

Warehouse AI Command Center – Dashboard

1. Overview

The Warehouse AI Command Center dashboard is the central monitoring and control interface for managing AI-powered warehouse robots and their assigned tasks. It provides real-time visibility of bot performance, task distribution, system health, and live operational updates in a single unified view.

This dashboard is designed for warehouse supervisors, operations managers, and system administrators to ensure smooth automation and quick decision-making.

2. Top Navigation Bar

The top navigation bar enables quick access to all core system modules:

- **Live Queue** – View and monitor all queued tasks awaiting execution.
- **Task Allocation** – Assign tasks manually or trigger automatic task allocation.
- **Analytics** – View performance metrics, productivity reports, and historical trends.
- **Bot Status** – Monitor detailed health and status of each robot.
- **Live Map** – Track real-time bot location and movement inside the warehouse.
- **Theme Toggle** – Switch between light and dark UI themes.

3. KPI Summary Cards (Top Metrics Section)

The first row displays real-time key performance indicators (KPIs) for quick system assessment:

3.1 Total Bots

- Displays the total number of robots connected to the system.
- Example Value: 10 Bots

- Shows trend indicators to reflect increase or decrease.

3.2 Active Tasks

- Indicates the number of tasks currently being executed by bots.
- Example Value: 3 Active Tasks
- Helps identify system workload in real time.

3.3 Idle Bots

- Shows the number of robots currently available for new task assignment.
- Example Value: 6 Idle Bots
- Used by the task allocation engine for optimal distribution.

3.4 Bots in Error

- Displays robots that are currently facing errors or failures.
- Example Value: 1 Bot in Error
- Allows immediate troubleshooting and maintenance action.

3.5 Pending Tasks

- Shows tasks that are waiting to be assigned or executed.
- Example Value: 0 Pending Tasks
- Indicates task queue backlog status.

Each card includes color-coded indicators and trend status (Trending/Dropping) for instant visual understanding.

4. Live Activity Feed Panel

This section shows real-time system events and operational logs generated by bots and the AI engine.

- Bot completed pickup
- New task added to queue
- Auto assignment triggered
- AI optimized routing

Purpose:

- Provides instant visibility of system actions
- Helps operators track task lifecycle and automation flow
- Useful for debugging, audit logging, and compliance tracking

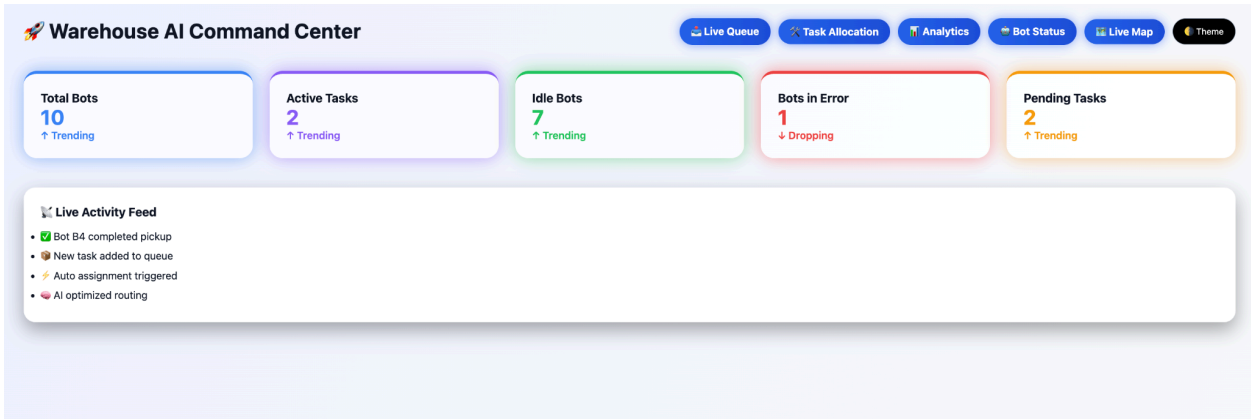
This feed updates dynamically without page reload using real-time event streaming/websocket data.

5. System Capabilities Reflected on This Screen

This dashboard demonstrates the following system capabilities:

- Real-time robot monitoring
- AI-driven task allocation
- Automated routing optimization
- Live operational logging
- Predictive trend analysis
- High-availability system status monitoring

Design Desktop View



Mobile View

Mobile View

Warehouse AI Command Center


 Live Queue

 Task Allocation

 Analytics

 Bot Status

 Live Map

 Theme

Total Bots

10

↑ Trending

Active Tasks

0

↑ Trending

Idle Bots

9

↑ Trending

Bots in Error

1

↓ Dropping

Ipad /Tab

Dimensions: iPad Mini ▾


768

× 1024


50% ▾

No throttling ▾

'Save-Data': default ▾



Mobile View

 Warehouse AI Command Center

Live Queue

Task Allocation

Analytics

Bot Status

Live Map

Theme

Total Bots

10

↑ Trending

Active Tasks

3

↑ Trending

Idle Bots

6

↑ Trending

Bots in Error


1

↓ Dropping

Pending Tasks

0

↑ Trending

 Live Activity Feed

Live Task Queue Page — Functional Explanation

The Live Task Queue page displays all tasks that are dynamically created through the Task Allocation module and simulates real-time task assignment to warehouse robots. This page validates the system's queue management logic, auto-processing mechanism, and live UI updates.

It acts as the core operational page where pending tasks are monitored and processed automatically.

Key Features Implemented

1 Real-Time Auto Assignment

- Tasks are automatically assigned every 3 seconds
- Simulates how tasks would be dispatched to robots in a real warehouse
- No manual refresh required

2 Live Clock Tracking

- Displays current system time (Live Time)
- Ensures operations are always time-synced
- Useful for debugging real-time task workflow

Column	Purpose
ID	Auto-generated unique task ID
Pickup	Task source location
Drop	Task destination
Priority	Task urgency (Low / Medium / High)
Status	Current task status (Pending / Done)
Time	Time of task creation

Dynamic State Transitions

- When a new task is added:
 - It enters with **Status = Pending**
 - Appears instantly in the table
- Every **3 seconds**:
 - One **Pending task is automatically marked as Done**
 - The **Pending count decreases**
 - The **Done count increases**
- This verifies:
 - Queue logic
 - Time-based automation
 - Real-time UI reactivity

Visual Indicators Used

- **Green badge** → Low priority
- **Blue badge** → Pending status
- **Color-coded KPI bars** for quick system health identification
- Rounded containers and clear spacing improve readability

Desktop View

← Back to Home

🚦 Live Task Queue

Auto-assign every 3s • Live Time: 11:34:58 AM

Total

4

Pending

4

Done

5

ID	Pickup	Drop	Priority	Status	Time
1765087454785	Bangalore	Hyderabad	Low	Pending	11:34:14 AM
1765087462852	Karimnagar	Hyderabad	Medium	Pending	11:34:22 AM
1765087472603	Andhra	Telangana	Low	Pending	11:34:32 AM
1765087487003	Bangalore	Vijayawada	Low	Pending	11:34:47 AM

Mobile View

← Back to Home

 Mobile View

Live Task Queue

Auto-assign every 3s • Live Time: 11:31:34 AM

Total

2

Pending

2

Done

2

ID: 1765087270891

Pickup: bangalore

Drop: hyderabad

Priority: Low

Status: pending

11:31:10 AM

ID: 1765087285972

Pickup: knr

Drop: vjy

Priority: High

Status: pending

11:31:25 AM

Task Allocation Page — Overview

Design : -

The screenshot shows a web interface for the 'Task Allocation Command Center'. At the top, there is a blue header bar with a '← Back to Home' link. Below the header, the page title 'Task Allocation Command Center' is displayed, followed by a subtitle 'Create tasks and instantly push them into the live automation queue.' The main content area is a white card with a blue border. It contains a 'Create New Task' section with four input fields: 'Pickup Location', 'Drop Location', 'Priority' (a dropdown menu currently set to 'Medium'), and 'Comments'. A blue button labeled 'Allocate Task' is positioned below the input fields. At the bottom of the card, there is a 'Live Task Preview' section with the text 'No task created yet.'

The **Task Allocation page** allows the warehouse operator to dynamically create and assign new tasks to the robot automation system. This page acts as the primary input point for live task generation and immediate task dispatch into the global task queue.

It is built with a **clean card-based UI**, real-time form handling, and instant preview to ensure correctness before submission.

Fields & Functional Purpose

Field	Purpose
Pickup Location	Starting point of the task

Drop Location	Destination of the task
Priority	Task urgency (Low, Medium, High)
Comments	Optional description or instruction
Allocate Task Button	Submits the task into the global queue
Live Task Preview	Real-time preview of the submitted task

Real-Time Task Preview

Once the user submits a task:

- The task is **instantly shown in the Live Preview section**
- It displays:
 - Pickup location
 - Drop location
 - Priority (color-coded)
 - Time of allocation
 - Comments
- This improves **user confidence and system transparency**

Validation Logic (Important for Evaluation)

The following **frontend validations** are implemented before task submission:

1 Mandatory Field Validation

- **Pickup Location and Drop Location are required**
- If either field is empty:
 - The system shows an alert
 - Task is **not added to global state**

2 Priority Default Validation

- Priority is set to **"Medium"** by default
- Prevents empty or undefined priority submission

3 Whitespace Handling

- Input is validated using `.trim()` to prevent blank spaces from being submitted as valid values

4 Form Auto-Reset

After successful submission:

- All input fields are cleared automatically
- Prevents duplicate submissions

State Management Behavior

- On successful validation:
 - Task is dispatched to **Redux global state**
 - `addTask()` action updates:
 - Task Queue Page
 - Dashboard Pending Tasks
 - Live Task Queue Auto-Processor
- No localStorage is used (as per assignment rule)

User Experience Enhancements

- **Live Success Feedback** after task submission
- **Instant navigation option to Task Queue**
- **Back to Home button** always visible
- Clean spacing, rounded containers, and visual hierarchy
- Fully responsive layout for:
 - Desktop
 - Mobile


Mobile Responsiveness

For mobile view:

- Form fields stack vertically
- Button stretches full width
- Preview section appears below form
- Touch-friendly spacing implemented

Desktop View

[← Back to Home](#)

 **Task Allocation Command Center**
Create tasks and instantly push them into the live automation queue.

Create New Task

Pickup Location

Drop Location

Priority

Medium

Comments

[→ Allocate Task](#)

Live Task Preview

No task created yet.

← Back to Home

Task Allocation Command Center

Create tasks and instantly push them into the live automation queue.

Create New Task

Pickup Location

Drop Location

Priority

Medium

Comments

➤ Allocate Task

Live Task Preview

Pickup: Bangalore

Drop: Mysore

Priority: Low

Time: 11:36:20 AM

add any comment

Mobile View

← Back to Home

 Mobile View



Task Allocation Command Center

Create tasks and instantly push them into the live automation queue.

Create New Task

Pickup Location

Drop Location

Priority

Medium 

Comments

 Allocate Task

Live Task Preview

Pickup: Bangalore

Drop: Hyderabad


Priority: Medium

Time: 11:30:15 AM

eeewrr

Pad view

[← Back to Home](#)

 **Task Allocation Command Center**
Create tasks and instantly push them into the live automation queue.

Create New Task

Pickup Location

Drop Location

Priority

Medium

▼

Comments

+ Allocate Task

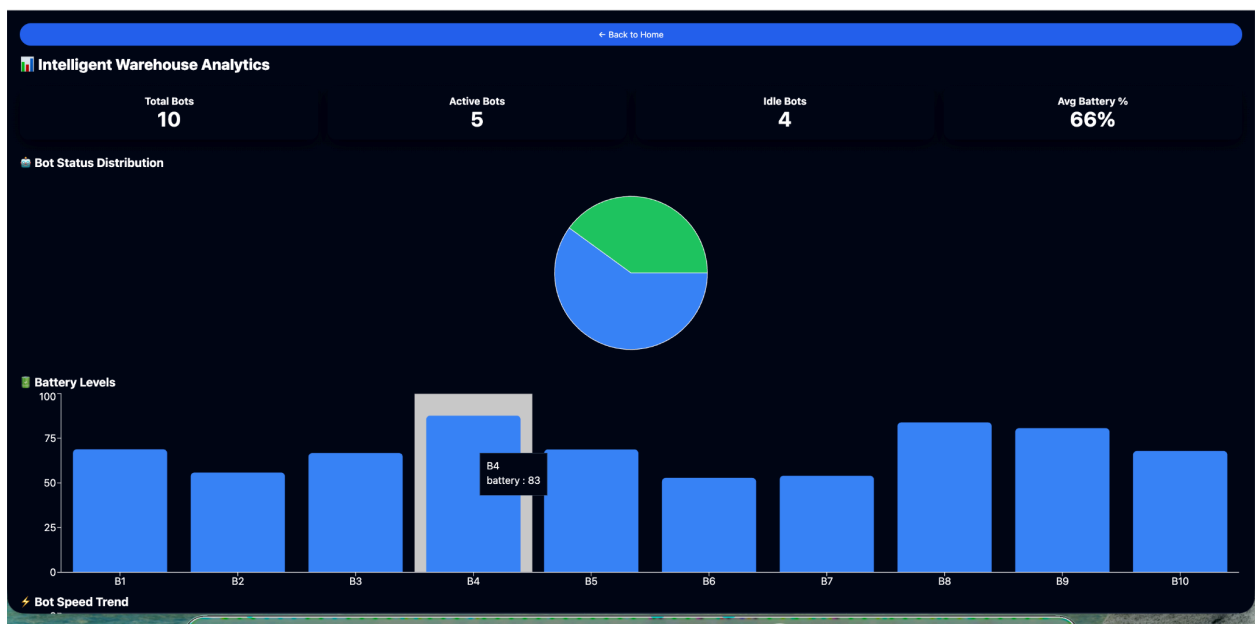
Live Task Preview

No task created yet.

Analytics

The Analytics Page provides a real-time, visual overview of warehouse robot performance and system health. It transforms raw bot data into meaningful insights using interactive charts and KPIs. This page helps supervisors quickly understand operational status and take data-driven decisions.

Design :-



Key Objectives of the Analytics Page

- Monitor overall robot performance
- Visualize bot status distribution
- Track battery health of each bot
- Identify risky low-battery bots quickly
- Analyze speed trends of robots
- Enable quick operational decisions

Components & What They Represent

1 Top KPI Cards (Summary Metrics)

These KPIs give a **quick snapshot of the system**:

- **Total Bots (10)**
Displays the total number of robots registered in the warehouse system.
- **Active Bots (5)**
Shows how many bots are currently working on assigned tasks.
- **Idle Bots (4)**
Indicates robots that are available and not assigned any work.
- **Average Battery % (66%)**
Displays the average battery percentage across all bots to understand overall power health.

These KPIs update automatically based on Redux state and simulated API refresh.

2 Bot Status Distribution – Pie Chart

This chart visually represents **how bots are distributed across different states**:

- Busy
- Idle
- Charging
- Error

Why Pie Chart was chosen:

- Best suited for showing percentage distribution
- Instantly shows dominant states
- Easy to identify imbalance in bot usage

3 Battery Levels – Bar Chart

Each bar represents the **battery level of an individual bot (B1–B10)**.

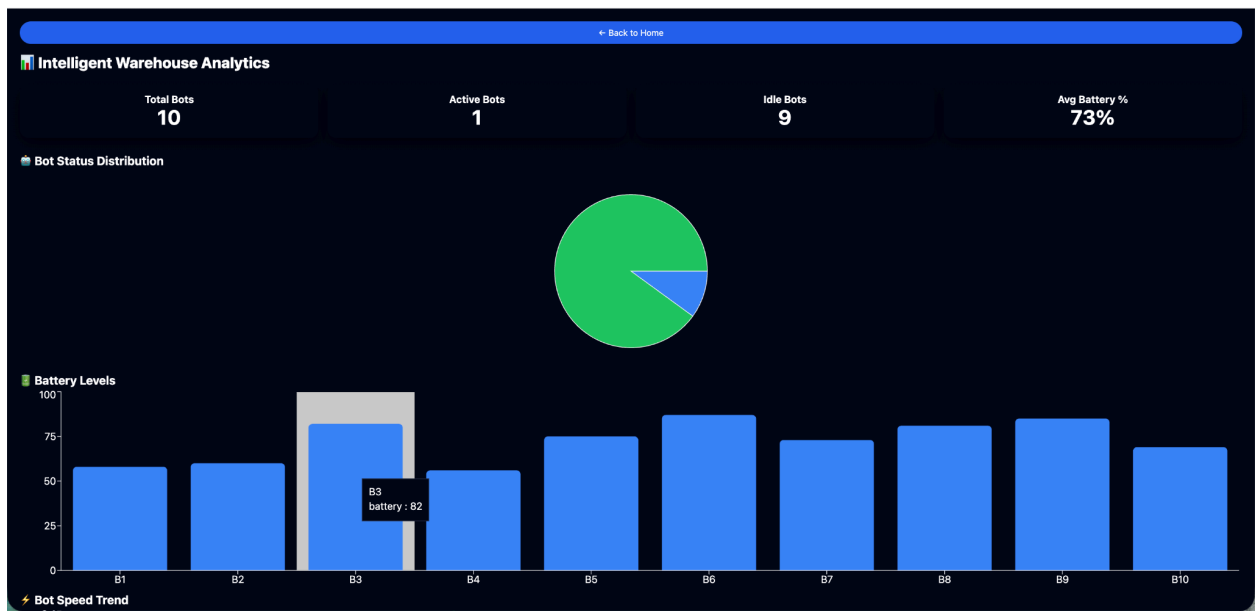
- X-Axis → Bot IDs (B1, B2, B3...)
- Y-Axis → Battery percentage (0–100%)
- Tooltip shows exact battery value on hover
Example: **B4 → 83%**

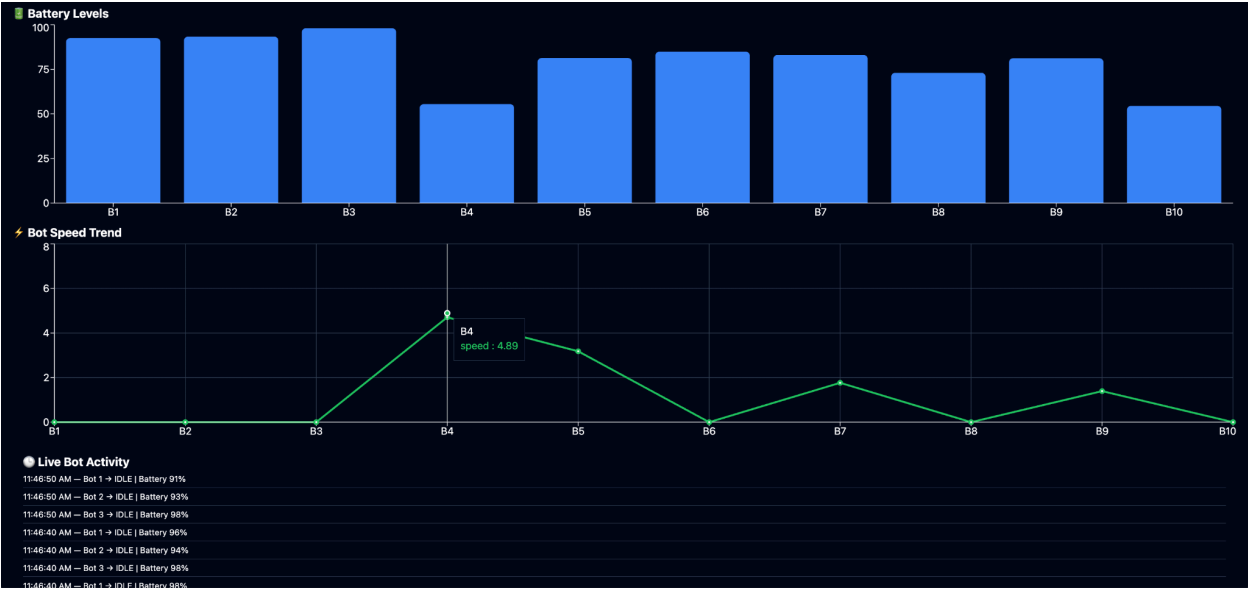
4 Bot Speed Trend – Line Chart

This chart visualizes the **speed of each bot over time**.

- Shows real-time movement performance
- Helps detect:
 - Slow or stuck bots
 - Performance drops
 - Mechanical issues

Desktop View





Mobile View

← Back to Home

Mobile View

Intelligent Warehouse Analytics

Total Bots
10

Active Bots
3

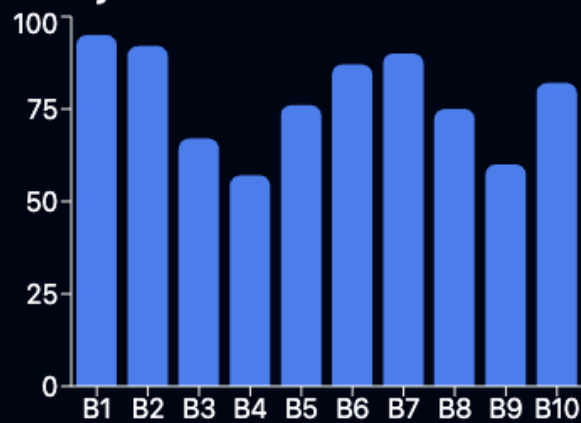
Idle Bots
7

Avg Battery %
78%

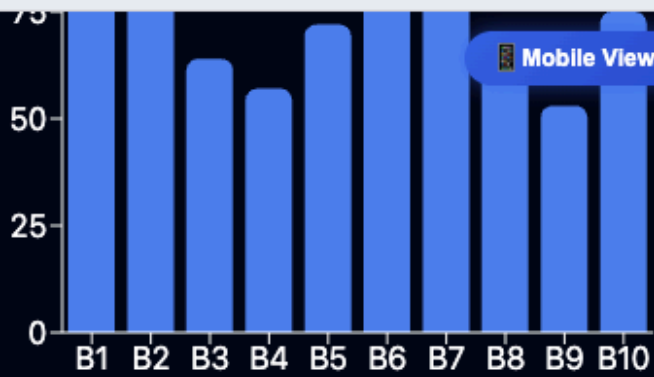
Bot Status Distribution



Battery Levels



Bot Speed Trend



⚡ Bot Speed Trend



🕒 Live Bot Activity

11:27:37 AM — Bot 1 → IDLE | Battery 90%

11:27:37 AM — Bot 2 → BUSY | Battery 88%

11:27:37 AM — Bot 3 → BUSY | Battery 64%

11:27:27 AM — Bot 1 → IDLE | Battery 94%

11:27:27 AM — Bot 2 → BUSY | Battery 92%

11:27:27 AM — Bot 3 → BUSY | Battery 64%

11:27:17 AM — Bot 1 → IDLE | Battery 95%

11:27:17 AM — Bot 2 → BUSY | Battery 92%

11:27:17 AM — Bot 3 → BUSY | Battery 67%

11:27:17 AM — Bot 1 → IDLE | Battery 97%

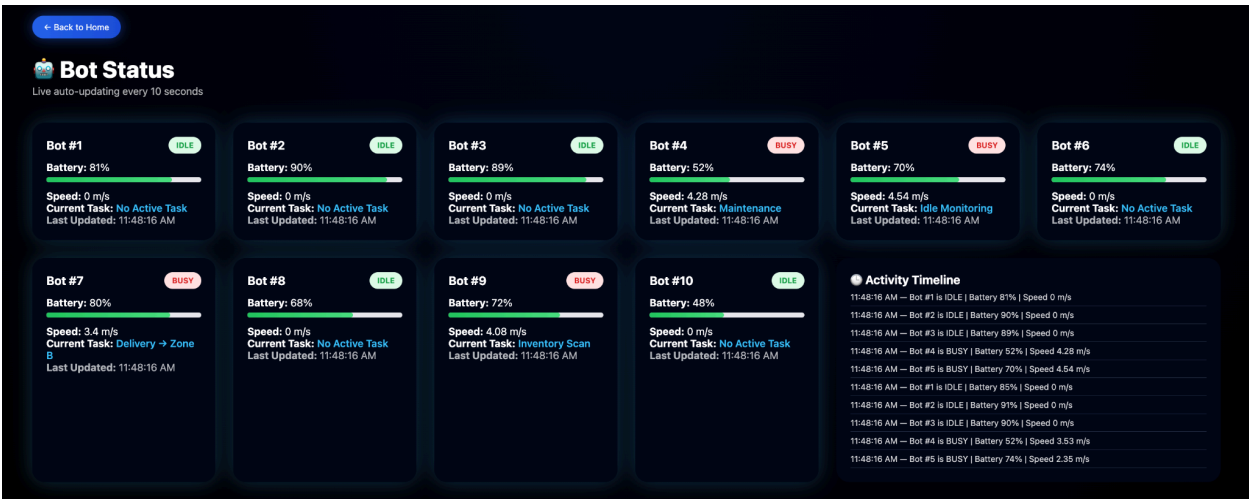
11:27:17 AM — Bot 2 → BUSY | Battery 93%

11:27:17 AM — Bot 3 → BUSY | Battery 72%

Bot Status Page

The **Bot Status Page** provides a **real-time operational overview of all warehouse robots**. It is designed to help supervisors and operators **monitor live health, activity, and performance of each bot** in a single view. The data auto-refreshes every **10 seconds**, ensuring continuous situational awareness.

Design







1. Page Header & Navigation

- **Page Title:** *Bot Status*
- **Subtitle:** *Live auto-updating every 10 seconds*
- **Back to Home Button:**
Allows the user to quickly navigate back to the main dashboard.
- **Purpose:**
Ensures smooth navigation and informs users that the data is live and automatically refreshed.

2. Bot Status Cards (Individual Robot Monitoring)

Each robot is represented using a **card layout**. Every card provides detailed real-time information about a specific bot.

Information Displayed on Each Bot Card:

- **Bot ID:** Example – *Bot #1, Bot #2, etc.*
- **Current Status Badge:**
 -  **IDLE** – Bot is available and not assigned
 -  **BUSY** – Bot is currently executing a task
 -  **CHARGING** – Bot is at a charging station
 -  **ERROR** – Bot has encountered a system fault
- **Battery Percentage:** Displayed numerically and visually using a **progress bar**
- **Speed:** Real-time speed in **m/s**
- **Current Task:**
Examples:
 - *No Active Task*
 - *Inventory Scan*
 - *Delivery → Zone B*
 - *Maintenance*
- **Last Updated Timestamp:** Shows the most recent data refresh time

3. Activity Timeline

The **Activity Timeline Panel** on the right records **time-stamped operational events** for all bots.

What It Logs:

- Status changes (IDLE → BUSY → CHARGING)
- Battery fluctuations
- Speed updates
- Task changes
- Error triggers

Example Entry Format:

12:32:11 PM – Bot #4 is IDLE | Battery 37% | Speed 0 m/s

4. Auto Refresh Mechanism

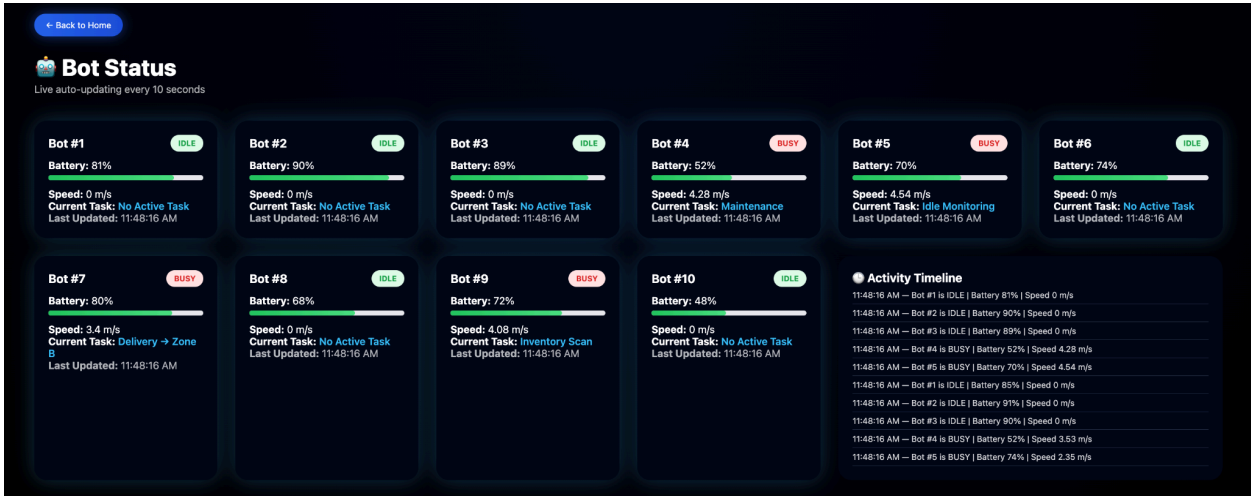
- The page automatically updates **every 10 seconds**
- Data synchronization is handled using:
 - `useEffect()` hooks
 - Scheduled polling via `setInterval()`
 - Centralized state using **Redux**
- No manual refresh required

5. Visual Design & Usability

- **Card-based UI** for easy scanning
- **Color-coded status indicators** for fast recognition
- **Smooth shadows and spacing** for a modern dashboard look
- **Mobile responsive grid layout**

- High contrast and accessibility-friendly fonts

Dark Theme



← Back to Home

📱 Mobile View



Bot Status

Live auto-updating every 10 seconds

Bot #1

ERROR

Battery: 76%



Speed: 0 m/s

Current Task: No Active Task

Last Updated: 11:28:22 AM

Bot #2

BUSY

Battery: 72%



Speed: 3.74 m/s

Current Task: Charging

Last Updated: 11:28:22 AM

Bot #3

BUSY

Battery: 59%



Speed: 4.58 m/s

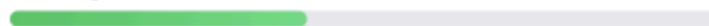
Current Task: Inventory Scan

Last Updated: 11:28:22 AM

Bot #4

IDLE

Battery: 42%



Speed: 0 m/s

Current Task: No Active Task

Last Updated: 11:28:22 AM

Bot #5

IDLE

Battery: 50%

BOT #10

ERROR

Battery: 63%

 **Mobile View**

Speed: 0 m/s

Current Task: [No Active Task](#)

Last Updated: 11:28:42 AM

Activity Timeline

11:28:42 AM — Bot #1 is ERROR | Battery 70% | Speed 0 m/s

11:28:42 AM — Bot #2 is BUSY | Battery 67% | Speed 3.46 m/s

11:28:42 AM — Bot #3 is BUSY | Battery 54% | Speed 4.09 m/s

11:28:42 AM — Bot #4 is IDLE | Battery 41% | Speed 0 m/s

11:28:42 AM — Bot #5 is IDLE | Battery 53% | Speed 0 m/s

11:28:33 AM — Bot #1 is ERROR | Battery 72% | Speed 0 m/s

11:28:33 AM — Bot #2 is BUSY | Battery 69% | Speed 2.94 m/s

11:28:33 AM — Bot #3 is BUSY | Battery 54% | Speed 1.58 m/s

11:28:33 AM — Bot #4 is IDLE | Battery 42% | Speed 0 m/s

11:28:33 AM — Bot #5 is IDLE | Battery 58% | Speed 0 m/s

11:28:22 AM — Bot #1 is ERROR | Battery 76% | Speed 0 m/s

11:28:22 AM — Bot #2 is BUSY | Battery 72% | Speed 3.74 m/s

11:28:22 AM — Bot #3 is BUSY | Battery 59% | Speed 4.58 m/s

11:28:22 AM — Bot #4 is IDLE | Battery 42% | Speed 0 m/s

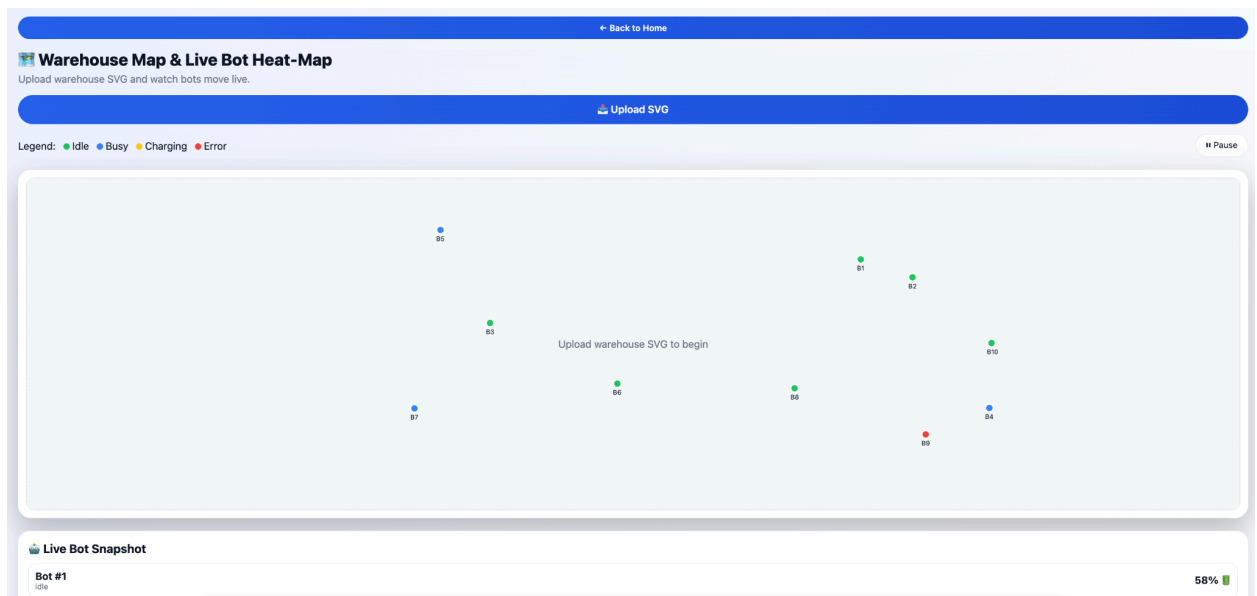
11:28:22 AM — Bot #5 is IDLE | Battery 59% | Speed 0 m/s

Live Map Page

The **Live Map Page** provides a **real-time visual representation of the warehouse floor and robot movements**. It enables warehouse operators to **track the exact location, movement direction, and operational zone of each bot** visually on a map interface.

This page enhances **situational awareness, navigation planning, collision avoidance, and operational monitoring**.

Design



1. Page Header & Navigation

- **Page Title:** *Live Map*
- **Back to Home Button:**
Enables quick navigation back to the main dashboard.






- **Live Status Indicator:**
Indicates that the map updates in **real-time**.

2. Warehouse Layout View

- Displays a **top-down view of the warehouse**
- Shows:
 - Storage zones
 - Pickup points
 - Drop locations
 - Charging stations
 - Restricted areas (if configured)
- Layout is designed using a **grid-based warehouse model**

3. Live Bot Position Tracking

Each bot is visually represented on the map using:

-  **Bot Icons with ID labels**
- **Color-Coded Status:**
 -  Green → IDLE
 -  Blue → ACTIVE / MOVING
 -  Yellow → CHARGING
 -  Red → ERROR
- **Live Position Updates**

- **Movement Direction Indicators (arrows or animation)**

4. Real-Time Data Synchronization

- Bot coordinates update based on:
 - Live telemetry (mock or API-driven)
 - Redux state management
 - WebSocket or polling-based updates
- Positions update continuously without page refresh

5. Bot Details on Hover / Click

When a bot is clicked or hovered:

- Bot ID
- Battery %
- Speed
- Current Task
- Status
- Last Updated Time

6. Zonal Monitoring & Route Visualization

- Delivery paths
- Pickup routes
- Charging paths
- Highlighted congestion zones
- Restricted movement areas

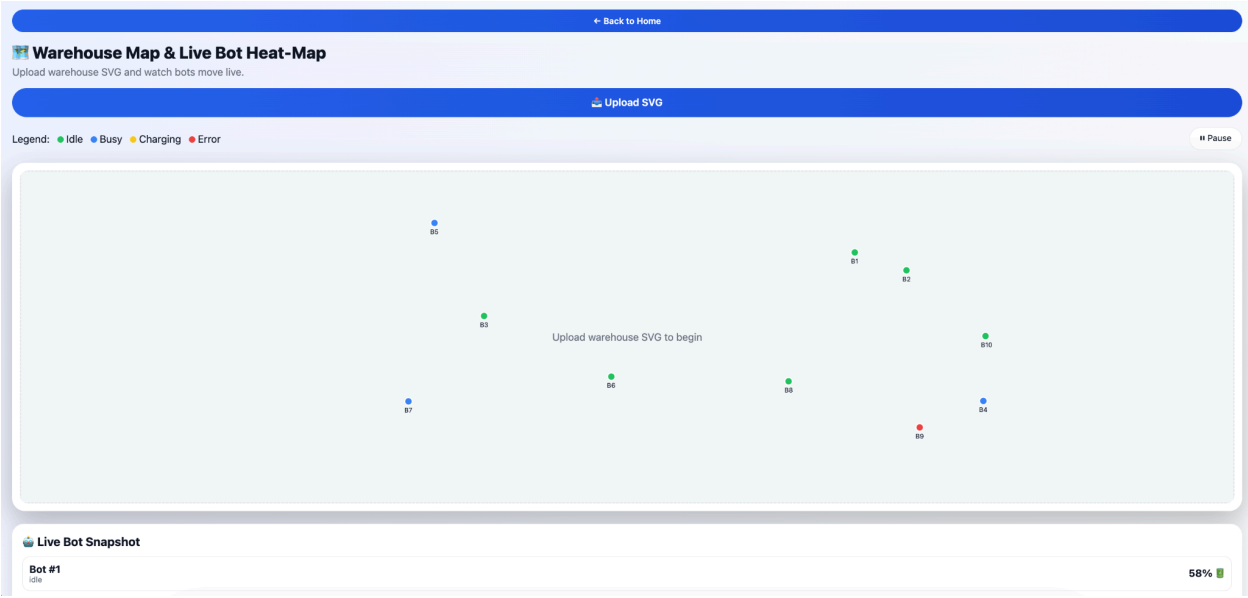
7. Auto Refresh & Performance Handling

- Live map auto-updates every **5–10 seconds**
- Smooth re-rendering without UI flickering
- Optimized state updates to avoid lag

Image Upload Feature

The Image Upload Feature allows users to upload images directly into the system for visual verification, task validation, monitoring, and record keeping. This feature enhances the platform by enabling real-world visual inputs alongside automated warehouse operations.

Maps



Mobile View

← Back to Home

 Mobile View

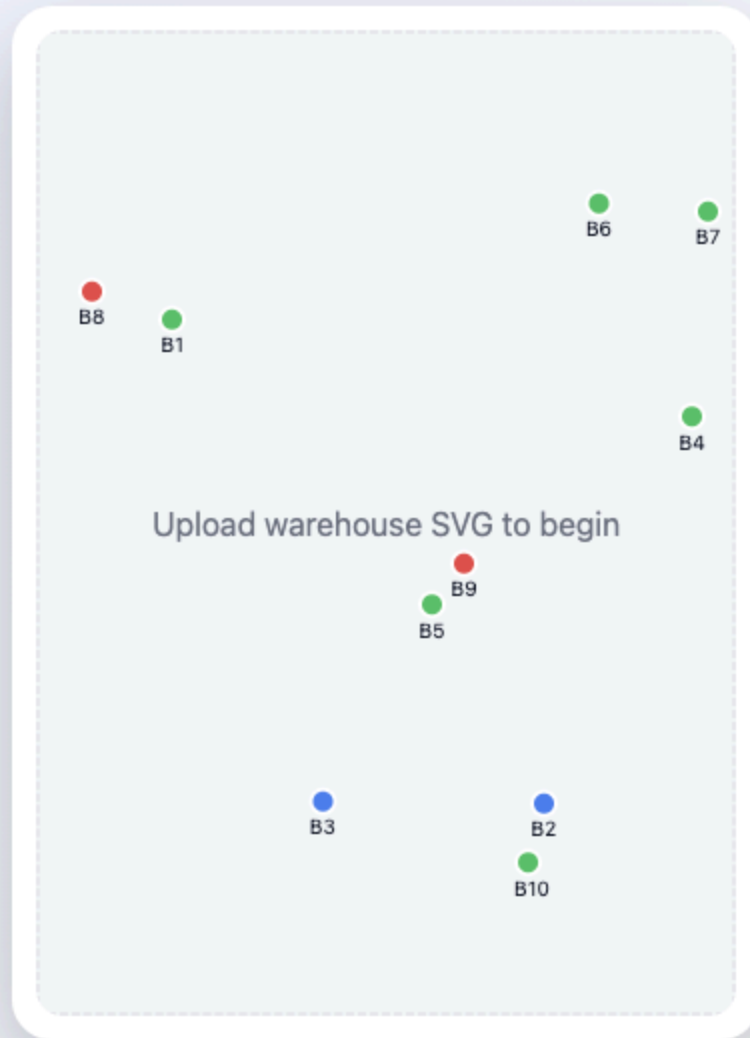
Warehouse Map & Live Bot Heat-Map

Upload warehouse SVG and watch bots move live.

 Upload SVG

Legend: ● Idle ● Busy ● Charging ● Error

⏸ Pause



 Live Bot Snapshot

