#securemanufactureui
CSC 591, Spring 2020
Stage 5 - Evaluate Phase

Team

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Participants

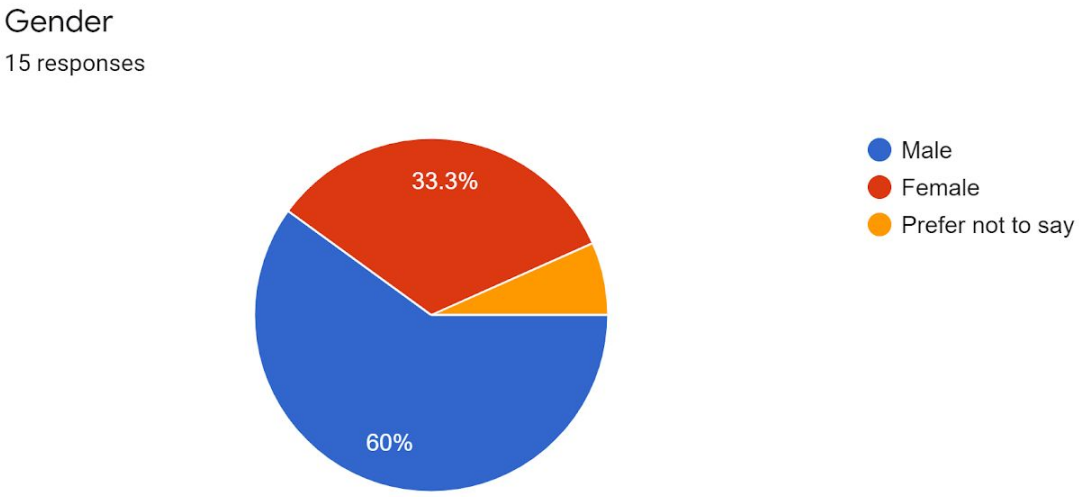
Number of participants: 5

List of characteristics wanted / not wanted :

- **Want:**
  - Age group 20-50. Most of the operators will fall into this category.
  - Basic proficiency in using applications.
  - Some prior knowledge of industrial and mechanical engineering.
  - Some background in using 3D printers/CNC machines.
  - Some background in working with machines in general.
- **Don't want:**
  - Someone with prior knowledge of this project
  - Sensitive age groups

Summary of participants who undertook the survey:

- Around 15 participants took the screening survey.
- 75% of the survey participants were in the age group 22-30. Since the surveys were sent to different peers and personal connections, this was expected.
- Half of the participants were from an Industrial/Mechanical engineering background or at least had some knowledge of the field.
- 60% had a Master’s degree and the rest had a Bachelor's.



Characteristics of actual participants:

- **Participant 1:**
  - Age: 25
  - Gender: Male
  - Education level: Master's
  - Profession: Computer Science
  - Prior knowledge of industrial engineering: No
  - Prior use of 3d printers: Yes
- **Participant 2:**
  - Age: 22
  - Gender: Male
  - Education level: Bachelor's
  - Profession: Electrical and Computer Engineering
  - Prior knowledge of industrial engineering: Yes
  - Prior use of 3d printers: Yes
- **Participant 3:**
  - Age: 26
  - Gender: Female
  - Education level: Master's
  - Profession: Industrial Engineering
  - Prior knowledge of industrial engineering: Yes
  - Prior use of 3d printers: Yes
- **Participant 4:**
  - Age: 25
  - Gender: Male
  - Education level: Masters
  - Profession: Student at Integrated Manufacturing Systems Engineering
  - Prior knowledge of industrial engineering: Yes
  - Prior use of 3d printers: No
- **Participant 5:**
  - Age:28
  - Gender: Female
  - Education level: Master's
  - Profession: Industrial Engineering

    - Prior knowledge of industrial engineering: Yes
    - Prior use of 3d printers: Yes

How we recruited them:

- We sent the survey that we made to our peers and personal connections on whatsapp and selected some of them based on their background for participating in the evaluation interviews.

Link to the screening survey:

- https://docs.google.com/forms/d/e/1FAIpQLSfb4VAZcbMGdVi7Y0cgYAfxphLCoSOOQLLTy4GhP2n4gSmSyQ/viewform?usp=sf_link

Labs

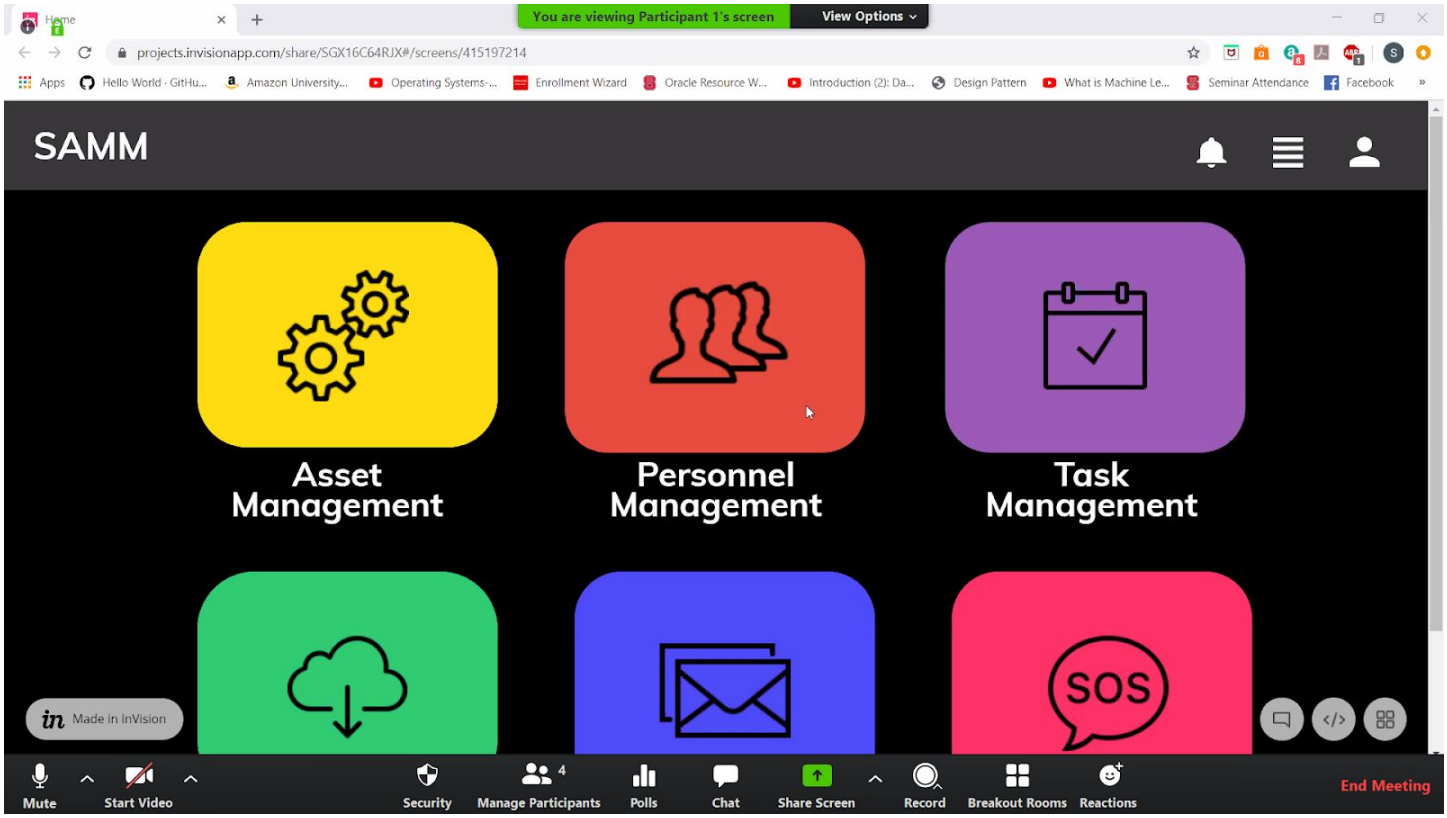
We did not have access to a lab and as a result, we adapted to the situation. We conducted the interviews using video conferencing tools. The interviewer had a copy of the script and the questions for the interview. The rest of the team members had joined the interview but their microphones and video cameras were disabled. They were in an “Observe only” mode. We did not record the interviews. The interviewee also had the video camera disabled to ensure anonymity. The link to the prototype was provided in the chats.

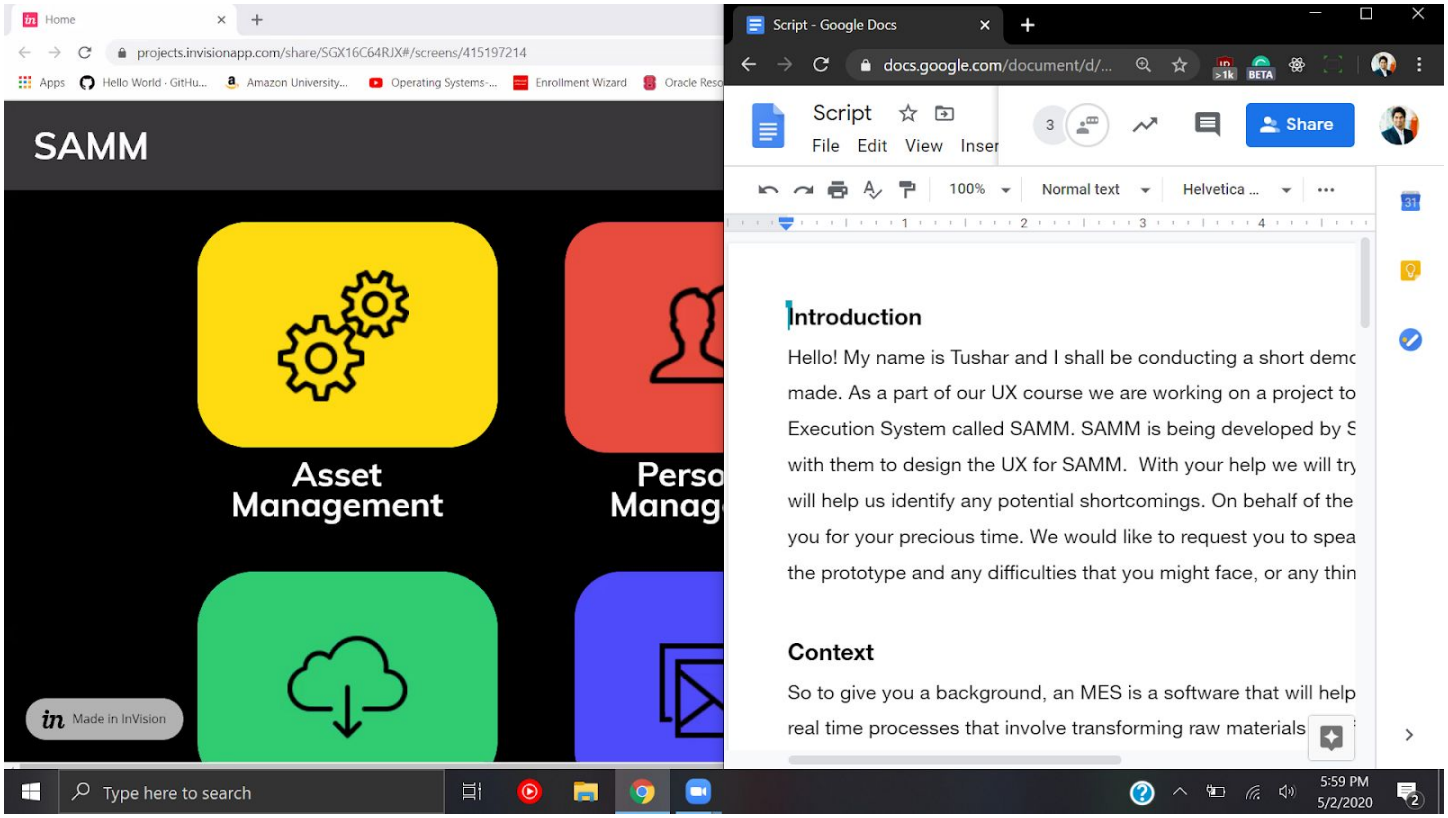
Tools used:

1. Laptops
2. Zoom - Video conferencing tool.
3. InVision app - The prototype was made using this tool.
4. Google docs - The script was made accessible to the interviewer using google docs
5. Google sheets - The rest of the team members were taking notes and recording the interactions using the grid format.

Figures

1. The figures below showcase the setup.




Home
projects.invisionapp.com/share/SGX16C64RJX#/screens/415197214
Apps
Hello World · GitHu...
Amazon University...
Operating Systems-...
Enrollment Wizard
SAMM
Asset Management
Made in InVision
Script - Google Docs
docs.google.com/document/d/...
Script
File Edit View Inser
Share
100%
Normal text
Helvetica ...
Introduction
Hello! My name is Tushar and I shall be conducting a short demo
made. As a part of our UX course we are working on a project to
Execution System called SAMM. SAMM is being developed by S
with them to design the UX for SAMM. With your help we will try
will help us identify any potential shortcomings. On behalf of the
you for your precious time. We would like to request you to spea
the prototype and any difficulties that you might face, or any thin
Context
So to give you a background, an MES is a software that will help
real time processes that involve transforming raw materials
Type here to search
5:59 PM
5/2/2020

Interviews

Script

The following is the script that we used to conduct the interviews: SCRIPT

Tasks

Start from Home/Landing page

1) **Home screen**
    a) Say this : “This is our Home screen which is supposed to give an idea of the various utilities housed by the system. Do you have any feedback about the overall structure and your first impressions of the page?
    b) “Now maybe you want to manage the infrastructure for this system, where do you think you should go to for that?”
2) **Asset Management**
    a) Say this : “This is the Asset Management page. Do you have any thoughts or comments when you first look at it?”
    b) Ask them to perform the following tasks -
        - “How do you check machine activities?”
        - “How do you check machine details?”
        - “How do you check machine job records?”
        - “How do you go back to the Asset Management page?”
3) **Machine Activity**
    a) Say this : “This is our Machine Activity Page. Did you have trouble navigating to this?”
    b) “Can you understand clearly the activity calendar, what the infographics represent?”
    c) “What are your thoughts and comments about this page at first look?”
4) **Machines**
    a) Say this: “This is the Machines Page. Was it difficult to understand how to navigate to this page?”
    b) “What’s your first impressions of this page, does it look simple to use?”
    c) “How do you think you would be able to search for any machine on this page using any pertinent keyword(s)?”
    d) “Do you think that the tabulation on this page gives you enough information on a machine?”
    e) “How do you check for More Details of a machine?”
5) **Machine Details**
    a) Say this : “This page shows every possible detail for a machine. Do you think the amount of details provided might be insufficient or overwhelming even?”
    b) Ask them to perform the following tasks -
        - “How do you check or edit the settings for this machine?”
        - “Do you think you have enough information available to make possible settings changes needed for a job?”
        - “How do you close this section?”
        - “How do you check the performance stats for this machine?”
        - “Do you think the infographics are easy to understand?”
        - “How do you close this section?”
6) **Checking Logs**

a) Say this: “This is the Asset Management Screen which has different options about how to check different machines and manage them. Could you easily figure out how from this page you can go ahead to check the logs. If yes, please navigate to the Logs page using the appropriate Tab”.
b) “This is the Logs page. You can see a summarised report of the tasks happening on different machines and check what errors are there along with the status of the activities etc. Could you please navigate though the page and tell me what all information can you check through the page”.
c) Ask them to perform the following tasks:
    - “Could you please try to check the detailed logs for the first activity. Now you can see that there are different tabs for different types of details”
    - “Could you try to check the Machine User’s details and check the page. Please make a mental note of the details that you feel might be missing”
    - “Now could you please go back to that particular log, and check the particular activity log. This would give many details about the particular job and a few details about the previous and next scheduled jobs”
d) Once the interviewee has performed the above tasks:
    - Say this: “How was your experience in navigating the Logs. Could you please rate your experience out if 5 (1 being the lowest). Also, let me know if you faced any issues”.
    - “Now could you please navigate to the Home Page of the website” .

7) **Troubleshooting and Help Center:**
a) Say this: “Now that you are on the Home page, could you please try to find where you can seek help for troubleshooting your errors”
b) “Please navigate to that page and check what all information you can see. Do you feel that these logs give you sufficient information about the errors”
c) “Now let’s suppose you want to troubleshoot a particular error how would you proceed from this consolidated error page”
d) “Now try to keep following the wizard step by step in order to fix the issues.”
e) Once the interviewee has performed the above tasks:
    - Say this: “Were the steps helpful in assisting you with the troubleshooting of the error”
    - “Is the information difficult to understand?”
    - “How would you like to rate the experience of the wizard out of 5 (1 being the lowest)”
    - “Was it easy for you to navigate to the main home page and then trying to fix the issue”

Grid

The following is the grid that we made.

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Home Page	Says that it is easy to identify each category with icons	Thinks that icons seem too big Says that the icon titles seem self explanatory Thinks that Help Center would let him contact some representative if he runs into troubles while using this system	Said that the home page looked very basic and self explanatory. Easy to navigate.	Looks nice and is intuitive.	Likes how the options are color coded. Comments that the flat design and icons are pleasing to look at.
Asset Management	He thinks the SAMM icon should go back to the menu page	Feel that it looks nice and self explanatory Complains that the yellow color seems a bit bright against the black background	Said that the all screen was good and covered many options that were good and detailed.	There should be a back button. When you open the machine overview, the bar above reads activity and that creates confusion.	Able to associate color with a particular section. Comments that the icons of view, add and remove machines could have been a machine instead of a robot head. No back button
Machine Activity	Like the different colors to identify each machine status He tried to find a return button	Feels that it looks pretty close to a standard calendar app Loves it how developers	Very convenient to use. Was easily able to perform the tasks and navigate on all the options suggested in	He could understand the information provided. Complaints about the back button and the	Comments that misleading naming used. Machine overview on the icon but machine activity on the actual

		have used various colors to represent each machine Does not understand how to go back	the task.	bar not reading activity log.	page. Thinks that red color signifies error and yellow color signifies warning. Comments that using green, yellow and red colors is misleading.
Machine page	No comments	Feels that it looks like a good way to search for machines Says that there should be option to sort	The page showing machine details had huge tabs to click, that did not suit.	The level of detail was satisfactory.	Comments on the convenience of filters.
Machine Details	Like the well-organized information	Likes the icon used to get to this page Asks if he can change the settings while running any job on a machine? Says that the stats are pretty informative for maintenance	Said adding graphical representation for the machine was a great idea.	In “View User Details”, there should be an option to view all machines that the user should work on.	Likes the condensed view of the page. Comments on the convenience of the accordions. Likes the KPI section. Asks about the save button after editing the settings. Asks if settings are locked during the duration of the job.
Logs page	He thinks a filter may be good for searching	Found it very compact & consolidated Feels that it gives all the info	The overall layout of the pages looked good but the information seemed to be a	Found it satisfactory.	Likes the condensed list of the logs. Comments that user details

		that I need to glance at for a quick check on job details Complains about no sorting option Likes how the activity log shows the percentage of task done Likes the layout, pretty easy and straightforward	bit redundant. He said that he was seeing similar information on every tab. So, we can try to consolidate the UI.		could have redirected to a different section. Asks what Personnel management module is for. Asks how view details is different from view activity log
Help Center	He thinks a filter will be good for searching He tried to click the step button on the side bar.	Says this pink color looks cool Find the tabulation layout nice Wants date to be added along with time to the table Again complains about no sorting option Finds the steps easy to read the troubleshoot steps, says they are very easy to read and infer	The Help Center was a good idea with a wizard. Suggested to add more graphical help options along with videos and an option for a chat bot for instant help/	Thinks that after the end of the tutorial, there should be a “done” button.	Likes the wizard and how it shows every step in a detailed manner. Asks if the error stays in the list after solving it. Says there is no way to mark complete or solved. Comments that some more options to solve the errors would have been nice.

Results

Patterns found:

Home Page:

1. In general, the home screen was viewed as valuable and the icons intuitive of what each would allow the user to achieve.
2. The color combinations used were aesthetically pleasing to the eyes of the users.

Asset Management:

1. The design was found to be compact but the absence of a Back button was viewed as troubling.
2. Seems that the use of navigation breadcrumb isn't something users quickly associate with navigation efficacy.

Machine Activity:

1. The information provided was viewed as a good consolidation of what, who & when.
2. Overall viewed it as that valuable information was represented very conveniently.
3. The absence of a return button again seemed troubling to the user.
4. The color combination used was at times found difficult to perceive.

Machine Page:

1. The search function makes the user more convenient to find what they want.
2. The participants think there can be a sorting option to aggregate the information.

Machine Details:

1. The participants liked the consolidated view of the page.
2. One main concern was about editing the machine options when a particular job was executing.
3. The information was presented as needed with the help of accordions. No bombardment of information.
4. The use of visualizations made it easier to view the KPIs.

Logs Page:

1. Users found the information a little difficult to find, so they suggested using filters and consolidating the information.
2. Navigation on all these pages looked quite smooth and it was pretty smooth for all the participants.

Help Center:

1. The participants think there should be other options rather than text to solve the error.
2. Wizard seems a good way to present the help function.

Follow up:

Based on the interactions, we came up with a few improvements to our prototype.

1. There should be a back button in every page so that the user can easily go back to the previous page. The lack of a back button frequently bothered the participants and this is an important aspect that needs to be incorporated into the design.
2. The sorting, searching and filtering function should be present in the log page and machine page.
3. Using different colors for different modules was welcomed by the participants but there is a concern of using status colors(red, amber and green). A different color scheme could be used.

4. Avoiding misleading namings.
5. Incorporating more options for solving errors.
6. Icons on machine view/add/delete buttons in the Asset management module must depict a machine.