

Final Report: An Investigation into Business Process Engineering Opportunities

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INFM400: Research Methods and Project Planning

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Introduction:

Executive Summary:

The purpose of this research project is to generate insights about a selected business and develop technical solutions to business process inefficiencies. Before conducting any research, the principal investigator has identified the business' inventory management processes as an area for improvements, thus the research study will revolve around improving this specific process. Improvements will be made to user experience and to further meet the needs of management where applicable. Interviews will be conducted with employees to understand user experience and collect grievances about the process. Data collected in the interviews will be organized and synthesized into a research findings report. This research findings report will then be utilized by researchers and developers to produce revisions for the current system. Such improvements will need to be transformed into prototypes. The prototypes will undergo pilot testing with users. The user experience, aesthetics, usability, and more will be compared between the current system and proposed solution systems. Proposed solutions are intended to improve general business efficiency, but also to improve employee user experience and job satisfaction. Once all these steps are completed, researchers will present these changes to company management for approval. Following approval, developers would be charged with coordinating with employees and management to implement the new system. Technical changes will be made, but training, support, and documentation will be provided to employees. This project's success depends on considerate planning, thorough research, appropriate technical revisions, and suitable presentation to the business stakeholders.

Acknowledgements:

Before we get to the rest of the report, I do want to recognize a few people and groups which were vitally important to the creation and success of this project and report. Firstly, I want to thank my friends and family who served as personal support in getting this completed. These people provided me with a lot of encouragement and motivation to get this assignment done, marking the coming end to my college career for now. Next, I want to thank some of my coworkers, the users who I got to test my prototypes with, for their vital feedback on my prototypes; without them I would certainly have a less powerful system upgrade. Then I want to thank all the Mercer faculty who have helped me get to this point, including previous professors, my academic advisor, my financial advisors, and the enrollment team who helped me earn and overcome conditional enrollment; I simply would not be here without them. And last, but certainly not least, I want to thank Dr. Liu for supporting not just myself, but every one of my peers in our college and career journeys. Dr. Liu was instrumental in encouraging myself and the students in their respective projects and was very proficient in pushing us to be the best selves, putting our best foot and work forward. Thank you again to all these people and groups mentioned for your support. I apologize if there was anyone I missed, but if you had some role in my success, know that I am grateful for your support.

Project Background:

The ultimate deliverable of this research study is a proposal. This proposal would be presented to the company which is being researched and should outline the research process, the current system's inefficiencies, and a new system prototype. I believe, at minimum, the proposal should include 4 sections: a summary of the research study, a report on research insights, a prototype of a new system, and results of pilot testing. There may be more components of a quality proposal which will be identified as the process is executed. In this case, I will present an inventory system upgrade implementation proposal to my workplace. This system upgrade will

not solve a specific problem, but rather improve the business process in general, making it easier and faster for those involved to achieve their goals. Hopefully, this implementation's social impact is improved job satisfaction and team building due to the improved ease of use of the system.

Project Planning and Management:

Project Timeline Brainstorming:

The below timeline is meant to be used as a general guide; the exact tasks and timeline will be subject to change and in accordance with the class timeline.

Week 1:

- Identify, recruit, and schedule interviews with appropriate employee participants
- Prepare and deliver necessary interview materials including consent forms and meeting details

Week 2:

- Conduct interviews: Conduct interviews one at a time with a day gap between each interview. This day gap is to ensure the researcher can not only conduct the interview but also process/organize the data and reach out for clarification if necessary.

Week 3:

- Continue conducting interviews and follow-ups if necessary

Week 4:

- Synthesize data to identify common themes, issues, and insights
- Produce research finding report

Week 5:

- Using the research findings, begin to brainstorm process improvements
- Begin developing a technical solution

Week 6:

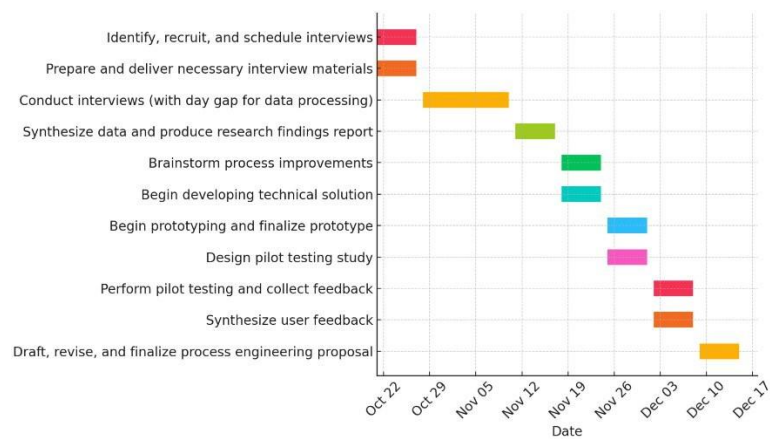
- Begin prototyping
- Finalize prototype
- Design pilot testing study

Week 7:

- Perform pilot testing
- Collect user feedback
- Synthesize user feedback

Week 8:

- Draft, revise, and finalize process engineering proposal

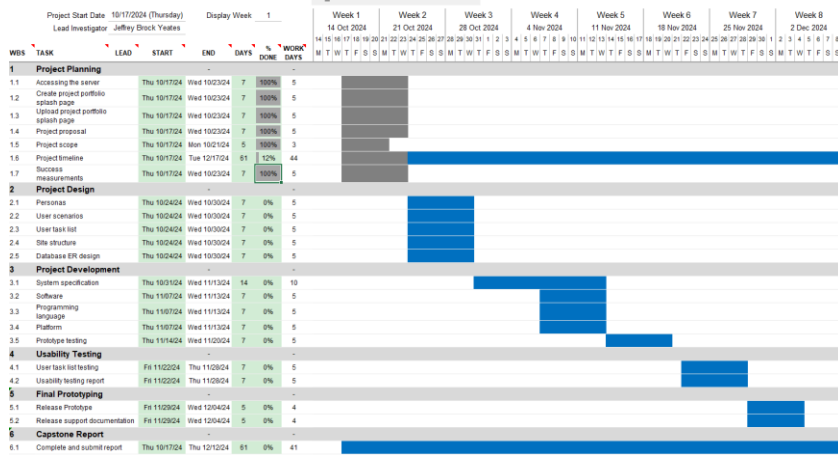


Weekly Timeline Updates:

Week 1 Timeline Update:

INFM480: Capstone Project

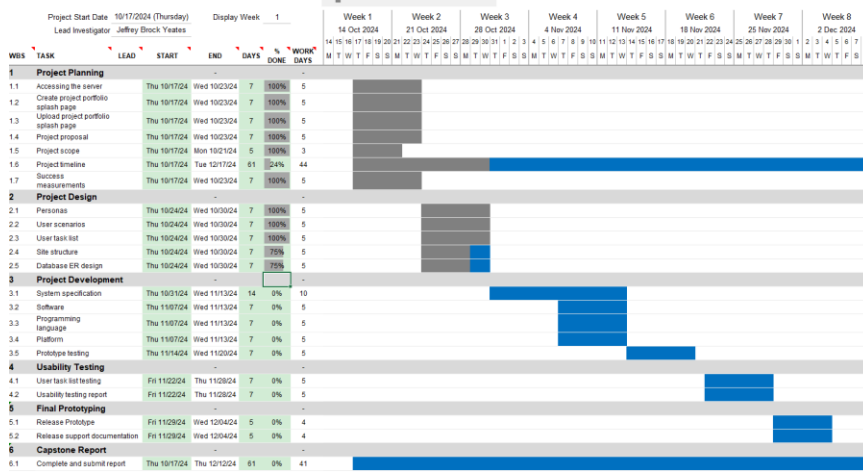
Opportunities for Business Process Engineering



Week 2 Timeline Update:

INFM480: Capstone Project

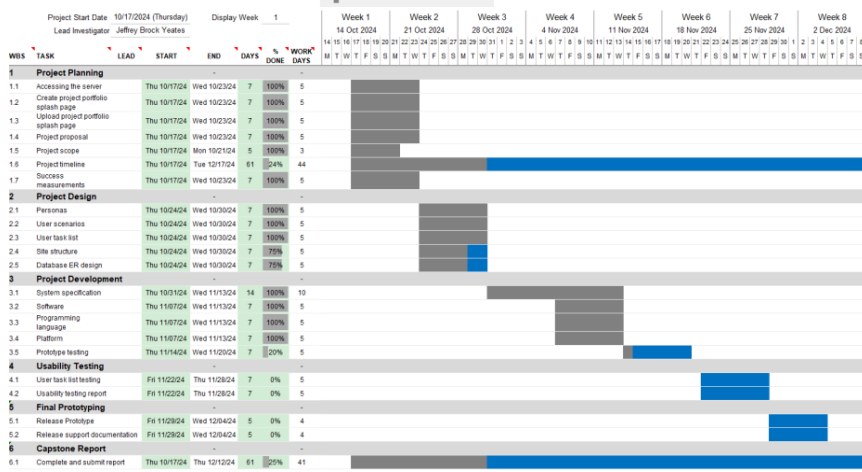
Opportunities for Business Process Engineering



Week 3 Timeline Update:

INFM480: Capstone Project

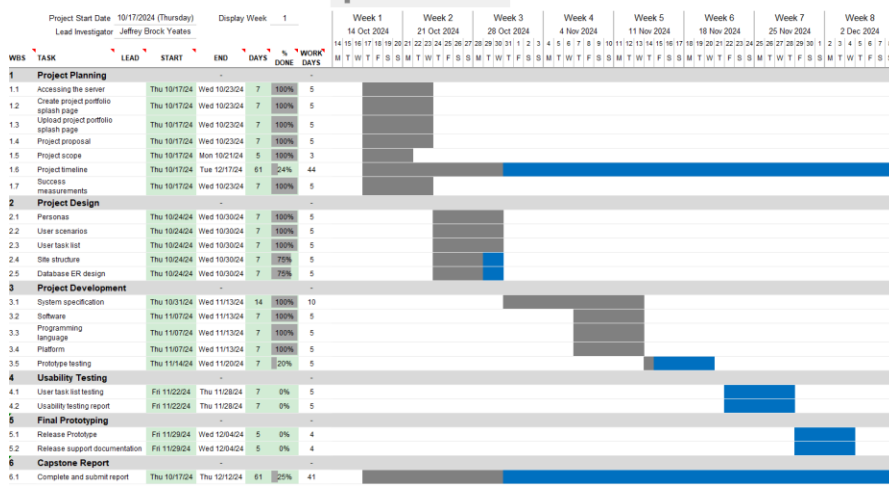
Opportunities for Business Process Engineering



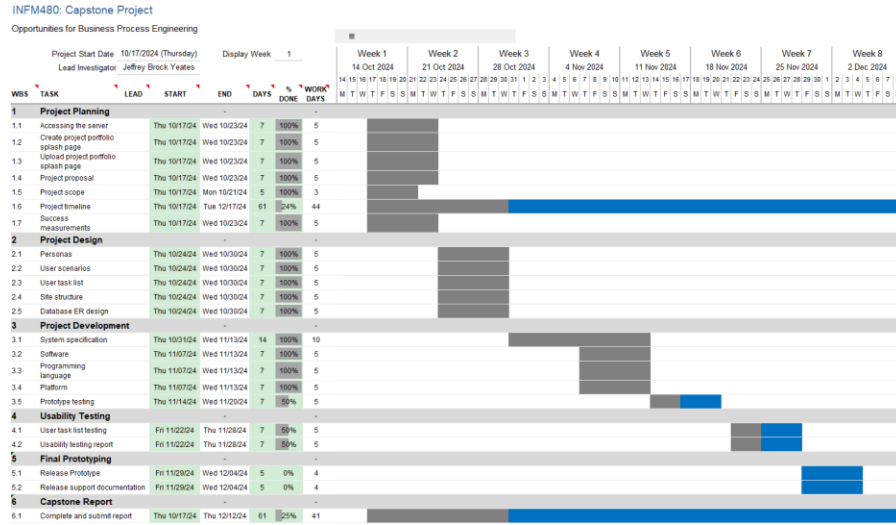
Week 4 Timeline Update:

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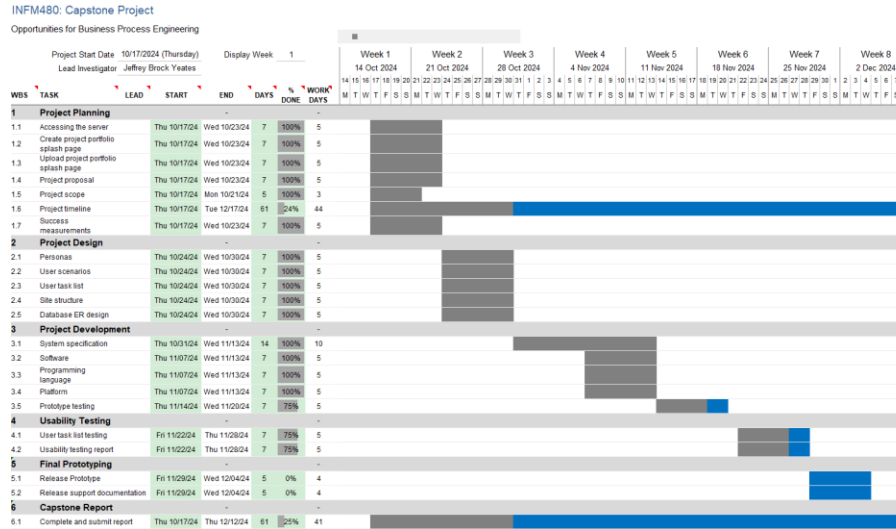
Opportunities for Business Process Engineering



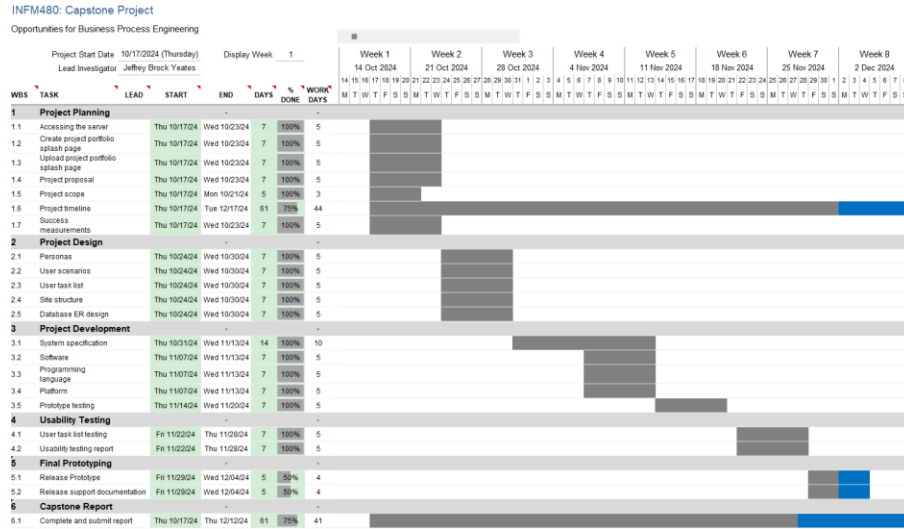
Week 5 Timeline Update:



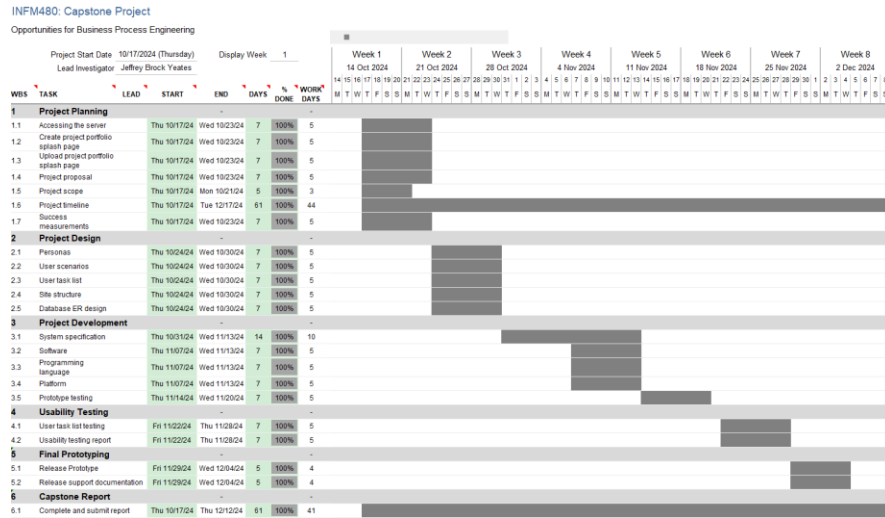
Week 6 Timeline Update:



Week 7 Timeline Update:



Week 8 Timeline Update:



These timelines are generally representative of the progress through the timeline, however looking back at these snapshots, it is clear that I forgot to update some of the timelines as I was progressing. For example, it is clear that I neglected to update the project timeline portion of the GANTT chart during weeks 4-7. Additionally, this timeline does not dive deep into the little details of my progression but rather estimates progress with percentage complete reporting. Furthermore, I did experience some difficulty sticking to the intended progression,

however with extra time on the weekend when I was not at work, I was able to catch up. I could have perhaps made this clearer by adopting a daily timeline compared to this weekly timeline update; doing so would have revealed a great amount of progress during the weekends of this course.

Project Scope:

This project scope is also mentioned above as the project background:

The ultimate deliverable of this research study is a proposal. This proposal would be presented to the company which is being researched and should outline the research process, the current system's inefficiencies, and a new system prototype. I believe, at minimum, the proposal should include 4 sections: a summary of the research study, a report on research insights, a prototype of a new system, and results of pilot testing. There may be more components of a quality proposal which will be identified as the process is executed. In this instance I will be presenting an inventory system upgrade implementation proposal to my place of work. This system upgrade will not solve a specific problem, but rather improve the business process in general, making it easier and faster for those involved to achieve their goals. Hopefully the social impact of this implementation is improved job satisfaction and better team building due to the improved ease of use of the system.

Project Deliverables:

The end deliverables of this inventory management system project are as follows:

- Process engineering proposal to be shared with upper management of the company
- If the proposal is accepted, the deliverables will increase considerably to include
 - o Implementation of new inventory management system including, but not limited to technical, administrative, hardware, software, and training needs
 - o Continued maintenance of system

- o Continued development of system to further align with current and future business needs. For example, financial reporting is currently outside of the scope of this project, however it could certainly be included in future developments.
- All research and subsequent implementation must comply with IRB and other institutional standards

Success Measurements:

To measure the success of this project we must refer to its function, what is the purpose of this study? The intent of this research is to gather user feedback on the company inventory management system and process. Interviews will be conducted by researchers to gather insights about the current inventory process. Researchers should guide the interview discussion to generate valuable and unforeseen insights. These insights will be synthesized and utilized in the development of a process engineering proposal to be presented to company management.

Thus, ultimately the measurement for the success of this project and research is whether the end deliverable, a process engineering proposal is produced. And if the proposal is accepted, there should be an expectation of being in part responsible for the implementation of any changes (technical, administrative, hardware, software, training, etc.) to the current system. Not to be undervalued, another measure of success is the effectiveness of the research process. A quality proposal and implementation are not possible without first creating an effective research design. Since human research is being conducted, the design must comply with IRB and other institutional standards. One must select and perform effective data collection methods. Next, the data needs to be synthesized and analyzed for relevant takeaways. Then, using those takeaways from the research, a solution to the research problem can be developed. Only after all these steps have been taken can a proposal be made to the company. This proposal should essentially

summarize the research and design process, highlighting inefficiencies in the current system and describing benefits of the new system.

In all, I believe there are a bunch of measures of success of my project. There is the ultimate deliverable of the research, but not to be undervalued is the process to getting to the final proposal.

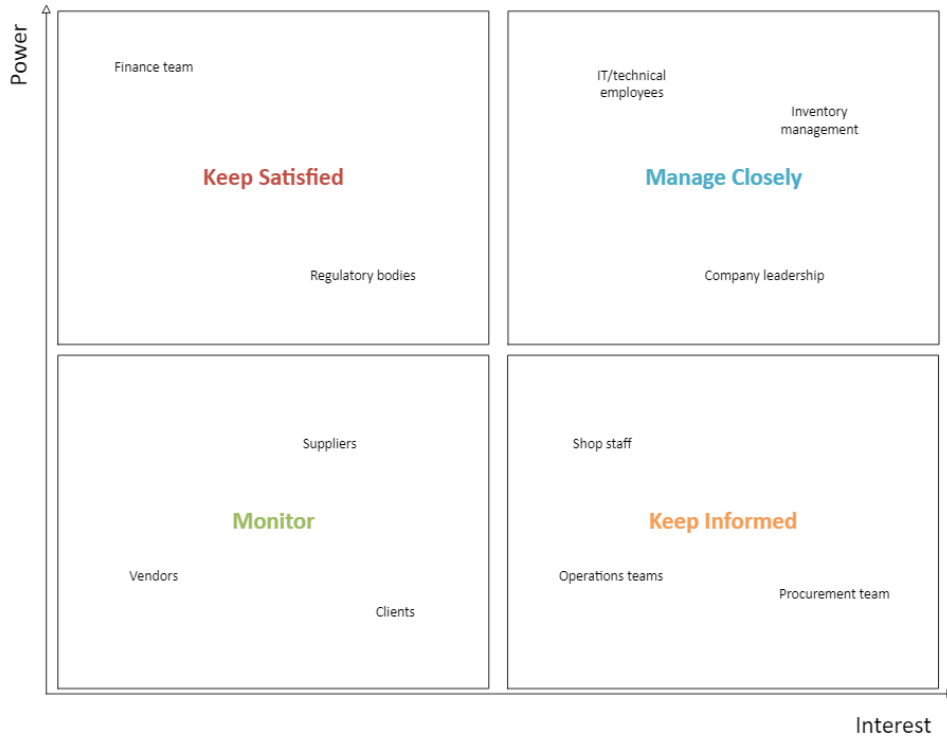
Project Mangement Takeaways:

Having completed the project, I am of course happy with the progress, but it was certainly not without its hardships. I fell behind a multiple occasions and I think that is reflected in some of the inaccurate reporting regarding the project timelines. But again, I must refer back to the acknowledgements section of this report; Dr. Liu was again so important to making sure that no matter how many times I fell behind, I still had a plan to recoup and move forward with my project. To some extent with all projects there is an expectation for the scope and timeline of the project to change, so some of this is expected. On the other hand, this being a capstone project, a final submission must be made, so thank you again to Dr. Liu for guiding me to ensure the final submission was achievable. Our weekly meetings to continually modify plans to keep up were of the utmost importance to achieving all that needed to be done.

System Design:

Stakeholders Map:

Shown below is the stakeholder map for my capstone for information technology and informatics, followed by a short rundown of each member presented in the map:



Keep satisfied:

- Finance team
 - o They have power over the budget, however their interest in the operations of the inventory process is relatively low.
- Regulatory bodies
 - o Significant impact on inventory process compliance. Compliance is relatively easy to maintain, thus the bodies are easy to keep satisfied.

Manage closely:

- Inventory management
 - o High interest in the process, and whether it meets daily operational needs. This group has supreme power in developmental decision-making.
- IT/technical team
 - o High technical influence. Direct interest and influence in development, implementation, and subsequent maintenance.
- Company leadership
 - o High decision-making power, and vested interest in project success.

Monitor:

- Suppliers
 - o Indirectly impacted by process changes, but no influence over process implementation
- Vendors
 - o Indirectly impacted by process changes, but no influence over process implementation
- Clients
 - o Indirectly impacted by process changes, but no influence over process implementation or results

Keep informed:

- Shop staff
 - o High interest in a usable solution, but, comparatively less influence than other stakeholders.

- Procurement team
 - o Requiring constant updates on inventory, this group has high interest, but if deliverables are made, they also have low influence on decision-making.
- Operations team
 - o Dependent on system for effective analysis, but not the same power to drive decision-making.

Interview Methodology:

The purpose of this interview is to understand employee sentiment or experience surrounding the company's small equipment inventory process. This interview will attempt to identify issues with the current system keeping in mind employee roles, needs, and seniority.

This is only the initial interview. Researchers may initiate follow-up interviews with participants if necessary.

Employees are busy people, so establishing interviews in comfortable environments at suitable times is very important to receiving high volunteer rates. Of course, it is possible to meet with these employees at the place of work, however for its simplicity and flexibility, an online video meeting environment will be used instead. Microsoft Teams is already in use at the company so it will be the standard choice for the interviews. This study will not utilize video or audio recordings, so it is important for researchers to have some method of recording user responses to interview questions. Researchers will use Microsoft Word to take note of user responses.

Researchers must be sure to use the automatic cloud saving feature to prevent data loss and ensure privacy of the data. It may be permissible to utilize the automatic transcription feature to record the conversation.

Introduction:

- Introduce yourself to the participant
- Thank the participant for engaging in the interview
- Inform the participant of the purpose of the study
- Remind the participant of their right to withdraw from the study at any time
- Remind the participant that after data collection has begun, any already collected data is preserved for the study regardless of their choice to withdraw
- Inform the participant that the interview should take approximately 45 minutes to an hour, but depending on the engagement and discussions, it could take even more time. Researchers should not allow the interview to go on too long unless there is notable engagement from the participant and there are no signs of fatigue because of the long interview time.

Background:

- Can you tell me about your job role at the company?
- How long have you been at this company? How long have you been in this job role?
- Can you tell me about your current connection to the inventory process?

Main Questions:

- What tools do you use to track equipment?
- What is your current experience with the inventory process?
- How often do you perform the inventory process?
- Have you experienced any challenges or frustrations with the current inventory process?
- How often do you encounter misplaced, broken, or missing equipment?
- In your opinion, what are some inefficiencies within the inventory management process?

- How well do you feel the current inventory system facilitates communication between team members? If it does not, why do you think this is the case?
- Do you feel there is enough coordination between field members and management regarding the equipment inventory? Are there any issues with coordination? What could improve this?
- What improvements or changes would you like to see for the current inventory process?
- Are there any specific technologies or existing inventory management solutions you would like to see replicated?
- How do you think a better inventory management system would improve your work or the company operations in general?

Closing:

- Is there anything else you would like to share about your experience with the small equipment inventory process?
- Before we end the interview, is there anything else you would like to share or discuss in general?
- Announce the end of the interview session. Thank the participant for doing the interview with you. Wish them a good day.

User Analysis and Personas:

To develop these personas, I simply had to analyze the job positions at my place of work. Since I am conducting this research at my place of work, I have easy access to the people who represent these personas. When needed, I could easily reach out to these people to better

understand their job roles, goals/responsibilities/tasks, skill sets, and involvement in the inventory management process. The personas from #5 (Finance department persona) onward have been excluded from the scope of the project for simplicity and to meet deadlines; they are not excluded from future developments should the business decide to pursue this system implementation.

1. Inventory Manager Persona: Stavros



- Primary user:
 - Likely using the system daily
 - Technical solution designed mostly around their needs
- Goals:
 - Accurate inventory auditing
 - System is conducive to completing job tasks
 - Reduced discrepancies in inventory records
 - Usable methods for revising false inventory reports
 - Ideally would receive automated reporting, especially with regards to low stock or repairs processes
- Skill Set:

- o Inventory management experience
- o Leadership/management, collaboration skills
- o Budgeting and financially conscious
- o Familiar with inventory softwares but not necessarily technically proficient
- Tasks:
 - o Regular updates to inventory records
 - o Inventory audits
 - o Repair audits
 - o Oversees reordering
 - o These tasks are performed daily and are vital for fluid business operation
- Relationships:
 - o Warehouse staff for inventorying and repairs
 - o Procurement team for reordering
 - o Operations/production teams for deployment and job assignment
 - o Finance team for budgeting
 - o IT team for system support
- Requirements:
 - o Reliability of data,
 - o User-friendly interface
 - o Integrates nicely with existing systems
 - o Basic training on new system
- Expectations:
 - o System minimizes manual audit,

- o Real-time data tracking

2. Warehouse Staff Persona: Joshua



- Primary user:
 - o Using system daily to manage inventory and track repairs
- Goals:
 - o Easy access to accurate inventory records
 - o Centralized check-in/check-out process
 - o Minimize data entry.
- Skill Set:
 - o Hands-on inventory management
 - o Proficient in repairs and reporting
 - o Moderate computer skills, familiar with basic inventory software
- Tasks:
 - o Add new equipment to system
 - o Reports damaged goods and reports on repair process

- o Assists in larger inventory audits
 - o These tasks are completed frequently and are important to the accuracy of information. Reports are needed quickly and often
- Relationships:
 - o Inventory managers for reporting and accuracy audits
 - o IT team for system support
- Requirements:
 - o Mobile device friendly
 - o Barcode scanning
 - o Minimal manual entry.
- Expectations:
 - o System simplifies their workload
 - o Reduces errors
 - o Improves day-to-day efficiency

3. IT Team Persona

- Secondary user:
 - o Supporting role. Not needing to use the system besides to amend technical or process issues.
- Goals:
 - o Implement all-encompassing inventory management system
 - o System aligns with user needs and expectations

- o Ensure system uptime
 - o Train users
 - o Intuitive to use system interface and good user experience
- Skill Set:
 - o High technical expertise in software implementation
 - o System integration
 - o Troubleshooting
 - o Data management
 - o Process engineering
 - o Training end users
 - o Collaboration with various individuals and teams to meet needs
- Tasks:
 - o Design, deploy and support new system
 - o Resolves technical issues
 - o Train end users
 - o Tasks are ongoing and essential for system functionality, especially during the initial launch of the system
- Relationships:
 - o Supports warehouse staff training
 - o Establishes clear deliverables with inventory managers, procurement team, finance team, and other adjacent administrative members
- Requirements:
 - o Administrative control

- o Robust security features
 - o Collaboration with stakeholders to ensure all needs are met
- Expectations:
 - o Scalable system
 - o Easy to maintain system that
 - o Integrates with existing infrastructure, smooth user experience of implementation

4. Procurement Team Persona

- Secondary User:
 - o Not as frequent of a user of the system as primary users
 - o More reliant on deliverables than usability.
 - o Still provide important considerations to system output, particularly regarding the procurement process.
- Goals:
 - o Access real-time inventory data to manage reordering
 - o Manage optimal inventory levels
- Skill Set:
 - o Vendor management and relations
 - o Purchasing
 - o Familiar with inventory databases and reporting tools
- Tasks:
 - o Review stock levels

- o Initiate orders
- o Manages vendor relationships.
- o Tasks are done periodically but are critical for maintaining supply levels.
Effective reporting impacts business relationships
- Relationships:
 - o Works closely with inventory managers, shop staff, and suppliers to establish orders with respect to current inventory and repairs in progress
- Requirements:
 - o Reliable access to up-to-date inventory data
 - o Low-stock alerts/reports
 - o Visibility on repair progress and operations' equipment scheduling
- Expectations:
 - o System with clear reporting tools
 - o Real-time data conducive to proactive ordering

5. Finance Department Persona

- Secondary User:
 - o Not as frequent of a user of the system as primary users. More reliant on deliverables than usability. Still provide important considerations to system output, particularly the financial metrics.
- Goals:
 - o Financial reporting from inventory system

- o Optimize budget allocation
 - o Inventory, and subsequent financial, forecasting based on reliable data
- Skill Set:
 - o Financial analysis
 - o Budgeting
 - o Compliance
 - o Familiar or proficient with industry standard financial management systems
 - o Limited technical skills in inventory systems.
- Tasks:
 - o Analyze inventory cost, reviews spending, and
 - o Compliant with financial regulations
 - o Financial tasks are performed monthly and quarterly. Furthermore, these tasks may be run at more frequent intervals for larger commercial project requirements.
- Relationships:
 - o Works with inventory managers for data on stock value
 - o Procurement team for budgeting
 - o IT team for integrations and report revisions
- Requirements:
 - o Access to summarized inventory reports, especially for valuation and cost tracking
- Expectations:
 - o Accurate and easily accessible inventory reporting system to support financial analysis

6. Operations/Logistics Team Persona: Jim

- Status: Secondary User
- Goals:
 - Optimize the assignment of equipment
 - Reduce delays
 - Maintain efficient inventory levels for smooth operations
- Skill Set:
 - Logistics management and operations planning
 - Moderate familiarity with inventory tracking systems
- Tasks:
 - Plan and monitor the movement of equipment
 - Coordinates with warehouse staff on repairs
 - Track inventory to anticipate logistical needs
- Relationships:
 - Works closely with warehouse staff and inventory managers to ensure timely order fulfillment
 - Works with procurement when necessary to maintain productive output
- Requirements:
 - Quick access to stock levels
 - Inventory/repair assignment data to coordinate logistics effectively
- Expectations:

- o Real-time, reliable, accessible data
- o Minimized disruption due to poor data integrity or inefficient repairs reporting

7. Suppliers/Vendors Persona

- Status: Tertiary User
 - o As an outside stakeholder, they are not affected directly, however the deliverables from the company side must be accurate to maintain company relationships
- Goals:
 - o Receive timely, accurate orders from the company and maintain a good supply chain relationship.
- Skill Set:
 - o Product supply and order management.
 - o Familiar with online vendor portals
- Tasks:
 - o Fulfills orders
 - o Tasks depend on company orders
- Relationships:
 - o Procurement team for order processing and delivery scheduling
- Requirements:
 - o Clear and consistent communication from the system regarding order volumes and timelines.
- Expectations:

- o Timely, accurate orders with minimal back-and-forth communication

8. Regulatory Bodies Persona

- Status: Tertiary Stakeholder
 - o These entities should hopefully not be involved at all. Involvement would indicate an audit due to poor business practices.
- Goals:
 - o Ensure compliance with industry and safety standards, data protection, and reporting accuracy
- Skill Set:
 - o Knowledgeable in industry regulations and compliance requirements
- Tasks:
 - o Conducts periodic audits and reviews to ensure regulatory compliance.
- Relationships:
 - o Coordinates with the finance department, HR, and the IT team for compliance audits
- Requirements:
 - o Needs access to clear records and reports which demonstrate compliance
- Expectations:
 - o Adherence to regulatory standards and cooperation during any audits

9. Anti-users:

- Implementation team members should try to identify anti-users. Anti-users are users who, either intentionally or unintentionally, stress test the system in many ways. For example, an employee disgruntled with the new system implementation process may intentionally misuse the system. These users are valuable for user experience insights, identifying security vulnerabilities, and more.

User Scenarios:

1. Inventory Manager

Task: monthly inventory audit

Goal: discover any discrepancies between physical inventory and digital records

- Process:
 - o Login to inventory system
 - o Create new logs for all equipment
 - o Review inventory system reports for differences
 - o Adjust records as needed
 - o Generate report summary
- Frequency: monthly
- Features:
 - o Auditing process
 - o Real-time alerts for potential mismatches
 - o Scanner integration, mobile device usage
 - o Summary reporting

2. Repair shop staff

- Task:

- o Receive new stock and update the inventory system.
- Goal:
 - o Quickly log new items to keep inventory accurate and up to date.
- Process:
 - o Log in on a mobile device, scan items as they come in, verify quantities, and confirm the update.
- Frequency:
 - o Daily, as shipments arrive.
- Needed Features:
 - o Mobile-friendly interface
 - o Fast barcode scanning
 - o Automatic inventory updates

3. **IT Team**

- Task:
 - o Troubleshoot a data sync issue
- Goal:
 - o Fix the issue quickly to prevent downtime and keep data accurate
- Process:
 - o Receive an alert, log into the admin panel, check error logs, diagnose and resolve the problem, then verify with warehouse staff that everything's back to normal
- Frequency:
 - o As needed, quick response
- Features:
 - o Admin controls

- o Error logs
- o Alerts and reports

4. **Procurement Team**

- Task:
 - o Review stock levels and reorder items that are low
- Goal:
 - o Prevent stockouts by staying on top of reorder points
- Process:
 - o Check inventory reports
 - o Generate a purchase order for low-stock items
 - o Send it to the supplier
 - o Track order status
- Frequency:
 - o Weekly
- Needed Features:
 - o Dashboard for low-stock equipment
 - o Reorder feature
 - o Order status tracking

5. **Finance department**

- Task:
 - o Generate a quarterly report on inventory value
- Goal:
 - o Get accurate numbers for budgeting and financial planning

- Process:
 - o Access the system
 - o Pull up the valuation report
 - o Verify cost data
 - o Export it for the quarterly financial report
- Frequency:
 - o Quarterly
- Needed Features:
 - o Exportable valuation report
 - o Integration with accounting tools
 - o Cost analysis

6. **Operations/Logistics Team**

- Task:
 - o Review stock levels and reorder equipment that are low
- Goal:
 - o Prevent low stock by staying on top of reorder points
- Process:
 - o Check inventory reports
 - o Generate a purchase order for low-stock items
 - o Send it to the supplier
 - o Track order status
- Frequency: Weekly or as needed
- Needed Features:
 - o Dashboard for low-stock items

- o Reorder feature
- o Order status tracking

7. **Suppliers/Vendors**

- Task: Receive and fulfill purchase orders.
- Goal: Deliver orders accurately and on time.
- Process:
 - o Receive the order
 - o Confirm details
 - o Set a delivery date
 - o Update the system with delivery status
 - o Keep track of past orders
- Frequency:
 - o As orders come in
- Needed Features:
 - o Supplier portal
 - o Order confirmation
 - o Delivery status updates.

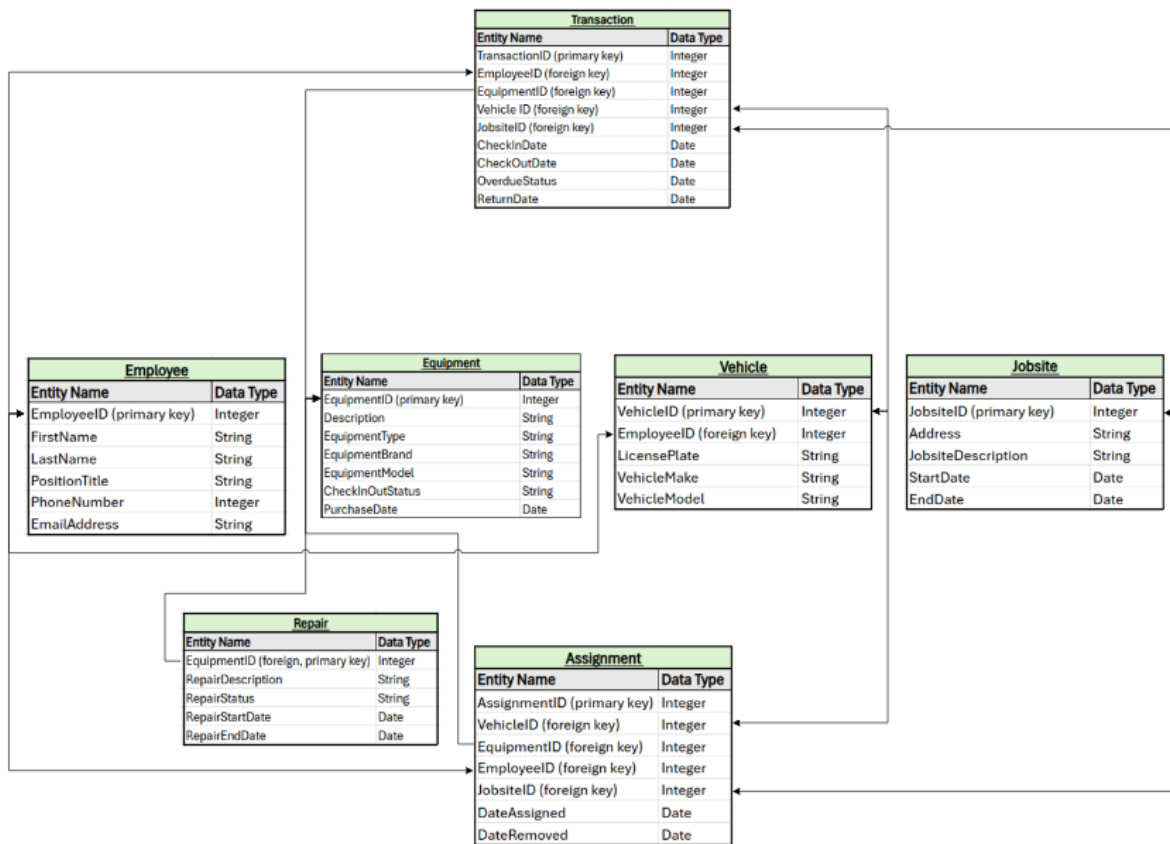
8. **Regulatory Bodies**

- Task:
 - o Conduct a compliance audit
- Goal:

- o Verify the company follows industry standards for inventory and data management
- Process:
 - o Access compliance reports, review logs, verify data accuracy, and download audit trails if needed
- Frequency:
 - o Annually or as needed
- Needed Features:
 - o Read-only access to compliance reports, data logs, and audit trail records

Database Design:

Below is a screenshot of the DB design. Please refer to the landing page for a full PDF of the design:



System Specification:

Overview:

This system specification document is a deliverable from the stakeholder requirements, user personas, user scenarios, and user task list research. This document outlines the main goals of the project and defines necessary system components.

Requirements:

Functional: Re-stating the primary purposes of this system implementation:

- Inventory management needs
- Equipment repairs processing
- Equipment scheduling to crews, vehicles, and jobsites

Software:

The application is intended to be set up on the Microsoft forms platform. Other modules within the Microsoft Office environment (Excel, Teams, etc.) are already in place at the business, so these would likely be used adjacent to or in tandem with the Microsoft forms platform. For the project proposal, however, the system will be introduced as an entirely standalone application with its own dedicated application and database.

Hardware:

The users will access the application forms via their mobile phones. Although a common feature on most modern smartphones, these devices will need a full HD (high definition, 1080p) camera to read scan QR/barcodes.

User Testable Task List:

This is just a very short list of the user tasks which will be tested in usability testing with end users. If you want to see the brainstorming and rationales behind these tasks, refer to the document called User Tasks Brainstorming. This list is much smaller than the personas, scenarios, and brainstorming lists because it has been shortened to those tasks which are able to fit within the timeline of the project. Further tasks will need to be identified, tested, and developed should the business decide to move forward with system implementation and maintenance.

1. Inventory Manager Task:

Locate a piece of equipment (locate asset ID #12345) by referencing the current inventory in the new system application

2. Shop Staff Task:

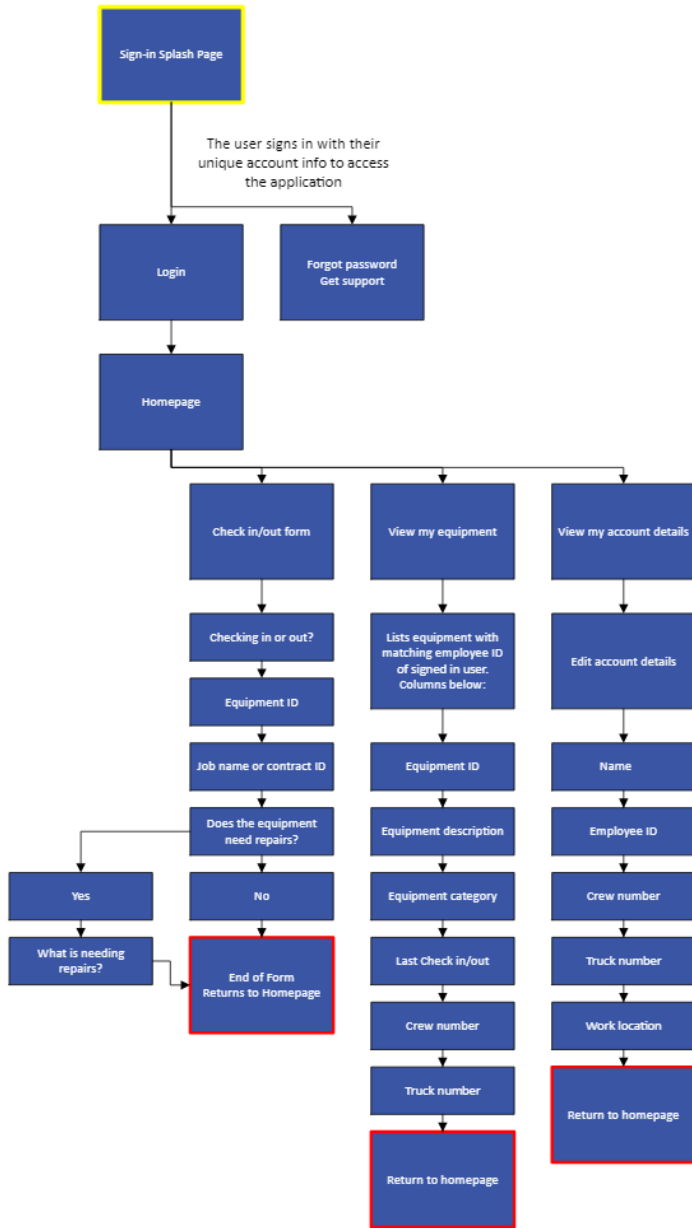
Identify equipment needing repairs by filtering the equipment database by the repair status

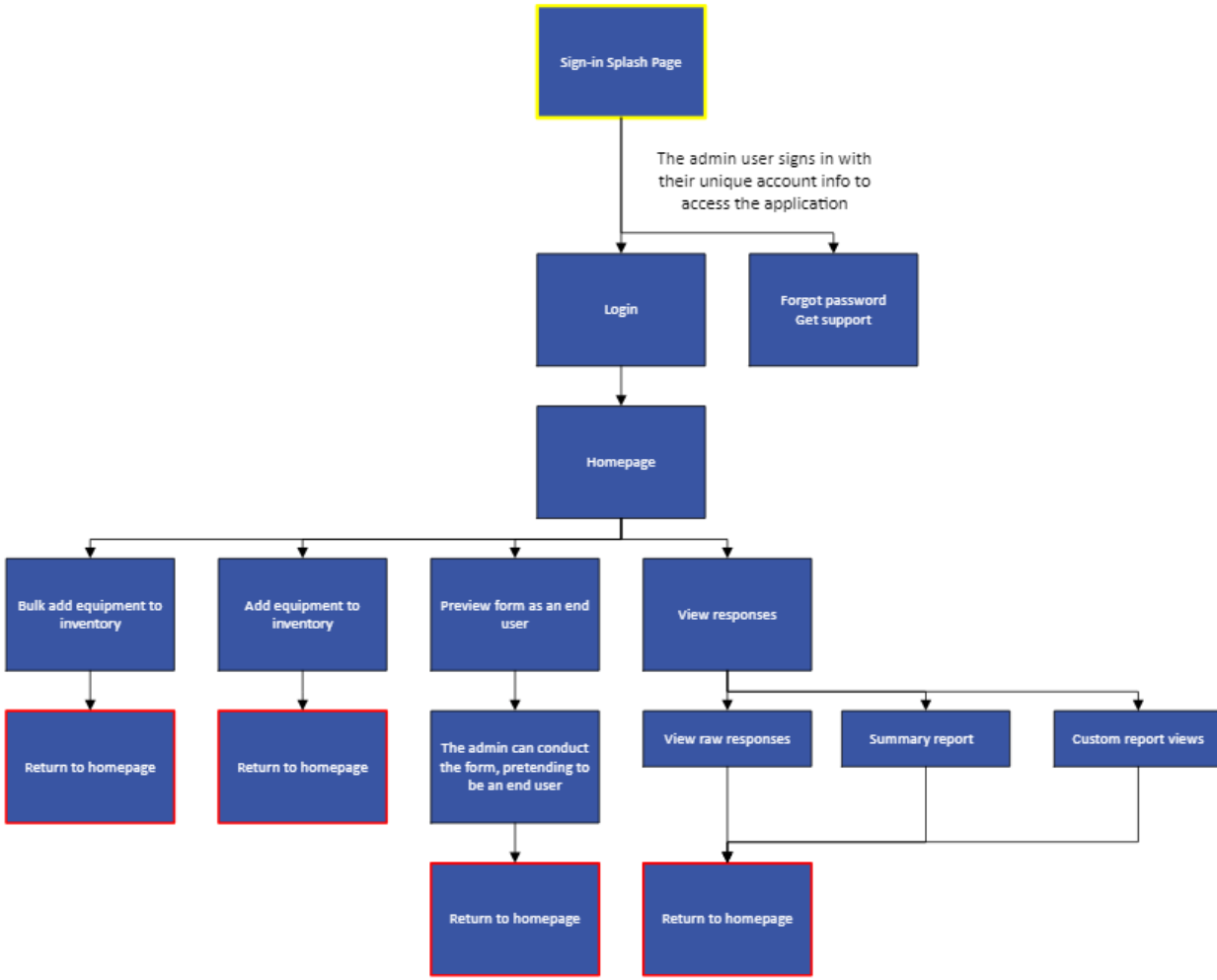
3. Procurement Team Task:

Add multiple new equipment to the inventory database via the file upload

Site Structure:

Again, the below images can be seen as a full PDF in the project landing page. The first image is the end user side, and the second image is the admin side of the system:





Usability study methodology:

Unfortunately, this portion of the research process was developed with a different research project in mind, so I do not have a specific section for this. Though I will refer you back to the section called **Interview Methodology** which essentially describes the same interview process that was used in the usability study.

Wireframe Prototype:

Below are screenshots from the wireframe prototype scans. To see the full-sized PDFs of these, please refer to the project landing page:



EMAIL:

PASSWORD:

LOGIN

PAGE 3.

FORGOT PASSWORD?

PAGE 2.

1.



FORGOT PASSWORD?

Type your email below
to receive a password
reset link:

EMAIL:

SUBMIT

PAGE 1.

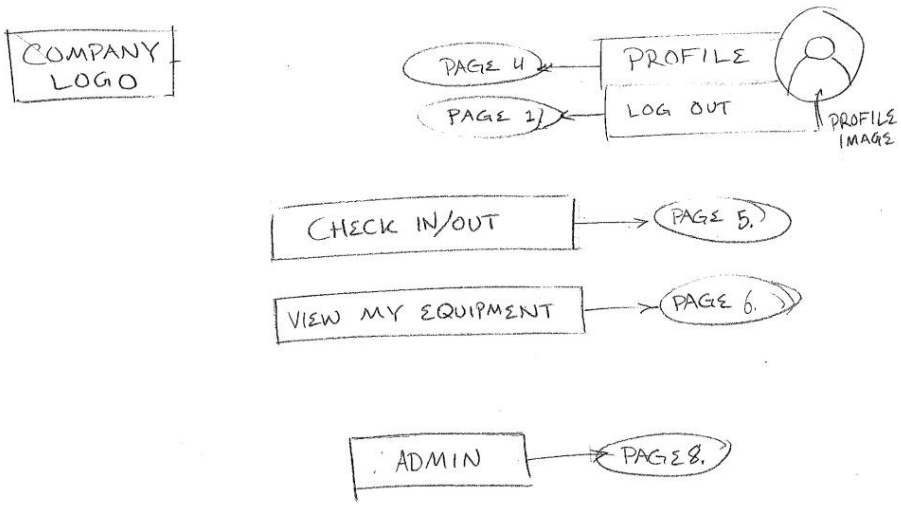
Still not working?
Click below to email
the support team:

GET SUPPORT

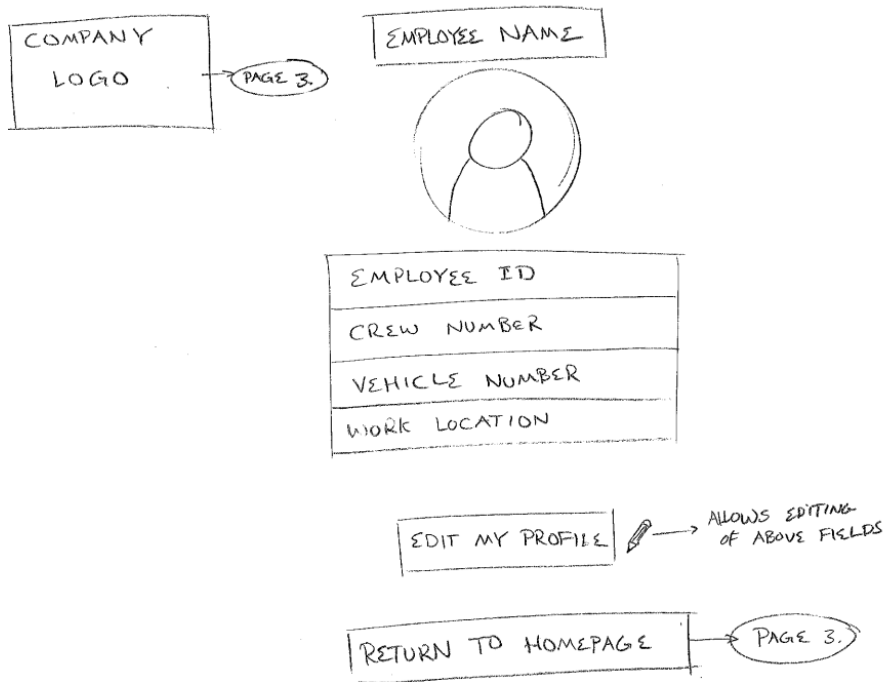
PAGE 1.

OPENS MAIL
APPLICATION
"email: support@email.com"

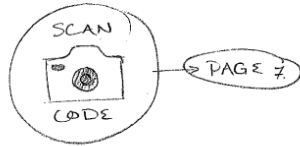
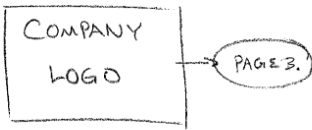
2.



3.



4.



CHECK IN or OUT?
IN OUT RADIO BUTTONS

JOB NAME / ID

NEED REPAIRS?
YES NO
DESCRIBE EQUIPMENT ISSUES

IF YES, TEXT BOX APPEARS BELOW

SUBMIT → PAGE 3.

5.



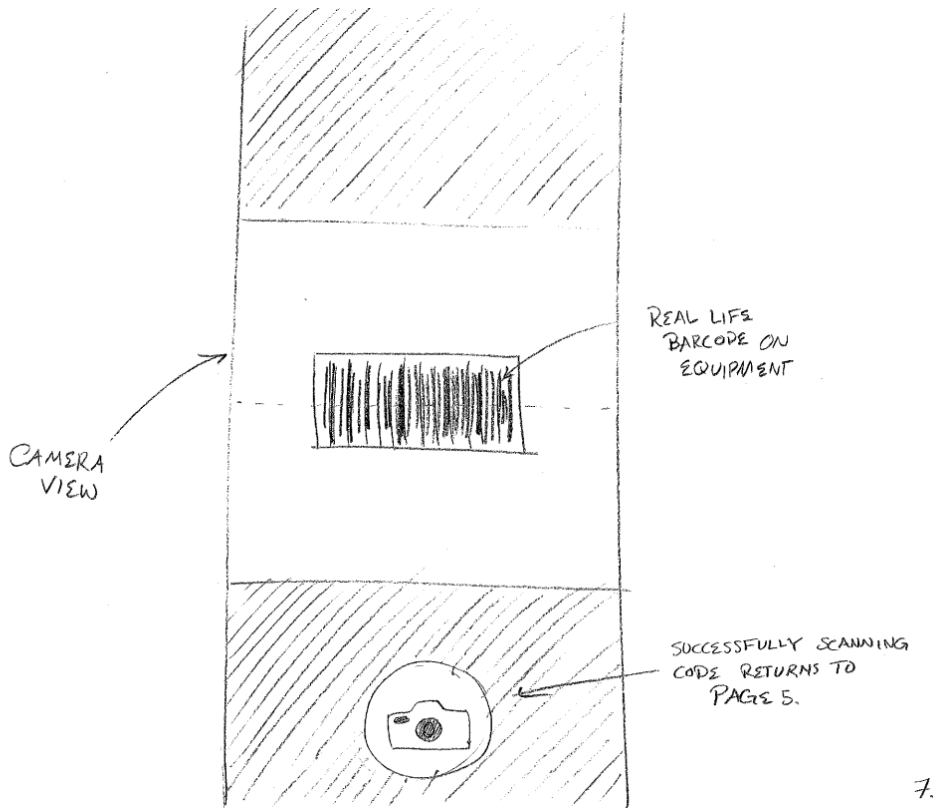
MY EQUIPMENT

ID	DESCRIPTION	CATEGORY	LAST CHECK IN/OUT	CREW	VEHICLE	JOB SITE EQUIPMENT PHOTO ETC.

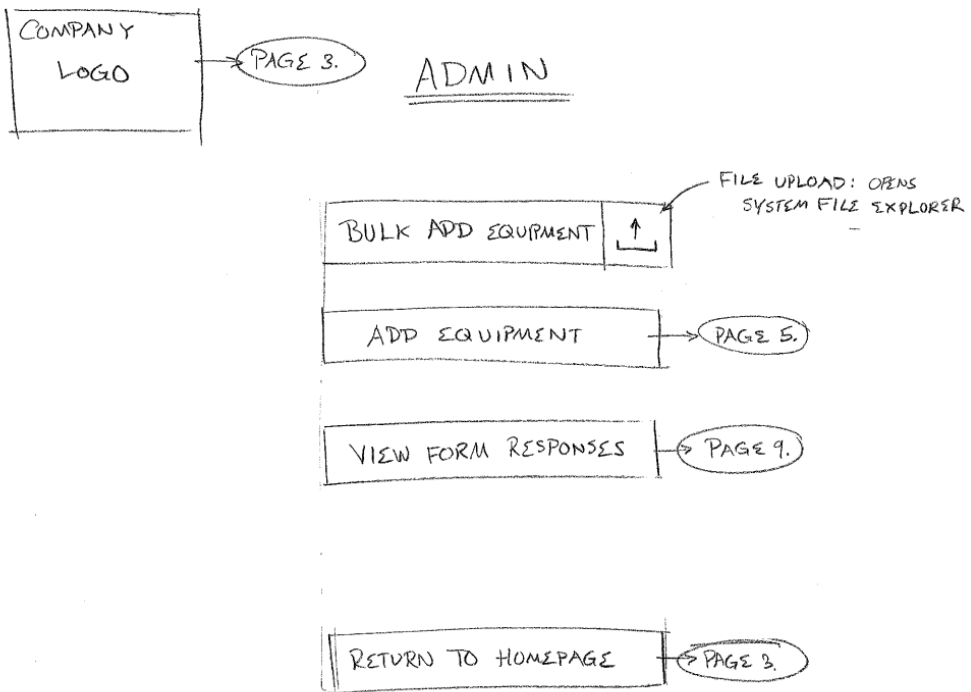
SCROLLBAR

RETURN TO HOME PAGE → PAGE 3.

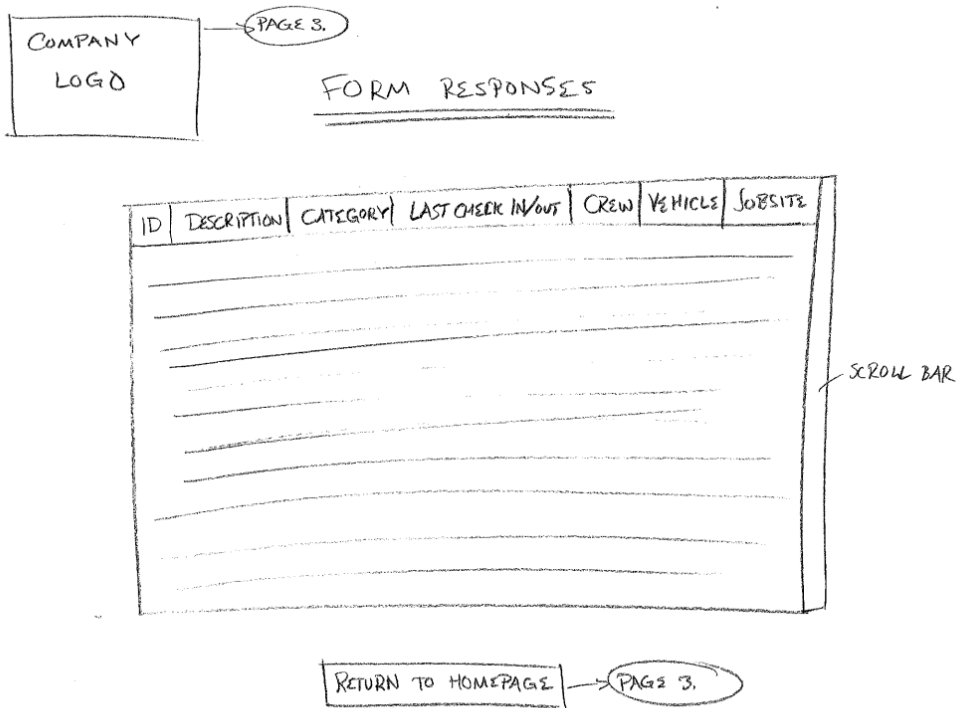
6.



7.



8.



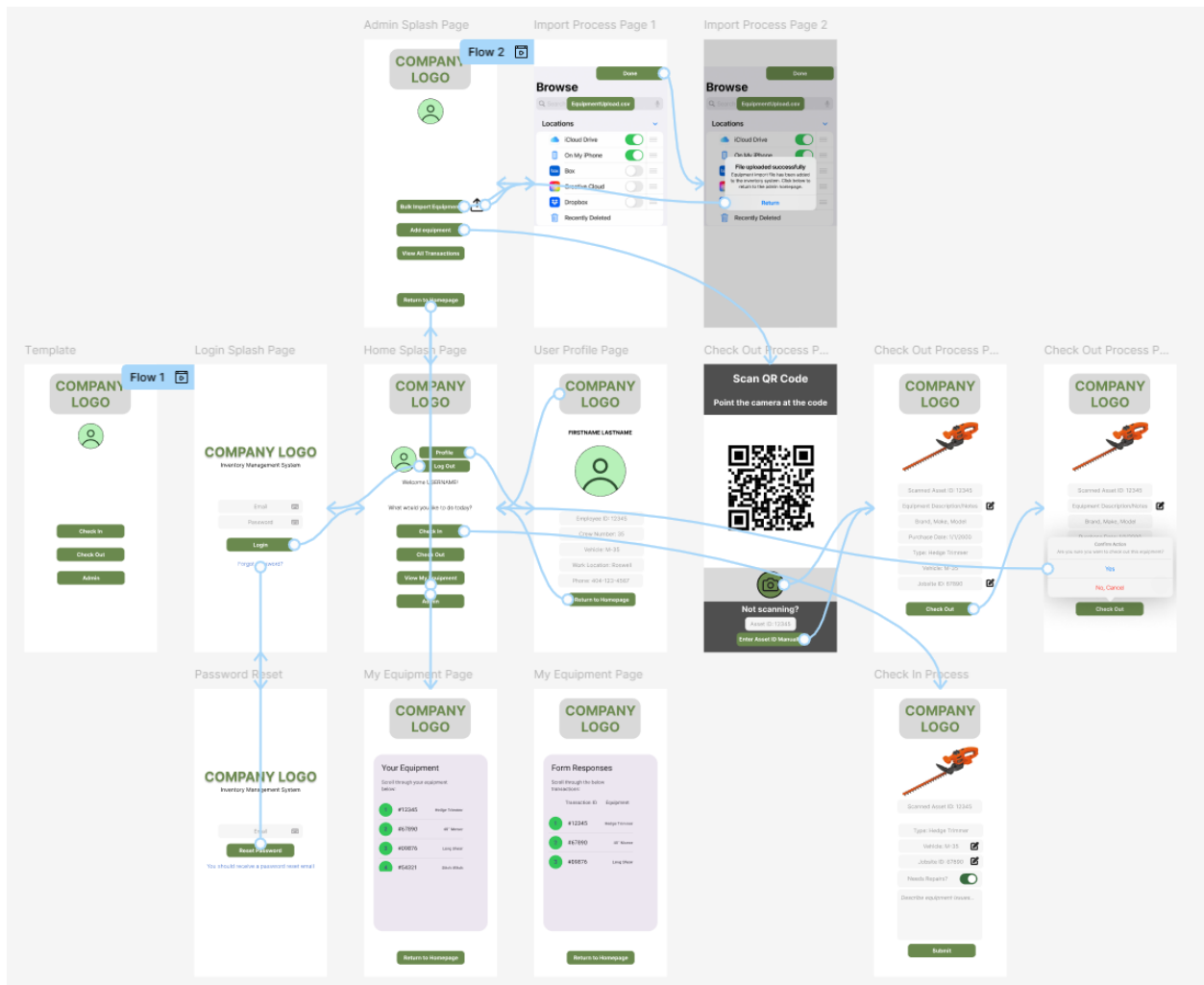
9.

Figma Prototype #1:

Below is a screenshot of the entire structure of the Figma prototype. Again, to see the full prototype, refer to the landing page or follow these links:

Overview: <https://www.figma.com/design/weBIzmuuKSTLp4zqUdd1gz/INFM480-Prototype-v2?m=auto&t=ZyKhMIHge6CYs9Fk-1>

Application: <https://www.figma.com/proto/weBIzmuuKSTLp4zqUdd1gz/INFM480-Prototype-v2?node-id=0-1&t=pafGYKCna0sbmy6s-1>



Usability Testing Insights:

Through user testing with each of the prototypes, we have identified some improvements to be made. These potential improvements have been briefly summarized below for each prototype:

Prototype #1:

- Need to improve upon the visual style, granted this is a wireframe prototype
- Need more clear delineation between admin and user side of the application

- Overall needing more frames for exact steps in certain processes (file upload process for example, how does it look to select and upload the file)
- Frames need to be resized to match mobile phone resolution and aspect ratio. This will be easily achieved when I move to prototyping on Figma as Figma provides frames for mobile application design.

Prototype #2:

- Still needing to separate admin and end user functions
 - o For this it was suggested that we implement a separate login for users and admins.
I think I will implement this idea in the next edition
- Need further frames for exact steps in certain processes (again the file upload process)
- The check out process does not need to involve the repair process; you would not check out equipment that is in the repair process, you would only initiate a repair process when you are checking in the equipment.
- Generally, more user feedback on system status is needed. For example, the file upload process does not inform the user about whether the function was executed properly or what to do next.

Prototype #3

- Identified a need for a hamburger style menu for easy exit out of processes should the user choose to start over
- Though outside the scope of this project, the finance department has described interest in the application and whether it can generate financial based reports. Should the business choose to accept this system implementation, we can work with the finance and

procurement departments to create reports by automatically filtering the equipment table in the database.

- The repair process needs to be developed and reports alongside this process for the shop members. It would also be helpful to include an image upload process for users to take a picture of what repairs are needed. This would help the shop mechanics in their repair efforts.

Final Figma Prototype:

Once again, the below image is simply a screenshot of the application structure as of the final prototype. Please refer to the landing page for the full version or click the following links:

Overview: <https://www.figma.com/design/CzvPjPPqZCwF4GQqo76LMP/INFM480-Prototype-v3?m=auto&t=Q9Ko2srZmZLkOxTB-1>

Application: <https://www.figma.com/proto/CzvPjPPqZCwF4GQqo76LMP/INFM480-Prototype-v3?node-id=0-1&t=Q9Ko2srZmZLkOxTB-1>

This version of the prototype considers the insights described in the above section under Prototype #2 insights.

