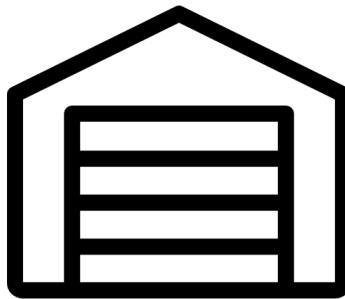


**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
THE UNIVERSITY OF TEXAS AT ARLINGTON**

**PROJECT CHARTER  
CSE 4316: SENIOR DESIGN I  
SPRING 2023**



**TEAM STOCKERS  
GENERAL INVENTORY MANAGEMENT**

**JOSEPH SALAS  
JEREMY WALKER  
RODNEY RAMIREZ  
IVAN CUARENTA**

## REVISION HISTORY

Revision	Date	Author(s)	Description
0.1	03.03.2023	JS, JW, RR, IC	document creation
0.2	7.22.2023	JW	Updated Problem Statement, Methodology, Value Proposition, Development Milestones, Background, System Overview, Roles & Responsibilities, Preliminary Budget, and Facilities & Equipment
1.0	8.7.2023	JW	Final Review

## CONTENTS

<b>1 Problem Statement</b>	<b>6</b>
<b>2 Methodology</b>	<b>6</b>
<b>3 Value Proposition</b>	<b>6</b>
<b>4 Development Milestones</b>	<b>6</b>
<b>5 Background</b>	<b>7</b>
<b>6 Related Work</b>	<b>7</b>
<b>7 System Overview</b>	<b>7</b>
<b>8 Roles &amp; Responsibilities</b>	<b>8</b>
<b>9 Cost Proposal</b>	<b>8</b>
9.1 Preliminary Budget . . . . .	8
9.2 Current & Pending Support . . . . .	8
<b>10 Facilities &amp; Equipment</b>	<b>8</b>
<b>11 Assumptions</b>	<b>8</b>
<b>12 Constraints</b>	<b>9</b>
<b>13 Risks</b>	<b>9</b>
<b>14 Documentation &amp; Reporting</b>	<b>9</b>
14.1 Major Documentation Deliverables . . . . .	9
14.1.1 Project Charter . . . . .	9
14.1.2 System Requirements Specification . . . . .	9
14.1.3 Architectural Design Specification . . . . .	9
14.1.4 Detailed Design Specification . . . . .	9
14.2 Recurring Sprint Items . . . . .	10
14.2.1 Product Backlog . . . . .	10
14.2.2 Sprint Planning . . . . .	10
14.2.3 Sprint Goal . . . . .	10
14.2.4 Sprint Backlog . . . . .	10
14.2.5 Task Breakdown . . . . .	10
14.2.6 Sprint Burn Down Charts . . . . .	10
14.2.7 Sprint Retrospective . . . . .	11
14.2.8 Individual Status Reports . . . . .	11
14.2.9 Engineering Notebooks . . . . .	11
14.3 Closeout Materials . . . . .	11
14.3.1 System Prototype . . . . .	11
14.3.2 Project Poster . . . . .	11
14.3.3 Web Page . . . . .	11

14.3.4 Demo Video . . . . .	11
14.3.5 Source Code . . . . .	11
14.3.6 Source Code Documentation . . . . .	11
14.3.7 Installation Scripts . . . . .	11
14.3.8 User Manual . . . . .	12

## LIST OF FIGURES

1	Example sprint burn down chart . . . . .	10
---	--	----

## **1 PROBLEM STATEMENT**

Schools, rental businesses, libraries, and even private individuals can have large inventories of assets like tools, books, movies, or video games that they loan to other individuals or businesses for a time. Having a digital system to keep track of the inventory and who is currently in possession of any item or items at any given moment will make keeping track of that inventory significantly easier. Additionally, should the homeowner, business, or school be robbed, their items can find their way onto online markets for sale. Occasionally the owner can find their stolen items for sale on a website, but if the owner does not have a photograph of the item or items that were stolen to prove ownership, or know the serial numbers if applicable, then filing a police report would be difficult, and the chances of recovering the stolen property would be much lower.

## **2 METHODOLOGY**

We will build a web service that allows the user to monitor the current market value of their assets, and enter serial numbers, the name of the item, a description, price paid, and images of the assets. The user will be able to generate a report of the items that have either been stolen to submit to the police or a report of assets that were checked out and loaned to other individuals.

## **3 VALUE PROPOSITION**

The value lies in the ability of the user to have an efficient inventory management system where they can know the value of each individual asset, an image of the asset that can make it identifiable should it be stolen, serial numbers, location in the house, and generate a report for law enforcement to know what has been stolen. Having all this information about the assets will increase the chances of the owner recovering their stolen property. Also, having a record of items that are out on loan will help the end user contact whomever they loaned some of their inventory to if it is out past the expected date.

## **4 DEVELOPMENT MILESTONES**

- Project Charter first draft - March 3rd, 2023
- System Requirements and Specification - March 31st, 2023
- Architecture Design Specification - April 30th, 2023
- Detailed Design Specification - July 16th, 2023
- Final project demonstration - August 4th, 2023

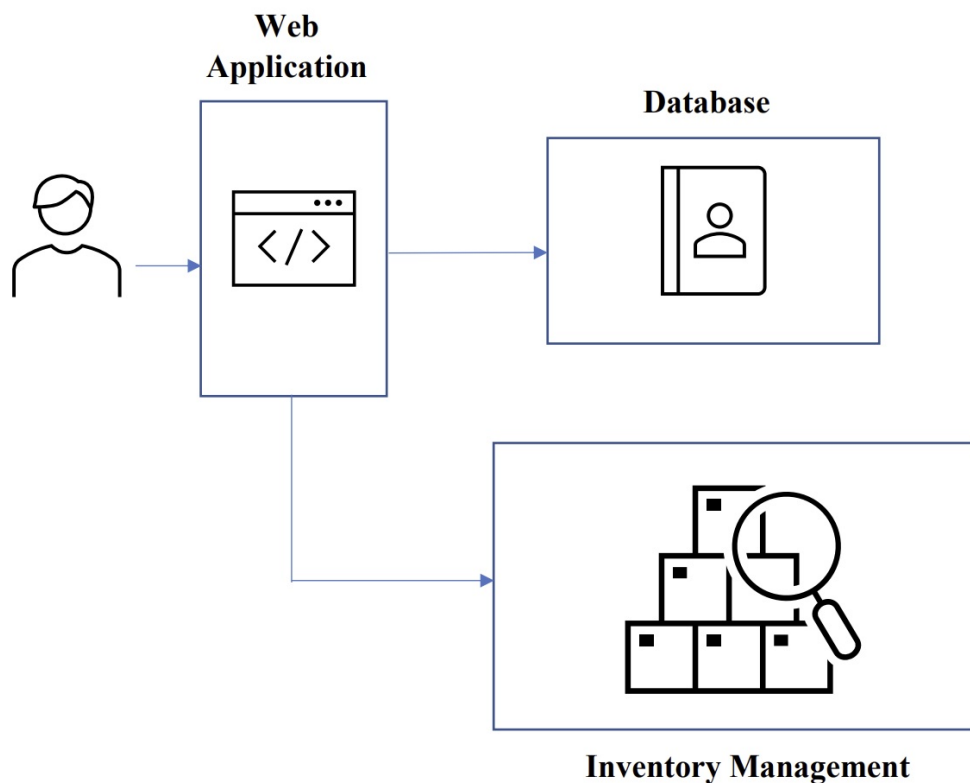
## 5 BACKGROUND

Companies such as grocery and electronic retailers keep track of their sales and inventory levels using an inventory management system. If a homeowner or a lab, such as a senior design lab, wanted to keep track of their inventory levels, they can use the inventory web-service application. In the web-service application, users will be able to submit photos and bar codes (if available) of their items that are being registered onto the database. The inventory system allows users to add notes or reminders to their items that may have been rented out to others. Some users may forget what their item looks like or when it was rented out, they can view notes they have put in for any given entry or view photos they put in with item entry. Reports can be run based on the whole inventory, or based on the status of some inventory whether the item has been loaned out or stolen.

## 6 RELATED WORK

There are few software applications that manage assets currently. Some software can have expensive starting plan of \$1499 and additional add-ons which makes its pricing no so transparent to users. Other software offers a similar service but differs a little as they offer a GPS location tracking service with standard pricing starting at \$500 and varying depending on which service plan is selected.

## 7 SYSTEM OVERVIEW



Once the user is on the web application, they will be directed to log in with their credentials (email and password), create an account, or change their password. If their password is forgotten or needs to be changed, there is an option for that as well. Once the user logs in or creates an account successfully they will have access to the inventory management system. The user can add items including photos, notes, bar codes, and the location of that particular item. The User can request an inventory level and/or description of their items, and generate reports of items based on their current status or the inventory

as a whole.

## 8 ROLES & RESPONSIBILITIES

The stakeholders of the project include the project members. The main objective of the project is to create a general inventory asset management program that can be used universally.

- UTA - Product Owner
- Joseph Salas - Front end development team member
- Ivan Cuarenta - Front end development team member and Scrum Master
- Jeremy Walker - Back end development team member and Risk Officer
- Rodney Ramirez - Back end development team member

## 9 COST PROPOSAL

Main source of the cost of the project will be for database tools/software. Our project, the Home Asset Management Web App will require us to maintain a database for the different users and the multitude of assets that will be inserted into the system. Due to supporting multiple users, we will require the use of authentication that can be provided by third-party management tools. We will also have asset bar-codes to place on the assets that will be added to the inventory. We also require a bar-code scanner to read the bar-codes as an input.

### 9.1 PRELIMINARY BUDGET

Product	Estimated Cost by Percentage
Digital Ocean Droplet Server Host	50%
Digital Ocean Droplet Price Prediction Algorithm	50%

Table 1: Overview of estimated project expenses

### 9.2 CURRENT & PENDING SUPPORT

Main source of funding for the project will be provided by the CSE Department. The amount of funding provided is \$800. No other support is pending or expected.

## 10 FACILITIES & EQUIPMENT

The Home Asset Management system is an online Web App and will be developed at home.

## 11 ASSUMPTIONS

The following list contains critical assumptions related to the implementation and testing of the project.

- The ability to host the web app will be available by the 3rd sprint cycle
- The asset tags are available by the 4th sprint cycle
- The Scanner will be available by the 4th sprint cycle
- We can gather enough data for value estimations
- The asset tags and scanners are in budget



## 12 CONSTRAINTS

- The final version of the product must be completed prior to the designated demonstration day August 10, 2023.
- The total cost of the project must be \$800.00 or less.
- Our team needs a subscription set up for Digital Ocean to be paid for by our sponsor.

## 13 RISKS

Some of the team members are not familiar with the programming languages that will be used for the project.

Risk description	Probability	Loss (days)	Exposure (days)
We might not have our subscription to Digital Ocean by the 3rd sprint cycle.	0.10	5	4.5
The asset tags delivery could be delayed.	0.10	14	10
The delivery of the scanners could be delayed.	0.30	14	60
Our data set for testing might not be ready when we are ready to start testing our system.	0.10	20	2.0
Some members of our team are not familiar with JavaScript.	0.15	14	1.5
Some members of our team are not familiar with Mongo DB.	0.15	5	1.5

Table 2: Overview of highest exposure project risks

## 14 DOCUMENTATION & REPORTING

### 14.1 MAJOR DOCUMENTATION DELIVERABLES

#### 14.1.1 PROJECT CHARTER

The Project Charter will be maintained on a shared overleaf account started by Ivan Cuarenta. The Project Charter will be updated as soon as new information becomes available and needs be added or updated to the current version at that time. Version 1 of the project charter will be delivered on February 28th, 2023.

#### 14.1.2 SYSTEM REQUIREMENTS SPECIFICATION

The System Requirements Specification document will be maintained in a Microsoft Word document in a shared folder on Google Drive. New system requirements will be added once the team is made aware of them or removed when the team is made aware they are no longer necessary. All changes will be agreed upon between team members and Dr. Conly. Version one of the System Requirements and specifications will be delivered on March 21st, 2023.

#### 14.1.3 ARCHITECTURAL DESIGN SPECIFICATION

The Architecture Design Specification will be created and updated on <https://www.diagrams.net/>. The document will be saved to the team's private GitHub repository. The document will be updated when new features are required to be added to the application, or if features need to be removed. All changes will be agreed upon between team members and Dr. Conly. Version 1 of the Architecture Design Specification will be delivered on April 11, 2023.

#### 14.1.4 DETAILED DESIGN SPECIFICATION

The Detailed Design Specification document will be maintained in a Microsoft Word document in a shared folder on Google Drive. The document will be updated when new specifications are agreed upon between the team and Professor Conly.

## 14.2 RECURRING SPRINT ITEMS

### 14.2.1 PRODUCT BACKLOG

Items will be added to the product backlog as they are added to the System Requirements Specification document by breaking them down into smaller tasks if possible. Items will be prioritized based on the level of impact they have on the product and if other features are dependent on them. The team will discuss these items during regular meetings and if necessary, also meet with Dr. Conly to make the final decision. An Excel spreadsheet will be used in a shared folder on Google Drive.

### 14.2.2 SPRINT PLANNING

At the beginning of each sprint, the team will meet and pull items with the highest priority from the product backlog and put them on the sprint backlog. However, if an item or items with high priority can not be handled during the sprint we are starting due to any constraints the next highest priority item on the product backlog will be put on the sprint backlog.

### 14.2.3 SPRINT GOAL

The team will decide the goals for each sprint during meetings. Dr. Conly will be informed of the group's decision in person or via email.

### 14.2.4 SPRINT BACKLOG

The scrum master will decide which tasks go to the scrum backlog. The backlog will be on an excel spreadsheet in the shared folder on Google Drive.

### 14.2.5 TASK BREAKDOWN

Items will be taken from the sprint backlog on a volunteer basis. Team members will put their names by tasks they choose on the Excel spreadsheet so other members of the team know the task has been taken and by whom it has been taken. Each member will be expected to document their time on their tasks and add the time to the appropriate documentation.

### 14.2.6 SPRINT BURN DOWN CHARTS

Jeremy Walker will generate the burndown charts for each sprint. The time spent on each task by each team member should be accessible via a document in the shared Google Drive folder. The burndown chart will have a table and a graph that represents the expected time in comparison with the actual time taken. The time taken for the work will be in hours. The total time will be in days.

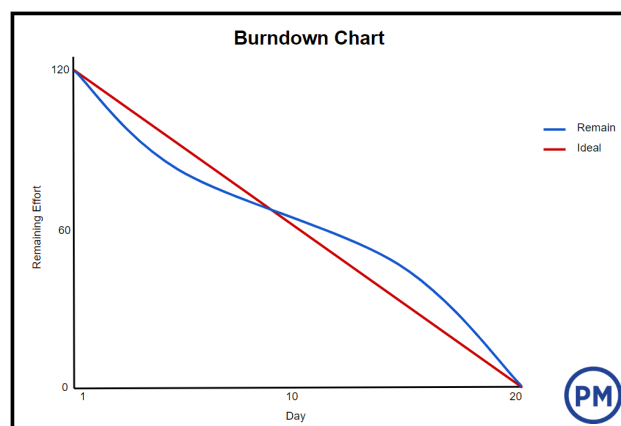


Figure 1: Example sprint burn down chart

#### **14.2.7 SPRINT RETROSPECTIVE**

At the end of each sprint, the team will have a meeting on Discord to discuss how our work went compared to the plan we had at the beginning of the sprint. If we need to adjust in our future estimations or workloads we will do so.

#### **14.2.8 INDIVIDUAL STATUS REPORTS**

The overall amount of work that was done during the sprint will be reported. The key items will be how much time a job took compared to how much time was estimated, and the peer reviews.

#### **14.2.9 ENGINEERING NOTEBOOKS**

The engineering notebook will be updated when each team member does work on their tasks during each sprint or does research on the project. There will not be a specific minimum page requirement. We will remind each other to document research in the notebook when discussing our project tasks. We will have one of our teammates or Dr. Conly sign off as a witness for each page.

### **14.3 CLOSEOUT MATERIALS**

#### **14.3.1 SYSTEM PROTOTYPE**

The final prototype will contain all features that are fully implemented. This will be demonstrated during final presentations of our project. We will do a PAT with Dr. Conly upon completion and prior to the final demonstration.

#### **14.3.2 PROJECT POSTER**

The presentation poster will be 40 X 32 in. in size. The poster will contain facts about our project and the technologies used to implement it. It will also contain information about similar products and their early stages of use and development.

#### **14.3.3 WEB PAGE**

The webpage will be primarily a blog about the various stages of development. It will be meant to show early stages of development and the progression of the project as well as changes made along the way. The website will be provided at the end of the project.

#### **14.3.4 DEMO VIDEO**

The video will include various tests and highlights of the development process as well as a demonstration of key features of the final product. The video should be around 5 minutes.

#### **14.3.5 SOURCE CODE**

The source code will be maintained by using whichever text editor/IDE each team member is comfortable using. The code will be in our private repository on GitHub while being developed. The version control will be handled through Git. The final version of the source code will be turned in at the end of the project. This project will be open-source with a GPL license.

#### **14.3.6 SOURCE CODE DOCUMENTATION**

Our source code will have comments describing what each function's role is. Sources for functions not implemented by us will be cited in the comments as well as the code documentation. We will use JSDocs to document our source code. There will be a README file in addition to any other documents we may have. All documents will be in PDF format.

#### **14.3.7 INSTALLATION SCRIPTS**

We will have an installation script for our final product.

#### **14.3.8 USER MANUAL**

The final user manual will be a digital PDF.

## REFERENCES