#securemanufactureui

CSC 591, Spring 2020

Stage 4 - Prototyping Phase

Team

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Tools

1. **InvisionApp**
   InVision is a prototyping, collaboration and workflow tool which provides control and interactivity to the design process. It helps to create efficient and simple interactive mockups for wireframes and designs.

   Link : https://www.invisionapp.com/

2. **Balsamiq**
   Balsamic is a tool that we use to do our first draft of our prototype. This tool has many inbuilt layouts and assets that help us to sketch the prototype quickly. It also supports collaboration mode so that we can see the modification from other team members in real time.

   Link: https://balsamiq.com

3. **Adobe XD**
   For the prototyping phase, we heavily used Adobe XD for designing all the screens. Adobe XD is a UX design tool by Adobe. This tool provides support for designing both mobile and web applications as well. It provides many plugins and there are many open source resources and wireframes available that could be used as per the requirement.

   Link: https://www.adobe.com/products/xd.html

4. **Powerpoint Gslide**
   In the initial prototype phase for making the wizard and machine maintenance tracker we used Powerpoint Gslide. It is an online collaborative tool that helps in making and editing presentations collaboratively. It is just like Microsoft Powerpoint tool and helps in making slides with different

templates, images, texts. It also allows us to insert images, audio and video. Although Google Slides has much more functionality in making presentations, we thought it would be a good idea to create our website app screens as well, because it provided all the functionalities required and was easy to work on. Also, it is free for use.

Link: https://www.google.com/slides/about/

Roles

Name	Tasks
Tushar Himmat Dahibhate	Explored the Adobe XD application for creating User Interfaces. Responsible for knowledge transfer of Adobe XD to the team members, designed the structure of the UI for the application and designed the homepage and Asset Management module.
Yang-Kai Chou	Worked with another team member on the prior version of the prototype. Made some details on the asset management page and machine overview page. Explored moqups tool.
Rajshree Jain	Worked on finding the appropriate tool that would be good for creating a connected demo out of various tools like mockups, InvisionApp, balsamic etc. Made details screens for asset management and activity logs. Worked with another team member on making the maintenance and update tracker that we presented to the client for feedback prior prototype development.
Satanik Ray	Explored InvisionApp for connecting the screen prototypes and designed the interaction/navigation across all screens. Also worked with another team member for designing the error & troubleshooting wizard which was presented to the client for feedback before prototype development.
Ankit Arvind Tiwari	Worked with Satanik to find different tools. Also, we worked on making a “process slide” on powerpoint and hosted it on the invisionapp to discuss with secmation and to get an idea about their expectation with the project. Later, made the wizard part of the final prototype on the Adobe XD.

The team initially worked on developing certain process prototypes from the storyboards in the previous phase and had a remote meeting with the client to discuss the ideas and get feedback on the same. The following ideas were discussed -

Troubleshooting wizard : This process depicts the control flow for any error that might occur upon submitting the job. It takes the user to error logs which provides possible reasons for the error while also providing clear instructions as to how the user might fix this issue. The client gave positive feedback on the process while also stressing on the need to have a very clear interface with navigation and controls to assist the user in troubleshooting an error.

Link: https://ankittiwari644129.invisionapp.com/public/share/KZ13O48OEG#screens/477374059

Maintenance and Configuration: This process represents the flow of a machine that needs updates before using it. It helps the user to update the machine and the setting step by step. The client suggests we should focus on graphical design.

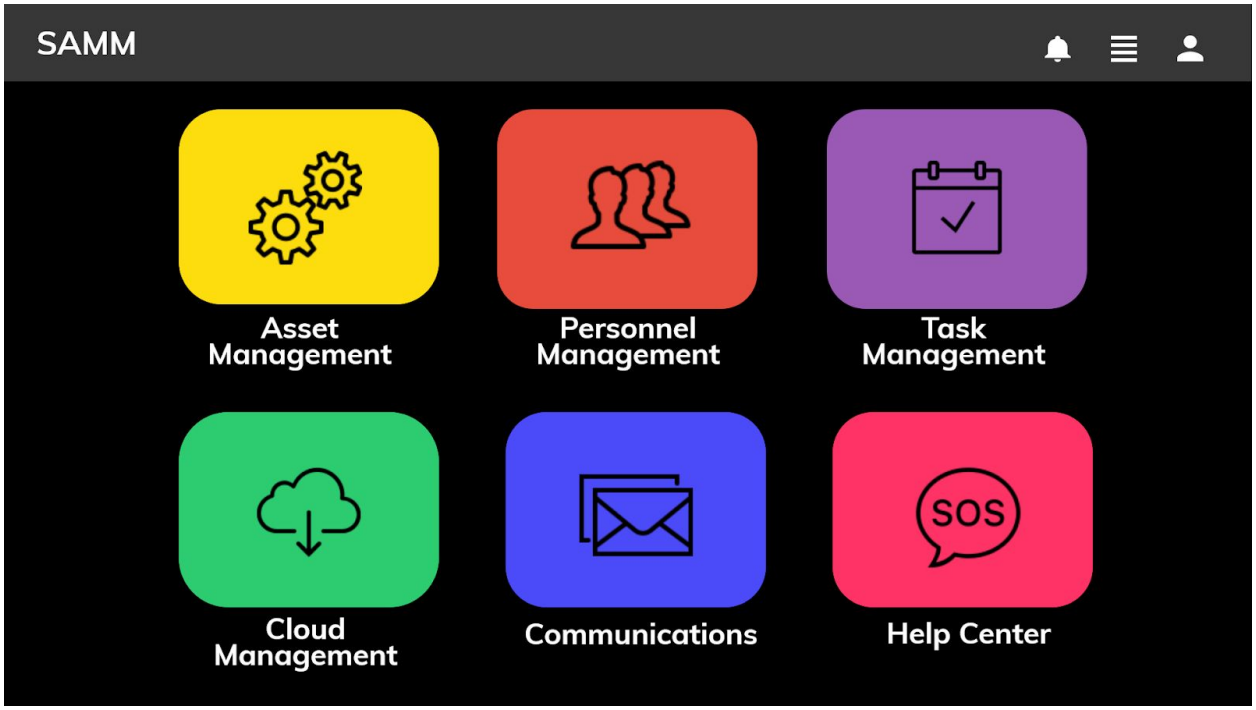
Link: https://projects.invisionapp.com/share/FVWVWYE2WMS#/screens

Link from Clients:(Screens relevant to Secmation)
https://docs.google.com/document/d/1P5ef8riNPbTvW7k7La93FnKtG9pmnxsWxyQv4Vtg13M/edit

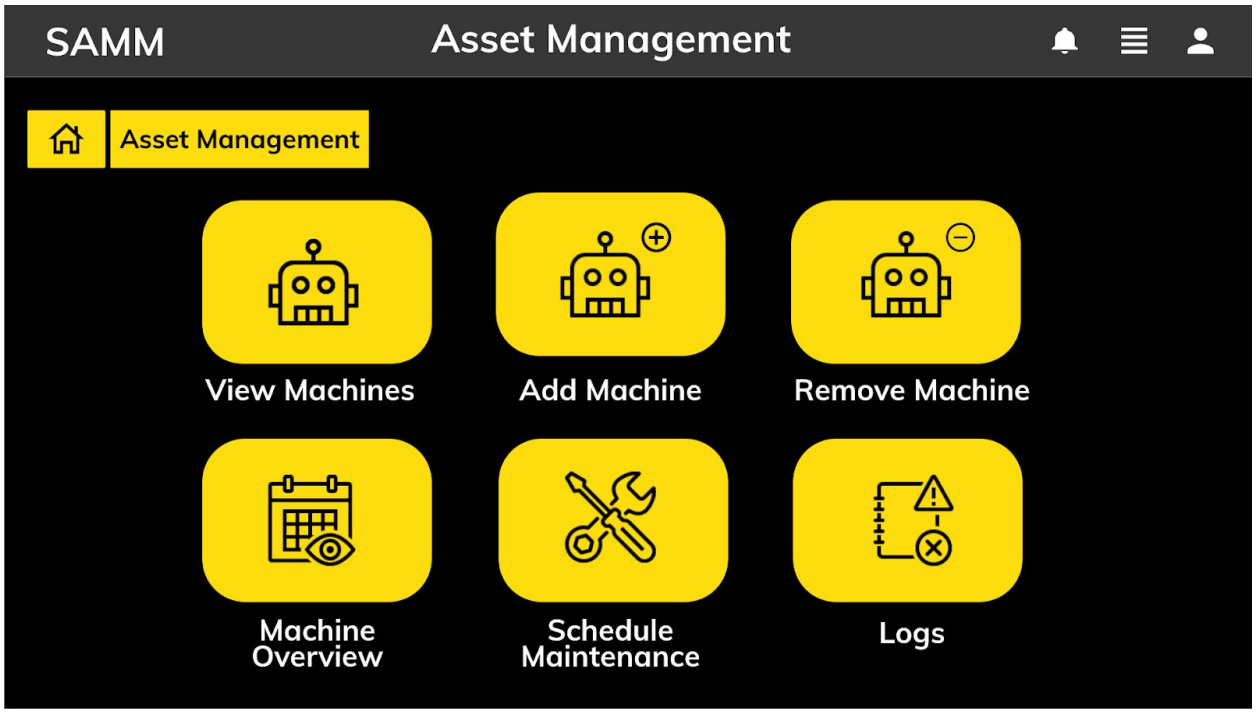
Prototype

Link to the live user interface: https://projects.invisionapp.com/share/SGX16C64RJX#/screens/415197214

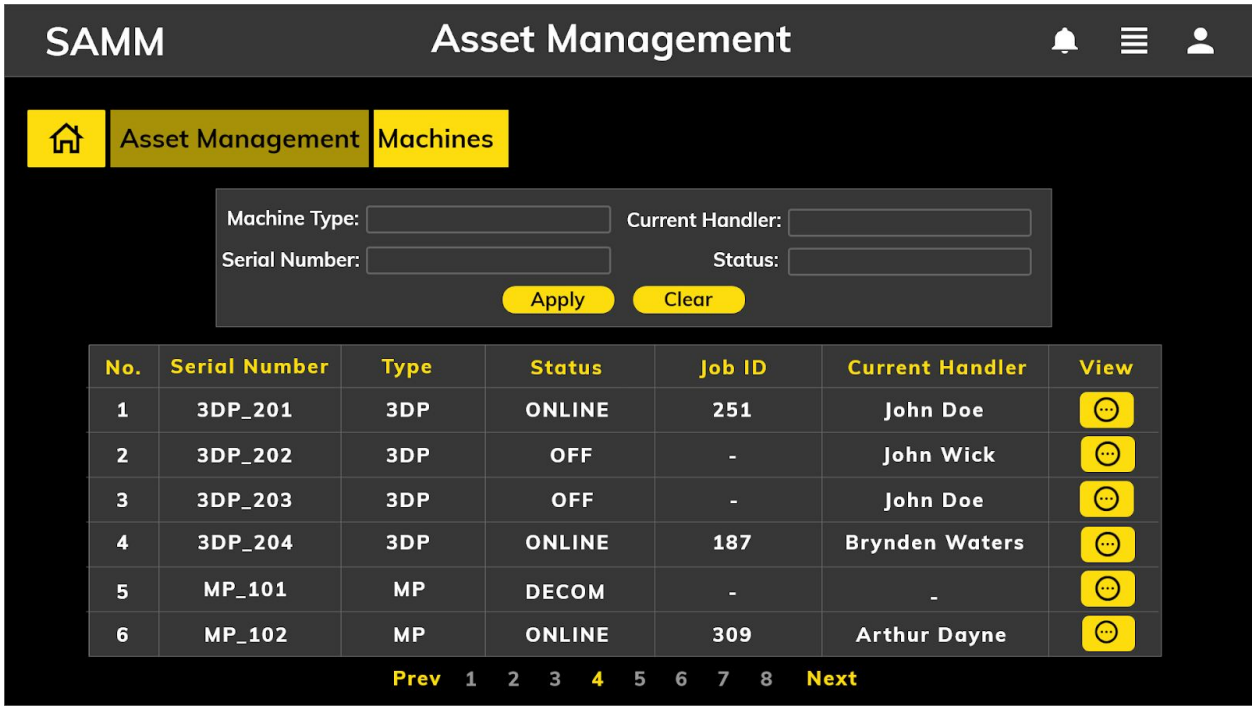
1. **Home page -** This page is the landing page after the user logs into the SAMM. This page will highlight different modules such as Asset Management, Personnel Management, Task management, Cloud Management, Communications and Help Center. The topmost bar contains different buttons for alerts, options and account settings



2. **Asset Management -** On pressing the Asset Management from Home Page, we can see this page. This page is the main page that relates to machines. It includes View Machine, Add/Remove Machine, Machine Overview, Schedule Maintenance and Logs.

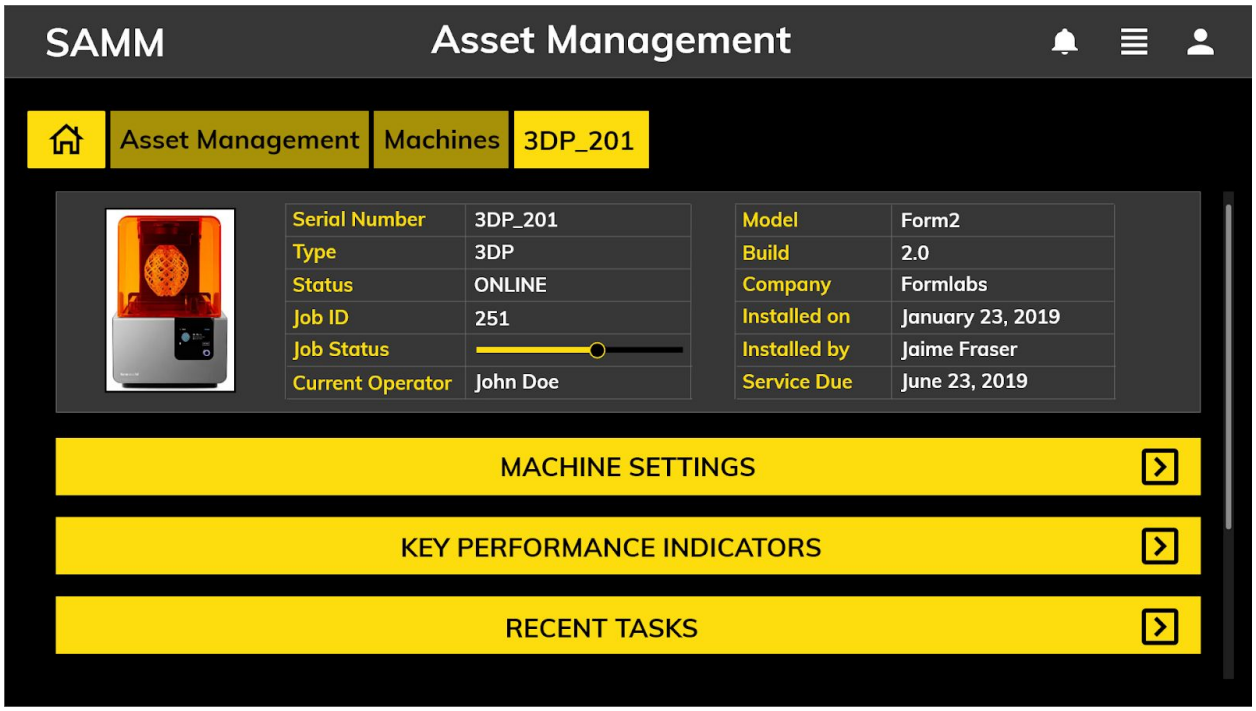


3. **View Machines -** This page comes under the Asset Management module. View machines page will provide a list of all the machines that are currently connected to the SAMM. This list will display the serial number, type, status, job ID, and the current handler/operator of every machine. A view more button is provided in front of every machine to view its entire information. A filter is also provided to search appropriate machines.

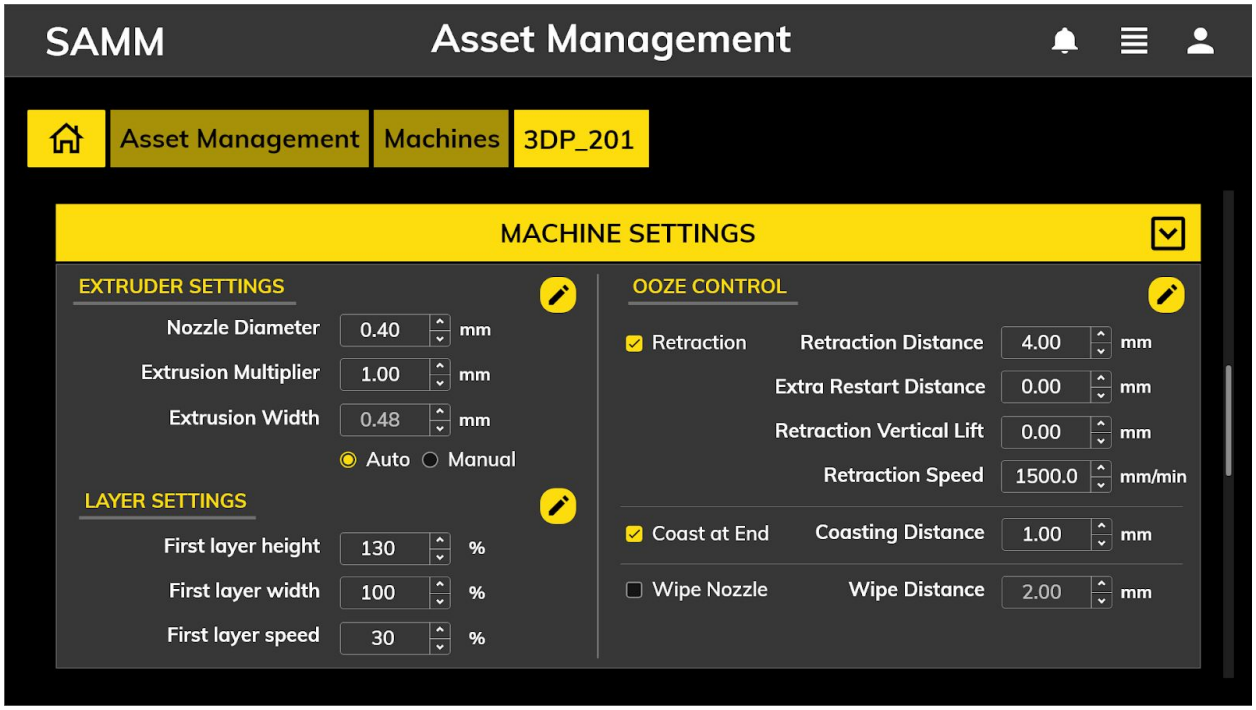


4. **Machine Details -** This page provides all the details relevant to a particular machine. This includes everything from the serial number, model, build, installation details, and the current job the machine is

executing. This page contains sections for machine settings, key performance indicators and recent tasks.

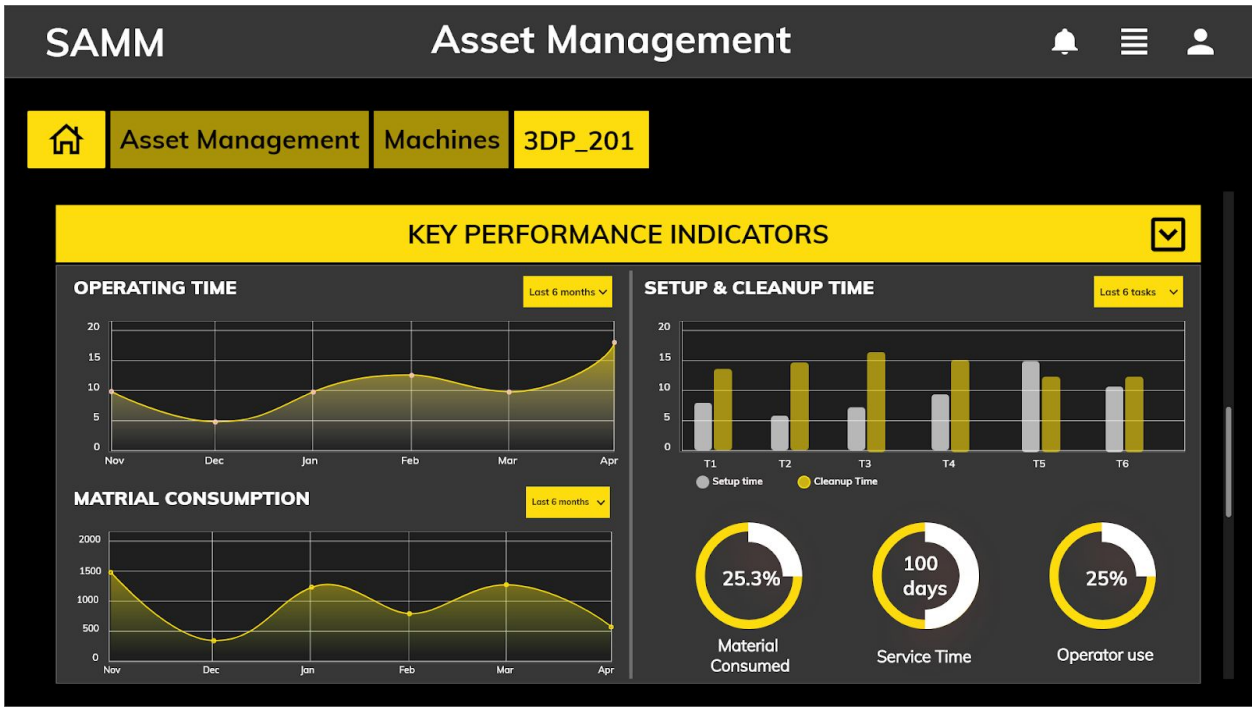


5. **Machine Settings -** This section opens up when the user clicks on the machine settings accordion on the machine details page. This section contains all the settings of the machine. These configurations can be edited using the edit buttons given at the top right corners. The screenshot below highlights the settings of a 3D printer.

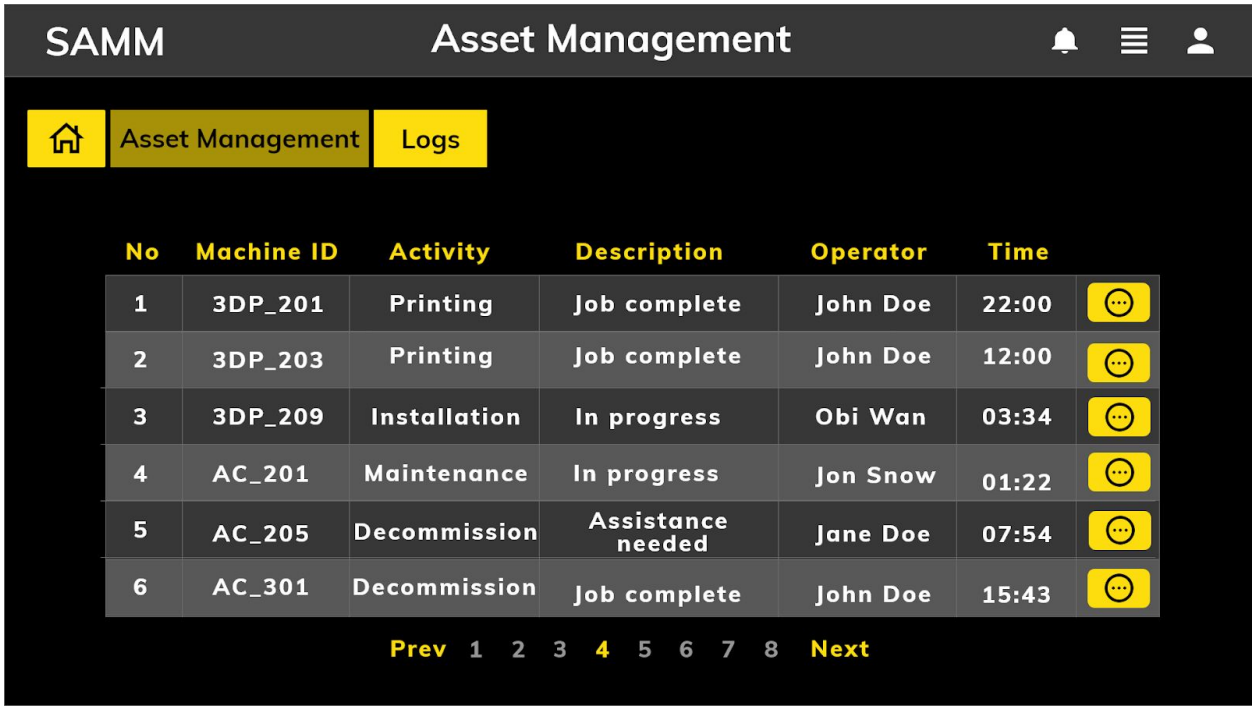


6. **Machine Key Performance Indicators -** This section opens up when the user clicks on the key performance indicators accordion on the machine details page. This section will display all the Key

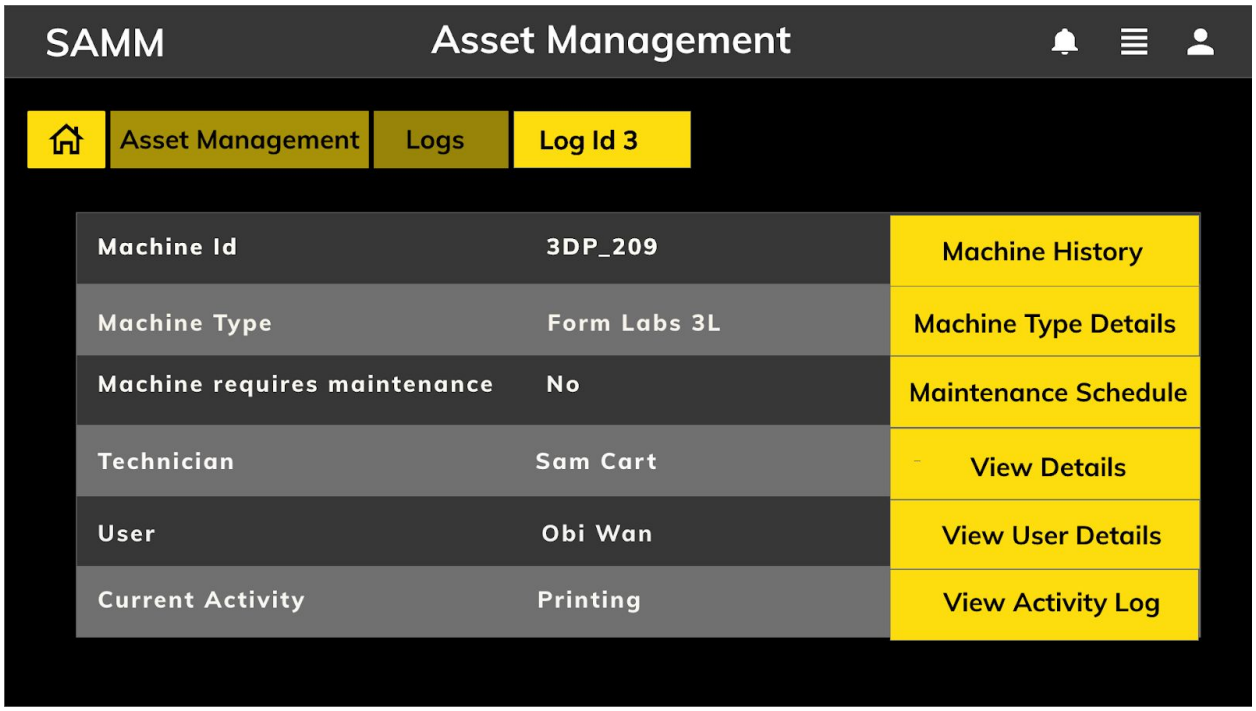
performance indicators of the machine in a graphical format. The screenshot given below visualises the operating time and material consumption over a period of 6 months. Details regarding the current consumption level, operator use and number of days left before the next maintenance cycle are mentioned.



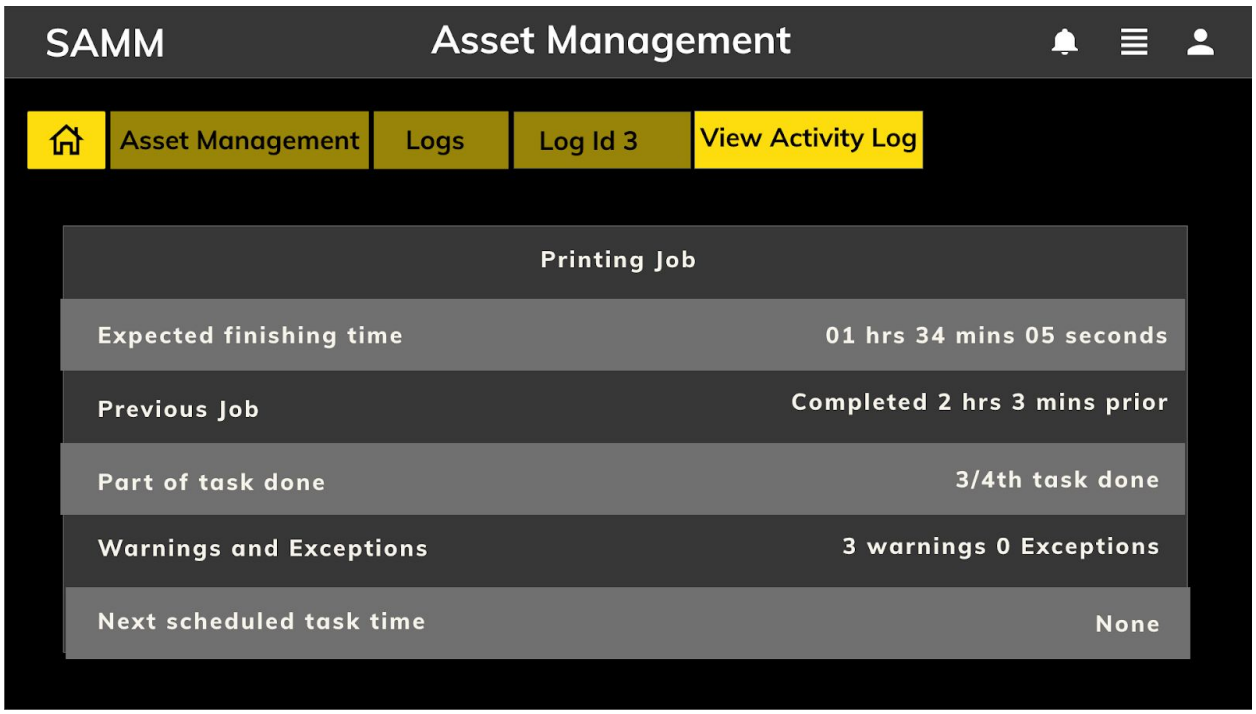
7. **List Logs -** This page provides a list of all the logs that are generated by any task a user or a machine is performing. This is where a paper trail is generated and listed. The list will give an overview of the log and will contain details like machine ID, activity, short description, the operator performing the task and the timestamp of the log. To get detailed information the user will have to click on view more.



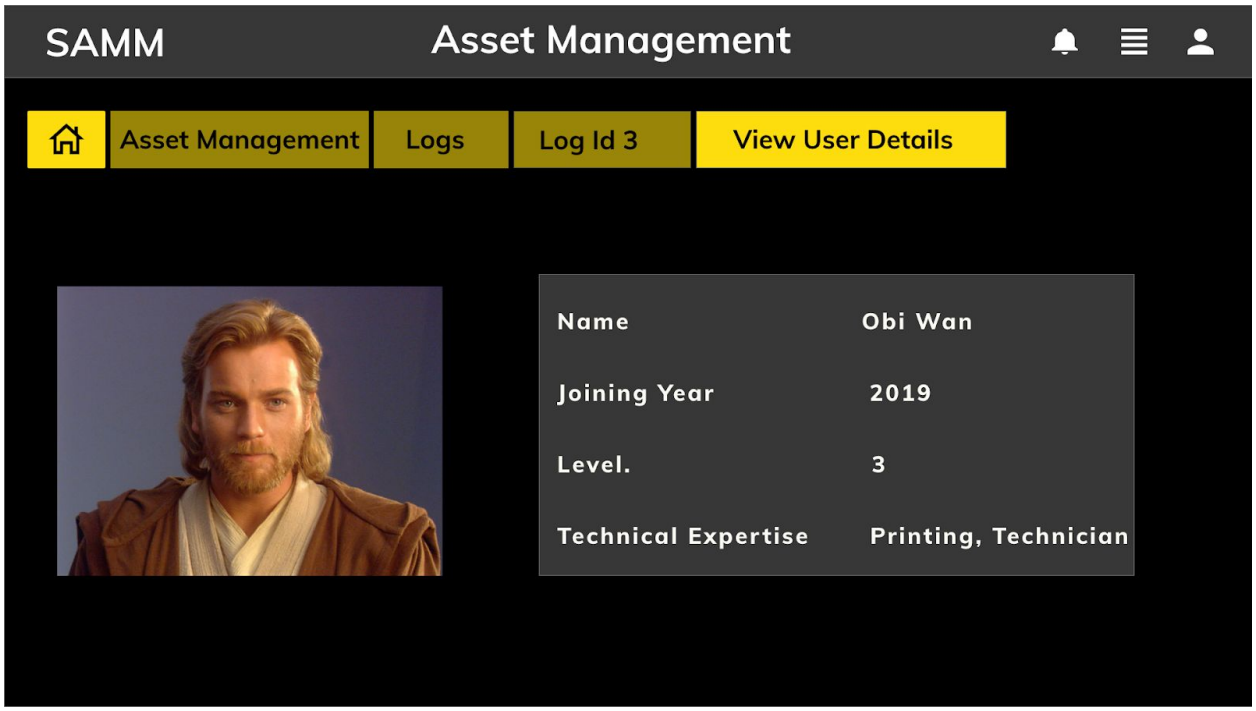
8. **Log Details -** The below screen comes from clicking the more menu from the above screen and shows a detailed overview of the particular log and also what all further options we can see.



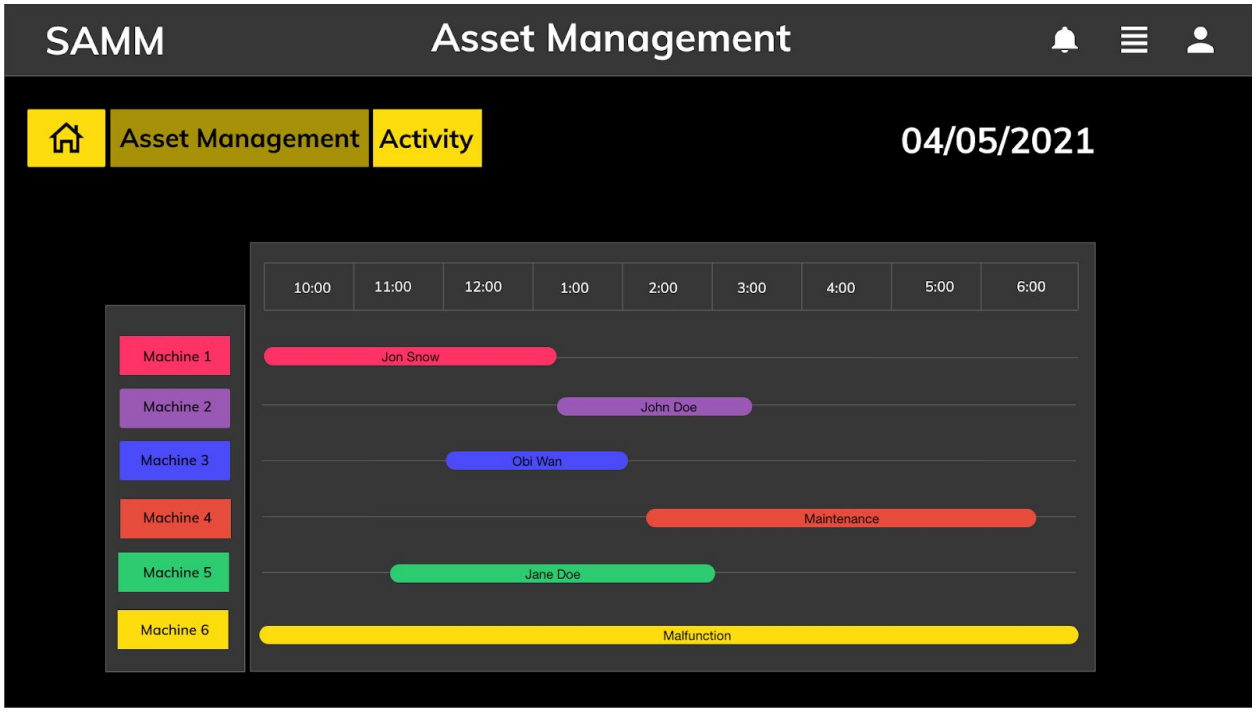
9. **Job Statistics -** On pressing the View activity log option we can see the statistics of the job, and details like estimated finishing time, next scheduled update on the machine on which the job is running, how much task is complete, how long before was the previous task over and after how long is the next task scheduled.



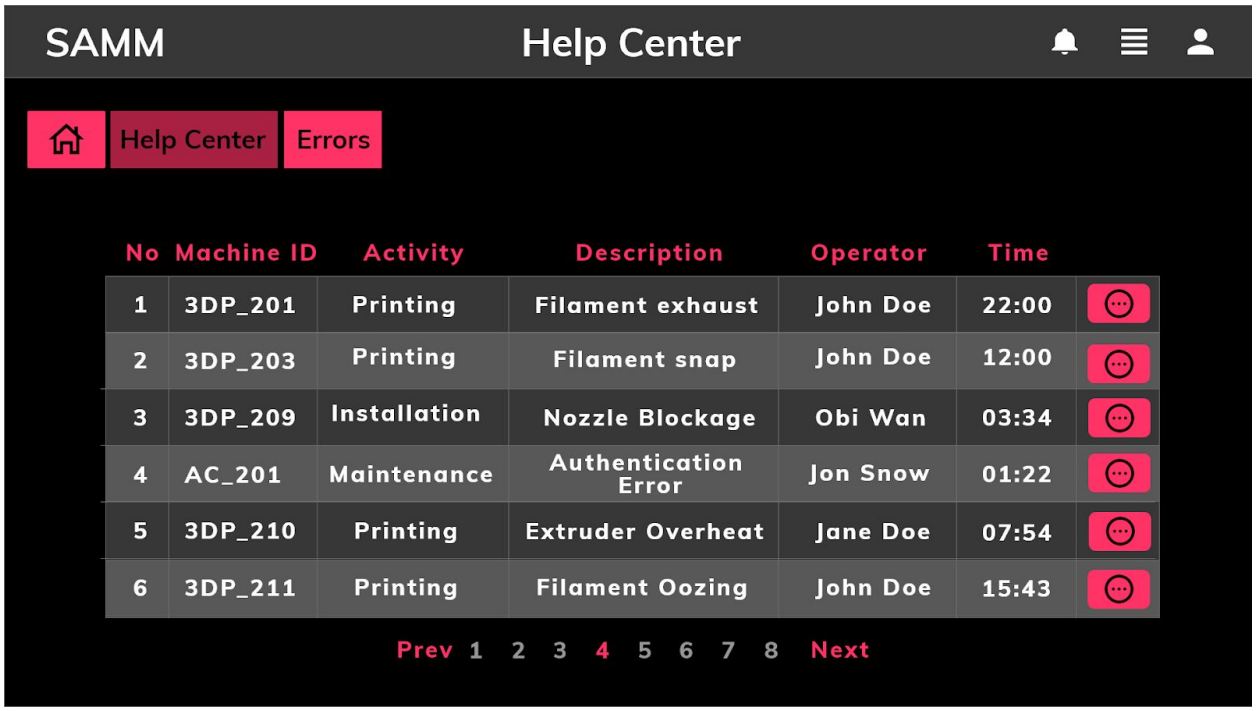
10. **User Details -** On pressing the View user details option on the sixth screen, we can see the details of the person who configured the task.



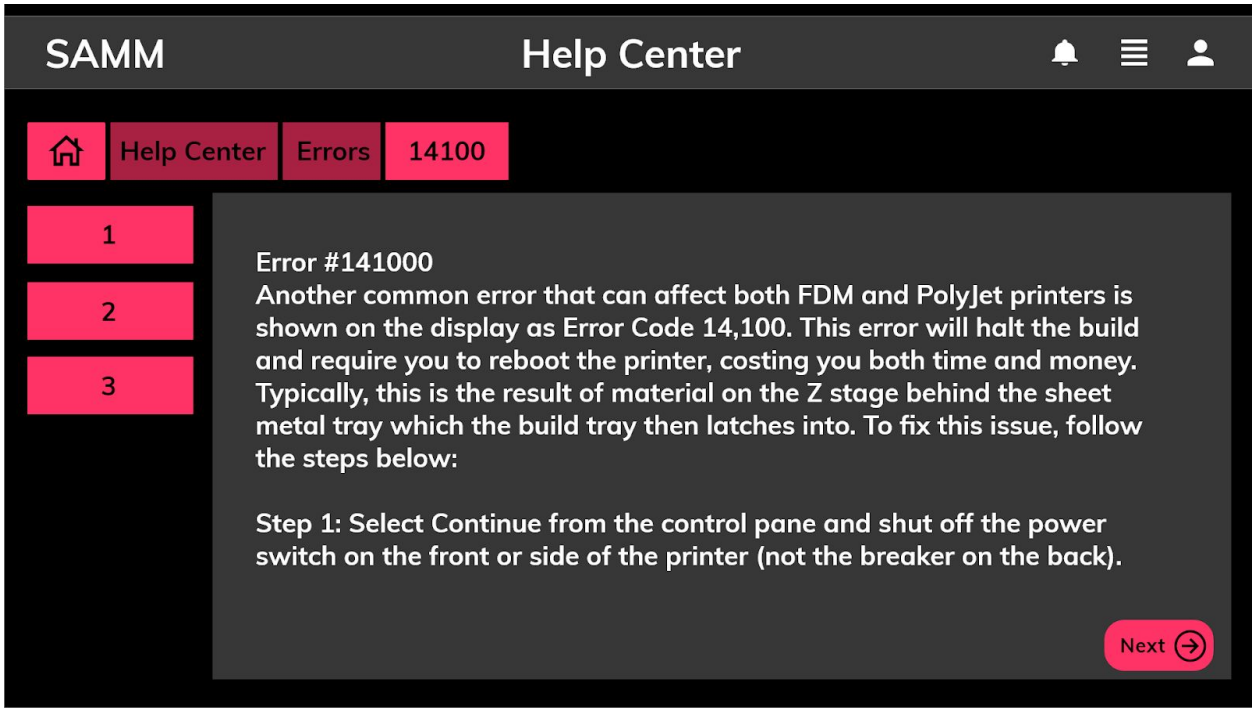
11. **Machine Overview -** This page is under the asset management module called Machine Overview. This page provides users a brief summary of all machines by using graphical view in real time.



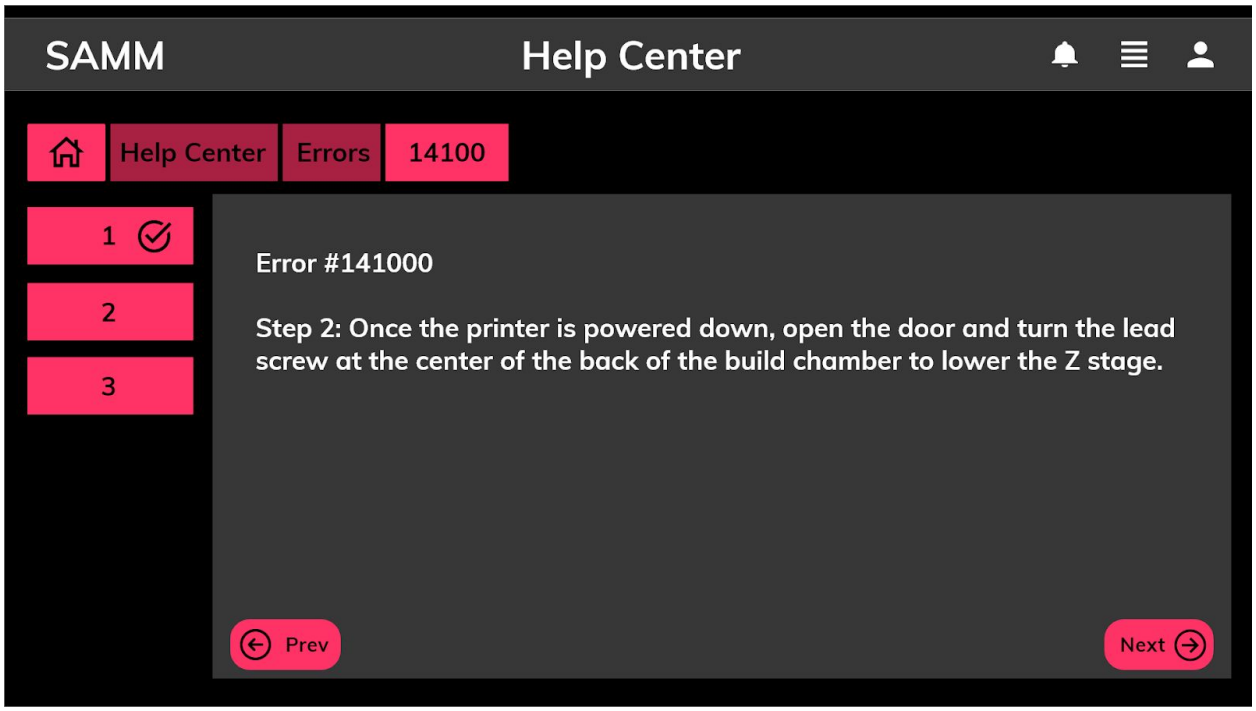
12. **List Errors -** This section opens up when the user clicks on Help Center from Home screen. It lists all errors sorted by date-time and the concerned detail for each job which resulted in the error. For further insight into an error, users can click on the More option on each row.



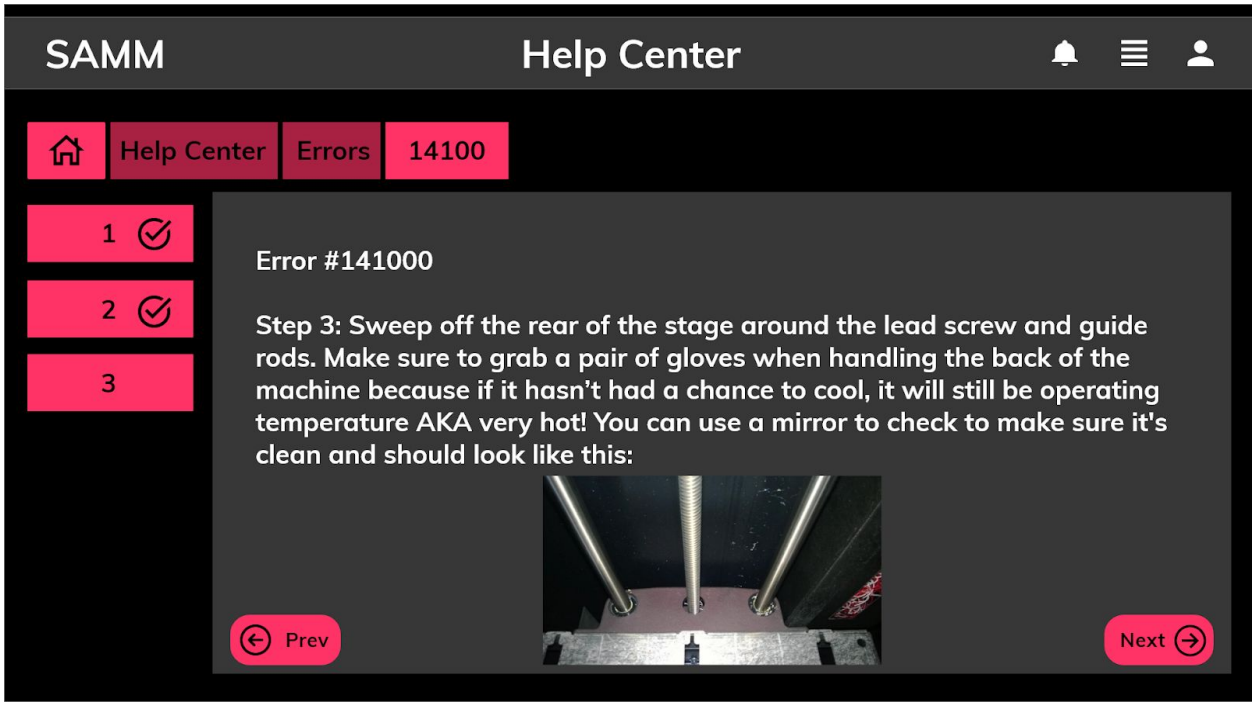
13. **Error wizard (1) -** Users can arrive on one such screen by clicking on the More option for each error on List Errors screen. This screen details an error insight and provides instructions on what to do next, basically assists the user in troubleshooting an error, The Next option takes the user to the next set of instructions, if available.



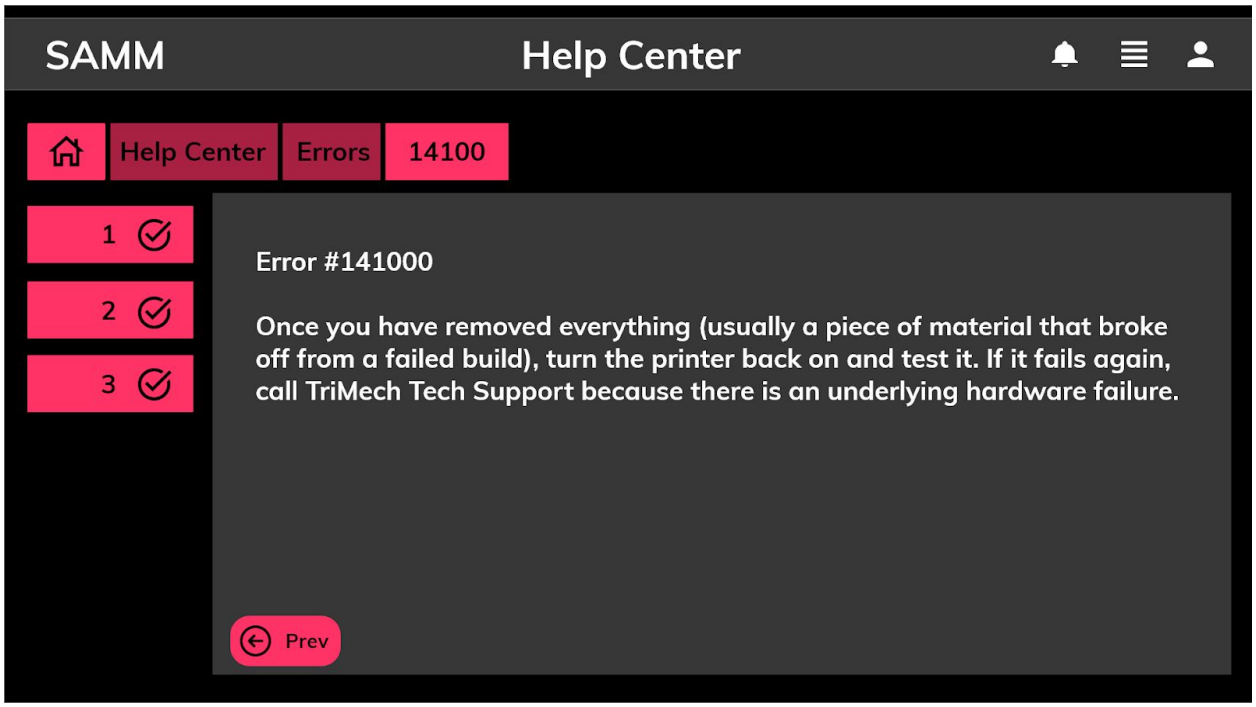
14. **Error wizard (2) -** Users can arrive on one such screen by clicking on the Next option on Error Wizard(1), if it exists. This screen provides further insight into the error and instructs the user on what to do next to fix the issue. The Prev option takes the user back to the preceding error wizard screen.



15. **Error wizard (3) -** Users can arrive on one such screen by clicking on the Next option on Error Wizard (2), if it exists. This screen provides further insight into the error and instructs the user on what to do next to fix the issue.



16. **Error Wizard (4) -** Users can arrive on one such screen by clicking on the Next option on Error Wizard (3). This denotes the end of troubleshooting instructions for the user.



Trial

We did a trial run with our application and found out a few shortcomings.

Breadcrumbs - While designing breadcrumbs for our application, there was some inconsistency among different screens. Some team members were of the opinion that the breadcrumb related to the current level must be bright while the rest all including the homepage button must be of a lower opacity. Some members opined that the homepage breadcrumb must also be bright.

Alignment issues - After the first trial run, we noticed several alignment issues related to different elements in the pages. The aesthetic appeal was affected by such alignment issues.

Font inconsistencies - We noticed different font consistencies as well.

Screen sizes - Some team members used the export option of the Adobe XD while some members opted for a screenshot of the screens. This resulted in different screen sizes after we linked all the screens in the invision app.

References:

1. https://www.adobe.com/products/xd.html
2. https://balsamiq.com
3. https://www.invisionapp.com/
4. https://www.google.com/slides/about/
5. Icons were imported from the following resource: https://icons8.com/
6. Adobe XD tutorial: https://www.youtube.com/playlist?list=PLSOZBpgNzv42dFSo_JvBFNZPFn95UuafG
7. Adobe XD templates: https://freebiesupply.com/adobe-xd-templates/
8. https://pinshape.com/blog/3-most-common-3d-printer-errors-and-fixes/
9. http://www.geeetech.com/blog/2018/01/troubleshooting-does-your-3d-printer-stop-in-the-middle-of-a-print-we-have-the-solution/
10. https://www.machinedesign.com/3d-printing-cad/article/21127585/eight-tips-for-improving-3d-print-quality
11. https://blog.trimech.com/troubleshooting-3d-printer-errors
12. https://formlabs.com/3d-printers/form-2/
13. 3D printer settings: https://pinshape.com/blog/10-advanced-3d-slicer-settings-that-will-save-your-prints/