Group 9

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Project Description:
Plumbing and electrical management system.

Our project is about scheduling and inventory management for plumbing and electrical work in construction. We noticed that construction software often lacks up to date functionalities, so we want to create a software where a project manager in the plumbing and electrical sector can upload project blueprints and use built in tools to draw pipelines and wiring on top of them.

Workers would be able to view the blueprints and, if they are clocked in at the correct location (similar to iClicker), they can access the blueprint and mark the sections they've completed. The manager can then view the updated blueprint and see the materials used for each completed section (as submitted by the workers). The schedule would show due dates for each section (similar to eClass), and the inventory would update with each worker submission.

Potential Customers:
Plumbers

Similar Existing Products:
https://www.housecallpro.com/industries/plumbing-software/

Marketable Features:
- When the manager draws a pipe/wire section, it automatically becomes a scheduled item with a due date (no double entry).
- Each section carries its required materials list (and prices if applicable), so the plan is directly tied to inventory needs (not just a note on a drawing).
- Worker completion updates that instantly update 3 things at once: (1) blueprint changes color/status, (2) schedule marks complete, (3) inventory subtracts used material. All of this happens from one worker submission.
- Workers can only open/mark plans after location verification ("iClicker-style"). • Planned vs. actual material tracking per section: compare what was expected vs what was used and highlight over-use/under-use by section (useful for cost control).
- Progress heatmap on the blueprint: instantly see what's done, in progress, overdue, and blocked, directly on the drawing (not buried in a task list).
- Inventory alerts tied to upcoming sections: if next week's sections need materials you don't have, the system warns early (and can suggest reorder quantities).

Use Case Scenario:

A plumbing or electrical project manager begins by creating a new project for an apartment, house, or any other building. They upload their blueprint into the system, which becomes the main workspace for the project. Using built-in tools, the manager draws plumbing pipelines and electrical wires directly on top of the blueprint. Each drawn section represents a real part of the job, such as a bathroom line, kitchen pipeline or wiring around the building, and is given a name, a due date, and a list of required materials.

Once these sections are created, the system automatically connects them to the project schedule and inventory. Each section appears as a task with a deadline, allowing the

manager to track progress over time. At the same time, the required materials for each section are accounted for in the inventory system, giving the manager an overview of how much material is needed and how much is available.

When a plumber or electrician arrives at the construction site, they open the app and clock in. The system verifies that the worker is physically at the correct location before allowing access to the project blueprint. After completing their assigned work, the plumber opens the blueprint, selects the section they worked on, marks it as completed, and submits the materials they used during the task.

As soon as the worker submits their update, the system automatically updates the project. The completed section on the blueprint changes visually to show that the work is finished, the schedule marks the task as completed, and the inventory levels are reduced based on the materials used. The project manager can immediately see these updates, allowing them to monitor progress, track material usage, and manage deadlines without relying on manual reporting or constant communication.

Plumbing and Electrical Management System Vision Statement

The plumbing and electrical management system will be used to plan, track, and manage plumbing and electrical work in construction projects. The system enables project managers and on-site workers to collaboratively interact with digital blueprints in order to schedule work, report progress, and monitor material usage in real time.

The system is centered around construction blueprints uploaded by a project manager. These blueprints serve as the primary workspace for both planning and execution. Managers can annotate the blueprints by drawing pipelines or wiring paths and dividing the work into clearly defined sections. Each section is associated with a schedule, due date, and expected material usage. In this way, the blueprint becomes a live representation of the project rather than a static reference document.

On-site workers, such as plumbers and electricians, access the system during their work sessions. Before accessing the blueprint, workers must clock in at the correct job location, ensuring that only authorized personnel can view or modify project data. Once authenticated, workers can view their assigned sections, mark completed work directly on the blueprint, and submit the material used for each completed section.

The system automatically integrates worker updates with project scheduling and inventory management. When a section is marked as completed, the project schedule is updated to reflect the current state of the work, and inventory levels are adjusted based on the materials reported by workers. Project managers can view an up-to-date blueprint that visually distinguishes completed, in-progress, and pending sections, along with summaries of upcoming deadlines and current inventory status.

The primary users of the system are project managers in the plumbing and electrical construction sectors, who require timely and accurate information to make scheduling and procurement decisions. Secondary users include plumbers and electricians working on-site, who need a clear and efficient way to understand assigned tasks and report completed work.

Certain system functions, such as inventory control and schedule management, may be restricted to managers, while the workers have access to features relevant to their assigned work.

The use of a blueprint-based plumbing and electrical management system represents a significant improvement over traditional paper-based methods and fragmented digital tools. By combining blueprint interaction, scheduling, and inventory management into a single platform, the system reduces miscommunication, minimizes manual record keeping, and improves visibility into project progress for all stakeholders.

The system will be considered successful based on three criteria. First, the amount of resources used will be compared across similar projects managed with and without the system.

Big Stories:

1- Visual Construction Planning

As a project manager, I want to upload a blueprint and visually define plumbing and electrical sections, so that planning is directly tied to the actual building layout.

Priority: High
Story Points: 15

2- Project Sharing and Scheduling

As a manager, I want after drawing sections on blueprint for them to be automatically labelled and given status and a due date. I want users to be able to access the blueprint and see what must be done according to work assigned to them and when it is due.

Priority: Medium
Story Points: 10

3- Workers Completion System

As a manager, I want to view the completion status of blueprints and want to be able to see completed sections inside of it and get real time updates. It would be helpful to mark completed sections with different colours.

Priority: Medium
Story Points: 10

4- Historical Project Tracking

As a manager, I want to save past projects and their blueprints so that I can review previous work, compare material usage, and replicate successful plans.

Priority: Medium
Story Points: 9

Small Stories:

1- Worker Login

As a worker, I want to log in with my credentials so that I can access the sections I am assigned to.

Priority: High
Story Points: 3

2- Manager Login

As a manager, I want to log in with my credentials so that I can access full project controls and modify blueprints.

Priority: High
Story Points: 3

3- Role-Based Dashboard

As the system, I want to show different dashboards for managers and workers so that each user sees only what they are authorized to access.

Priority: High
Story Points: 4

4- Session Persistence

As a user, I want to remain logged in while using the system so that I do not have to log in repeatedly.

Priority: Low
Story Points: 2

5- Access Restriction

As the system, I want to block workers from accessing manager-only features so that project data stays secure.

Priority: High
Story Points: 2

6- Upload Blueprint

As a manager, I want to upload a blueprint image file so that it becomes the main workspace for the project.

Priority: High
Story Points: 3

Meeting video Link: https://www.youtube.com/watch?v=ytbclsm6Geg&feature=youtu.be