3D Acupuncture Healthcare Data Management And Treatment System
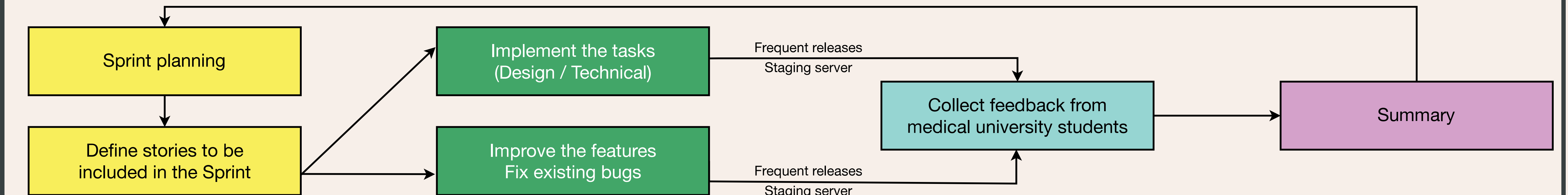
Introduction

Learning Acupuncture has never been easy, especially for medical students, because the network of more than 360 acupuncture points spanning over 14 meridians on the human body is very complex. 3D modeling technology has been and is always an effective solution to model physical objects, to increase interaction and visuals for users. Taking that as an opportunity, our project provided an easy-to-use and efficient website with 3D Acupuncture Human body model integrated, aiming to be a companion for medical students to learn Acupuncture more effectively and more easily.
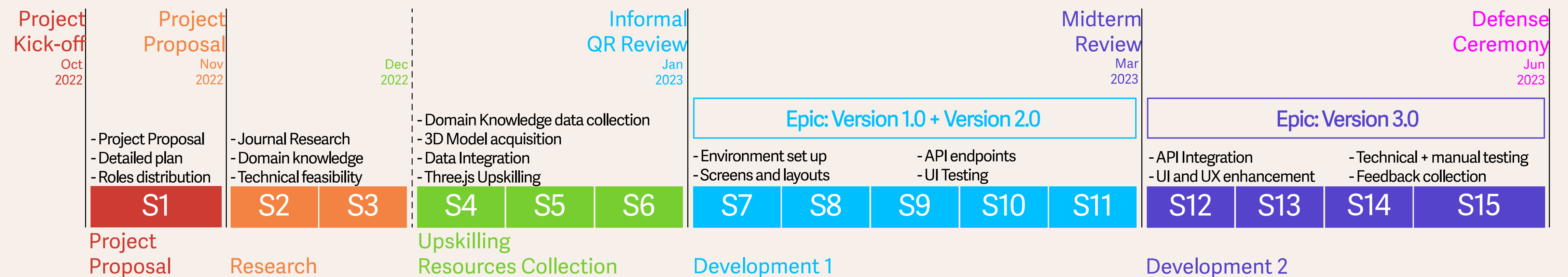
Objectives

- Apply advanced Software Engineering methodology into professional environment.
- Learn and apply new technical skills and soft skills into building software products.
- Design and develop a website that would be a great companion to assist medical students in learning Acupuncture.
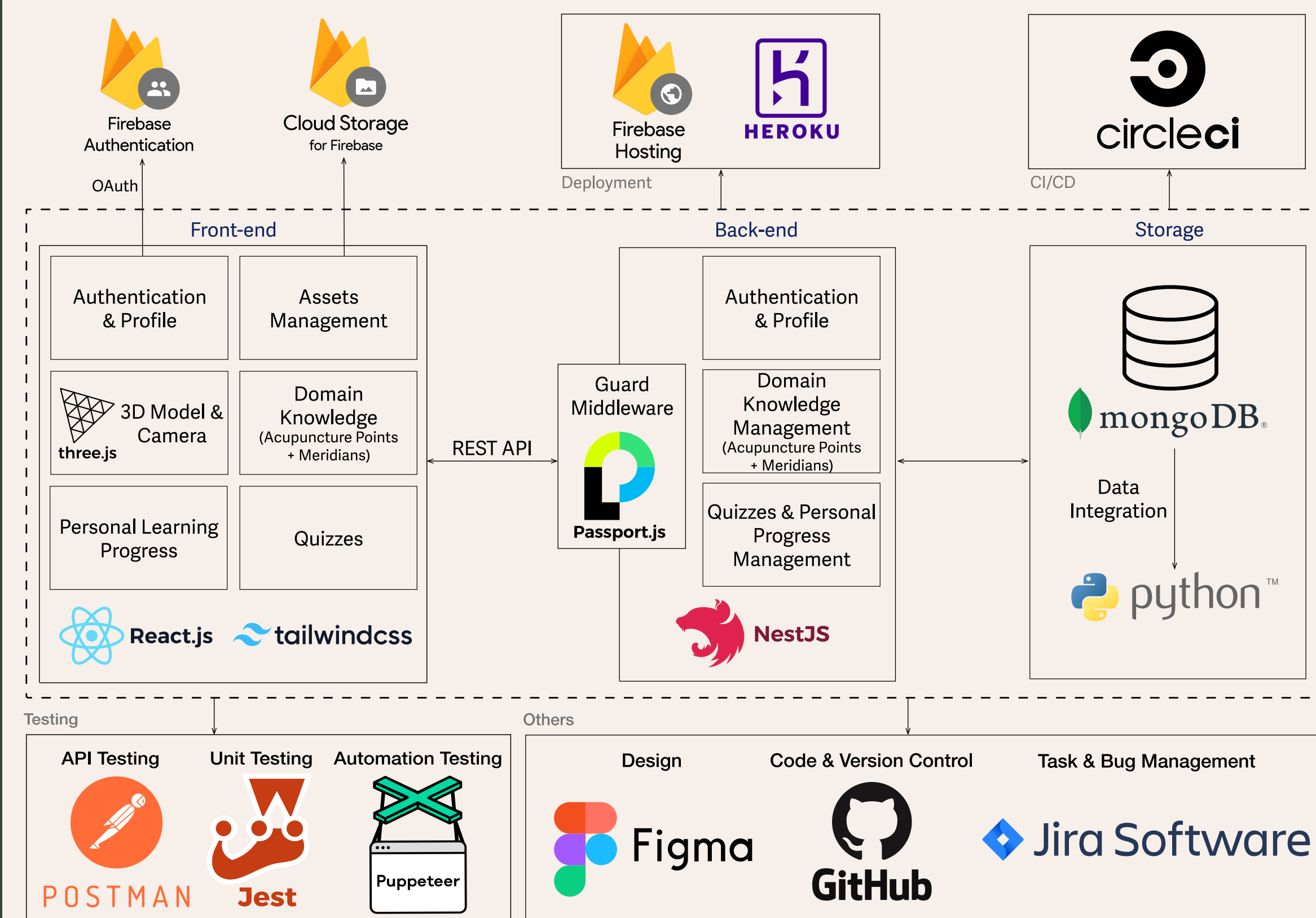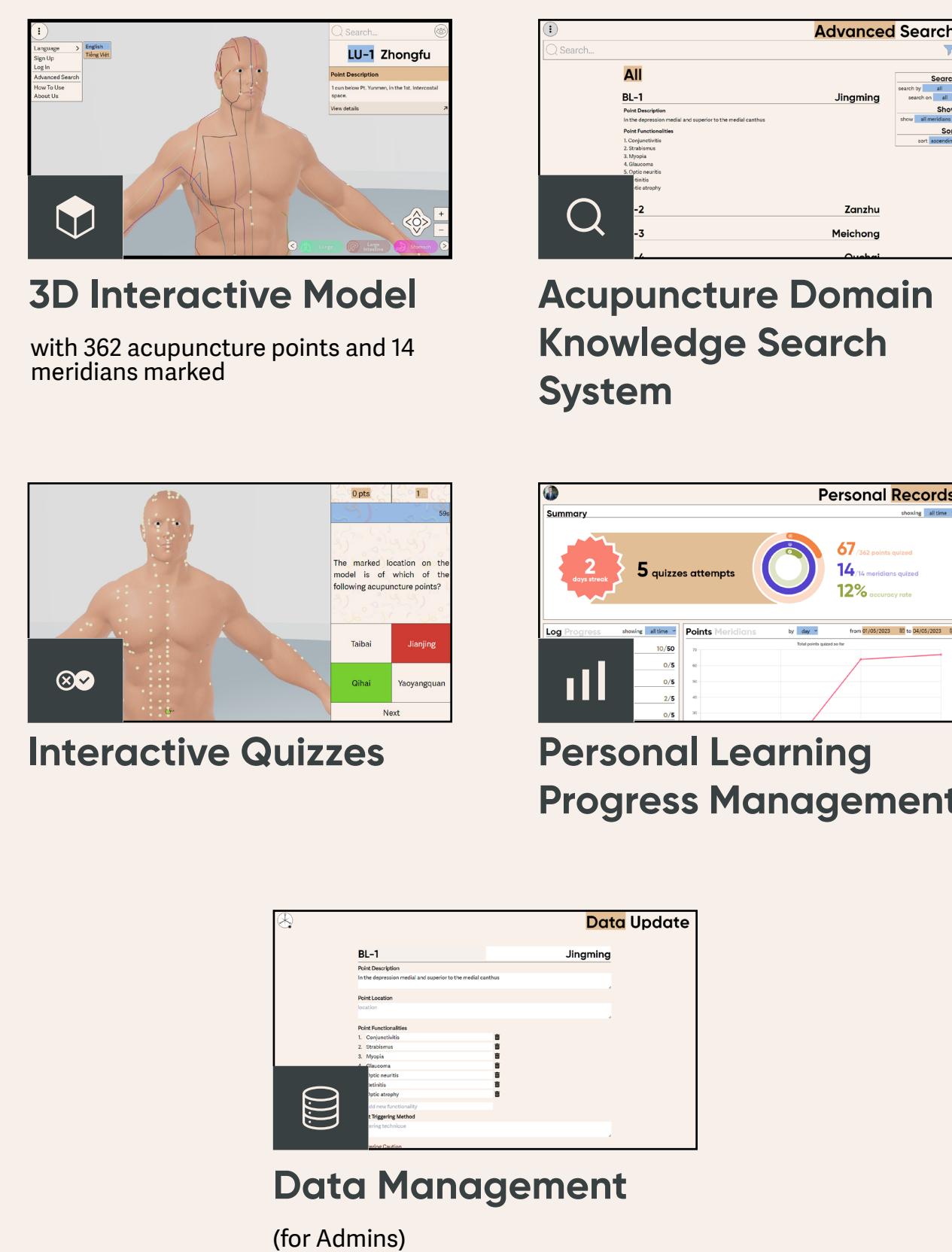
Method

Modified Scrum Framework

- Sprint planning → Define stories to be included in the Sprint → Implement the tasks (Design / Technical) → Improve the features Fix existing bugs
- Frequent releases / Staging server → Collect feedback from medical university students → Summary

Timeline

- Project Kick-off — Oct 2022
- Project Proposal — Nov 2022
- Dec 2022
- Informal QR Review — Jan 2023
- Midterm Review — Mar 2023
- Defense Ceremony — Jun 2023

S1 — Project Proposal:
- Project Proposal
- Detailed plan
- Roles distribution

S2, S3 — Research:
- Journal Research
- Domain knowledge
- Technical feasibility

S4, S5, S6 — Upskilling Resources Collection:
- Domain Knowledge data collection
- 3D Model acquisition
- Data Integration
- Three.js Upskilling

Epic: Version 1.0 + Version 2.0 (S7, S8, S9, S10, S11) — Development 1:
- Environment set up
- Screens and layouts
- API endpoints
- UI Testing

Epic: Version 3.0 (S12, S13, S14, S15) — Development 2:
- API Integration
- UI and UX enhancement
- Technical + manual testing
- Feedback collection

Architecture

Front-end:
- Authentication & Profile
- Assets Management
- 3D Model & Camera — three.js
- Domain Knowledge (Acupuncture Points + Meridians)
- Personal Learning Progress
- Quizzes
- React.js, tailwindcss

Back-end:
- Authentication & Profile
- Domain Knowledge Management (Acupuncture Points + Meridians)
- Quizzes & Personal Progress Management
- Guard Middleware — Passport.js
- NestJS

Storage:
- mongoDB
- Data Integration — python

Firebase Authentication, Cloud Storage for Firebase, OAuth

Deployment: Firebase Hosting, HEROKU

CI/CD: CIRCLECI

REST API

Testing:
- API Testing — POSTMAN
- Unit Testing — Jest
- Automation Testing — Puppeteer

Others:
- Design — Figma
- Code & Version Control — GitHub
- Task & Bug Management — Jira Software

Feature List

3D Interactive Model
with 362 acupuncture points and 14 meridians marked

Acupuncture Domain Knowledge Search System

Interactive Quizzes

Personal Learning Progress Management

Data Management
(for Admins)

Achievements

- Understood fundamental Acupuncture knowledge.
- Applied user-first Design Thinking techniques.
- Developed a website with an interactive 3D Acupuncture Human body model.
- Resolved all challenges & difficulties.
- Enhanced team's technical skills and soft skills.

Difficulties

- Disparity between practice and theory.
- Lost contact and Client withdrawal.
- New to 3D rendering in browser, advanced DevOps practices and technical testing techniques.
- Lack of fundings.

Team Members

- Nhan Nguyen Cao
- Trang Ho Ngoc Thao
- Chuong Pham Dinh
- Tan Le Tran Ba

Supervisor
- Dr. Nhan Le Thi

Project Coordinators
- MSc. Petteri Kaskenpalo
- Dr. Vu Lam Quang