

# WEARABLE SYSTEM FOR MONITORING POSTURE AND HUMAN MOVEMENTS

**MS1 28/10/2025**

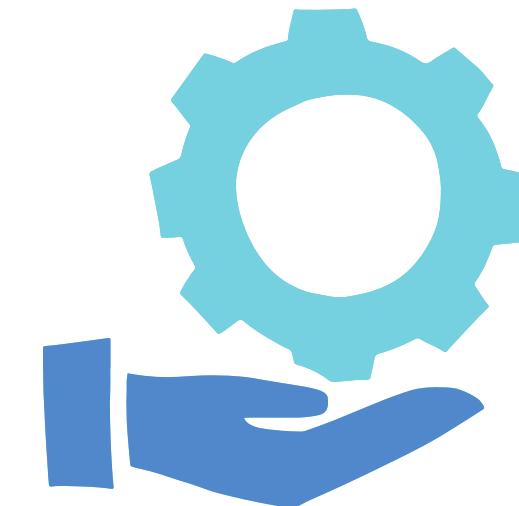


Beatriz Francisco Nº 118638  
Catarina Ribeiro Nº 119467  
Mariana Marques Nº 118971  
Marta Cruz Nº 119572  
Matilde Rodrigues Nº 119714

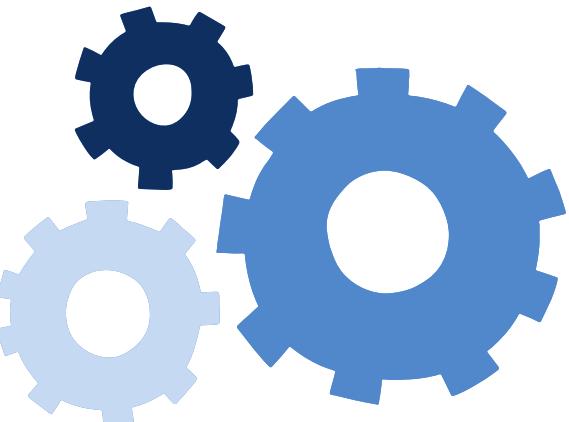
# CONTEXT



**Many people suffer from ergonomic problems that could be prevented with prior precautions.**

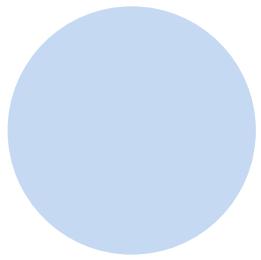


**Develop a system that monitors human movement, heart rate and temperature through a wearable suit with sensors.**

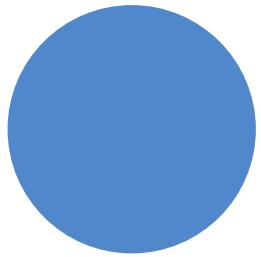


**Capable of detecting and recording human body movements in real-time. And a feedback system tha provides notifications and status updates when risky postures are detected.**

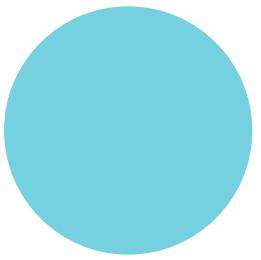
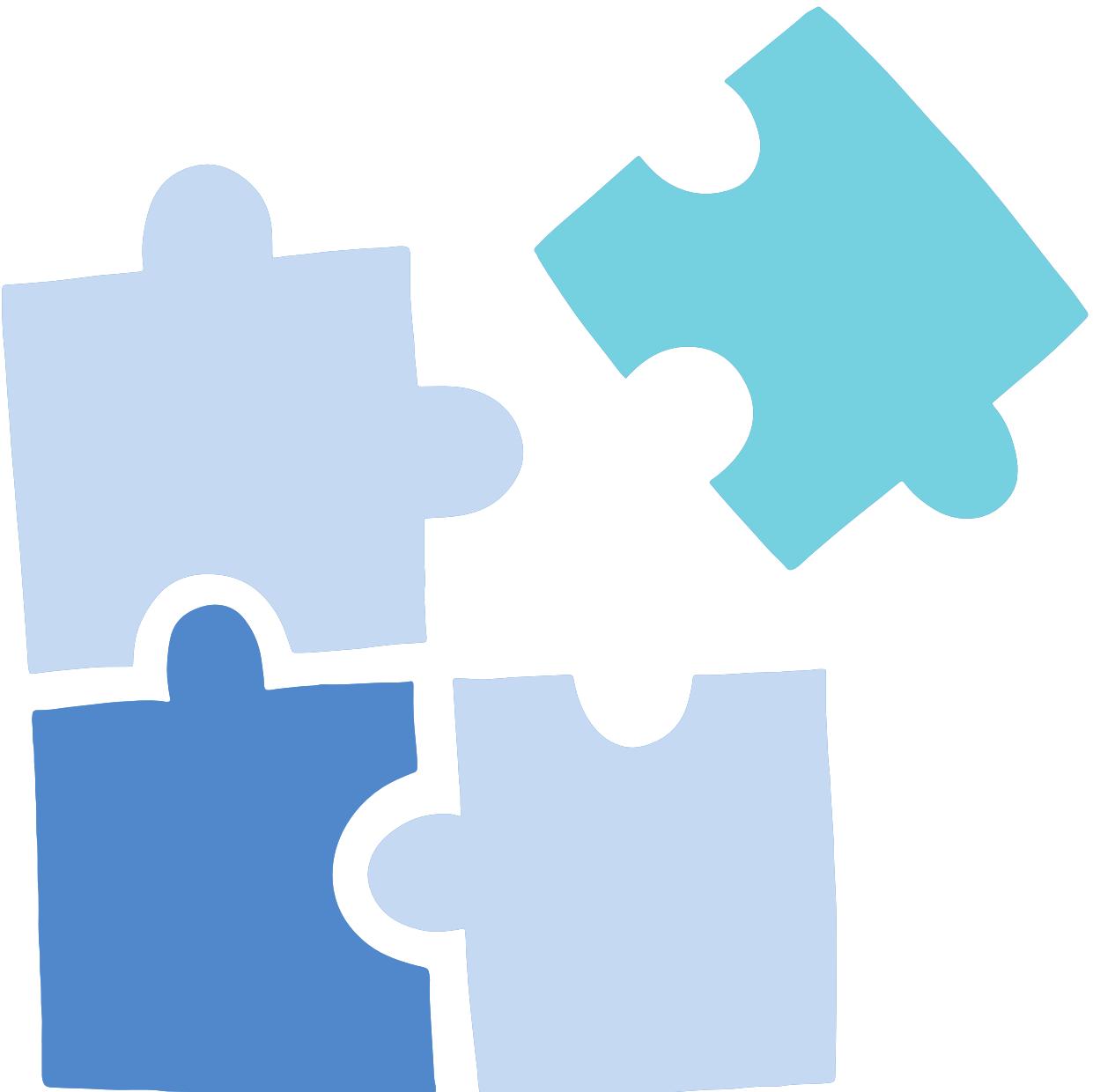
# PROBLEM



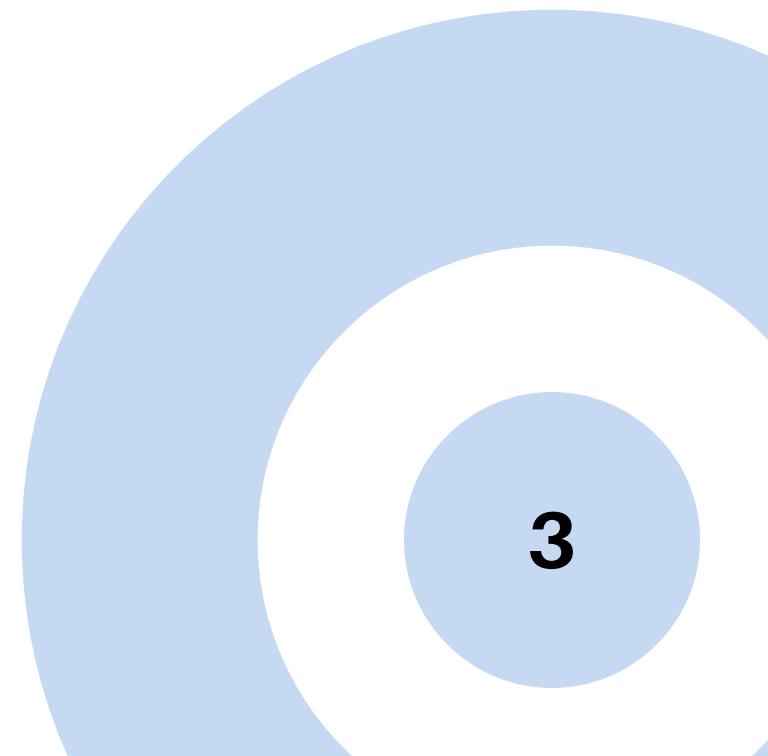
Poor posture



Traditional methods



Wearable suit and  
Feedback system



# MOTION SUIT

Our project involves developing a suit equipped with sensors that measure body posture and detect anomalies



# OUR TEAM



**Marta Cruz**  
Software Architect



**Beatriz Francisco**  
DevOps Master



**Matilde Rodrigues**  
Hardware Leader

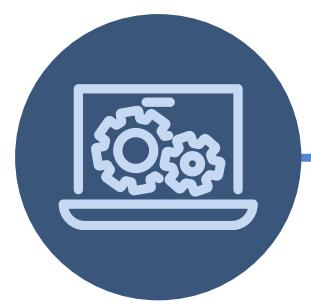


**Mariana Marques**  
Team Manager



**Catarina Ribeiro**  
Web Platform

# GOALS



Advanced technology  
integration



Data analysis and reports



Specialized Access  
Management

# GOALS



Strengthening safety and  
health



Reduce ergonomic risks

# TASKS

- |            |   |             |   |
|------------|---|-------------|---|
| <b>T-1</b> | Receive alerts for incorrect posture    | <b>T-7</b>  | Calibrate the suit                                |
| <b>T-2</b> | View statistics on the dashboard        | <b>T-8</b>  | Monitor the battery and manage energy efficiently |
| <b>T-3</b> | View real-time metrics on the dashboard | <b>T-9</b>  | Access all collected information                  |
| <b>T-4</b> | Customize app alerts                    | <b>T-10</b> | Manage user accounts                              |
| <b>T-5</b> | Set goals to improve posture            | <b>T-11</b> | Analyze collected data                            |
| <b>T-6</b> | View real-time progress toward my goals | <b>T-12</b> | Compare data from different users                 |

# EXPECTED RESULTS



Improve the user's posture



Functional suit with sensors



Export data for investigation purposes



Sending alerts and display user data



# RELATED WORK

	DorsaVI	FlexiTrace	SmartPosture	SwordHealth	Current Suit	MotionSuit
Wearable Sensors	✓	✗	✗	✗	✓	✓
Performance Analytics	✓	✓	✓	✓	✓	✓
Real-Time Feedback	✓	✗	✗	✓	✓	✓
Gamification	✗	✓	✗	✗	✗	✓

# PERSONAS



**Suit User**

- Factory Line Operator
- Construction worker
- Deti University Student

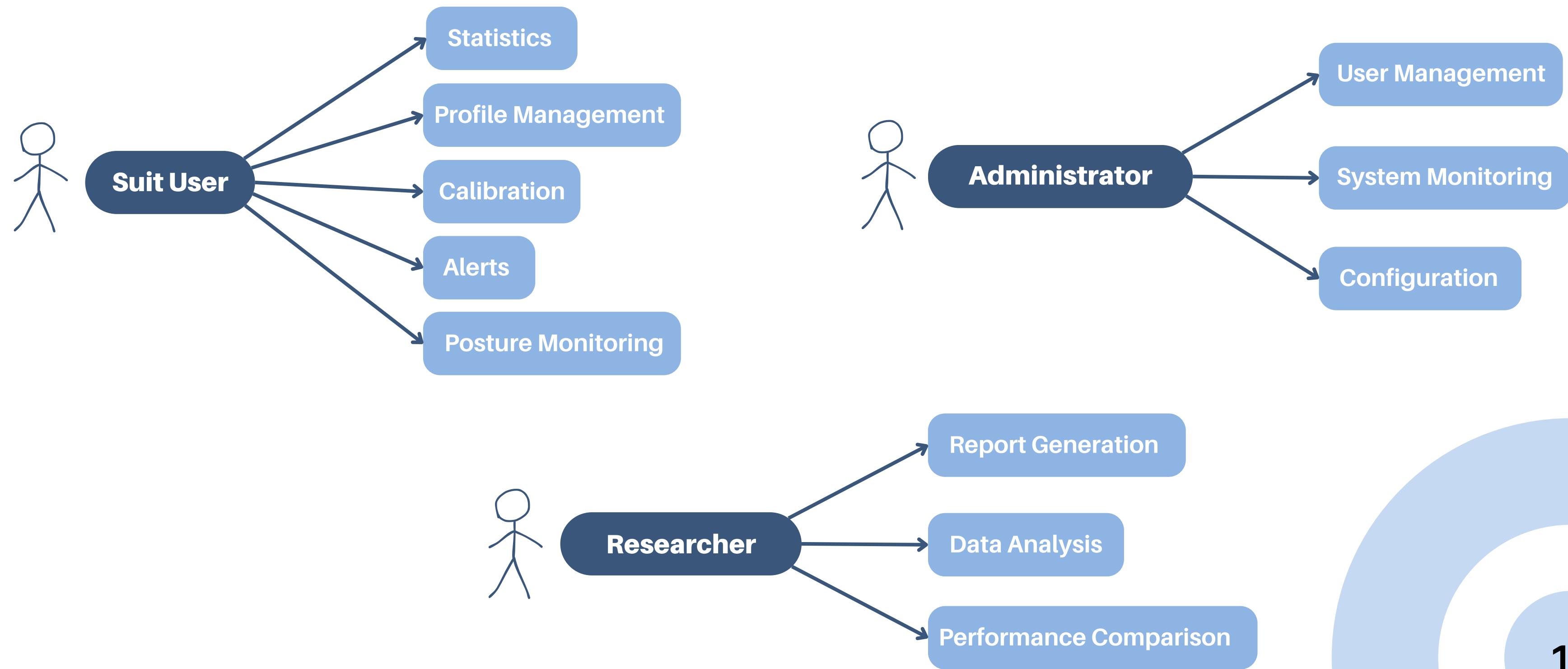


**Researcher**

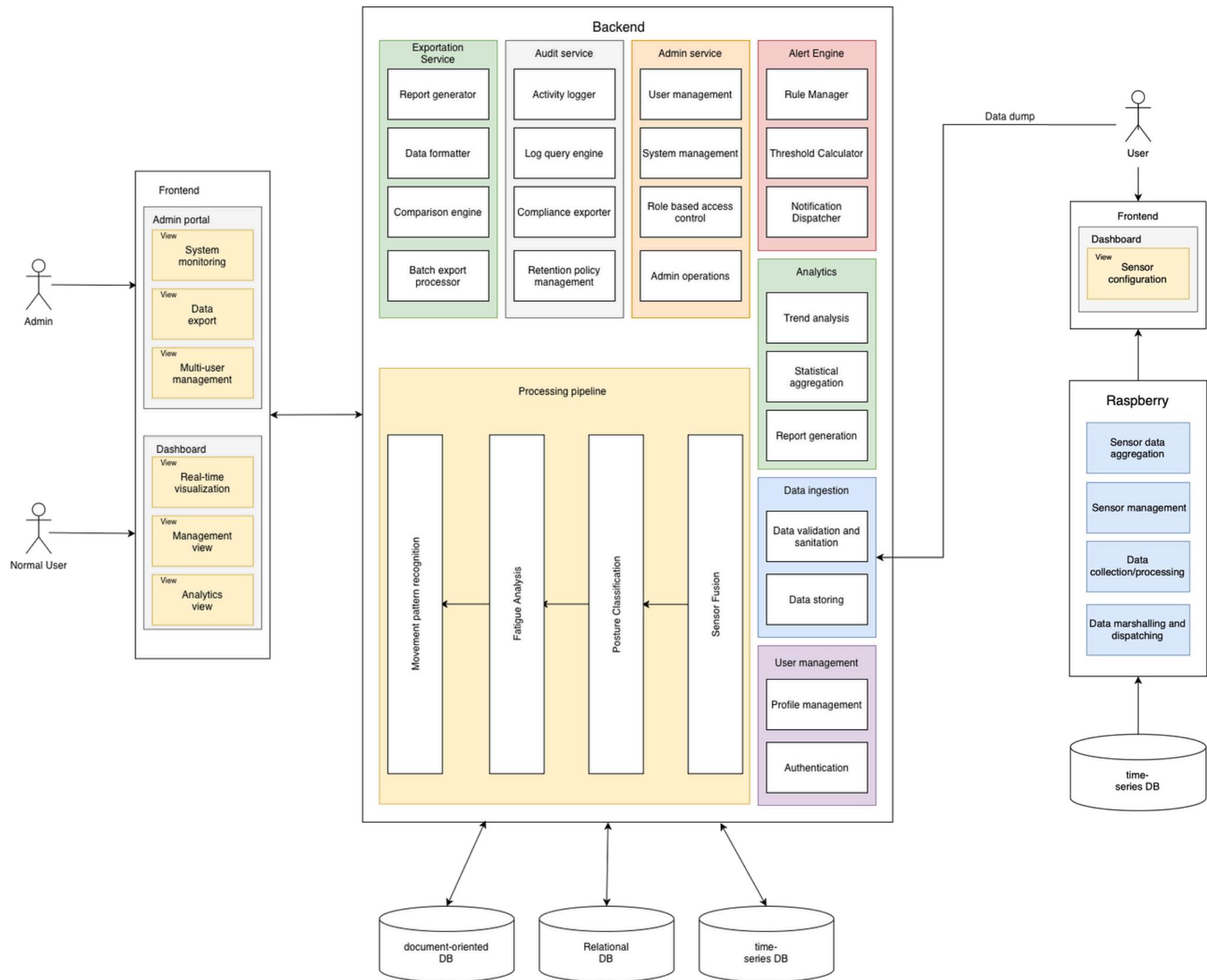


**Administrator**

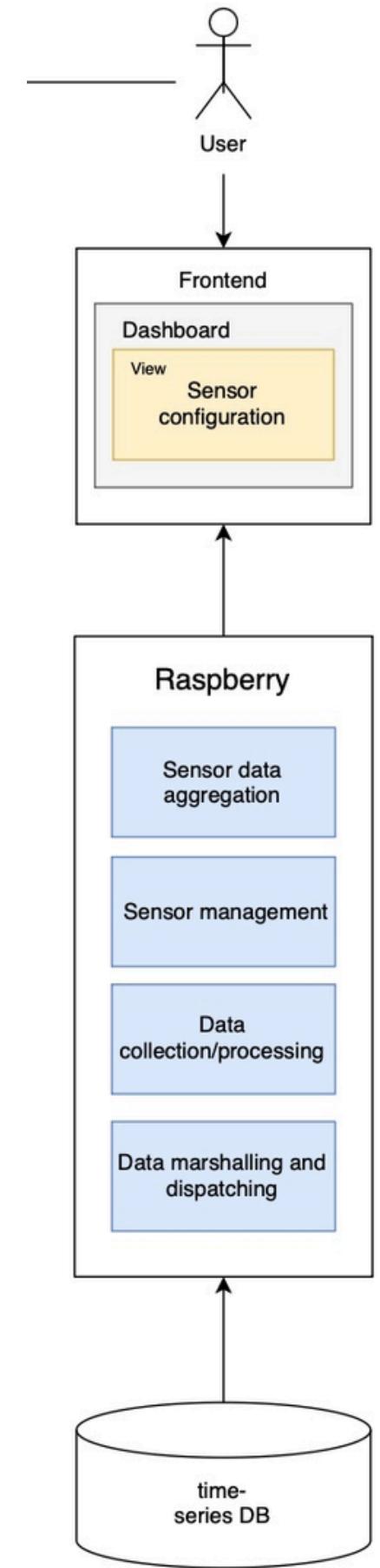
# USE CASES



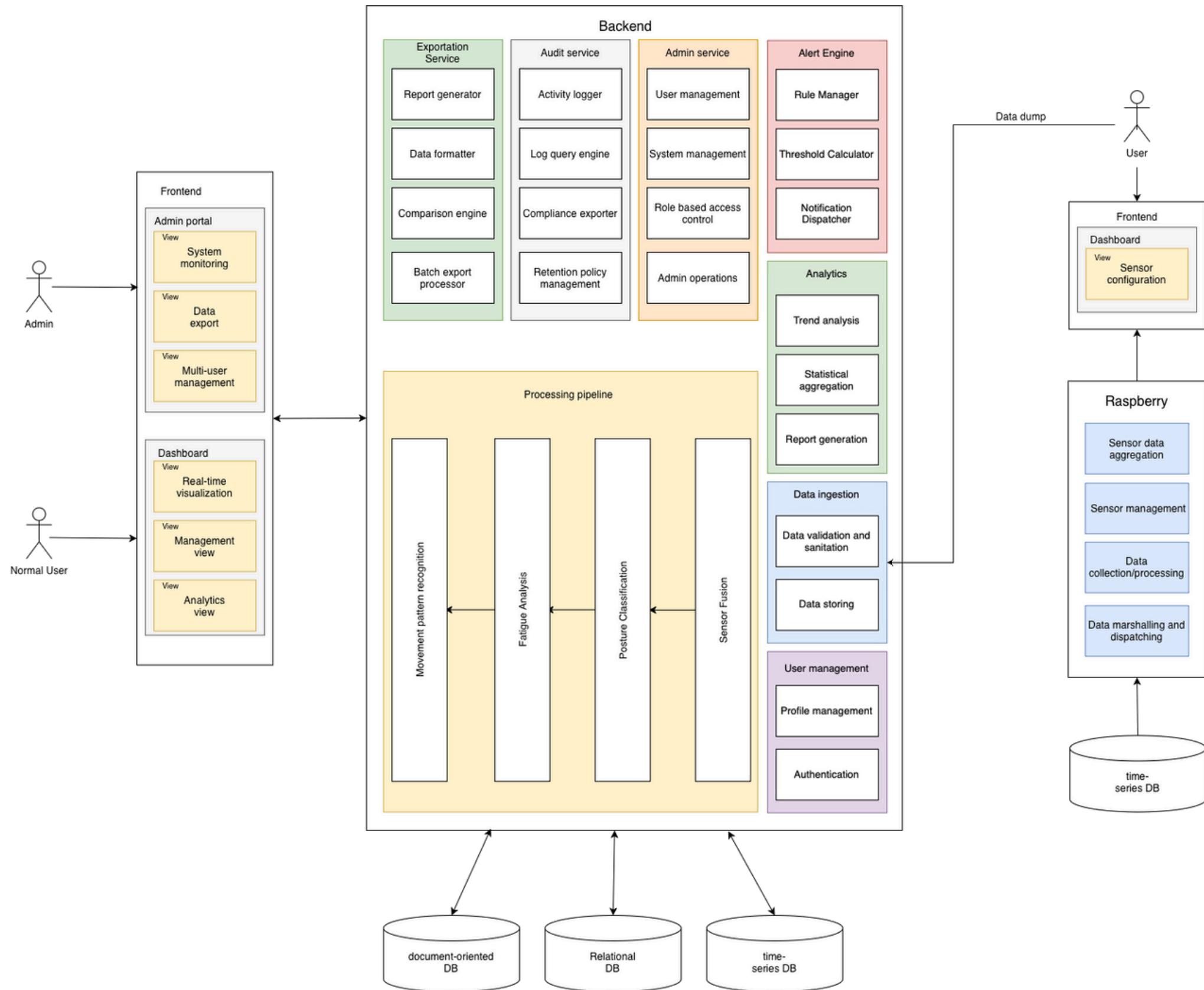
# ARCHITECTURE



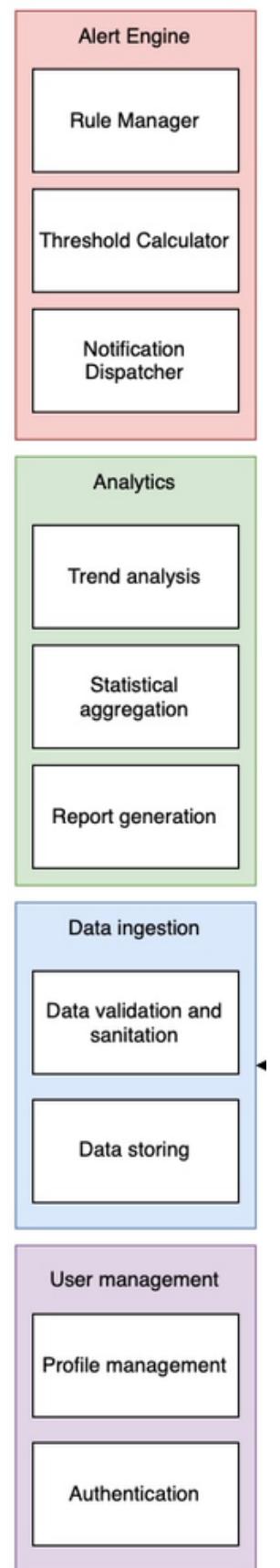
# ARCHITECTURE



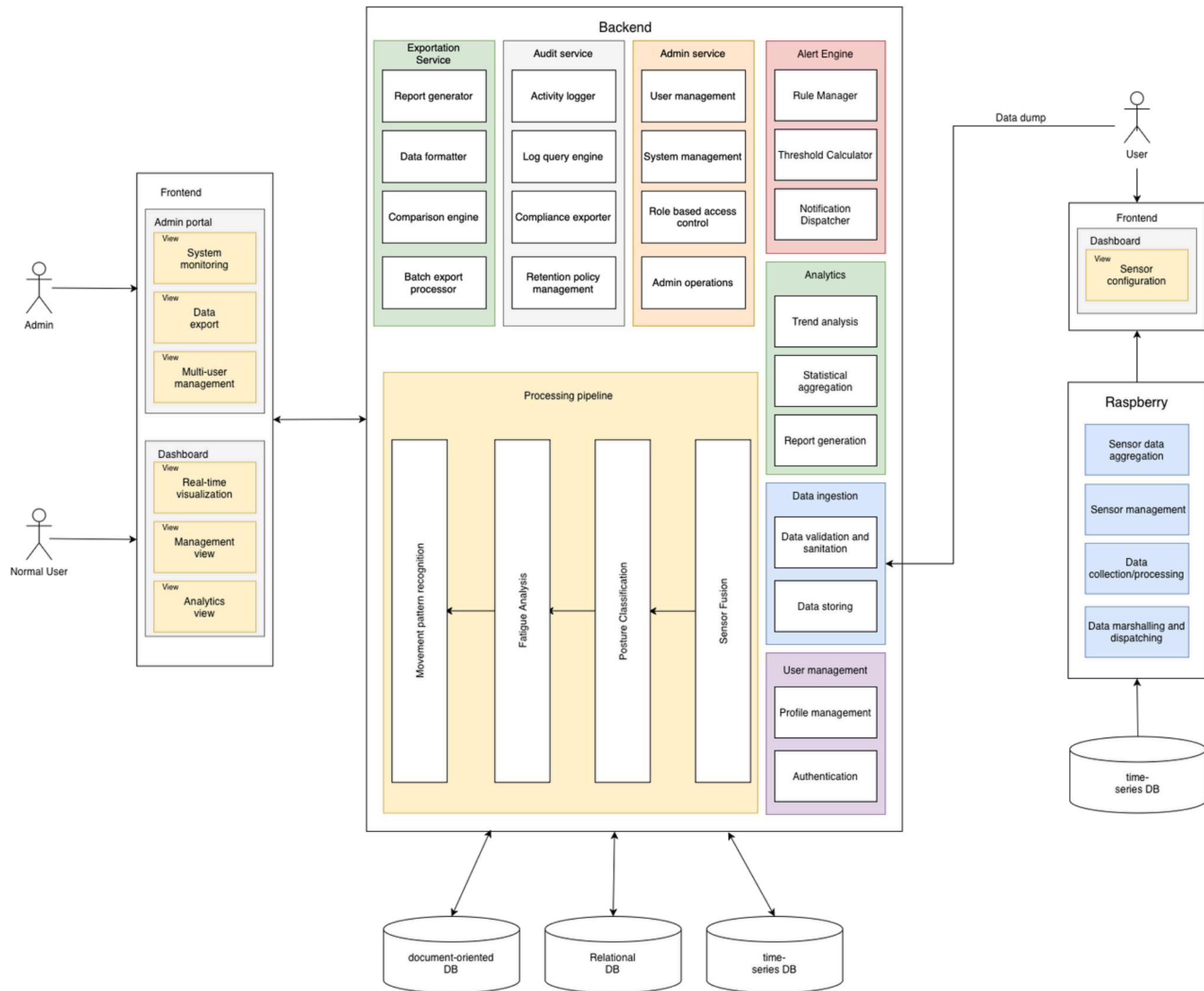
# ARCHITECTURE



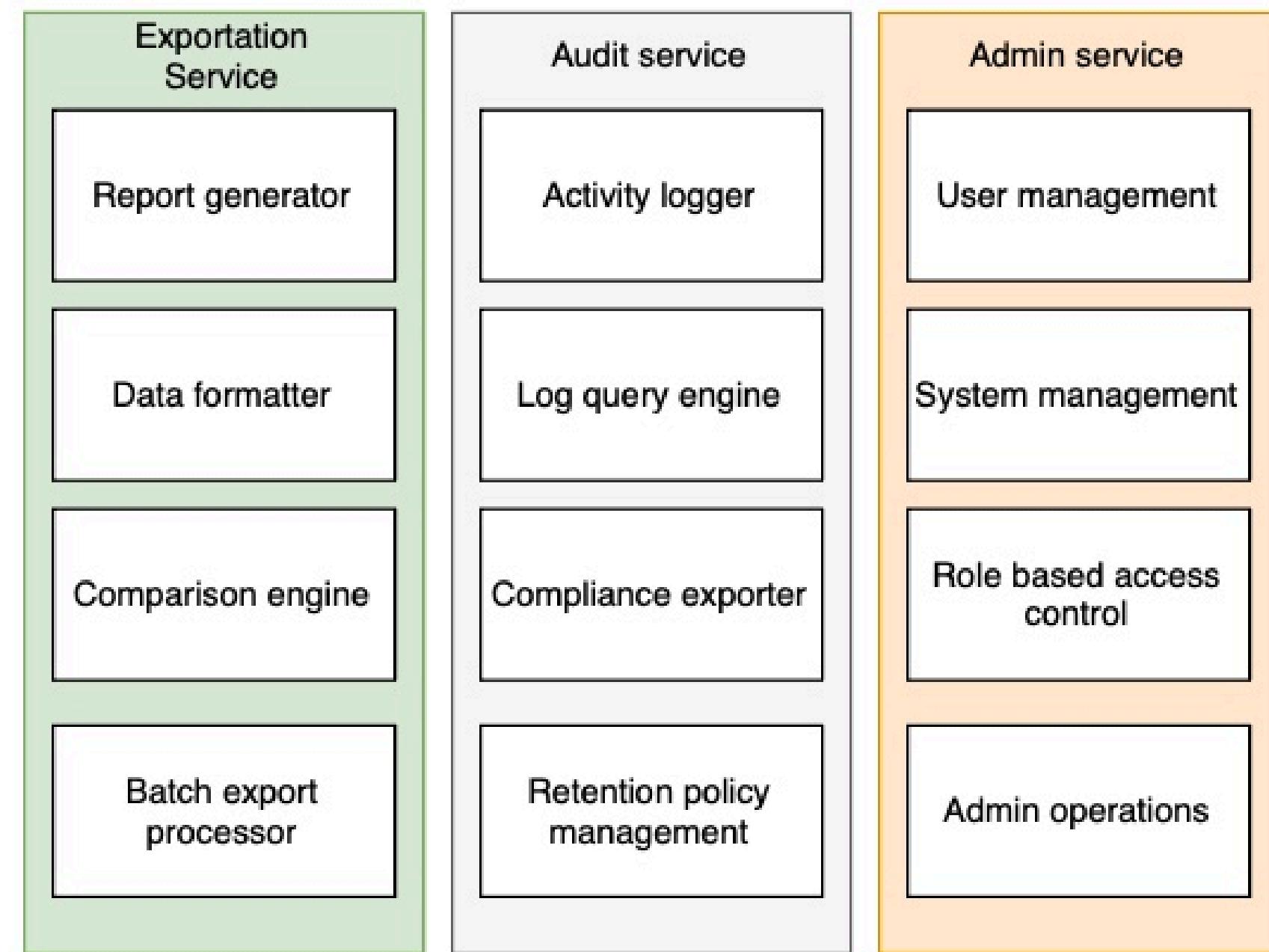
# ARCHITECTURE



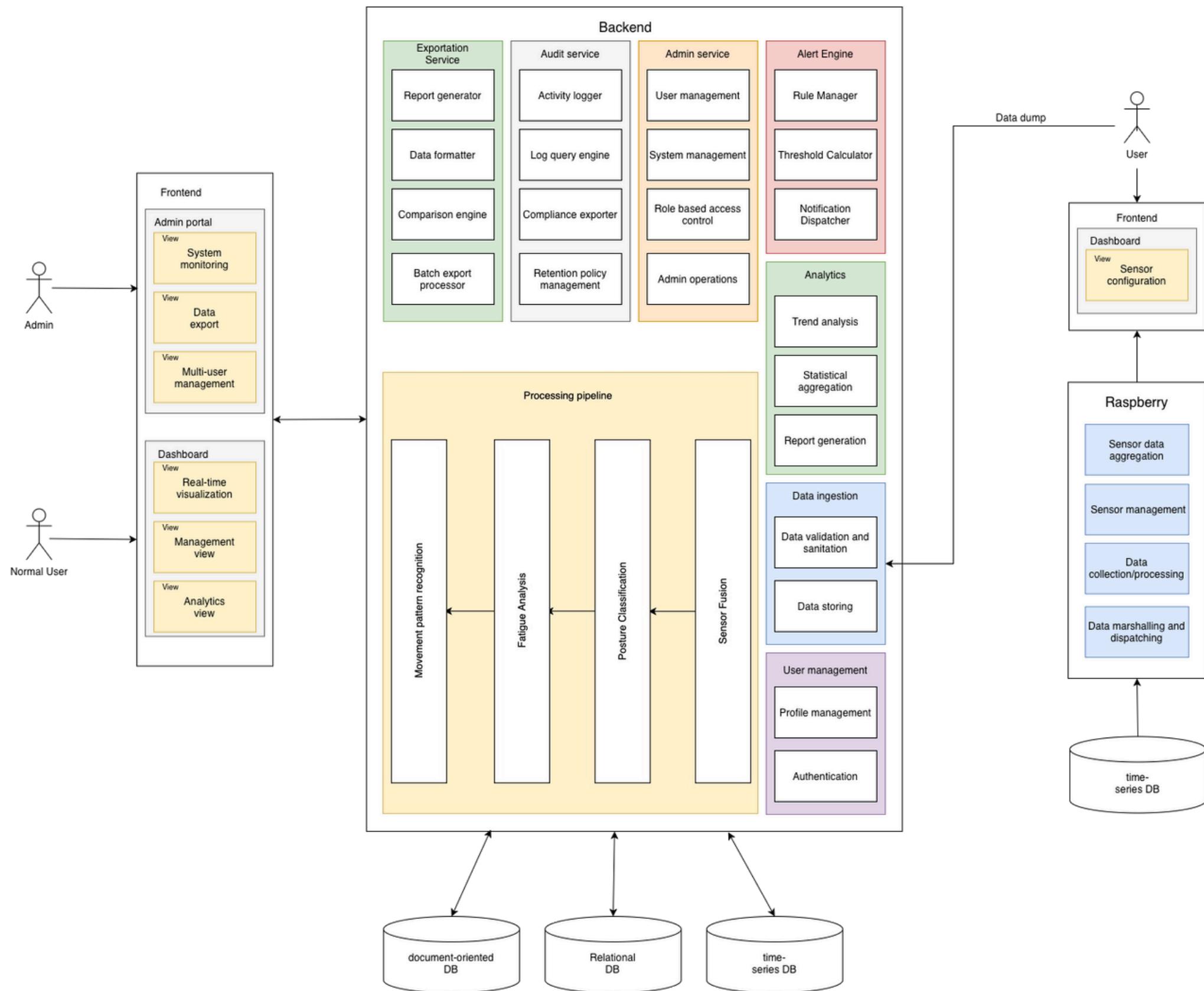
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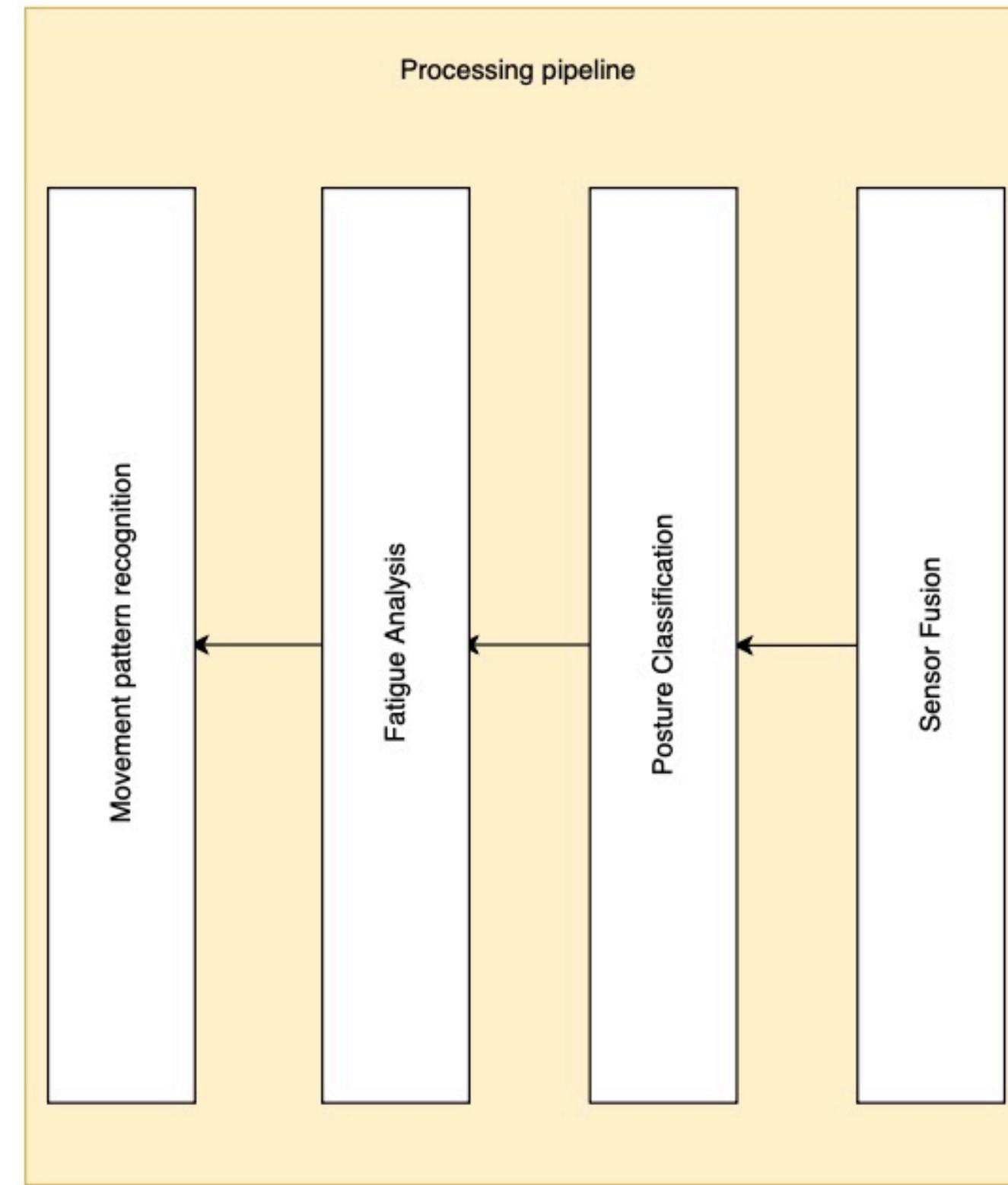
# ARCHITECTURE



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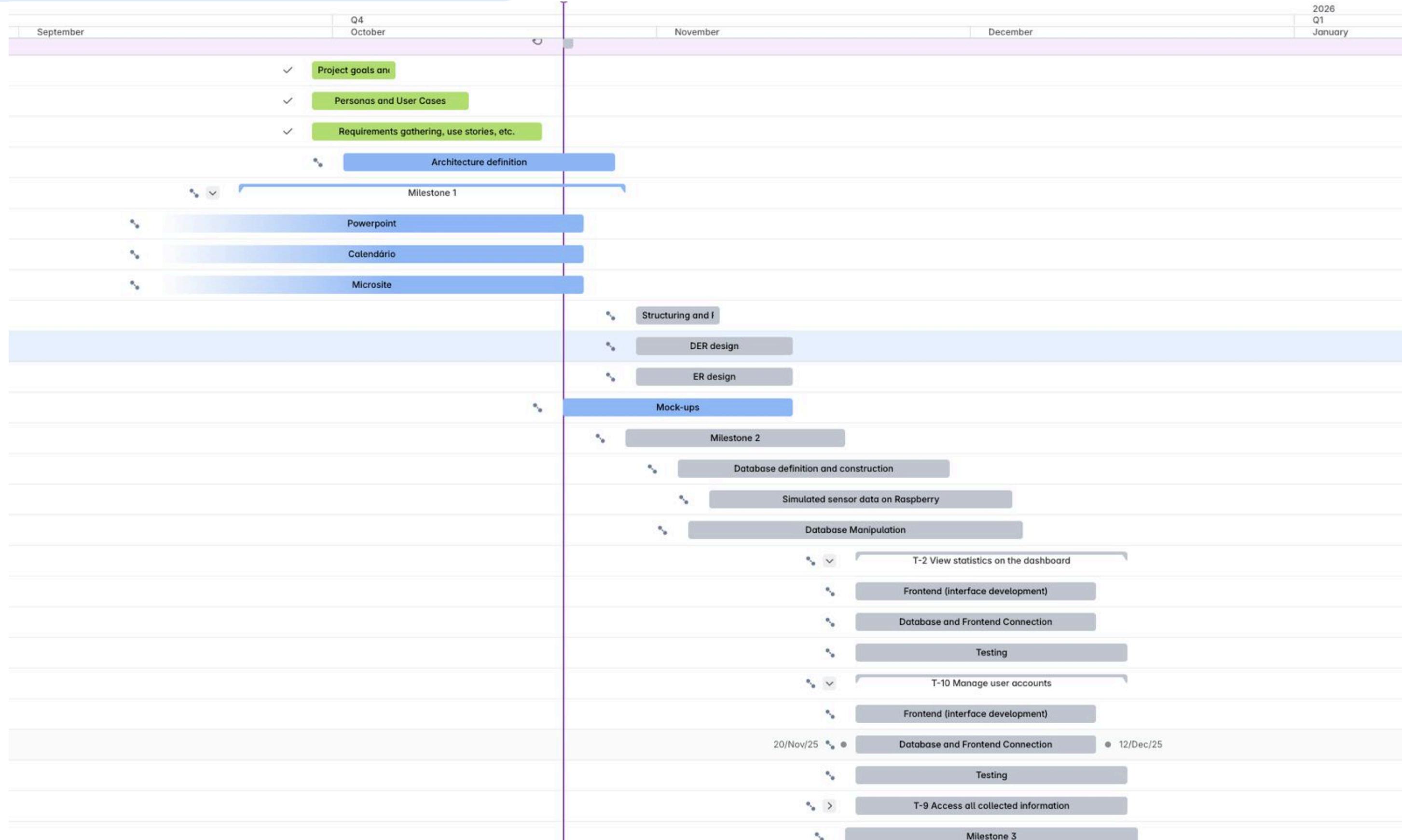


# RISKS

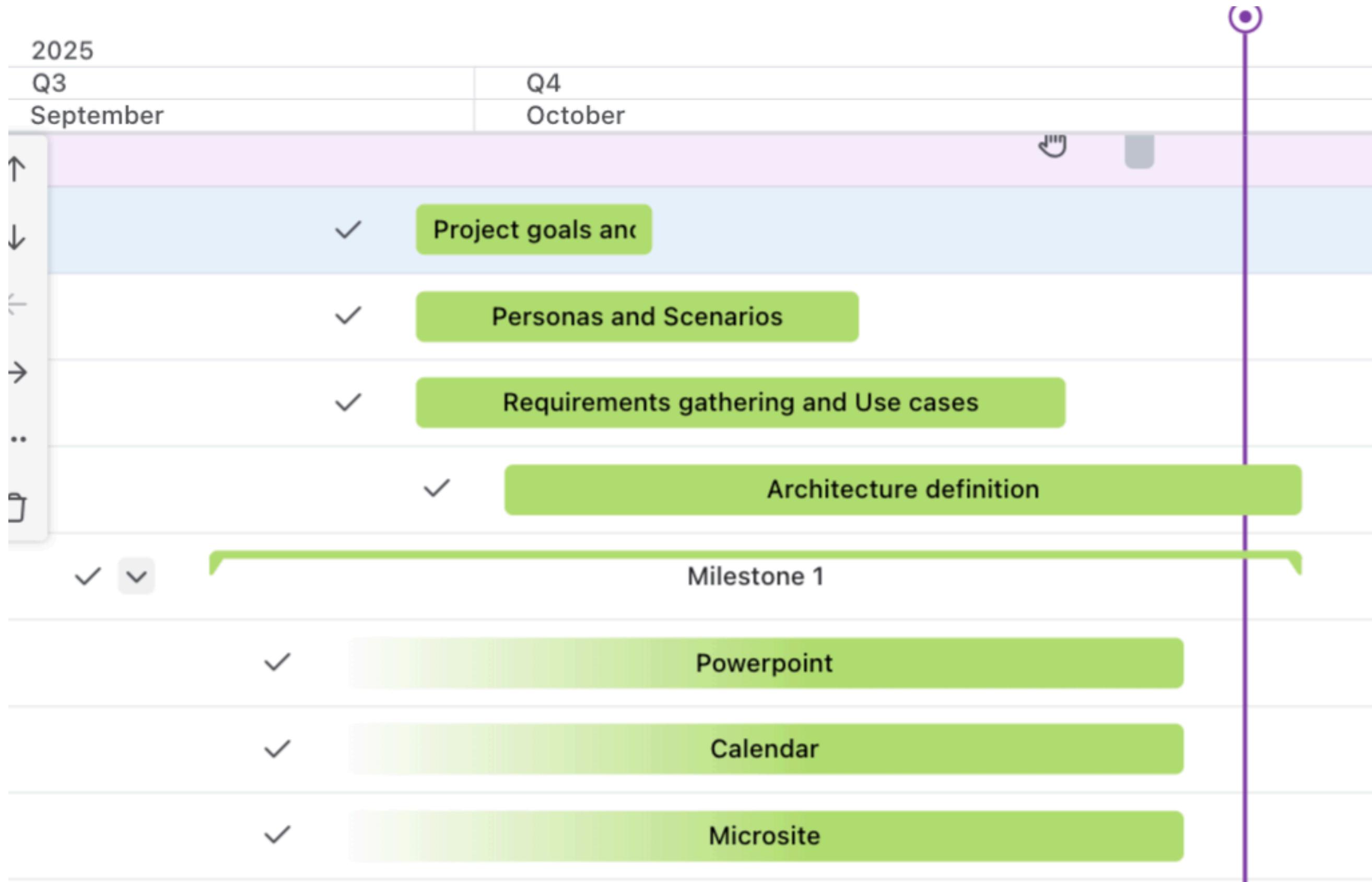
- Incomplete suit development
- Limited battery life
- Connectivity issues
- Sensor calibration and reliability issues
- Accuracy of sensors due to different body types



# CALENDAR



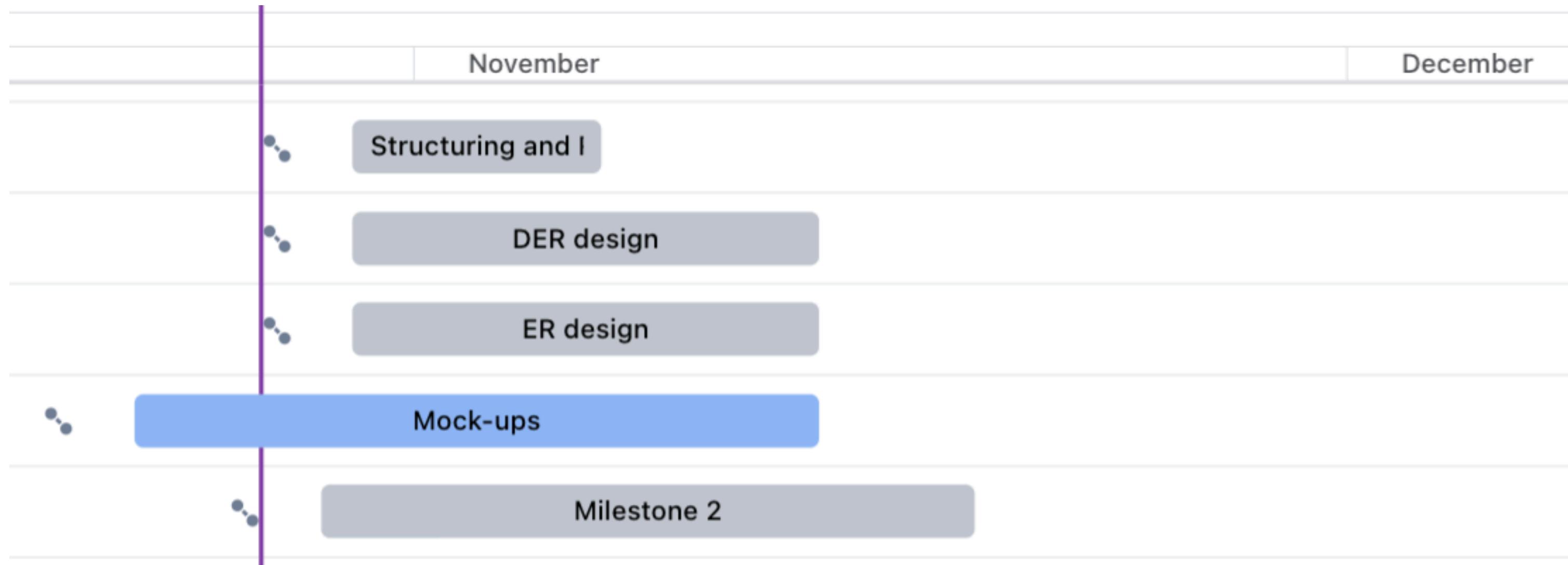
# CALENDAR



# CALENDAR

Module	Name	Assignee	Start date	Due date	Issue T...	Parent ...	Priority	Status
Inception	Project goals and overall expected fur	everyone	29/Sep/25 12:00 AM	06/Oct/25 12:00 AM	Task		Low	Done
Inception	Personas and Scenarios	Matilde Rodrigues Catarina Ribeiro Mariana Marques	29/Sep/25 12:00 AM	13/Oct/25 12:00 AM	Task		Low	Done
Inception	User Stories	Mariana Marques	29/Sep/25 12:00 AM	20/Oct/25 12:00 AM	Task		Low	Done
Requirements	Requirements gathering and use case	Mariana Marques Beatriz Francisco	29/Sep/25 12:00 AM	20/Oct/25 12:00 AM	Task		Low	Done
Architecture	Architecture definition	Marta Cruz Beatriz Francisco	02/Oct/25 12:00 AM	28/Oct/25 12:00 AM	Task		High	Done
Milestone	Milestone 1	everyone	22/Sep/25 12:00 AM	28/Oct/25 12:00 AM	Task		Highest	In Progress
	Powerpoint	Matilde Rodrigues Catarina Ribeiro Beatriz Francisco		24/Oct/25 12:00 AM	Subtask	Milestone 1	High	In Progress
	Calendário	Mariana Marques		24/Oct/25 12:00 AM	Subtask	Milestone 1	Highest	In Progress
Communication	Microsite	Catarina Ribeiro		24/Oct/25 12:00 AM	Subtask	Milestone 1	Highest	In Progress

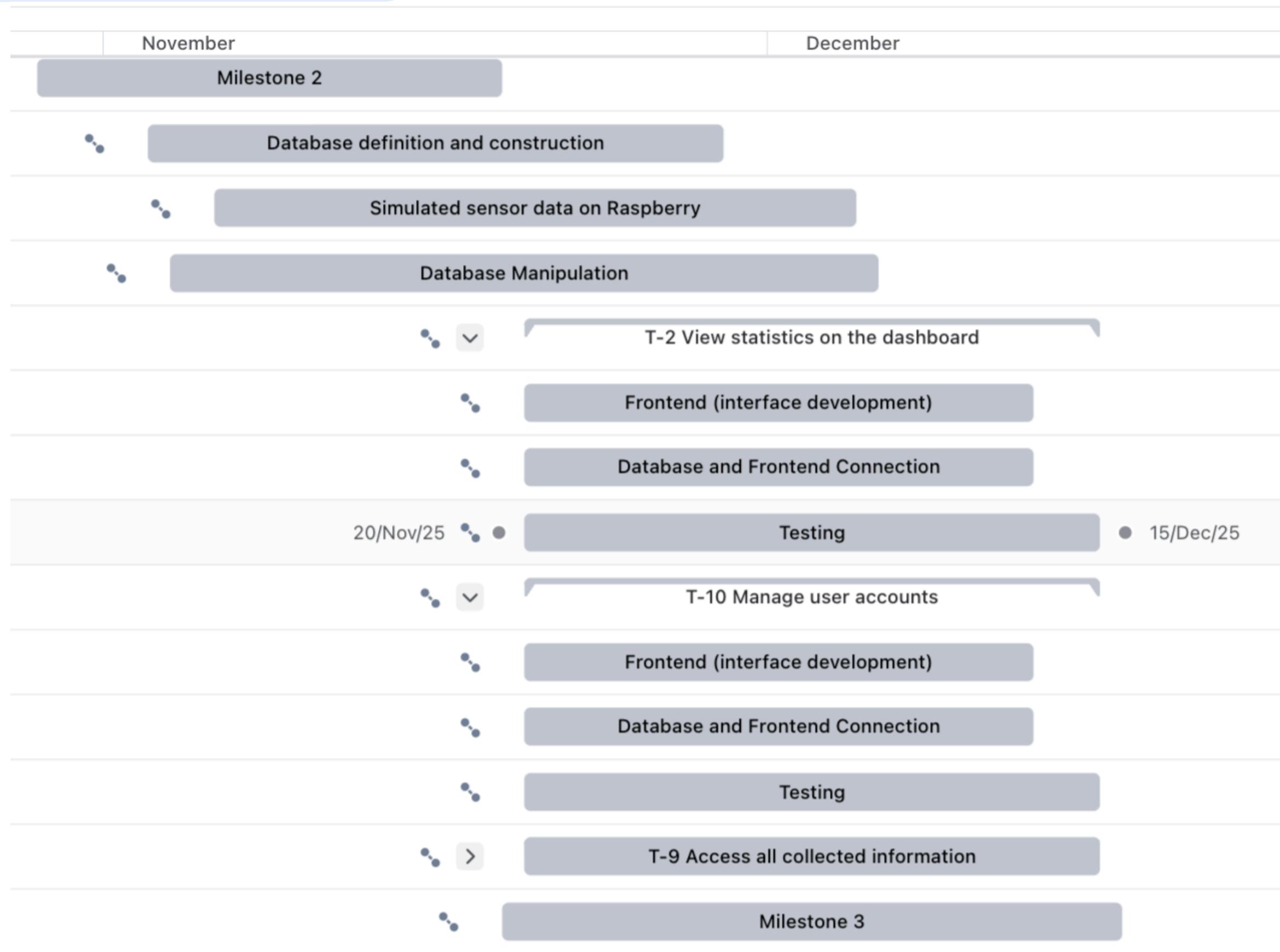
# CALENDAR



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Database	Structuring and Relationship between everyone		30/Oct/25 12:00 AM	06/Nov/25 12:00 AM	Task		Medium	To Do
Database	DER design	everyone	30/Oct/25 12:00 AM	13/Nov/25 12:00 AM	Task		Medium	To Do
Database	ER design	everyone	30/Oct/25 12:00 AM	13/Nov/25 12:00 AM	Task		Medium	To Do
Prototype	Mock-ups	everyone	23/Oct/25 12:00 AM	13/Nov/25 12:00 AM	Task		High	In Progress
Milestone	Milestone 2	everyone	29/Oct/25 12:00 AM	18/Nov/25 12:00 AM	Task		Medium	To Do

# CALENDAR



# CALENDAR

Sensors	Simulated sensor data on Raspberry	Matilde Rodrigues	Marta Cruz		06/Nov/25 12:00 AM	04/Dec/25 12:00 AM	Task		Medium	To Do
Database	Database definition and construction	Matilde Rodrigues	Marta Cruz	Catarina Ribeiro	03/Nov/25 12:00 AM	28/Nov/25 12:00 AM	Task		Medium	To Do
Database	Database Manipulation	Beatriz Francisco	Mariana Marques	Marta Cruz	04/Nov/25 12:00 AM	05/Dec/25 12:00 AM	Task		Medium	To Do
Task	T-2 View statistics on the dashboard	everyone			20/Nov/25 12:00 AM	15/Dec/25 12:00 AM	Task		Medium	To Do
Frontend	Frontend (interface development)	Mariana Marques	Catarina Ribeiro		20/Nov/25 12:00 AM	12/Dec/25 12:00 AM	Subtask	T-2 View statis	Medium	To Do
Backend	Database and Frontend Connection	everyone			20/Nov/25 12:00 AM	12/Dec/25 12:00 AM	Subtask	T-2 View statis	Medium	To Do
Tests	Testing	everyone			20/Nov/25 12:00 AM	15/Dec/25 12:00 AM	Subtask	T-2 View statis	Medium	To Do
Task	T-9 Access all collected information	everyone			20/Nov/25 12:00 AM	15/Dec/25 12:00 AM	Task		Low	To Do
Task	T-10 Manage user accounts	everyone			20/Nov/25 12:00 AM	15/Dec/25 12:00 AM	Task		Low	To Do
Milestone	Milestone 3	everyone			19/Nov/25 12:00 AM	16/Dec/25 12:00 AM	Task		Low	To Do

# CALENDAR

Task	T-3 View real-time metrics on the dashboard	everyone		2nd Term	2nd Term	Task		Low	To Do
Task	T-1 Receive alerts for incorrect posture	everyone		2nd Term	2nd Term	Task		Low	To Do
Task	T-7 Calibrate the suit	everyone		2nd Term	2nd Term	Task		Low	To Do
Task	T-4 Customize app alerts	everyone		2nd Term	2nd Term	Task		Lowest	To Do
Task	T-11 Analyze collected data	OPEN	everyone		2nd Term	2nd Term	Task	Low	To Do
Task	T-5 Set goals to improve posture	everyone		2nd Term	2nd Term	Task		Low	To Do
Task	T-6 View real-time progress toward milestones	everyone		2nd Term	2nd Term	Task		Low	To Do
Task	T-12 Compare data from different users	everyone		2nd Term	2nd Term	Task		Low	To Do
Task	T-8 Monitor the battery	everyone		2nd Term	2nd Term	Task		Lowest	To Do
Task	Milestone 4	everyone		2nd Term	2nd Term	Task		Low	To Do

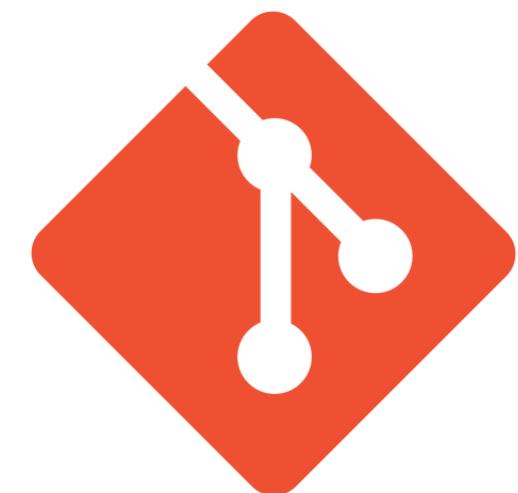
# COMMUNICATION



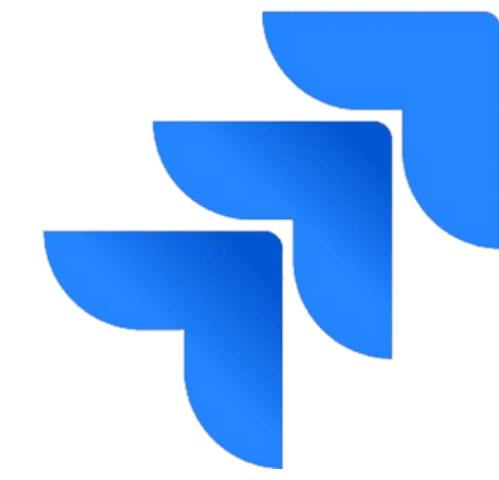
GitHub



GitHub



Git



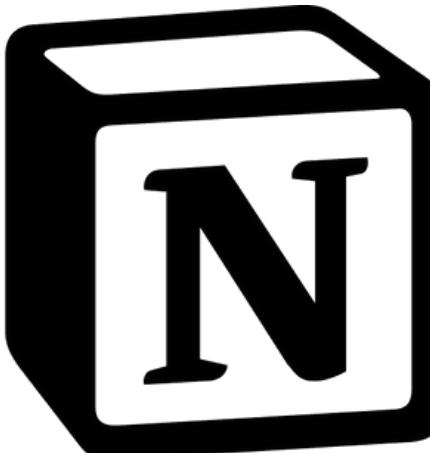
Jira



Jira

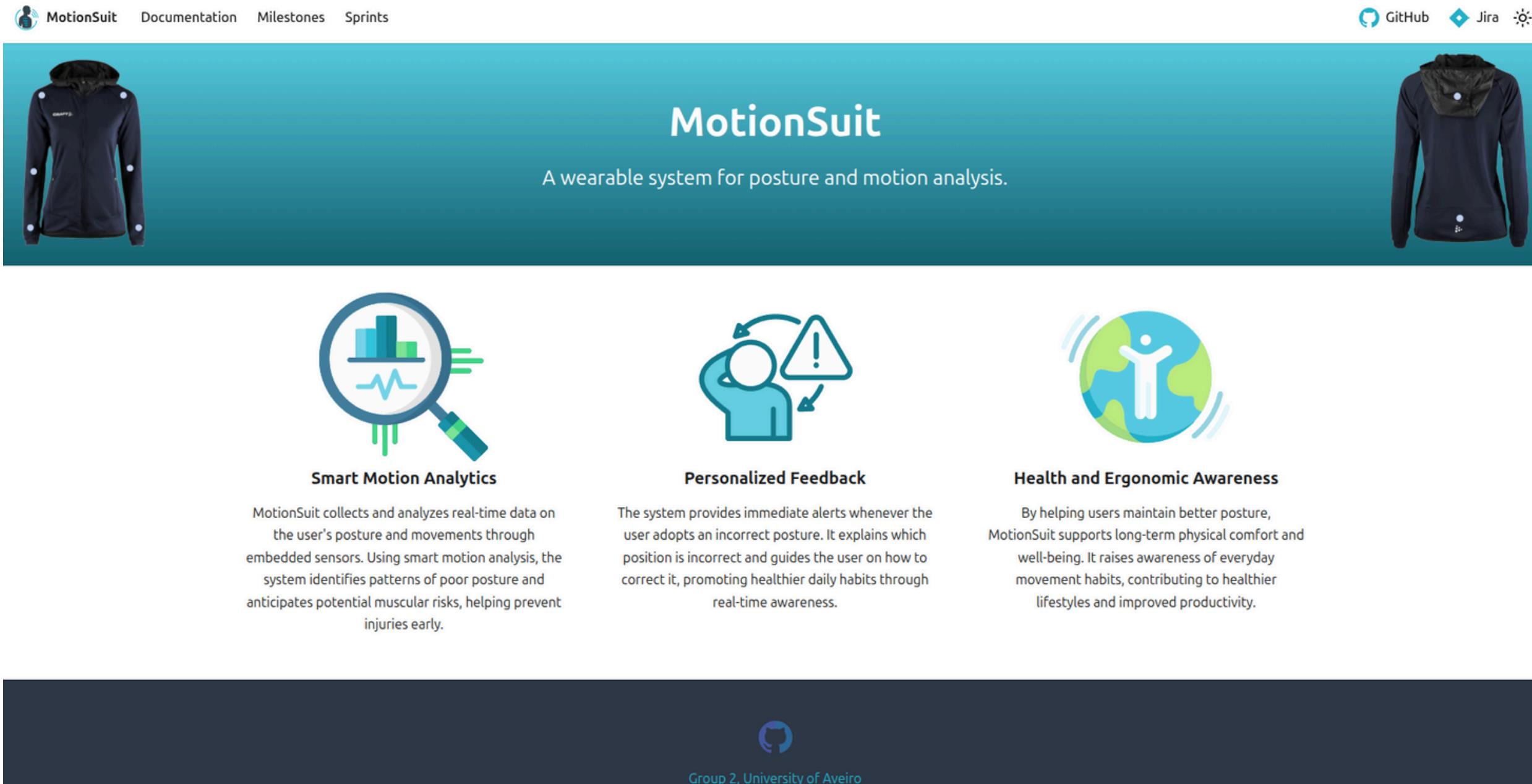


Discord



Notion

# MICROSITE



The screenshot shows the MotionSuit microsite. At the top left is the MotionSuit logo (a person icon with motion lines) and navigation links: Documentation, Milestones, Sprints. At the top right are GitHub, Jira, and a sun icon. The main title "MotionSuit" is centered above the subtitle "A wearable system for posture and motion analysis." Two images of the MotionSuit hoodie are shown: a front view on the left and a back view on the right. Below the title are three sections: "Smart Motion Analytics" (magnifying glass over a bar chart), "Personalized Feedback" (person icon with a warning triangle), and "Health and Ergonomic Awareness" (globe with a person icon). Each section has a detailed description below it. The footer contains the GitHub logo and the text "Group 2, University of Aveiro".

**MotionSuit**

A wearable system for posture and motion analysis.

**Smart Motion Analytics**

MotionSuit collects and analyzes real-time data on the user's posture and movements through embedded sensors. Using smart motion analysis, the system identifies patterns of poor posture and anticipates potential muscular risks, helping prevent injuries early.

**Personalized Feedback**

The system provides immediate alerts whenever the user adopts an incorrect posture. It explains which position is incorrect and guides the user on how to correct it, promoting healthier daily habits through real-time awareness.

**Health and Ergonomic Awareness**

By helping users maintain better posture, MotionSuit supports long-term physical comfort and well-being. It raises awareness of everyday movement habits, contributing to healthier lifestyles and improved productivity.

Group 2, University of Aveiro

<https://pei-motionsuit.github.io/microsite/>



# THANK YOU!

