

ShuhanMiner Business Requirements Document

1. Describing problems

ShuhanMiner is a comprehensive application designed to monitor, manage, and maintain cryptocurrency mining machines. It provides real-time tracking of key performance metrics, including hash rate, temperature, model, status, alerts, and electricity prices. Additionally, it supports remote management operations such as device restarts and firmware updates. ShuhanMiner aims to streamline mining operations management, enhance efficiency, and ensure the longevity of mining equipment. Whether managing small setups or large-scale mining farms, ShuhanMiner offers the necessary tools to maintain optimal performance and maximize profitability.

2. Rules of Business

I have highlighted the nouns in blue and the verbs in brown.

1. Real-time monitoring of mining machine status, including Ip address, hash rate, temperature, model, status, alerts, and electricity prices, with immediate notifications to users in case of anomalies.
2. Users must be able to select multiple mining machines simultaneously for batch restart operations.
3. The batch restart function should be efficient and stable, ensuring minimal downtime.
4. The system should provide restart success/failure feedback to help mining engineers analyze fault recovery.
5. The system must display real-time electricity prices, assisting engineers in deciding whether to continue mining operations.

6. When the electricity price **exceeds** the **preset cost threshold**, the system should automatically **trigger** an **alert** to **notify** the user.
7. The system should continuously **monitor** mining machine temperature data to ensure operations **remain** within **safe limits**.
8. If a mining machine's temperature exceeds the **safety threshold**, the system should trigger a **high-temperature alert** to notify the user.
9. Mining machines that enter **high-temperature protection mode** should be clearly **marked** on the **interface** for easy **identification**.
10. Users should be able to **filter**, **sort**, and **search** for **overheated machines** to **accelerate** **fault diagnosis** and **resolution**.

3. Nouns and Verbs

Nouns

1. Real-time monitoring
2. Ip address
3. hash rate
4. temperature
5. model
6. status
7. alerts
8. electricity prices
9. notification
10. user
11. anomaly
12. restart operation
13. downtime
14. restart success/failure feedback

15. mining engineer
16. fault recovery
17. mining operation
18. cost threshold
19. alert
20. temperature data
21. safety threshold
22. high-temperature alert
23. high-temperature protection mode
24. interface
25. identification
26. overheated machines
27. fault diagnosis
28. resolution
29. safe limits

Verbs

1. select
2. restart
3. analyze
4. display
5. exceeds
6. preset
7. trigger
8. notify
9. monitor
10. remain

11. marked

12. filter

13. sort

14. search

15. accelerate

4. Classes and Attributes

MiningMachine

- ipAddress
- temperature
- model
- status
- alerts
- highTemperatureMode

MonitoringSystem

- realTimeMonitoring
- miningMachines
- faultDiagnosis
- overheatedMachines

Alert

- alertType
- alertLevel
- timestamp
- triggeredBy
- notifiedUsers

RestartOperation

- selectedMachines

- restartStatus
- downtime
- faultRecoveryRate

User

- userId
- role
- notifications

ElectricityPricing

- currentPrice
- costThreshold
- priceHistory

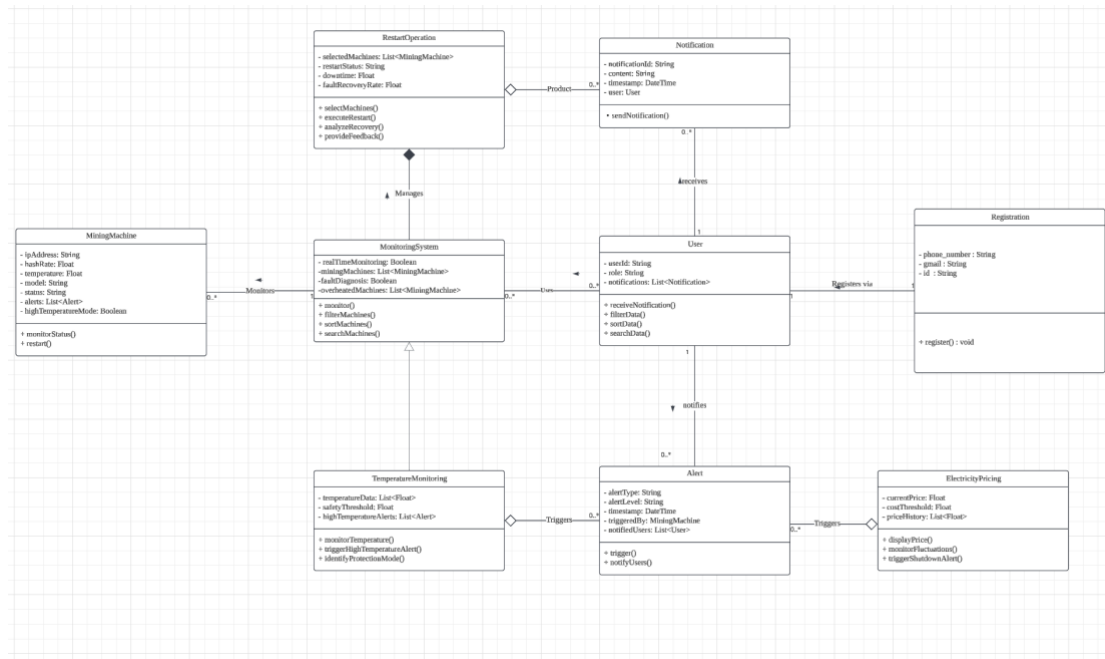
TemperatureMonitoring

- temperatureData
- safetyThreshold
- highTemperatureAlerts

Notification

- notificationId
- content
- timestamp
- user

5. Classes and Attributes



6. Create User Personas

User Persona 1: Alex

Age: 30

Occupation: Mining Farm Administrator

Backstory: Alex has been managing cryptocurrency mining operations for several years and has a deep understanding of mining machine efficiency and maintenance. He values real-time data analysis and wants to fine-tune operations to maximize profitability.

Scenario & Reason to Use ShuhanMiner: Alex uses ShuhanMiner to monitor hashrate, temperature, and electricity prices in real-time. He relies on automated alerts and batch operations to quickly respond to changing conditions and optimize mining performance.

User Persona 2: Emily

Age: 28

Occupation: Mining Operation Engineer

Backstory: Emily is responsible for the daily maintenance and troubleshooting of mining machines. She ensures that devices operate within safe limits and reacts quickly to overheating or performance drops.

Scenario & Reason to Use ShuhanMiner: Emily leverages ShuhanMiner to receive real-time notifications on machine failures and temperature spikes. She uses the platform's filtering and sorting tools to identify overheating machines quickly and perform batch restarts to maintain efficiency.

7. Target audience

Target Audience Examples

1. Mining Farm Administrator

Manages hundreds to thousands of mining machines, optimizing operations.

Needs real-time monitoring of hashrate, electricity costs, and temperature.

Uses batch management and electricity price alerts to reduce costs.

2. Mining Operation Engineer – Emily

Responsible for maintenance, troubleshooting, and cooling management.

Needs high-temperature alerts, fan monitoring, and fault detection.

Uses batch restart, filtering, and fault logs to improve efficiency.

3. Mining Investor

Focuses on profitability, electricity costs, and ROI.

Needs historical data analysis, revenue forecasting, and electricity price trends.

Relies on a dashboard for quick financial insights.

4. Small-Scale Miner

Operates a few machines, prioritizing cost efficiency and remote management.

Needs automated tools like scheduled restarts and power-saving modes.

Uses mobile monitoring to track machine status anywhere.

8. Challenge Questions

1. How can ShuhanMiner efficiently process and display real-time data for thousands of mining machines without delays?
2. How can the system intelligently manage high-temperature alerts and prevent hardware damage?
3. How can the system ensure stable and reliable batch restart operations for large-scale mining farms?

4. User Stories

User Persona 1: Alex - Mining Farm Administrator

As a mining farm administrator, Alex wants to select multiple mining machines simultaneously for batch restarts to recover devices that have entered high-temperature protection mode quickly, minimize downtime, and improve overall efficiency. He also needs the system to monitor real-time electricity prices and automatically trigger alerts when the price exceeds the preset cost threshold, allowing him to decide whether to shut down certain machines to avoid financial losses. Additionally, Alex relies on the platform to display real-time monitoring data, including IP address, hash rate, temperature, status, alerts, and electricity prices, so he can quickly identify anomalies and optimize mining operations for long-term profitability.

To further enhance decision-making, Alex requires the system to provide future electricity price estimations based on historical trends, market fluctuations, and predictive analytics.

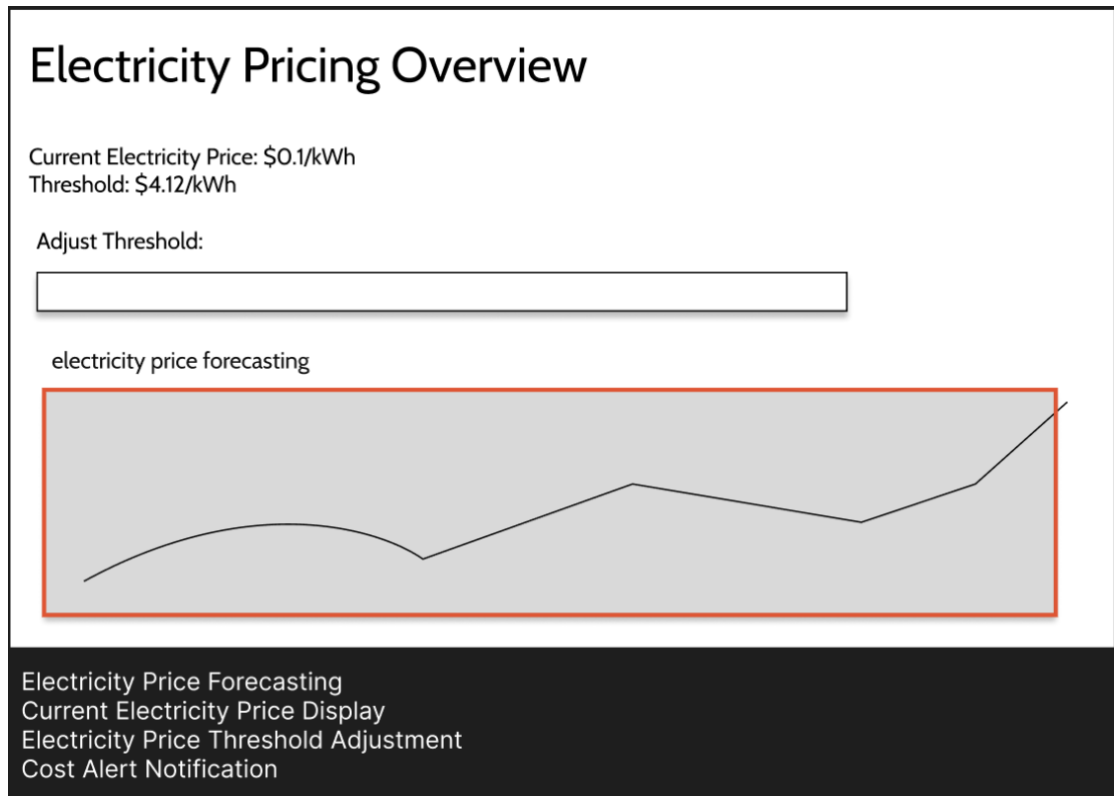
User Persona 2: Emily - Mining Operation Engineer

As a mining operation engineer, Emily needs restart success/failure feedback after batch restarts to analyze which machines are malfunctioning and require further maintenance. She also depends on high-temperature alerts to notify her when a mining machine exceeds the safety threshold, enabling her to take immediate action, such as adjusting the cooling system or relocating the device. Additionally, Emily requires filtering, sorting, and searching functionalities to quickly identify

overheating machines, accelerating fault diagnosis and resolution to ensure efficient mining operations.

5. Interface Mockups

Alex's interface



Emily's interface

Mining Machine Dashboard

Filter by IP or status

| Select | IP Address | Hash Rate | Temperature | Status | Electricity Price |
|--------------------------|------------|-----------|-------------|--------|-------------------|
| <input type="checkbox"/> | | | | | |

Restart Selected Machines

Monitor mining machine status in real-time (IP, hash rate, temperature, status, and electricity price).
Filter and search for specific machines.
Select multiple machines for batch restarts.
Receive alerts for overheating machines.