Design Document

Project Description

The Mining Machine Monitoring and Management System is a high-efficiency management platform integrating real-time device monitoring, mining pool management, and electricity price analysis and optimization. Users can intuitively view key metrics such as hashrate, temperature, model, status, customer information, and mining pool configurations, while also performing CRUD operations on devices via IP addresses for precise maintenance. Additionally, the system supports mining pool management, allowing users to configure mining machines for optimal performance flexibly. Furthermore, the electricity price analysis feature provides electricity price views and trend curves, enabling users to add or delete electricity price data, helping to optimize power costs and maximize overall profitability.

Core Features

1. Device Monitoring and Management

- Real-time Monitoring: Provides real-time data of mining machines, including hashrate, temperature, model, and status, enabling users to promptly grasp device operating conditions.
- CRUD Operations: Supports creating, reading, updating, and deleting mining machines via IP addresses, facilitating precise device maintenance.
- Customer Information Management: Records and manages customer information associated with each mining machine, supporting quick query and updates.

2. Electricity Price Analysis and Optimization

- Electricity Price Data Management: Users can add, delete, and view electricity price data; the system provides electricity price trend curves to help users understand price fluctuations.
- Cost Optimization Suggestions: Based on electricity price data and device energy consumption, the system offers optimization suggestions to help users reduce power costs and enhance overall profitability.

User Personas

1. Han – Operation Engineer

Age: 32

Responsibilities:

Monitors and maintains mining machines to ensure stable operations.

Minimizes downtime and optimizes mining performance.

Pain Points & Needs:

Requires a real-time monitoring system to track all mining machines, including key metrics like hashrate, temperature, model, and status.

Needs operations to quickly identify and manage faulty machines via IP addresses for precise maintenance.

Seeks an efficient way to manage customer information, ensuring machine assignments are up to date.

2. David – Professional Broker

Age: 45

Responsibilities:

Manages newly purchased mining machines and optimizes operational efficiency.

Facilitates ownership transfers and mining pool configurations.

Pain Points & Needs:

Requires customer information management to update ownership details efficiently.

Needs a mining pool management system to seamlessly reassign machines and modify mining pool settings for optimal performance.

Seeks an easy-to-use interface to streamline asset transitions between clients.

3. Kevin – Parts Manager

Age: 39

Responsibilities:

Oversees asset tracking and inventory control of mining machines.

Conducts regular audits to ensure an up-to-date and accurate inventory.

Pain Points & Needs:

Needs the ability to remove inactive or decommissioned machines using the

operations to maintain a clean and organized system.

Requires electricity price data management tools to monitor energy costs and optimize expenditures.

Looks for cost optimization suggestions based on electricity price trends and machine energy consumption to improve profitability.

User Stories

1. Han – Operation Engineer

As an Operation Engineer, I want to:

Monitor mining machines in real-time, so that I can promptly detect performance issues

View key metrics like hashrate, temperature, model, and status, so that I can quickly assess the health of each mining machine.

Perform operations on mining machines via IP addresses, so that I can efficiently update machine details, troubleshoot issues, and ensure optimal performance.

Manage customer information, so that I can keep track of machine assignments and ownership changes.

2. David – Professional Broker

As a Professional Broker, I want to:

Update customer ownership details efficiently, so that I can manage newly purchased mining machines without administrative delays.

Reassign mining machines and modify mining pool settings, so that I can optimize operational efficiency for my clients.

3.Kevin – Parts Manager

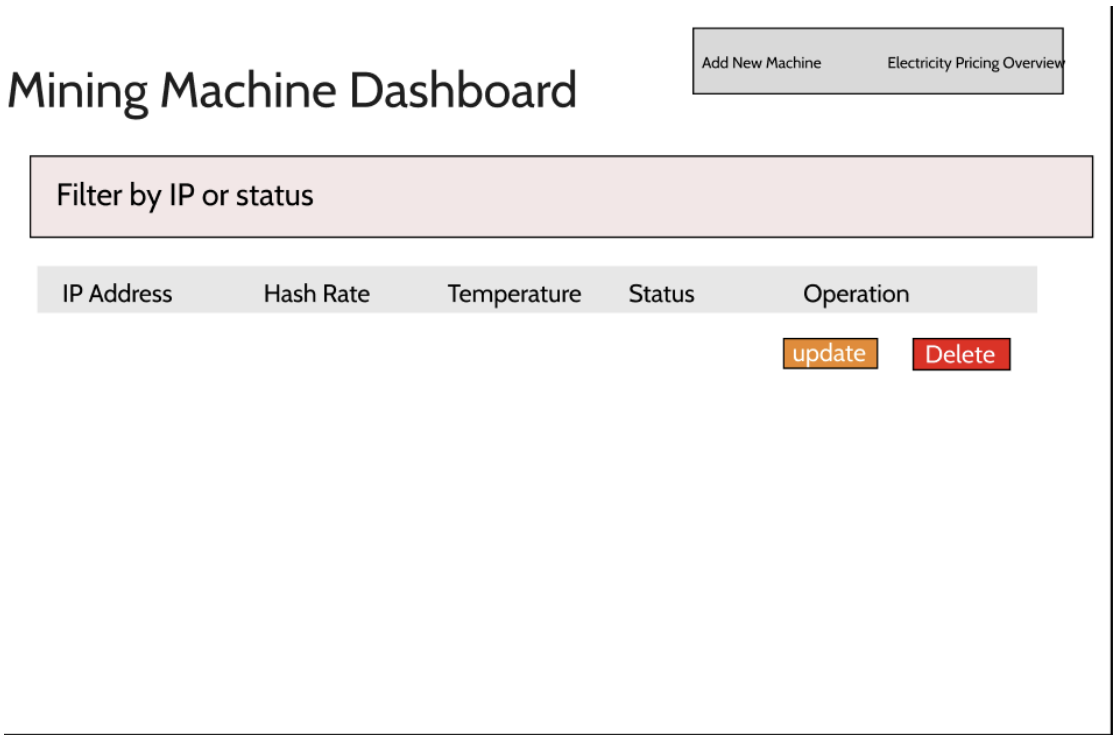
As a Parts Manager, I want to:

Remove inactive or decommissioned machines, so that I can maintain an accurate and updated inventory.

Access electricity price data and trends, so that I can monitor energy costs and make informed financial decisions.

Receive cost optimization suggestions, so that I can reduce power expenses and improve overall profitability.

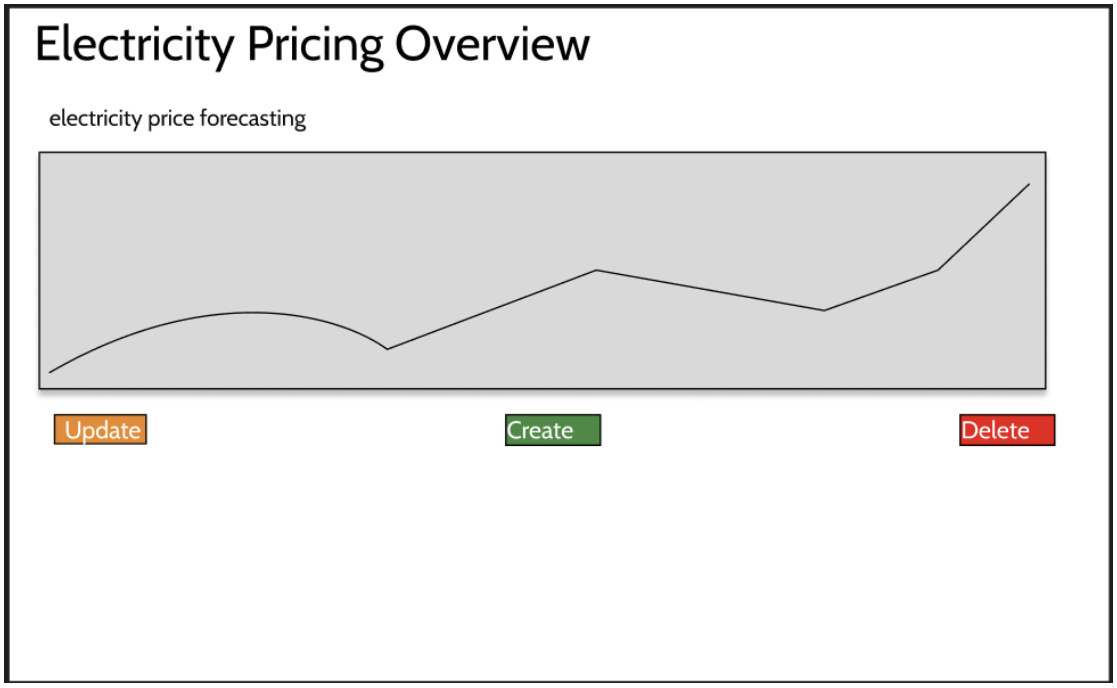
Design Mockup



Han – Operation Engineer: Uses the dashboard to monitor real-time performance metrics (hash rate, temperature, and status) and quickly identify faulty machines using the filter function. The update button helps him manage repairs efficiently.

Kevin – Parts Manager: Relies on the status column and delete button to remove inactive or decommissioned machines from the system. The Electricity Pricing Overview helps him evaluate cost efficiency when managing inventory.

--Electricity Pricing Overview



Kevin – Parts Manager: Monitors electricity pricing trends to ensure mining machines operate under the most cost-effective conditions and adds or deletes electricity price data to refine cost forecasting and make informed decisions on decommissioning inefficient machines.

--Add Machine

David – Professional Broker: Utilizes the update feature to reassign mining machines, update customer ownership details, and change mining pool configurations for optimal profitability. The "Add New Machine" button enables smooth onboarding of newly acquired machines.