Joe'ss Usability Final Testing Report

November 18, 2020

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Executive Summary

This document presents a report of the usability test of Joe'ss (pronounced "Joe's"), a web-based application used by students and faculty of Missouri S&T for accessing, requesting for, and managing their information. Five users who were students and graduate teaching assistants at Missouri University of Science and Technology were recruited. Findings showed that the average number of completed tasks per user was 7, while the average number of users who completed a task was 3.5 users. A total of 46 errors were recorded. Further, the average system usability scale score, as rated by the five users, was 41. Four problems were identified. These included misleading labels, flawed information architecture, lack of cues to perform task, and numerous criteria. To improve the usability of the application, recommendations are provided.

Introduction

Joe'ss (pronounced "Joe's") is a campus solution developed by Oracle PeopleSoft for Missouri University of Science and Technology. Short for Joe Miner's Self Service, Joe'ss is a web-based application that allows students to access, request for, and manage information such as enrollment, graduation status, online payment options, course history, payment history, billing statements, registration schedule, financial aid information, academic records, and transcripts. The application also provides functionalities for faculty to access and manage their course-related activities, including class and exam schedules, class rosters, and grading.

Joe'ss is one of the few automated tools available to students and faculty for accessing, requesting for, and managing their information. As a matter of fact, there are student- and faculty-related activities that can only be performed via Joe'ss. This underscores why the app should be able to effectively support its users—students and faculty—to access, request for, and manage their information. This requirement primarily determines its usability. It is therefore important to conduct a usability test of Joe'ss to identify areas that can be improved to facilitate easier access to and more effective management of information.

Test Objectives

This report presents a usability test of Joe'ss. The goals of the usability test are to determine the following:

i.   If users can successfully and quickly search for student- and course-related information without assistance on Joe'ss.
ii.   If users can successfully request for student-related information via Joe'ss.
iii. If users are satisfied or enjoy using Joe'ss.
iv.   If users can successfully recover from errors whenever they experience them.

Audience Analysis

The users of Joe'ss are students and faculty of Missouri University of Science and Technology. To use the application, users must have some substantial knowledge and experience of information technology. Based on what is known about the users, a persona was created. Figure 1 presents a persona of a user of the Joe'ss application.

Test Plan
Methods

To investigate the usability of Joe'ss, a moderated summative test was conducted between October 30–31, 2020 to collect objective and subjective measurements of a set of tasks. Five users (3 males, 2 females) were recruited. Their average age was 29.8 years (SD = 3.4 years). Most of the users were advanced in their use of information technologies such as the Internet, mobile phones, and

computer systems. Further, all the users reported to have been using Joe'ss for between 6 months and 1 year. A demographic summary of the users is presented in Table 1.

Persona

> **Name**: Kate Thompson
>
> **Gender**: Female
>
> **Age**: 30
>
> **Occupation**: Currently a student and GTA at Missouri University of Science and Technology.
>
> **Highest level of Education**: Bachelor's degree
>
> **Technical Profile**: She has more than 10 years' experience using the Internet and web-based applications and services. Further, she has been using both student and faculty modules of Joe'ss for more than 8 months.
>
> **Goals/Motivations**: Every semester, Kate enrolls for new courses, pays her fees, views her grades, among other related requirements. As a GTA, she often monitors her class roster to know if any of the students has dropped her course. Further, she uses Joe'ss for managing her class schedule and grade roster. Her school and work schedules always leave very little room to engage in other activities. She expects that available tools to support her roles as student and GTA can be used with utmost ease. She fears that not being able to use Joe'ss to perform some required tasks or expending long period of time to complete such tasks can negatively impact her productivity.

Figure 1. User persona

Consent Form

The usability test of Joe'ss involves not only the use of human subject but also the recording of the testing process. In line with the ethical principle of respect for persons, such humans should be given the opportunity to decide what shall or shall not happen to them. It was therefore necessary to obtain the permission of the users before they proceeded for the test.

The consent form, as presented in Figure 2, contained information on (1.) the purpose of the test, (2) the risks involved in participating in the test, (3.) the management of user information, and (4.) the right of users to opt out of the test, withdraw their consent, and request for their records to be deleted.

Table 1. Demographics of users

Characteristic	Frequency
Sex	
Male	2
Female	3
Age (in years)	
20 – 30	2
30 – 40	3
Level of IT Proficiency	
Basic	0
Intermediate	1
Advanced	4
Experience with Joe'ss	
Less than 6 months	0
Between 6 months to 1 year	5
More than 1 year	0

Administrator Script

A briefing before the test provides the opportunity for users to understand the purpose of a usability test and what is expected of them. This can help to minimize inconsistencies and improperly conducted tests. The briefing process essentially entails interacting with the users before commencing the usability test. The briefing script read to users during the test is presented as follows:

"Once again you are welcome and thank you for accepting to participate in the usability test of Joe'ss. The purpose of the test is to determine if you can successfully and quickly search for student- and course-related information without assistance on Joe'ss, if you can successfully request for student-related information via Joe'ss, if you are satisfied or enjoy using Joe'ss, and if you can successfully recover from errors whenever you experience them. During the test, your activities on the computer will be recorded using Zoom. Before you commence, I will need to obtain your consent. Please read the consent form, and if you agree with the terms, sign the form. For the test, there are going to be two scenarios and 5 tasks under each scenario. The first scenario will assume that you are a student while the second will assume you are a GTA. During the test, you will work alone, with no input from me at any time. On any given task, if you take longer than 3 minutes or make 5 errors, I will terminate the task. I will sit with you to observe the proceedings. At the end of each scenario and corresponding tasks, you will undertake a post-task interview. By the end of the test, you will be required to complete a post-test questionnaire. One of the tasks involves printing some information. For that, you are expected to print the information to pdf. I want to say that what

we are testing is Joe'ss and not you. So, do not feel like a failure when you are having issues completing a task. All the problems you may experience will be useful towards improving the application. If you have any questions before we commence the test, please let me know."

Joe'ss Usability Test Consent Form

Please read carefully and sign this form.

I understand that the goal of this test is to assess the effectiveness of Joe'ss in supporting its users—students and faculty—to access, request for, and manage their information.

I accept that I will be asked to perform certain task on a computer, which will be recorded, and I will be required to undertake a post-task interview and complete a post-test questionnaire.

I understand that there are no known or foreseeable risks in participating in this usability test.

I understand that all information relating to my participation will be used strictly for the purpose of the usability test and will remain strictly confidential.

I also understand that I reserve the full right to stop my participation and withdraw my consent to the test at any time.

Signature: ………………………………………...

Date: ……………………………………………..

Figure 2. Consent form

Screening

One of the core requirements of conducting an effective usability test is recruiting the right users to test the system. For the usability testing of Joe'ss, to ensure that only users who met the specified criteria, as described by the persona, were selected, invited users were screened using a screening questionnaire (presented in Figure 3). The completed screening questionnaires for the recruited users are contained in Appendix B.

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Joe'ss Usability Test Screening Questionnaire

Candidate

1. Name: …………………………….

2. Gender:
   - ☐ Male
   - ☐ Female

3. Age (in years): …………………………………

4. What is your level of proficiency with the use of information technologies such as mobile phone, computer system, Internet?
   - ☐ Basic
   - ☐ Intermediate
   - ☐ Advanced

5. Are you a student at Missouri S&T?
   - ☐ Yes
   - ☐ No

6. Are you a GTA at Missouri S&T?
   - ☐ Yes
   - ☐ No

7. Have you ever used Joe'ss?
   - ☐ Yes
   - ☐ No

8. If your response to question 7 was yes, how long have you been using Joe'ss? (Please skip this question if you selected *No* in question 7.)
   - ☐ Less than 6 months
   - ☐ Between 6 months and 1 year
   - ☐ More than 1 year

</div>

Figure 3. Screening questionnaire

Pre-Test

After the process of selecting users using the screening questionnaire, it was important to get additional information about each of the users. This was because everyone has differences in their goals and motivations for using Joe'ss, and learning more about such differences can be useful. The pre-test questionnaire completed by recruited users is presented in Figure 4. The completed pre-test questionnaires for the 5 users are presented in Appendix C

1. As a student, which of the student-related functions of Joe'ss have you used? Name at least three.

2. As a student, which of the student-related functions of Joe'ss do you use more often? Name at least three.

3. As a GTA, which of the GTA-related functions of Joe'ss have you used? Name at least three.

4. As a GTA, which of the GTA-related functions of Joe'ss do you use more often? Name at least three.

Figure 4. Pre-test questionnaire

Checklist for Test Administrator

The use of a checklist was to ensure that the administrator of the test remained aware of their responsibilities prior to, during, and after the test. It also helps to ensure a uniform testing process for all users. The checklist for Joe'ss usability test is given in Figure 5 below.

Think-Aloud Protocol (TAP)

The think-aloud protocol is a valuable way of gathering qualitative data during usability test. It helps to capture users' expressed thoughts, actions, feelings, and reactions, providing access to their cognitive processes. For Joe'ss usability test, the TAP was employed. What the users said and did during the test recorded using Zoom. The instruction users were given is presented below.

"Once again, the purpose of today's usability test is to determine if you can successfully and quickly search for student- and course-related information without assistance on Joe'ss, if you can successfully request for student-related information via Joe'ss, if you are satisfied or enjoy using Joe'ss, and if you can successfully recover from errors whenever you experience them. I want you to be as natural as possible during the entire test. As you undertake the tasks, please feel free to think aloud: tell me what you expect when you make a certain choice. I am interested in knowing your surprises, disappointment, confusion, frustration. Share with me whatever is running through you mind—positive or negative—throughout the entire process. As you think aloud throughout the entire test, it gives us a better understanding of the application and how it works for you."

Joe'ss Usability Test Checklist

Before the test
☐ Turn on computer
☐ Confirm that the Internet connection is stable
☐ Open the Joe'ss web application.
☐ Ensure the recording software is open.

Welcome
☐ Introduce myself
☐ Appreciate the user for choosing to participate
☐ Lead user to evaluation room
☐ Ask user to sit at desk
☐ Sit beside user
☐ Explain the purpose of the usability test

Consent form, pre-test questionnaire
☐ Inform user that they will be recorded during the test
☐ Ask user to read and sign the consent form
☐ Ask user to complete the pre-test questionnaire
☐ Ask for questions and concerns

Instructions
☐ Explain the process of using scenarios
☐ Ask user to think aloud during test; describe how think-out-loud works
☐ Inform user that there will be post-task interview after each scenario and a post-test questionnaire after the test

After each scenario
☐ Pause the recording software
☐ Conduct post-task interview
☐ Ask user to re-login to Joe'ss to start next scenario

After test completion
☐ Ask user to complete post-test questionnaire
☐ Thank user for their time
☐ Reload Joe'ss homepage, if needed
☐ Restart the recording software, if needed

Figure 5. Checklist

Metrics and Measurements

Metric-based reporting was used to record all observations during the testing. The following data were recorded during the test:

i. **Task Time:** To measure the amount of time a user spends to successfully complete a task.
ii. **Error Frequency:** To measure the number of errors that a user recovered from and successfully complete a task or that prevented the user from successfully completing a task.
iii. **Recovery Time**: To measure the time it takes a user to recover from an error and identify the correct path to a task.
iv. **Error:** This implies the description of error by a user during the test.
v. **Think-Aloud Protocol:** Indicates users' body language, facial and verbal expressions, and non-verbal cues during the test.

Based on the recorded task times and errors, the following measurements were determined:

vi. **Task Completion rate by User:** To measure the number of tasks successfully completed by a user.
vii. **Task Completion Rate by Task:** To measure the number of users who successfully completed a task.
viii. **Error-Free Rate by User:** To measure the number of tasks successfully completed by a user without any errors.
ix. **Error-Free Rate by Task:** To measure the percentage of users who successfully complete a task without any errors.

Other metric and measurements used in the test include the following:

v. **Post-Task Interview:** These comprised of users' responses to the post-task interview.
vi. **System Usability Scale Score:** Indicates the usability rating of Joe'ss by users.

For each of the metric, the unit and means of measurement are presented in Table 2.

Table 2. Usability test metric and measurement

Metric	Units	Measurement
Task time	Minutes and seconds	Zoom
Error frequency	Frequency	Zoom
Recovery time	Minutes and seconds	Zoom
Error		Zoom
TAP		Zoom
Task completion rate by user	Frequency	Zoom
Task completion rate by task	Frequency	Zoom
Error-free rate by user	Frequency	Zoom
Error-free rate by task	Frequency	Zoom
Post-task interview		Post-task interview questionnaire
SUS score	Percentage	Post-test questionnaire

Scenario

For the test, two scenarios (one each for student and faculty) were created, and users were briefed on the process of using the scenarios before commencing the test. The scenarios are presented below.

Student scenario:

It is a new semester at Missouri S&T. You need to enroll for courses. But first, you would like to print your paid fees letter for last semester.

You recently came across a scholarship advertisement that you are interested in. Part of the requirement is the submission of an unofficial copy of your transcript. So, you need to request for your unofficial transcript.

Lastly, you received an email from the Registrar's office asking those who have not duly accepted the campus policy agreements to do so before the end of the semester. You wish to confirm if you have accepted the agreements.

Faculty scenario:

You currently teach two sections of ENGL 1120. Two of your students have not been turning in their assignments. You would like to know if they are still registered for the course.

You have decided to reshuffle your time schedule to meet up with the demand of other things needing your attention. To plan the new schedule, you wish to view your ENGL 1120 class schedule for the rest of the semester and the exam schedule.

A parent of one of your students called yesterday to request for some information about their child. Being aware of the FERPA, you wish to know the FERPA permission pertaining to such student.

Tasks

For each of scenarios, users were asked to complete 5 tasks. The tasks are presented below.

Student scenario
   i.   Search for TCH COM 6070 – Teaching of Technical Communication.
   ii.   View your grades.
   iii. Request for an unofficial transcript.
   iv.   Print your paid fees letter (evidence of payment of fees) for 2020 spring semester.
   v.   View your campus policy agreements.

Faculty scenario

vi. View the list of the students (in any of the sections you are teaching) enrolled in your ENGL 1120 class to confirm if any of them have dropped the course.

vii. View the grade roster of your ENGL 1120 class.

viii. View your ENGL 1120 (both sections you are teaching) weekly schedule for the week of 30/11/2020 – 6/12/2020.

ix. View the final exam schedule for 2020 spring semester.

x. View the Family Education Rights and Privacy Act (FERPA) permission.

Post-Task Interview

The post-task interview provided opportunity for users to share more insights about their experience. For each user, after completing the set of tasks for each scenario, a semi-structured, open-ended interview was conducted for users to shed more light on their experience completing the tasks.

Post-Test Questionnaire

This came after the completion of task tasks. The goal of the post-test questionnaire was to get users' perception of their overall experience of the Joe'ss app. The System Usability Scale (SUS) questionnaire, developed by John Brooke, was used. It consisted of ten 5-point Likert-type questions. Appendix D contains the completed post-test questionnaire for the 5 users.

Log Form

During the usability testing of Joe'ss, observations were logged using log forms. A sample log form for each user is presented in Table 3.

Table 3. Usability test log form

User	Task	Code	Test Comment	User Comment
1.	1			
	2			
2	1			
	2			

To categorize the findings, the top-down method of using codes was adopted. This approach promotes efficiency: it saves time and ensures quick review of findings. The following codes were used:

S – Start   E – Error

C – Complete   R – Recovered

N – Noncomplete   U – User action

Presentation of Data

Quantitative Data

From the data collected during and after the tests, we determined some quantitative parameters that encapsulate the usability of Joe'ss. Specifically, in this section, we present the time taken to perform tasks for each user, task completion rate, number of errors, error-free rate, and the usability score of Joe'ss (as rated by users).

Task Times

Table 4 below presents the different times taken by users to complete the tasks. The minimum and maximum time recorded were 5 seconds and 2 minutes, 12 seconds, respectively.

Table 4. Usability test task times

User	Task									
	1	2	3	4	5	6	7	8	9	10
1		0.09				0.29	0.07		0.23	
2	1.34	1.08	0.33		0.45	0.24	0.11	1.13	0.37	
3	1.01	0.05	1.03			0.23	0.07	0.49	0.27	
4		0.26	2.12	0.50	0.65	0.38	0.26	1.42	0.38	
5		0.25	0.38	0.37	0.25	0.27	0.10	1.42	3.05	

Task Completion Rate

The number of tasks completed by each user is presented in Figures 6. The average number of completed tasks per user was 7. The least number of tasks completed was 4, and it was completed by user 1. On the other hand, users 2, 4, and 5 were able to complete 8 tasks.

Figure 7 presents the number of users who completed each task. The average number of users who completed a task was 3.5 users. Our findings revealed that only four out of the 10 tasks were completed by all five users. It must be noted that no users completed task 10.

Errors

The number of errors for each task by each user is presented in Table 5. A total of 46 errors were recorded. For tasks 7 and 9, no errors were recorded. Conversely, all users had at least 1 error while undertaking task 10.

Error-Free Rate

Figure 8 presents the number of tasks completed by each user without errors. User 5 had the highest error-free rate by completing 7 tasks without any errors. On the other hand, user 1 had an error-free rate of 4 for completing only 4 tasks without errors.

In Figure 9, the number of users who completed each task without errors is displayed. Tasks 7 and 9 had the highest error-free rate by task. Each of the tasks was completed without errors by all the 5 users.
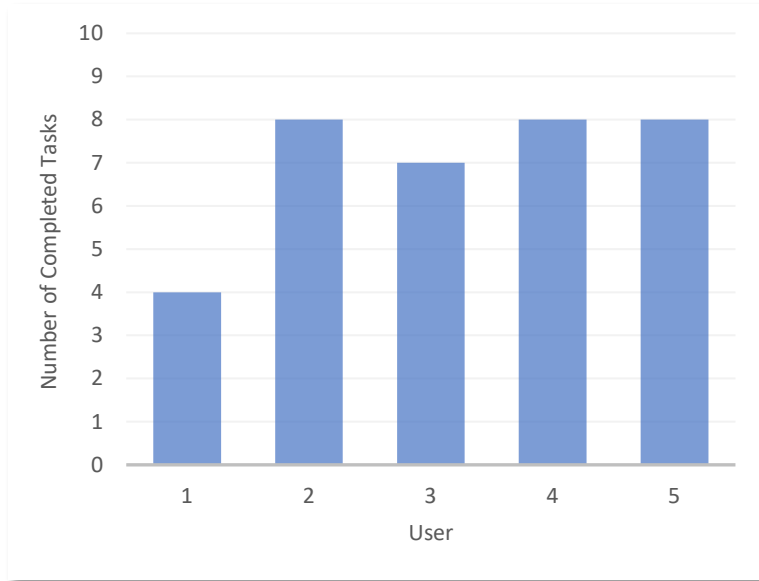

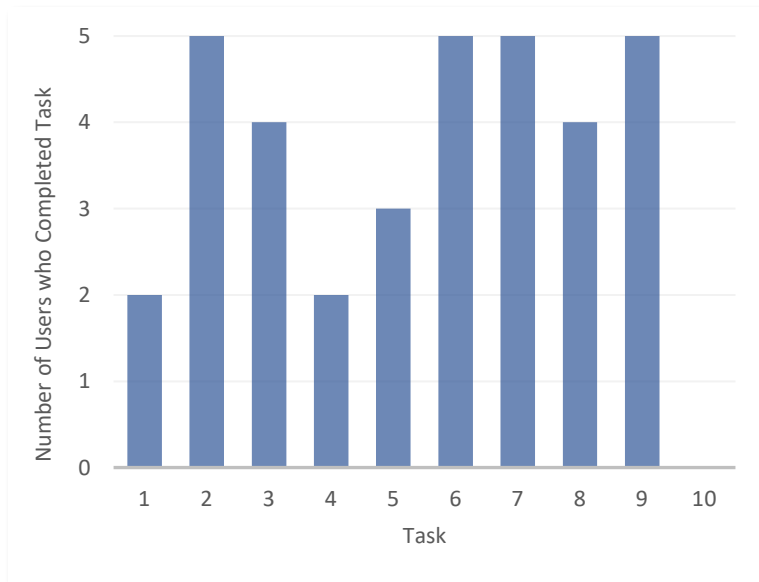Figure 6. Completion rate by user

Figure 7. Completion rate by task

Table 5. Number of errors

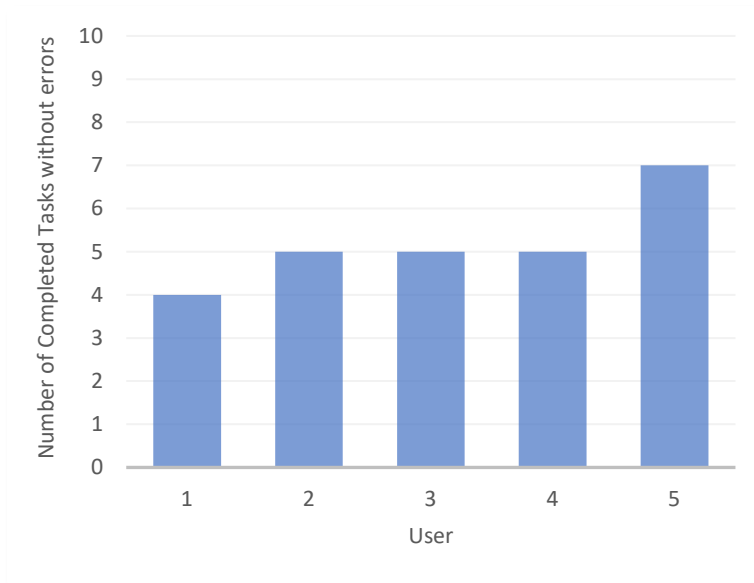| User	Task									
	1	2	3	4	5	6	7	8	9	10
1	2		6	3	2					1
2	1	1		1				1		1
3			1	2	1	1				8
4	1		2			1		1		4
5	1							1		3

Figure 8. Error-free rate by user

Recovery Times
The recovery times are presented in Table 6. One of the users was able to recover from errors twice in each case while completing tasks 3 and 4. Task 3 had the highest number of recoveries by users. There were no recoveries for tasks 7 and 9. This was because all users were able to complete both tasks without errors.

Post-Test Questionnaire
For the System Usability Scale, the score contribution of each item ranged from 0 to 4. To calculate the score, for items 1, 3, 5, 7, and 9, we deducted 1 from the scale position (that is, the value selected by respondents for the item). For items 2, 4, 6, 8, and 10, the contribution was obtained by

deducting the scale position from 5. The calculated score contributions were aggregated and multiplied by 2.5 to obtain the SUS overall value.
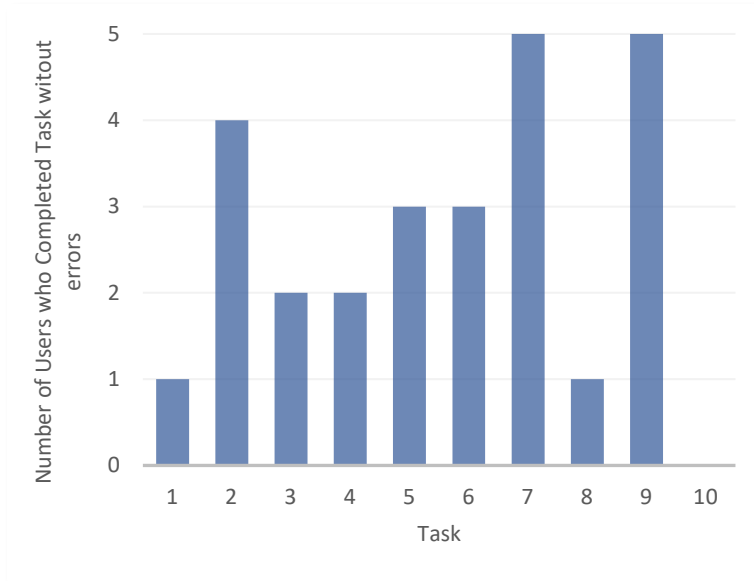

Figure 9. Error-free rate by task

Table 6. Recovery times

User	Task									
	1	2	3	4	5	6	7	8	9	10
1			0.20	0.10						
			0.06	0.59						
2	0.23	0.27						0.05		
3			0.20		0.16	0.07				0.07
4	0.24		0.46			0.17		0.08		0.13
5	1.01							0.27		

The SUS overall score for Joe'ss by each user is displayed in Figure 10. It was discovered that 4 out of the 5 users rated the usability of Joe'ss below average. The average system usability scale score was 41.
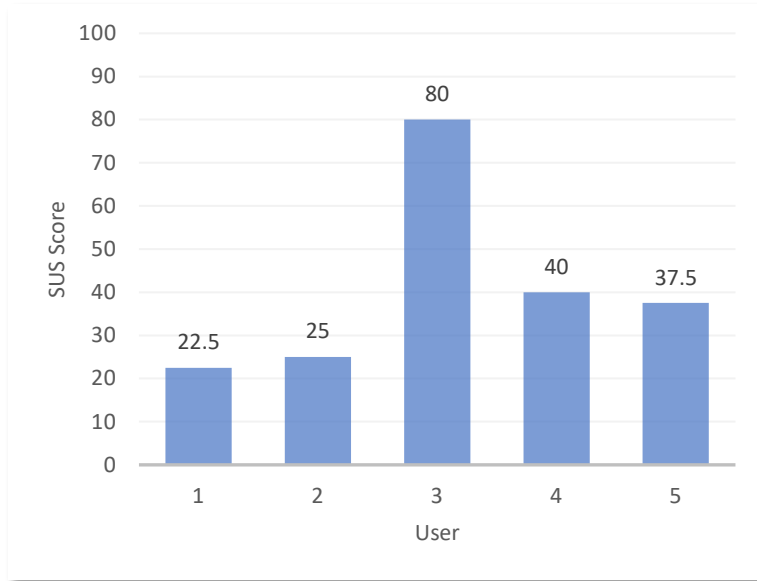
Figure 10. System usability scale score of Joe'ss by users

Qualitative Data

Error codes

Table 7 presents a description of the 46 errors recording during the usability testing of Joe'ss.

Table 7. Errors by users

Task	User	Time	Error
1	1	0.24	User selected wrong semester.
		2.32	User again selected wrong semester.
	2	0.53	User chose a wrong search criterion.
	4	0.26	User clicked link to Enrollment: Edit a Class.
	5	0.52	User selected wrong semester.
2	2	2.16	User clicked View My Academic Standing link.
3	1	4.14	User chose the wrong label.
		4.43	User clicked Request a Transcript link that redirected to a new website.
		5.07	User returned to the new website
		5.24	User clicked a link to order a transcript on the new website.
		5.43	User clicked another link to order transcript(s) on the new website.
		5.53	User could not determine the right process to perform task.
	3	1.40	User clicked link to transfer credit report.
	4	3.44	User clicked MyAcademics link.
		4.24	User clicked TranscriptAudit Trail.
4	1	8.10	User clicked a link to TouchNet: the payment management system used by MS&T.

		8.54	User re-clicked link to TouchNet.
		10.01	User wrongly selected 2020 fall semester.
	2	3.52	User clicked a link to TouchNet: the payment management system used by MS&T.
	3	2.57	User clicked link to billing statement history.
		3.33	User printed a payment statement relating to one payment.
5	1	14.07	User clicked Faculty Center.
		14.27	User clicked UM E-Consent.
	3	5.06	User clicked link to UM E-Consent.
6	3	7.41	User clicked link to course information.
	4	8.56	User clicked link to course information.
8	2	10.59	User clicked My Schedule link since the task had to do with schedule.
	4	10.10	User clicked link to course information.
	5	11.19	User clicked link to course information.
10	1	26.26	User clicked a wrong FERPA link that redirected to MS&T Registrar webpage.
	2	14.19	User clicked FERPA since the task had to do with FERPA.
	3	9.43	User clicked a link to FERPA and directory information which opened a new website.
		10.03	User clicked Faculty Center link.
		10.09	User clicked link to course information.
		10.27	User clicked link to grade roster.
		10.56	User clicked link to pivot grid.
		11.08	User clicked link to UM processes and reports.
		11.34	User clicked link to FERPA restrictions.
		12.08	User clicked link to FERPA releases.
	4	12.54	User clicked Faculty Center.
		13.15	User clicked link to class roster.
		14.33	User clicked a link to FERPA and directory information which opened a new website.
		14.59	User clicked link to faculty center.
	5	16.05	User clicked link to FERPA restrictions.
		16.08	User clicked link to FERPA releases which opened another website.
		17.12	User used the search bar to search for faculty.

TAP comments

The main comments by users during the testing of Joe'ss are presented in Table 8.

Table 8. TAP comments

Task	User	Time	User Comments
1	1	1.18	…if you can see, I was searching for courses for next fall. I think our courses for next fall has already been arranged.
		1.39	I don't know why I'm not able to …I'm moving on to the next task.
		2.06	I'm trying to view next semester courses….
	2	1.16	No, I said spring.
	4	2.05	I can't see 6070 here for spring semester.
	5	0.45	What course is 6070?
		0.55	It's not valid.
		1.28	It's only number format that use to work.
		1.58	This search [criteria] is too much.
		3.05	This one is not working.
		3.07	Let me try another way.
		3.23	It's the same thing I did before.
		3.35	This thing cannot do.
3	1	4.43	Okay, Femi, I don't know what you mean by unofficial transcript, because on the system, what I have is official transcript.
		5.43	What I can see is official transcript; there is no unofficial transcript.
		5.53	This is the stage I have gotten to. I don't think I will have to put in a request for the transcript.
		6.04	Let me go back to self-service and see if I can find unofficial.
	2	3.03	I've not done that before.
		3.22	You want me to actually request for it? And I will get it?
	3	2.00	I might request for unofficial transcript.
	4	4.30	Where is this transcript? I am finding it difficult to find.
		4.39	I know I have seen it before.
4	1	9.32	You can see the screen, right?
	3	3.33	I've saved one of my school fees.
		3.37	So, I'm done with that one.
	5	7.23	So, I have letter for paid fees.
5	2	6.28	I didn't know there was something like that.
	3	4.44	Wow, I'm not finding it.
8	1	20.43	So, this is my schedule.
	5	11.11	Do they have schedules for different week?
		11.48	What kind of schedule is this?

		12.10	There is no 'To.'
		12.16	Let me just click this.
9	2	12.07	Do we have exam?
	5	13.34	Am I still in Joe'ss?
10	1	27.36	Ok, so, Femi, I can see the FERPA stuff on Joe'ss.
	2	14.23	Yeah, these are the restrictions.
		14.26	I don't know.
	3	11.00	I don't know what happened.
	4	14.02	So, I'm supposed to see the permission per student, right?
		14.56	I can't find it on Joe'ss.
		15.37	I don't know where that is.
	5	18.19	Where is permission?

The observations and nonverbal cues during the testing are presented in Table 9.

Table 9. Observations and nonverbal cues.

Task	User	Observations and nonverbal cues
1	1	User conceded she could not complete the task.
	4	User conceded he could not complete the task
	5	Users used the search bar as aid to perform task.
		User expressed frustration at not being able to complete task.
2	5	Users used the search bar as aid to perform task.
3	1	User laughed at her inability to perform task
		User conceded she could not complete the task.
	4	User hovered around the Student Center page for some time.
	5	Users used the search bar as aid to perform task.
4	1	User was convinced she had completed the task when in fact she had not.
	2	User was convinced she had completed the task when in fact she had not.
	3	User was convinced he had completed the task when in fact he had not.
	5	Users used the search bar as aid to perform task.
5	1	User conceded she could not complete the task.
	5	Users used the search bar as aid to perform task.
6	5	Users used the search bar as aid to perform task.
8	1	User was convinced she had completed the task when in fact she had not.
	5	Users used the search bar as aid to perform task.
9	5	Users used the search bar as aid to perform task.
		User expressed doubt if he was on the right page, though he was.

10	1	User conceded she could not complete the task.
	2	User hovered around, without clicking any of the links.
		User conceded she could not complete the task.
	3	User voiced frustration for not being able to complete the task.
	4	User made sound of frustration.
	5	Users used the search bar as aid to perform task.
		User mistakenly clicked the MS&T logo and had to re-login to Joe'ss.
		User expressed frustration.
		User conceded he could not complete the task.

Post-Task Interview

The post-task interview was conducted after each set of tasks under a scenario. The interview basically sought to collect users' perception of the tasks. The following, in Tables 10 and 11, are some of the responses from the users:

Scenario 1 (Tasks 1 – 10)

Table 10. Users' responses to scenario 1 post-task interview

User	Responses
1	To be honest, before this usability testing, I've always had problem with Joe'ss. My issue is that it's not user-friendly. It's very difficult to find what you are using…what you are looking for.
	The webpage is a bit too busy; it's not basic; and you will have to struggle to find what you are looking for.
2	It wasn't that easy, I think. I feel like there's too much information on Joe'ss. You click on one thing, and it has a lot of things under it…. I don't think it's easy to use.
3	It wasn't really hard; it wasn't really easy. You have to like…go through some menus before you find what you are looking for
	[On why user was able to complete some tasks]: Because I've done it before
	[On why user was not able to complete some tasks]: I haven't done [them] before.
	A new user will find it very difficult [to use].
4	[On why user was not able to complete task 1]: Basically, I searched for 6000, but there was no 6070 for next spring. I wonder if it will be there for another semester.
5	[On why user was not able to complete task 1]: The system reported that it was invalid. They said I could not register it for that semester. So, I did not see the course. I was hoping that, at least, I will see it show up; it's when I want to add it, it will now say no, you cannot add. I did not even see it. What if I want to get the properties of the course or check the details of the course? I expect that once I

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| | put that course code, the course details should come out with the name of the lecturer, everything about it and the period it is available for. |

Table 10. Users' responses to scenario 2 post-task interview

User	Responses
1	[On why user was able to complete more tasks under scenario 2]: To be very honest, I got used to the Faculty Center more this semester just because I have two dedicated classes to my name. So, that's what has drawn me more to the Faculty Center.
	The functions that I go there to perform, they are okay for me. I get to find what I'm looking for.
	The other stuff that you brought up, they are new things I'm learning: like the schedule stuff, this FERPA stuff, because I have not had a need to use any of those services yet in the system.
	The faculty center was pretty easy.
2	[On task 5]: I didn't think I've seen any FERPA permission. In fact, I didn't even know there is FERPA permission
3	There are some sections I'm used to. So, it was pretty much easy to find those kind of sections. Those I'm not used to or haven't used before, I couldn't even find.
4	[On task 5]: I don't know. I guess if FERPA applies to students, then it should be close to where the class list is. And I don't see it here.
5	[On task 5]: Probably, I'm not looking at the right place. I felt like if I click faculty, I'm supposed to see every resource that is in faculty.

Findings and Surprises

Based on observation during the usability testing of Joe'ss and the responses of the users, the following were discovered:

i. Users generally were able to complete some tasks mainly because they had performed those tasks before. 3 out of the 5 users directly or indirectly reported this finding. For instance, when asked why he was able to complete some tasks, user 3 responded, "Because I've done it before." For task 5, which asked users to view the FERPA permission, none of the users was able to complete the task. When asked why, user 1 replied, "I didn't think I've seen any FERPA permission. In fact, I didn't even know there is FERPA permission." She further submitted, "For a new user, using Joe'ss without help will be difficult."

ii. The Joe'ss search bar significantly reduced the amount of navigation required to perform a task. User 5 was able to complete most of the tasks with the aid of the search bar. During

the post-task interview, he confessed, "If I was not using that navigation search page, I think Joe'ss would have been harder to navigate because I think the way the arrangement them is clumsy: it's not…it doesn't give you ease of access or ease of navigation, except you are using the search [bar], and that's because you are probably used to searching for things on the site. But for somebody that is not used to that, he is going to have a hard time navigating Joe'ss, because the arrangement of things, the organization, is complex."

Problem Scope and Severity

Based on users' experience, their views, and observation of the usability test, the following problems were identified:

Misleading Labels

The way some tabs were labelled was misleading. For instance, task 7 asked users to view their grades. One of the users (specifically, user 2) thought this would be found in the Academic Records tab. Under this tab, she clicked the View My Academic Standing option. No information was found. However, the option to view grade could be found in the Enrollment tab. Similarly, for task 4, in which users were asked to print their paid fees letter, one user (user 3) thought this would be accomplished by using the Billing Statement History link. The user ended up printing one of the payment bills and concluded he had completed the task. User 1 had the same issue with requesting for unofficial transcript. She saw and clicked a Request a Transcript link.

This is a global problem and should be categorized as catastrophic as it affects users' capacity to effectively navigate to information. Of the five users tested, three of them experienced the problem.

Flawed Information Architecture

This was observed when user 2 tried to complete task 2. While the user was able to complete the task, it was observed that the path through which the task was completed was different from the expected path. However, the user was adjudged to have completed the task because the information on both pages were relatively similar, though the pages were obviously different. For instance, the user used the following path to view her grades: Main Menu>Self Service>Academic Records>My Course History. However, another route to viewing grades is as follows: Main Menu>Self Service>Enrollment>View My Grades. Because users can complete the task, this may not be categorized as a problem.

Lack of Cues to Perform Task

Users cannot view the Family Education Rights and Privacy Acts (FERPA) permission (task 10). Even a use of the search bar (by user 5) None of the five tested users was able to complete the task, so the task should be considered a catastrophe. Relevant TAP comments included "I can't find it on Joe'ss," "I don't know what happened," and "I don't know where that is."

Numerous Criteria

This is a local problem applicable to task 1—search for TCH COM 6070 (Teaching of Technical Communication). To search for a course to register, there are about 18 search criteria on the Search for Classes page. Out of the five tested users, three of them had issues with completing the task. As a result, this problem should be categorized as major.

Recommendations

Based on the test objectives, developed tasks, and users' performance at and perception of the tasks, we provide some recommendations.

i. Our first objectives entailed successfully and quickly searching for student- and course-related information without assistance of Joe'ss. To achieve this, we designed 9 tasks that required users to search for TCH COM 6070 – Teaching of Technical Communication, view their grades, request for an unofficial transcript, print their paid fees letter, view their campus policy agreements, view the list of their students, view the grade roster of their ENGL 1120 class, view their ENGL 1120 weekly schedule for the week of 30/11/2020 – 6/12/2020, view the final exam schedule for 2020 spring semester, and view the Family Education Rights and Privacy Act (FERPA) permission. Results showed that users were able to complete some of the tasks because they were already familiar with the tasks, while the non-familiar tasks were difficult to complete. In response to this, the following are recommended:
   a. A training should be organized for new users to familiarize them with the functionalities and navigation of Joe'ss. One of the 5 users specifically suggested this
   b. A help page and manual should be integrated to provide technical assistance, user guidance, and cues to users perform any tasks.

ii. Objective 2 of our usability test considered if users could successfully request for student-related information via Joe'ss. One task—request for an unofficial transcript—was designed to assess this goal. While 4 out of the 5 users were able to complete the task, one of the users was not. This was despite that the user saw and clicked a *Request a Transcript* link. The label was misleading. To mitigate this kind of problems, links and tabs should be labelled based on the function they perform. Misleading labels confuse users and can prevent them from completing tasks successfully or, in some cases, correctly.

iii. The third test objective related to user satisfaction with or enjoyment using Joe'ss. To elicit users' perception, post-task interview and post-test survey were employed. 3 of the 5 users felt it was "a bit complicated," and "not user-friendly." In addition, the average usability score by the 5 users 41 (out of 100). Based on this, we recommend that the navigation should be improved. Clear and efficient navigation can enhance usability.

iv. The last objective was to determine if users could successfully recover from errors whenever they experience them. The test findings revealed that there were a significant number of errors that users were not able to recover from. It is therefore important that the error-

prevention, -detection and -correction capabilities of Joe'ss should be improved. One way of achieving this is by providing descriptive labels.

Appendices

A. Consent form

For privacy purpose, the consent forms were removed.

B. Screening

For privacy purpose, the screening forms were removed.

C. Pre-Test

Joe'ss Usability Test Pre-Test Questionnaire

Please answer the following questions.

1. As a student, which of the student-related functions of Joe'ss have you used? Name at least three.

   - Student Center
   - Faculty Center
   - TouchNet

2. As a student, which of the student-related functions of Joe'ss do you use more often?

   - Student Center
   - Faculty Center
   - Touch Net

3. As a GTA, which of the faculty-related functions of Joe'ss have you used? Name at least three.

   Faculty Center

4. As a GTA, which of the faculty-related functions of Joe'ss do you use more often?

   Faculty Center

Joe'ss Usability Test Pre-Test Questionnaire

Please answer the following questions.

1. As a student, which of the student-related functions of Joe'ss have you used? Name at least three.

    * Enroll

    * grades

    * Fees

2. As a student, which of the student-related functions of Joe'ss do you use more often?

    * Enroll

3. As a GTA, which of the faculty-related functions of Joe'ss have you used? Name at least three.

    * Email students

    * Input grades

    * Check class list

4. As a GTA, which of the faculty-related functions of Joe'ss do you use more often?

    * Email Students.

Joe'ss Usability Test Pre-Test Questionnaire

Please answer the following questions.

1. As a student, which of the student-related functions of Joe'ss have you used? Name at least three.

   Checking midterm grades

   Checking the holds I have

   Enrollment list

2. As a student, which of the student-related functions of Joe'ss do you use more often?

   Checking grades and enrollment list

3. As a GTA, which of the faculty-related functions of Joe'ss have you used? Name at least three.

   Grade roaster

   Class roaster

   My schedule

4. As a GTA, which of the faculty-related functions of Joe'ss do you use more often?

   Grade roaster

Joe'ss Usability Test Pre-Test Questionnaire

Please answer the following questions.

1. As a student, which of the student-related functions of Joe'ss have you used? Name at least three.

    — Registration of Courses
    — Requesting transcript
    — Payment of fees

2. As a student, which of the student-related functions of Joe'ss do you use more often?

    — Registration of Courses

3. As a GTA, which of the faculty-related functions of Joe'ss have you used? Name at least three.

    — Grade Roster
    — View teaching schedule
    — ~~Sta View Student~~ View class capacity

4. As a GTA, which of the faculty-related functions of Joe'ss do you use more often?

    — Grade Roster

Joe'ss Usability Test Pre-Test Questionnaire

Please answer the following questions.

1. As a student, which of the student-related functions of Joe'ss have you used? Name at least three.

   — Student Centre
   — Tuition
   — Class Schedule .

2. As a student, which of the student-related functions of Joe'ss do you use more often?

   — Tuition

3. As a GTA, which of the faculty-related functions of Joe'ss have you used? Name at least three.

   faculty Centre
   class Schedule
   Class roster

4. As a GTA, which of the faculty-related functions of Joe'ss do you use more often?

   Class roster

①

Joe'ss Usability Test Post-Test Questionnaire

Please rate your overall experience of Joe'ss.

		Strongly disagree				Strongly agree
		1	2	3	4	5
1.	I think that I would like to use this system frequently			✓		
2.	I found the system unnecessarily complex					✓
3.	I thought the system was easy to use	✓				
4.	I think that I would need the support of a technical person to be able to use this system				✓	
5.	I found the various functions in this system were well integrated			✓		
6.	I thought there was too much inconsistency in this system			✓		
7.	I would imagine that most people would learn to use this system very quickly	✓				
8.	I found the system very cumbersome to use					✓
9.	I felt very confident using the system		✓			
10.	I needed to learn a lot of things before I could get going with this system				✓	

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Joe'ss Usability Test Post-Test Questionnaire

Please rate your overall experience of Joe'ss.

		Strongly disagree				Strongly agree
		1	2	3	4	5
1.	I think that I would like to use this system frequently			✓		
2.	I found the system unnecessarily complex					✓
3.	I thought the system was easy to use		✓	✓		
4.	I think that I would need the support of a technical person to be able to use this system			✓		
5.	I found the various functions in this system were well integrated	✓				
6.	I thought there was too much inconsistency in this system		✓		✓	
7.	I would imagine that most people would learn to use this system very quickly		✓			
8.	I found the system very cumbersome to use				✓	
9.	I felt very confident using the system			✓		
10.	I needed to learn a lot of things before I could get going with this system			✓		✓

Joe'ss Usability Test Post-Test Questionnaire

Please rate your overall experience of Joe'ss.

		Strongly disagree				Strongly agree
		1	2	3	4	5
1.	I think that I would like to use this system frequently					✓
2.	I found the system unnecessarily complex				✓	
3.	I thought the system was easy to use			✓		
4.	I think that I would need the support of a technical person to be able to use this system	✓				
5.	I found the various functions in this system were well integrated					✓
6.	I thought there was too much inconsistency in this system	✓				
7.	I would imagine that most people would learn to use this system very quickly			✓		
8.	I found the system very cumbersome to use	✓				
9.	I felt very confident using the system				✓	
10.	I needed to learn a lot of things before I could get going with this system	✓				

Joe'ss Usability Test Post-Test Questionnaire

Please rate your overall experience of Joe'ss.

		Strongly disagree				Strongly agree
1.	I think that I would like to use this system frequently	1	2	3 ✓	4	5
2.	I found the system unnecessarily complex	1	2	3	4 ✓	5
3.	I thought the system was easy to use	1	2	3 ✓	4	5
4.	I think that I would need the support of a technical person to be able to use this system	1	2	3 ✓	4	5
5.	I found the various functions in this system were well integrated	1 ✓	2	3	4	5
6.	I thought there was too much inconsistency in this system	1	2	3	4	5 ✓
7.	I would imagine that most people would learn to use this system very quickly	1 ✓	2	3	4	5
8.	I found the system very cumbersome to use	1 ✓	2	3	4	5
9.	I felt very confident using the system	1	2	3 ✓	4	5
10.	I needed to learn a lot of things before I could get going with this system	1	2 ✓	3	4	5

Joe'ss Usability Test Post-Test Questionnaire

Please rate your overall experience of Joe'ss.

		Strongly disagree				Strongly agree
		1	2	3	4	5
1.	I think that I would like to use this system frequently			✓		
2.	I found the system unnecessarily complex					✓
3.	I thought the system was easy to use			✓		
4.	I think that I would need the support of a technical person to be able to use this system			✓		
5.	I found the various functions in this system were well integrated		✓			
6.	I thought there was too much inconsistency in this system			✓		
7.	I would imagine that most people would learn to use this system very quickly	✓				
8.	I found the system very cumbersome to use		✓			
9.	I felt very confident using the system			✓		
10.	I needed to learn a lot of things before I could get going with this system				✓	

User	Task	Code	Time	Test Comment	User Comments
1	1	S	0.00		
		E	0.24	User selected wrong semester.	
		U	1.18		…if you can see, I was searching for courses for next fall. I think our courses for next fall has already been arranged.
		U	1.39		I don't know why I'm not able to …I'm moving on to the next task.
		U	2.06		I'm trying to view next semester courses….
		E	2.32	User again selected wrong semester.	
		N	2.51	User could not continue the task.	
	2	S	2.54		
		C	3.03		
	3	S	4.06		
		E	4.14	User chose the wrong label.	
		E	4.43	User clicked Request a Transcript link that redirected to a new website.	Okay, Femi, I don't know what you mean by unofficial transcript, because on the system, what I have is official transcript.
		R	5.03	User returned to Joe'ss.	
		E	5.07	User returned to the new website.	

		E	5.24	User clicked a link to order a transcript on the new website.	
		E	5.43	User clicked another link to order transcript(s) on the new website.	What I can see is official transcript; there is no unofficial transcript.
		E	5.53	User could not determine the right process to perform task.	This is the stage I have gotten to. I don't think I will have to put in a request for the transcript.
		R	5.59	User went back to Joe'ss.	
		U	6.04		Let me go back to self-service and see if I can find unofficial.
		N	6.20	User asked to stop and go to next task.	
	4	S	7.33		
		E	8.10	User clicked a link to TouchNet: the payment management system used by MS&T.	
		R	8.20	User clicked Student Center.	
		E	8.54	User re-clicked link to TouchNet.	
		U	9.32	The external link displayed an error message.	You can see the screen, right?
		U	9.34	User reloads the external link.	
		R	9.53	User clicks Paid Fees Letter link.	
		E	10.01	User wrongly selected 2020 fall semester.	
		N	10.33	User concluded wrongly she had completed the task.	
	5	S	11.14		

		U	12.38	User sighed heavily.	
		E	14.07	User clicked Faculty Center.	
		E	14.27	User clicked UM E-Consent.	
		N	14.34	User expressed inability to complete task.	
	6	S	18.37		
		C	19.06		
	7	S	19.34		
		C	19.41		
	8	S	20.33		
		N	20.43	User thought she had completed the task.	So, this is my schedule.
	9	S	24.52		
		C	25.15		
	10	S	25.56		
		E	26.26	User clicked a wrong FERPA link that redirected to MS&T Registrar webpage.	
		U	27.36		Ok, so, Femi, I can see the FERPA stuff on Joe'ss.
		N	28.43	User could not complete the task.	
2	1	S	0.00		
		E	0.53	User chose a wrong search criterion.	
		R	1.16	User realized her mistake and selected the right criteria.	No, I said spring.
		C	1.34		

	2	S	1.44		
		E	2.16	User clicked View My Academic Standing link.	
		R	2.43	User used the My Course History link.	
		C	2.52		
	3	S	2.58		
		U	3.03		I've not done that before.
		U	3.22		You want me to actually request for it? And I will get it?
		C	3.31		
	4	S	3.36		
		E	3.52	User clicked a link to TouchNet: the payment management system used by MS&T.	
		N	6.19	User thought she had completed the task.	
	5	S	6.28	User laughed.	I didn't know there was something like that.
		C	7.13		
	6	S	9.43		
		C	10.07		
	7	S	10.16		
		C	10.27		
	8	S	10.43		
		E	10.59	User clicked My Schedule link since the task had to do with schedule.	
		R	11.04	User clicked the correct link.	

		C	11.56		
	9	S	12.02		
		U	12.07	User laughed.	Do we have exam?
		C	12.39		
	10	S	12.48		
		U	14.17	User has been hovering around, without clicking any of the links.	
		E	14.19	User clicked FERPA since the task had to do with FERPA.	
		U	14.23		Yeah, these are the restrictions.
		U	14.26		I don't know.
		N	15.10	User expressed inability to complete task.	
3	1	S	0.00		
		C	1.01		
	2	S	1.09		
		C	1.14		
	3	S	1.19		
		E	1.40	User clicked link to transfer credit report.	
		R	2.00	User located correct link to request unofficial transcript.	I might request for unofficial transcript.
		C	2.22		
	4	S	2.31		
		E	2.57	User clicked link to billing statement history.	

		E	3.33	User printed a payment statement relating to one payment.	I've saved one of my school fees.
		U	3.37		So, I'm done with that one.
		N	3.55	User was convinced he had completed the task.	
	5	S	3.58		
		U	4.44		Wow, I'm not finding it.
		E	5.06	User clicked link to UM E-Consent.	
		R	5.22	User went back to homepage.	
			5.40		No, I can't find it.
		N	5.43	User gave up the task.	
	6	S	7.27		
		E	7.41	User clicked link to course information.	
		R	7.48	User clicked link to class roster.	
		C	7.50		
	7	S	7.55		
		C	8.02		
	8	S	8.05		
		C	8.54		
	9	S	8.58		
		C	9.25		
	10	S	9.30		
		E	9.43	User clicked a link to FERPA and directory information which opened a new website.	

		R	9.50	User returned to Joe'ss.	
		E	10.03	User clicked Faculty Center link.	
		E	10.09	User clicked link to course information.	
		E	10.27	User clicked link to grade roster.	
		E	10.56	User clicked link to pivot grid.	
		U	11.00		I don't know what happened.
		E	11.08	User clicked link to UM processes and reports.	
		E	11.34	User clicked link to FERPA restrictions.	
		E	12.08	User clicked link to FERPA releases.	
		U	12.29	User voiced frustration.	
		N	12.30	User was stopped from continuing with task since he was not making progress.	
4	1	S	0.00		
		E	0.26	User clicked link to Enrollment: Edit a Class.	
		R	0.50	User clicked option to a course.	
		U	2.05		I can't see 6070 here for spring semester.
		N	2.21	User conceded he could not complete the task.	
	2	S	2.45		
		C	3.11		

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	3	S	3.17		
		E	3.44	User clicked MyAcademics link.	
		E	4.24	User clicked TranscriptAudit Trail.	
		U	4.30	User hovered around the Student Center page.	Where is this transcript? I am finding it difficult to find.
		U	4.39	User continued to hover around the Student Center page.	I know I have seen it before.
		R	5.10	User identified a drop-down menu containing the option to complete task.	
		C	5.29		
	4	S	5.33		
		C	6.23		
	5	S	6.46		
		C	7.11		
	6	S	8.39		
		E	8.56	User clicked link to course information.	
		R	9.13	User found the correct link.	
		C	9.17		
	7	S	9.22		
		C	9.50		
	8	S	9.54		
		E	10.10	User clicked link to course information.	
		R	10.18	User found the correct link.	
		C	11.36		

	9	S	11.40		
		C	12.18		
	10	S	12.35		
		E	12.54	User clicked Faculty Center.	
		E	13.15	User clicked link to class roster.	
		U	14.02		So, I'm supposed to see the permission per student, right?
		E	14.33	User clicked a link to FERPA and directory information which opened a new website.	
		R	14.56	User returned to Joe'ss.	I can't find it on Joe'ss.
		E	14.59	User clicked link to faculty center.	
		U	15.35	User made sound of frustration.	
		U	15.37		I don't know where that is.
		N	16.01	User was stopped from continuing with task.	
5	1	S	0.00		
		U	0.21	Users used the search bar as aid to perform task.	
		U	0.45		What course is 6070?
		E	0.52	User selected wrong semester.	
		U	0.55		It's not valid.
		U	1.28		It's only number format that use to work.
		U	1.42	User made sound of frustration.	

		R	1.53	User decided to search.	
		U	1.58		This search [criteria] is too much.
		U	3.05	User did not enter all required criteria.	This one is not working.
		U	3.07		Let me try another way.
		U	3.23	When user clicked Enrollment: Add Classes, a page initially opened was reopened.	It's the same thing I did before.
		U	3.35	User expressed frustration at not being able to complete task.	This thing cannot do.
		N	3.37	User stopped task.	
	2	S	3.39		
		U	3.50	Users used the search bar as aid to perform task.	
		C	4.01		
	3	S	6.06		
		U	6.19	Users used the search bar as aid to perform task.	
		C	6.44		
	4	S	6.49		
		U	7.07	Users used the search bar as aid to perform task.	
		U	7.23		So, I have letter for paid fees.
		C	7.26		
	5	S	7.49		
		U	8.02	Users used the search bar as aid to perform task.	
		C	8.14		

	6	S	9.52		
		C	10.19		
	7	S	10.25		
		C	10.35		
	8	S	10.40		
		U	11.11		Do they have schedules for different week?
		E	11.19	User clicked link to course information.	
		R	11.46	User found the weekly schedule button.	
		U	11.48		What kind of schedule is this?
		U	12.10		There is no 'To.'
		U	12.16	User decided to click Refresh Calendar button.	Let me just click this.
		C	12.22		
	9	S	12.25		
		U	12.46	Users used the search bar as aid to perform task.	
		U	12.57	User expressed frustration because the View Final Exam Schedule link did not open the exam schedule.	
		U	13.25	Users repeated the use of the search bar as aid to perform task.	
		U	13.34	User expressed doubt if he was on the right page, though he was.	Am I still in Joe'ss?

		U	14.16	Users used again the search bar; this time, he searched for a new keyword: schedule.	
		U	14.56	Users did another search via the search bar: he searched for the keyword 'faculty.'	
		C	15.30		
	10	S	15.34		
		U	15.57	Users used the search bar as aid to perform task.	
		E	16.05	User clicked link to FERPA restrictions.	
		E	16.08	User clicked link to FERPA releases which opened another website.	
		E	17.12	User used the search bar to search for faculty.	
		U	17.49	User mistakenly clicked the MS&T logo and had to re-login.	
		U	18.13	User expressed frustration.	
		U	18.19		Where is permission?
		N	18.35	User could not continue the task.	