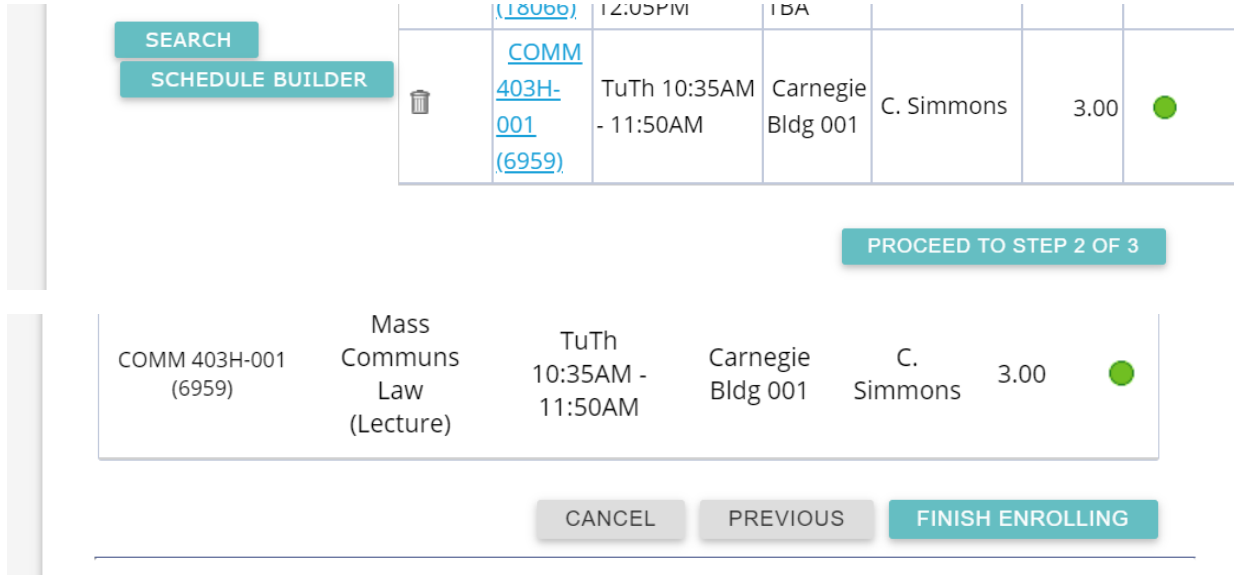
Proposed Hierarchical Task Analysis: Ordering Transcript

1. Turn on computer
 - a. Press “on” button
2. Enter Password
 - b. Type password in password text box
3. Click on web browser icon of choice
 - c. Click on “Google Chrome” icon
4. Enter website into website text box
 - d. Type “lionpath.psu.edu”
 - e. Press enter key
5. Type in Username and Password
6. Press “Log In”
7. Click “Academics”
8. Click “Academic Records”
9. Click “View Unofficial Transcript”
10. Select “Report Type” from drop down menu
11. Click “View Report”

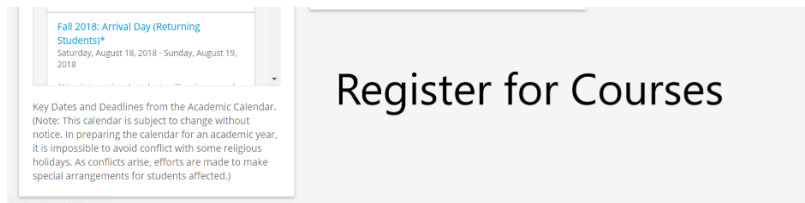
Appendix C: Screenshots of the Current and Proposed LionPath System: Registering for Courses



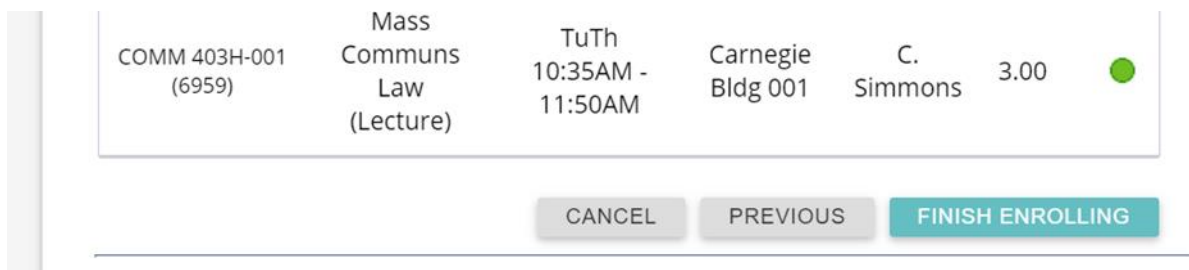
Currently, one has to click on the “Academics” tab to start enrolling for courses



One has to then click on both “Proceed to Step 2 of 3” and “Finish Enrolling”



A “Register for Courses” section could be added to the homepage in the empty space at the bottom



The “Proceed to Step 2 of 3” button could be replaced and switched with the “Finish Enrolling” button

Appendix D: Screenshots of Current and Proposed LionPath System: Checking One's Schedule

Select a term then select Continue.

	Term	Career	Institution
<input type="radio"/>	Fall 2018	Graduate School	The Pennsylvania State Univ
<input checked="" type="radio"/>	Spring 2019	Graduate School	The Pennsylvania State Univ

CONTINUE

The "Continue" button must be pressed

	Term	Career	Institution
<input type="radio"/>	Fall 2018	Graduate School	The Pennsylvania State Univ
<input checked="" type="radio"/>	Spring 2019	Graduate School	The Pennsylvania State Univ

<< PREVIOUS WEEK **Week of 1/7/2019 - 1/13/2019** NEXT WEEK >>

Show Week of Start Time End Time

Time	Monday Jan 7	Tuesday Jan 8	Wednesday Jan 9	Thursday Jan 10	Friday Jan 11	Saturday Jan 12	Sunday Jan 13
8:00AM							
9:00AM			IST 597 - 005 Lecture				
10:00AM							

The semester selection button should be pressed, followed by an automatic view of the "Weekly Calendar View".

Appendix E: Current and Proposed LionPath System: Ordering a Transcript

Academic Institution	<input type="text" value="The Pennsylvania State Univ ▼"/>	<input type="button" value="VIEW REPORT"/>
Report Type	<input type="text"/>	

	Request Date	Description
<input type="button" value="VIEW REPORT"/>	12/04/2018	Advising Graduate Transcript

The “View Report” button must be clicked twice

Academic Institution	<input type="text" value="The Pennsylvania State Univ ▼"/>	<input type="button" value="VIEW REPORT"/>
Report Type	<input type="text"/>	

It should be the case that immediately after pressing the first “View Report” button, the transcript will be shown on the screen.

References

- Mayer, R. E & Moreno, R. (2003). Nine Ways to Reduce Cognitive Load in Multimedia Learning, *Educational Psychologist*, 38(1), 43-52, DOI: 10.1207/S15326985EP3801_6
- Yen, D. C., Chou, D. C., & Chang, J. (2002). A synergic analysis for Web-based enterprise resources planning systems. *Computer Standards & Interfaces*, 24(4), 337-346.
doi:10.1016/S0920-5489(01)00105-2