Proposal: To identify and understand the usability problems related to "Late Add/ Drop" form RPI.

1. Introduction

The purpose of this report is to identify issues that can be solved with the Late Add/ Drop form. In order to solve the reasonable problems and figuring them out is our first step. According to wikipedia, "Forms, when completed, may be a statement, a request, an order, etc"[1]. This form is a request to add or drop a course at RPI.

When a student fills out a form, there are many elements involved. As this form is filled out manually, interaction of user with document matters. When a student fills out a form, there are many elements involved. This study seeks to comprehend the experience of usability. There are many research methods to test usability experience of the users. Some of them are Participatory Design, Focus Groups, Interviews, Eye Tracking, A/B Testing, Talk aloud testing etc. In this usability research, we aim to perform *concurrent usability test iterations* through one or more of the following methods like- surveys, talk aloud testing, Focus groups, etc. This is going to help us gather insights about what issues students face while filling up this form and what they would like to change.

While users for this form are the students who request to add/drop a course, there are also other stakeholders accountable for achieving this form's objective such as registrar, professors and advisors.

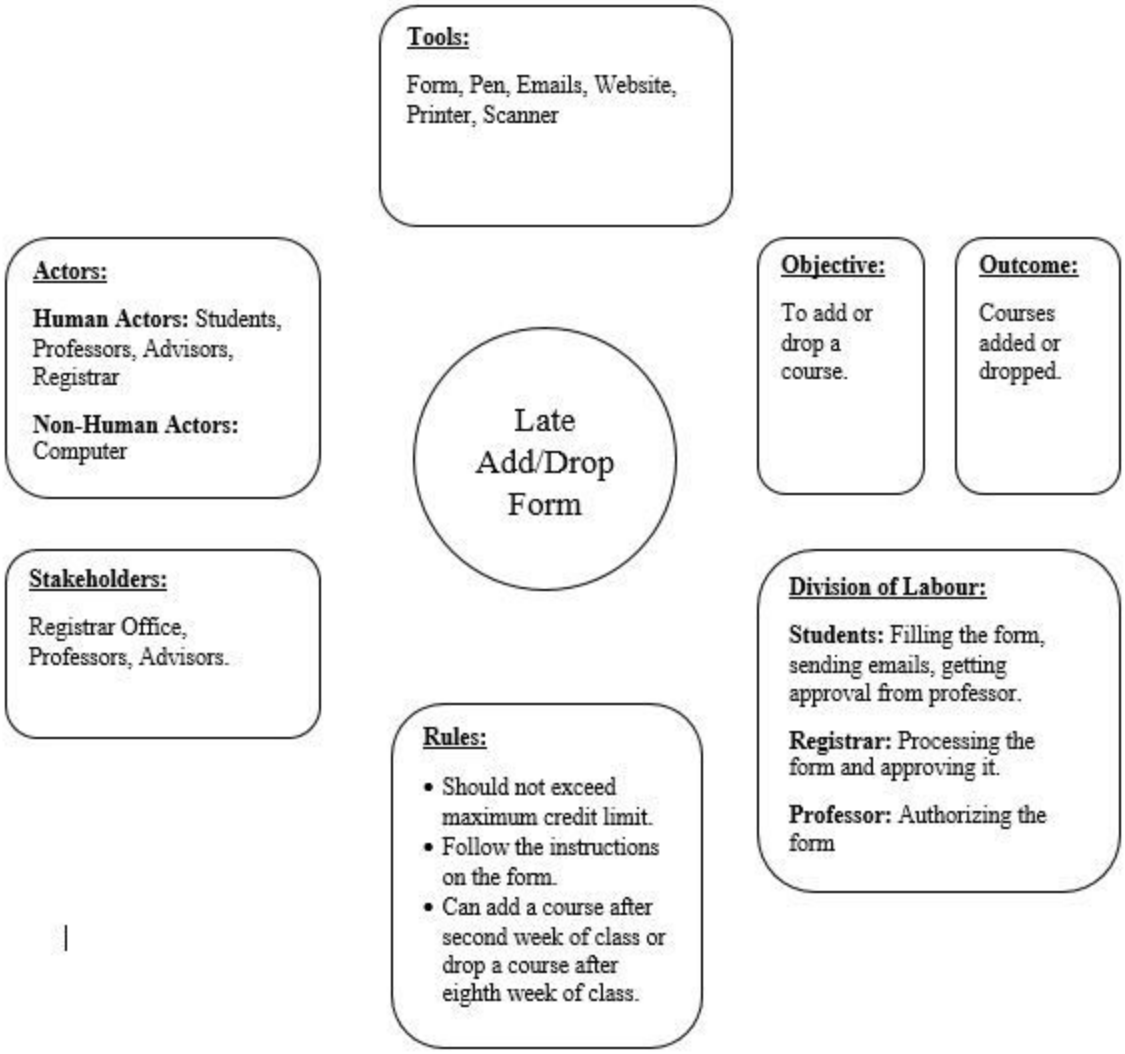
1.1 Network Diagram

The above diagram shows the activity network of the late add/drop form. It gives us the following information:

- The actors participating including human and non-human actors. Human actors include students, professors, advisors, and registrars. Non-human actors include entities like computers.
- The stakeholders or communities involved in the process. This includes professors, advisors and registrar offices.
- The tools used to complete and submit the form. This includes the website for downloading the form, printer for printing it, pen for filling out the form, scanner to scan the completed form and email to submit the form.
- The division of labor; that is who does the work. This includes students who fill the forms, professors who authorized it and the registrar who processes it.
- The rules that should be kept in mind while filling the form: a student should not exceed the maximum credit limit, can add a course after the second week of class or drop a

course after the eighth week of class and should follow the instructions on the given on the form.

- The objective of this form, which is to add or drop a course.
- The outcome or the utmost purpose of the form, which is the course being added or dropped.



2. Methodology for Research

In order to gather real-world data from users, we conducted a talk-aloud test and used a heuristic analysis to identify issues with the late add/drop form. Our methodology for this was focused on a few heuristics that aimed to make this process robust. Firstly, we wanted to get representation from both the undergraduate and graduate student perspectives. Additionally, we wanted to get feedback from some users who are familiar with usability principles and some who are not. This allowed us to get a better, more complete picture of the thought processes users go through when they fill out this form. After the talk-aloud usability test, we would go forward with the method of survey. This would allow us to get more granular thoughts from users as their experience with the form would be tested while they fill it as well as after they are done filling it and getting it authorized.

For our field report, we did talk-aloud with a few (two) other team members, and with (five) other people less familiar with usability principles. This consisted of a team member (usability researcher) sitting down with the human-subject, listening to the subject's response to the form and prompting them to talk more about any observations, problems, or successes. We tried to use the methods discussed in "Exploring Think-Alouds in Usability Testing: An International Survey". This included an instruction to the subject to speak their thoughts out loud as they filled the form. Additionally, we took a flexible approach to intervention. When necessary, we tried to get users to expand on their thoughts, explaining more about their thought processes. But while doing this, we focused on influencing them as little as possible. One way we used to accomplish this was to repeat their thoughts back at them. If they said, "That's weird..." when filling out a certain section, then we would use their own words to ask a question in response, perhaps saying, "What's weird?" This approach limits the amount of influence that the researcher has on the results, while still helping the subjects to talk aloud, about their ideas.

3. Research:

3.1 Background Research:

[2] "Usability testing is the core of usability engineering practice: Representative users are asked to interact with system prototypes, and their behavior and subjective reactions are studies."

- This report aims to perform the heuristic evaluation on the "late Add/Drop form" by making the subject users sit in a quiet surrounding, filling out the form while thinking out loud. This forms the core experiment of our study.

[3] "An important issue for laboratory studies is deciding what idea to collect. Most studies gather task performance times, videotapes of user actions, screen displays, and so on. But much of a user's experience is unobservable, taking place inside his or her head as information is interpreted and plans are constructed. Thus, it is also common for usability evaluators to gather think-aloud protocols: Users narrate their goals, plans, reactions,and concerns as they work through the test tasks(Ericsson Simon 1993)". The think-aloud protocol can then be analyzed to determine when the person became confused or experienced usage difficulties; the narration before and after a problem often provides insight into the causes and consequences of usability problems."

- Therefore, a *think-aloud* analysis can help us to find out which fields in this particular form confuse the users. We found a number of insights by just observing the users filling up the form *after* the test, mapping with the idea of redesigning this form and suggesting what *consequences* these confusions can create.
  For example, the deadline is not mentioned clearly on the form. It may happen that a student might not pay attention to it. This could cause a problem in receiving the required authorization, once a deadline is missed.

[4] " We asked participants to rate the extent to which they believed different measures contributed to the identification of usability problems and understanding their causes during analysis. The measures were: think-alouds, posttask interviews, performance metrics (e.g., time on task), and behavioral data (e.g., from video data) and eye tracking. A 5-point scale ranging from 1 (not at all useful) to 5 (very useful) was used."

	Identification		Causation	
	Mean	***SD***	**Mean**	***SD***
Think aloud	4.57	0.80	4.62	0.71
Interview	4.18	0.91	4.17	0.87
Performance	2.89	1.33	3.63	1.19
Behavior	3.55	1.22	3.95	1.03

"Perceived Contribution of Methods To Problem Identification and Understanding Problem Causation"

- The above IEEE paper explores the aspects of think-aloud method, its usability as well as its efficiency in comparison to other methods of usability testing. As explained in this citation, according to the participants, "*Think-aloud*" is more efficient in the *identification* of usability problems and finding their causes- *Causation*.
  Similar;y, in reference to this report of performing a usability test to identify problems with the "late add/drop" form, the think-aloud method worked really well. We found various insights related to the shortcomings with the usability of this form.

3.2 Insights obtained from the Usability Test Research

After conducting a Think-aloud test with users of disparate backgrounds, we found several insights about the usability of this form. This study helped in finding out problems associated with the form as well as about certain difficulties the students face with understanding the instructions for acquiring the required authorization.
Following are the key observations that the usability testers obtained while the participants filled up the form (thinking out loud):

- Users found the instruction to be a little verbose. Thus, most of them started filling out the form without reading them, thoroughly.
- As mentioned by the representatives of the registrar's office, we also found that the users faced difficulty while filling out the Student ID field, separated by three blacks. It becomes difficult for them to decide how many digits should be filled in each of those blanks.
- The Email address field seems to be poorly aligned, causing confusion. Since, it is an important field in the personal information column, it needs to be neatly aligned.
- The "credit hours" field in the subject information seems to be an overhead for many users. They find it to be of less importance and suggest that it can be excluded.
- The deadline instructions written at the beginning of the form are also poorly aligned and most of the users missed reading them. They would only pay attention to it if they go through the instructions at the back of the form.

4. Discussion:

4.1 General Discussion with the HASS Student Services Hub RPI

In our general discussion about the forms that are used by the advising staff of HASS department has made us aware that these forms are updated in every 5 years. They have also informed us that students usually have issues with Student ID field. It takes 24 hours to process these forms. Although digital forms can make the user experience and processing time more effective, this concept is not very exciting to all stakeholders. Also, if any type of mistake occurs in the form, students are notified about it, so fields such as email address, phone number are essential though they might be redundant.

4.2 Discussion

What changes would make it more usable?

(a) The text in this form is not poorly aligned:
Users report many alignment issues with the form. So, we would like to resolve some of the alignment issues. For example: The Date field at the top of the form is not properly aligned with the rest of the form

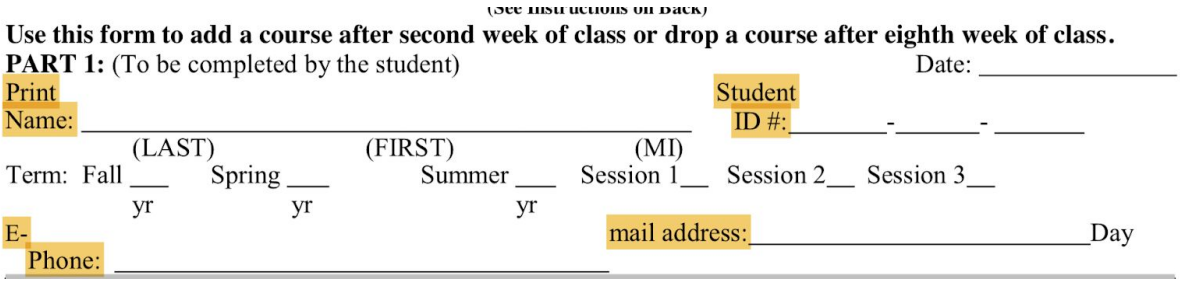
(b) Many users did not pay proper attention to the user's discretion at the top of the form:
The line "Use this form to add a course after the second week of class or drop a course after the eighth week of class" is not properly highlighted. Considering its importance we would like to properly highlight it and add some extra spacing after the line to make it more readable.

(c) The form lacks consistency:
There are different formats used for specifying the same fields. For example: the date formats are different at different places.

Date: _____ _Date:_____/_____/_____

We would like to have the same data format throughout the form.

(d) Improper formatting of several fields:


(See instructions on Back)
Use this form to add a course after second week of class or drop a course after eighth week of class.
PART 1: (To be completed by the student) Date: _____
Print Student
Name: _____ ID #:_____-_____- _____
(LAST) (FIRST) (MI)
Term: Fall ___ Spring ___ Summer ___ Session 1__ Session 2__ Session 3__
yr yr yr
E-mail address: _____Day Phone: _____

The above highlighted fields can be made to fit in one line in the following manner:

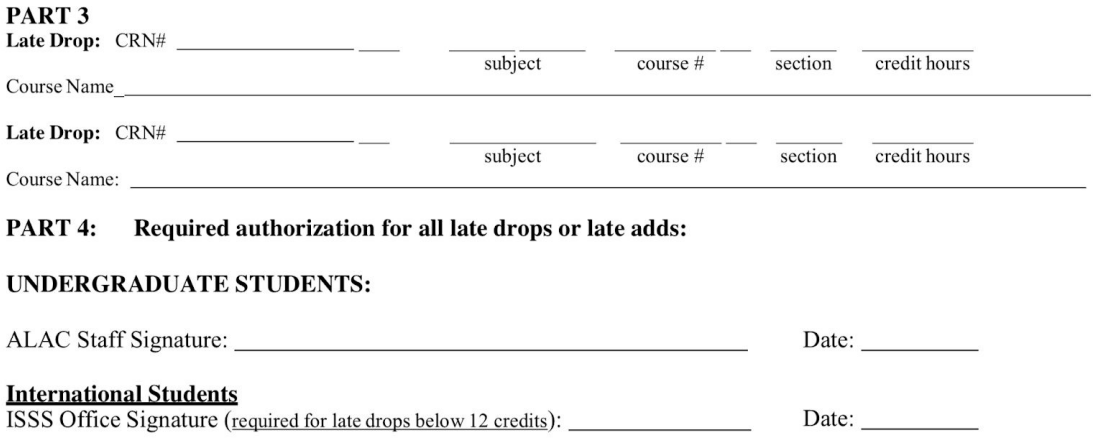
Print Name: _____ Student ID# _____-_____-_____

This would make the form more readable and easy to comprehend for a new user.

(e) Unnecessary extension of several fields:

The fields Course Name, Signature of instructor and Instructor's name could be made to fit in one line and form could be made much more condensed.

(f) Improper alignment within different sections of the form:



(g) Requirements of too many authorisations:

The students also face problems in getting the number of authorisations done. The number of authorisations should be reduced so as to make the process of add/drop a bit swift for the students.

UNDERGRADUATE STUDENTS:

ALAC Staff Signature: _____ Date: _____

International Students
ISSS Office Signature (required for late drops below 12 credits): _____ Date: _____

GRADUATE STUDENTS:

Advisor Signature: _____ Date: _____

Graduate Program Director Signature: _____ Date: _____

Dean of Graduate Education: _____ Date: _____

International Students
ISSS Office Signature (required for late drops below 9 credits): _____ Date: _____

(h) Improper design of fields:

Various fields for taking in students information are not designed properly. This hampers the readability of the form. A homogeneous design of the fields would help a lot in improving the readability of the form.

(i) Unnecessary spacing on the instructions page:

There are unnecessary line spacing on the instructions page of the form. The line spacing also does not follow a proper order. Non-uniform line spacing can deflect the users attention from the instructions page. A proper and uniform line spacing is what we think can make the form more usable.

GENERAL INFORMATION:

- You have 2 weeks to add courses and 8 weeks to drop courses on SIS.
- After these add/drop periods, this form is used to add or drop courses (*with extenuating circumstances*) at the discretion of the Advising & Learning Assistance Center and Academic Standing Committee. Submission of paperwork is NOT a guarantee of approval.
- Students who receive approval to drop a course after the eighth week of classes will receive a grade of "W" in the course.
- Additional requirements are listed below.

5. References and Links

[1] https://en.wikipedia.org/wiki/Form_(document)
[2] book -"Usability Engineering" by Mary Beth Rosson and John M. Carroll (section 6.3 Usability Testing)
[3] book -"Usability Engineering" by Mary Beth Rosson and John M. Carroll (section 7.3.2 Usability Testing in a Laboratory
[4] Exploring Think-Alouds in Usability Testing: An International Survey (IEEE) (C. Concurrent Think-Aloud Process: "2. Think-Aloud Practice").