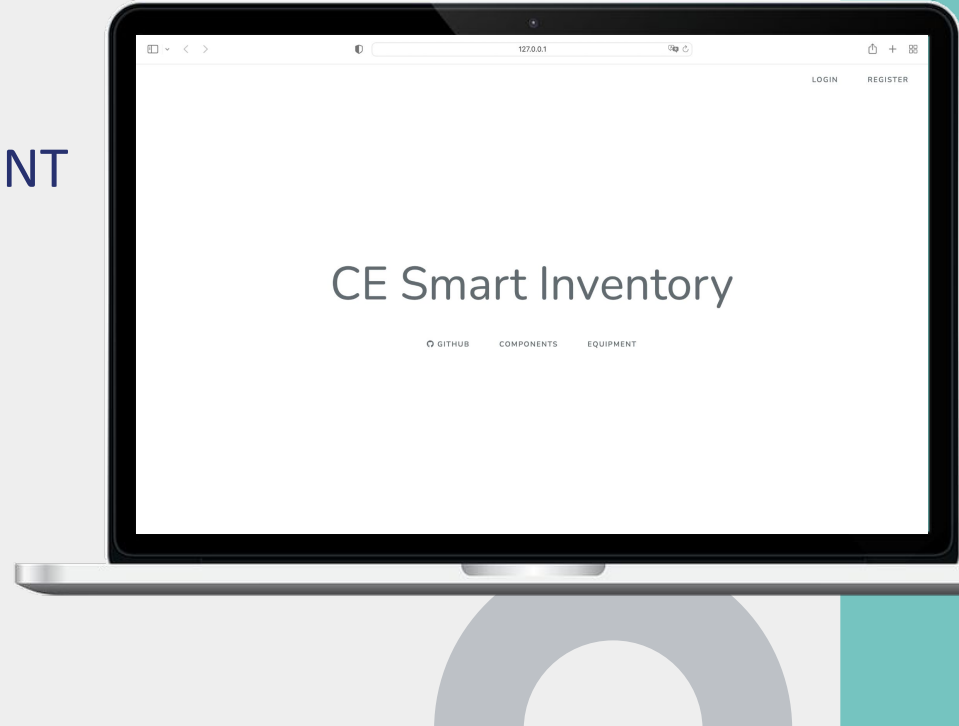


CO227 : COMPUTER ENGINEERING PROJECT

SMART INVENTORY MANAGEMENT  
SYSTEM

# ITEM LOCATOR

Milestone 3  
Group 13



# GROUP 13 - MEMBERS



**FERNANDO K.A.I.**

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- 1. System Overview**
- 2. Features and Functionalities**
- 3. User Experience**
- 4. Testing**
- 5. Extendability**
- 6. Demonstration**
- 7. Q&A**

# 01

# System Overview

**1.1 Physical overview**

**1.2 Web interface overview**



# 1. Physical overview



## Inventory Management for Makerspace Lab

- Accurate physical location of items in the department's Makerspace lab.
- Easy access.
- Proper replacement.
- Orderly arrangement.
- Time saving quick access avoiding misplacement in replacement.

## 2. Web interface overview (with database)



## Inventory database with details

- All items included in database in respective types with details such as location, amounts, value and reference images.
- Items can be added or removed and locations can be updated. (changed)
- Items may be searched by location or item name for quick access, replacement or for details.



02

# Features and Functionalities



# Basic Functionality

1. Equipments, Components and Consumables listing in database.
2. Details(specific) of Equipments, Components and Consumables items with amounts, values, reference images and locations.
3. Item search functionality.
  - a. Search by item
  - b. Search by location
4. Item location.
  - a. Hierarchical location
  - b. Relative coordinate location (For **AR/VR** implementation)
5. Item amount and location changing/updating. (**CRUD operations**)





























# 1. Equipments, Components and Consumables listing in database.

ome / Consumables / Items

Consumable Items Consumables

Filters

25

Code ↑↓	Title ↑↓	Category	Form Factor	Quantity	Actions
CS/12/1001	10 Ω Resistor	Through Hole Resistors (1/4W)	N/A	100	   
CS/12/1002	22 Ω Resistor	Through Hole Resistors (1/4W)	N/A	100	   
CS/12/1003	47 Ω Resistor	Through Hole Resistors (1/4W)	N/A	100	   
CS/12/1004	68 Ω Resistor	Through Hole Resistors (1/4W)	N/A	100	   
CS/12/1005	100 Ω Resistor	Through Hole Resistors (1/4W)	N/A	100	   
CS/12/1006	150 Ω Resistor	Through Hole Resistors (1/4W)	N/A	100	   
CS/12/1007	220 Ω Resistor	Through Hole Resistors (1/4W)	N/A	100	   

Super Admin

470Ω resistor

680Ω resistor

1000Ω resistor

1500Ω resistor

470Ω resistor

5100Ω resistor

6800Ω resistor

1K0 resistor

2.2K0 resistor

3.3K0 resistor

4.7K0 resistor

5.1K0 resistor

6.8K0 resistor

10K0 resistor

33K0 resistor

47K0 resistor

51K0 resistor

68K0 resistor

100K0 resistor

220K0 resistor

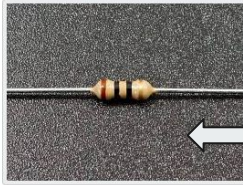
1 2

## 2. Details of Equipments, Components and Consumables items with amounts, values, reference images and locations.

Home / Consumables / Items / Show

Consumable Items Consumable Types

Consumable : Show | 10 $\Omega$  resistor

10 $\Omega$ resistor	
Code (to be finalized)	MS/CS/12/1001
Location	Makerspace Lab -> Soldering Station Desk
Type	THD Resistors
Price	Rs. 0.5
Quantity	100
Form factor	
Specification	
Thumbnail	

Edit options ...

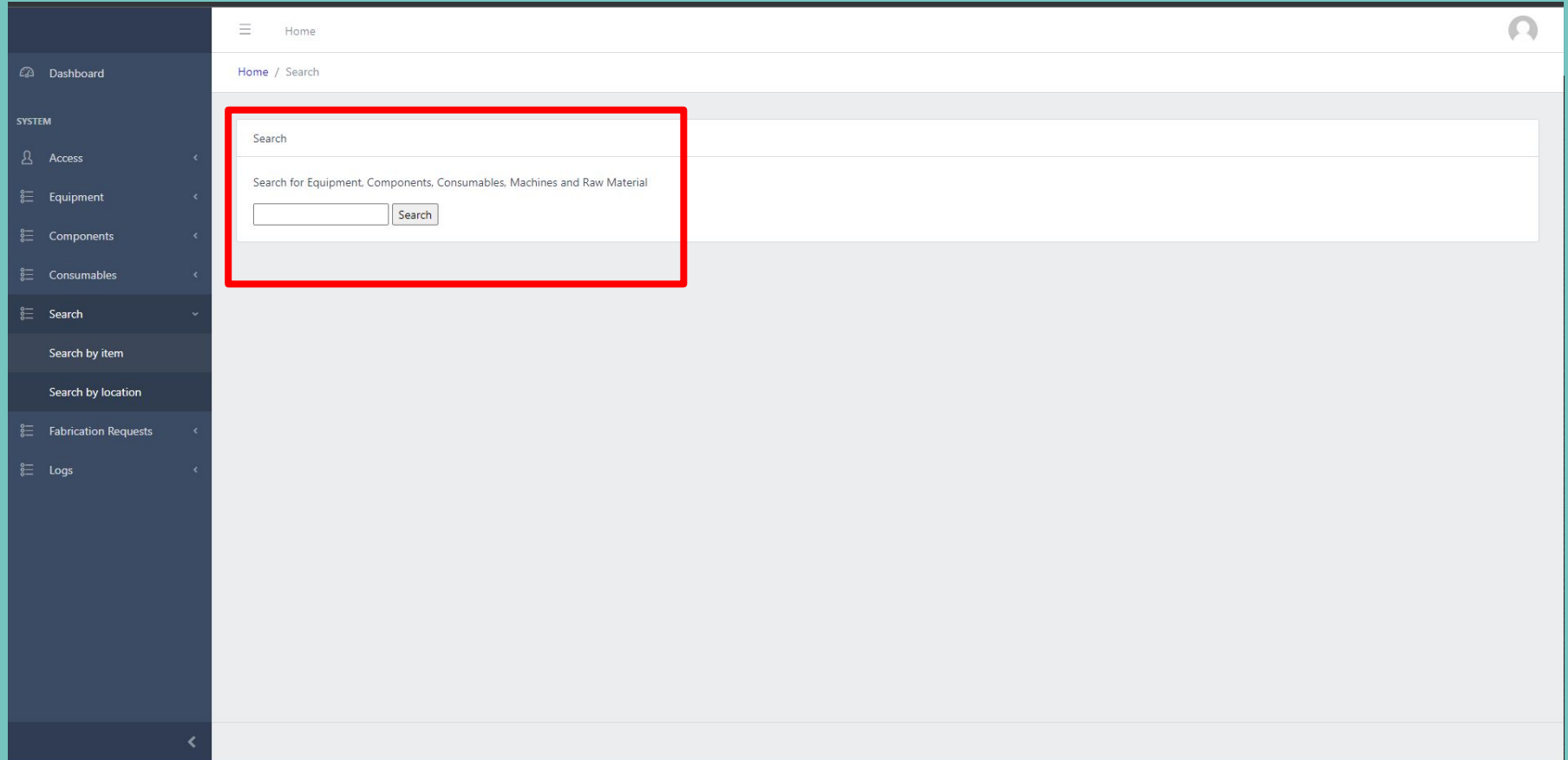
Location

Value

Amount

Reference Image

### 3. Item search function



### 3. a. Search by item name or keyword

The screenshot shows a web application interface with a dark sidebar on the left and a main content area. The sidebar contains a 'SYSTEM' section with links to Dashboard, Access, Equipment, Components, Consumables, Search, Fabrication Requests, and Logs. The main content area has a breadcrumb trail 'Home / Search / Results' and a search bar. Below the search bar, the text 'You are searching for 'resistor'. There are 51 results.' is displayed. A list of 16 resistor values is shown, each preceded by a bullet point. Annotations with arrows point to specific parts of the interface: two arrows point to the search bar area, and one arrow points to the list of results.

## Ex: Search results for “resistor”

Search keyword  
Total number of search results

Listing of all search results

- 10 $\Omega$  resistor
- 22 $\Omega$  resistor
- 47 $\Omega$  resistor
- 68 $\Omega$  resistor
- 100 $\Omega$  resistor
- 150 $\Omega$  resistor
- 220 $\Omega$  resistor
- 270 $\Omega$  resistor
- 470 $\Omega$  resistor
- 510 $\Omega$  resistor
- 680 $\Omega$  resistor
- 1K $\Omega$  resistor
- 2.2K $\Omega$  resistor
- 3.3K $\Omega$  resistor
- 4.7K $\Omega$  resistor
- 5.1K $\Omega$  resistor
- 6.8K $\Omega$  resistor
- 10K $\Omega$  resistor

### 3. b. Search by location

Home / Search

Search by location

Search


Measuring Station A  
Measuring Station B  
Soldering Station  
Testing Station  
Testing Station > Drawer Rack  
Assembling Station  
Assembling Station > Screwdriver Rack  
**Assembling Station > Double Open Wrench kit**  
3D Printer Station  
CNC Station  
Component Drawer Rack  
Component Drawer Rack > Drawer 01  
Component Drawer Rack > Drawer 02  
Component Drawer Rack > Drawer 03  
Component Drawer Rack > Drawer 04  
Component Drawer Rack > Drawer 05  
Component Drawer Rack > Drawer 06  
Component Drawer Rack > Drawer 07  
Component Drawer Rack > Drawer 08


Search location

## 4. Item location










### a. Hierarchical Location

Equipment

Search  **Filters**  Filters feature

Category: **Any** 

- Any
- Hand Tools
- Hand Tools > Screwdrivers**
- Hand Tools > Pliers
- Hand Tools > Clamps
- Hand Tools > Cutters and Saws
- Hand Tools > Hammers
- Hand Tools > Files
- Hand Tools > Wrenches
- Hand Tools > Wrenches > Combination Wrenches
- Hand Tools > Wrenches > Double Open Wrenches
- Hand Tools > Sockets
- Hand Tools > Sockets > Half Inch Sockets
- Hand Tools > Sockets > Quarter Inch Sockets
- Power Tools
- Power Tools > Tool Accessories
- Safety Equipment
- Soldering Tools
- Measuring Instruments

Code ↑↓	Title ↑↓	Product Code	Quantity ↑↓	Category ↑↓	Price (LKR) ↑↓	Action
EQ/22/1001	Hand S...		1	Cutters and Saws	780	
EQ/22/1002	Hacksaw		1	Cutters and Saws	600	
EQ/11/1003	Hand Riv...		1	Hand Tools	620	
EQ/23/1004	Claw Han...		1	Hammers	800	
EQ/23/1005	Rubber H...		1	Hammers	860	
EQ/11/1006	Hex Key S...		1	Hand Tools	1100	
EQ/11/1007	Torx Key S...		1	Hand Tools	1100	
EQ/27/1008	Trigeminal Socket Wrench	HYW081012 (Ingco)	1	Wrenches	500	
EQ/15/1009	Measuring Tape	HSMT08052 (Ingco)	2	Measuring Instruments	475	



## 4. Item location

### b. Relative coordinate Location (for AR/VR implementation)

Dashboard

SYSTEM

Access

Equipment

Components

Consumables

Stations

Fabrication Requests

Location Service

Logs

Home

Equipment

Items

Edit Location

Equipment Items

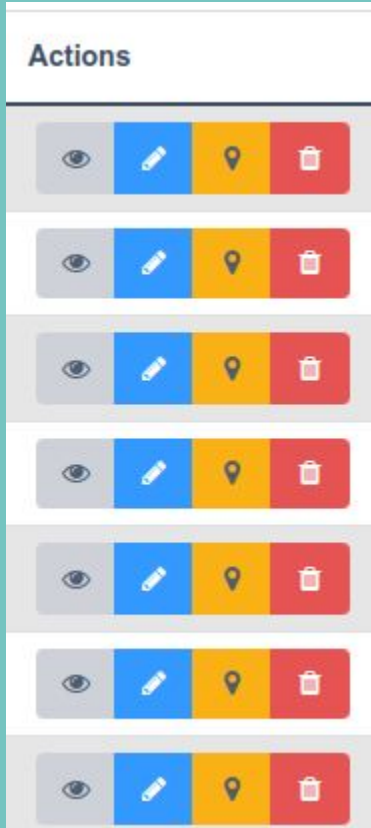
Equipment Types

Equipment Locations

Change locations for Size 19 Wrench

• Measuring Station A	X: 10	Y: 10	Z: 20	<input checked="" type="checkbox"/>
• Measuring Station B	X:	Y:	Z:	<input type="checkbox"/>
• Soldering Station	X:	Y:	Z:	<input type="checkbox"/>
• Testing Station	X:	Y:	Z:	<input type="checkbox"/>
• Drawer Rack	X:	Y:	Z:	<input type="checkbox"/>
• Assembling Station	X:	Y:	Z:	<input type="checkbox"/>
• Screwdriver Rack	X:	Y:	Z:	<input type="checkbox"/>
• Double Open Wrench kit	X:	Y:	Z:	<input type="checkbox"/>
• 3D Printer Station	X:	Y:	Z:	<input type="checkbox"/>
• CNC Station	X:	Y:	Z:	<input type="checkbox"/>
• Component Drawer Rack	X:	Y:	Z:	<input type="checkbox"/>

## 5. Item amount and location changing/updating



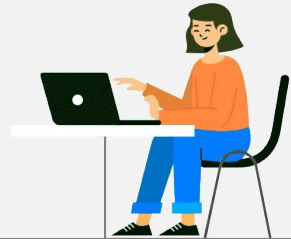
- View further details with images
- Edit details
- Edit location (Hierarchical & Coordinate)
- Delete

Change locations for 10  $\Omega$  Resistor

• Measuring Station A	X: <input type="text"/>	Y: <input type="text"/>	Z: <input type="text"/>	<input type="checkbox"/>
• Measuring Station B	X: <input type="text"/>	Y: <input type="text"/>	Z: <input type="text"/>	<input type="checkbox"/>
• Soldering Station	X: <input type="text"/>	Y: <input type="text"/>	Z: <input type="text"/>	<input type="checkbox"/>

03

# User Experience



# Different Search Modes

Users can search,

- ★ by item
- ★ by location

Which makes it easy to use.



Dashboard

## SYSTEM



Access



Equipment



Components



Consumables



Search



Search by item

Search by location



Fabrication Requests

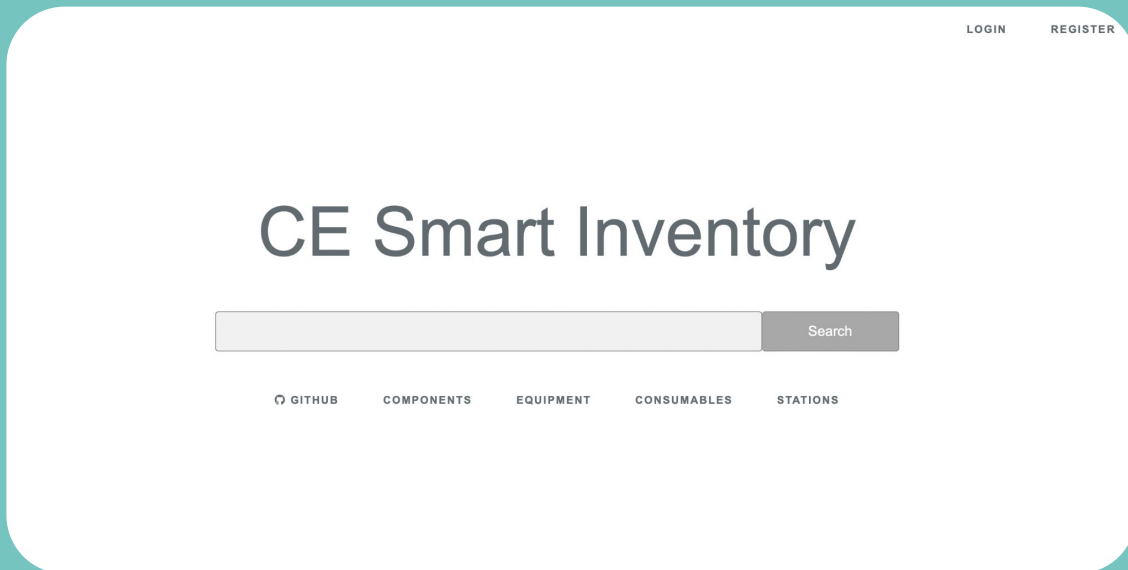


Logs



# Frontend Search

Even without logging in,  
Users can use the  
frontend search bar to  
search for items by name



04

# Testing



**Basically 289  
tests and 560  
assertions are  
run for every  
commit made  
on github**

```
88 ✓ an equipment type can be created
89 ✓ an equipment type can be updated
90 ✓ delete equipment type item
91 ✓ unauthorized user cannot delete equipment type item
93 PASS Tests\Feature\Backend\LocationService\LocationService
94 ✓ item locations table exists
95 ✓ locations table exists
96 ✓ equipment shows location
97 ✓ component shows location
98 ✓ consumables shows location
99 ✓ machines shows location
100 ✓ raw materials shows location
101 ✓ deleting component will remove entry in item location tab
102 ✓ deleting equipment will remove entry in item location tab
103 ✓ deleting consumable will remove entry in item location ta
104 ✓ deleting machine will remove entry in item location table
105 ✓ deleting raw material will remove entry in item location
107 PASS Tests\Feature\Backend\LocationService\LocationsMenuT
108 ✓ admin can see locations menu
109 ✓ menu shows all locations
110 ✓ can create new location
111 ✓ newly created location shows up on index
112 ✓ can edit location name
113 ✓ can delete location parent location
115 PASS Tests\Feature\Backend\LocationService\LocationsToggl
116 ✓ add location function adds equipment item location to db
```

# Tests









- Frontend search tests
- Location service tests
- Tests for the livewire tables
- Multiple locations service
- Consumable Items
- Consumable Types



- Tests are run to check newly added items are shown in the search results page
- Tests are run to check newly added livewire tables are shown in the search results page
- Tests are run to check if a single item can have multiple locations added in the database

## laravel-tests

Started 34s ago

- >  Set up job
- >  Run shivammathur/setup-php@15c43e89cdef867065b0213be354c28418
- >  Run actions/checkout@v2
- >  Copy .env
- >  Install Dependencies
- >  Generate key
- >  Directory Permissions
- >  Create Database

### ✓ Execute tests (Unit and Feature tests) via PHPUnit

```
10  PASS Tests\Feature\Backend\Component\ComponentItemTest
11  ✓ an admin can access the list component page
12  ✓ an admin can access the create component page
13  ✓ an admin can access the show component page
14  ✓ an admin can access the delete component page
15  ✓ create component requires validation
```



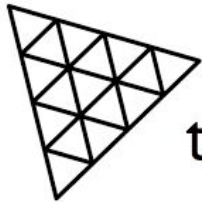
05

# Extendability





WebXR



three.js

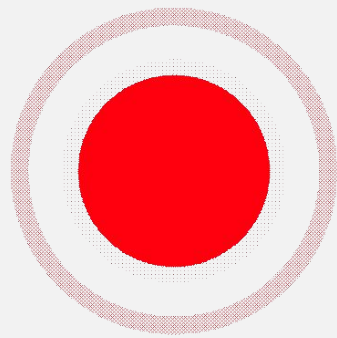
## AR Solution find what you look for

- We have already added X,Y,Z coordinates of the tools relative to the top of the table, to the system.
- This coordinates can be used to implement an AR tool.



06

**Demonstration**





**Q & A**



**Thank You!**