



COMP704 Research and Development Project

VN01 3D acupuncture healthcare data management and treatment system

Status Report

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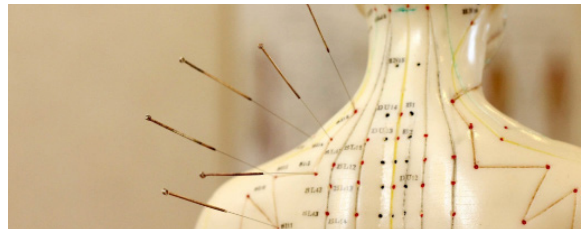


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DOCUMENT VERSION CONTROL

1. DOCUMENT INFORMATION

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2. DOCUMENT SIGN-OFF

ID	Member	Role	Signature	Timestamp
21142355	Tan Le Tran Ba	Project Manager		4 Feb 2023 14:29

3. DOCUMENT VERSIONS

Version	Timestamp	Description	Responsible members
1.0	2 Feb 2023 23:47	The initial version of the first Status Report document, covering the finish parts up to the Informal QR Review.	Nhan Nguyen Cao (21142377) Trang Ho Ngoc Thao (21142358)

I. QUICK RECAP

Up to the Project Proposal presentation, the project has processed up to the following key points, including:

1. Defined the Project Scopes and Objectives: basically contain of the Research phase (during which we would explore and study more about acupuncture), as well as the objectives for the project (as a tool to support the management of data for acupuncture, with an interactive 3D model for exploring about the field)
2. Defined the set of requirements, including both Functional and Non-functional requirements for the project.
3. Defined the planned Technology Stack and Technical Roles of all team members based on the evaluation from Skills Matrix.
4. Defined the detailed plans for the 5 main phases of the project, with the Gantt chart of detailed tasks distribution provided.



Figure 1 - Planned technical stack for the project

II. CHANGES

II.1. CHANGE IN REQUIREMENTS

Right after the Project Proposal presentation, as suggested by the council, our team started to reach some of the acupuncturists in Vietnam to introduce our project, and ask for them to be the specialist consultants for our project, as well as the user for the project in the final stage.

We consulted with two acupuncturists in Vietnam, who are also lecturers in traditional medicine at two famous universities of medicine and pharmacy in Vietnam, to ensure the accuracy of the information and knowledge about acupuncture included

in the project's final product. The acupuncturists who are serving as our team's specialist consultants have the following profiles:

- **MMed. Minh Ma Hoang:** with 15 years of experience in acupuncture, doctor Minh is one of the most popular acupuncturists in Ho Chi Minh City, Vietnam. He has a deep knowledge of traditional medicine, as well as understanding of the modern technology applied in medicals. Mmed. Minh is currently also a lecturer of traditional medicine from Ho Chi Minh City Medicine and Pharmacy University.



Figure 2 - Specialist consultant: MMed. Minh Ma Hoang

- **MMed. Van Le Thi Tuong:** is currently a lecturer of traditional medicine at Pham Ngoc Thach University of Medicine, Ho Chi Minh City. She has many years of experience as a lecturer, as well as working as a private acupuncturist in clinics, and especially contributed as a medical supporter for the national basketball team of Ho Chi Minh City.



Figure 3 - Specialist consultant: MMed. Van Le Thi Tuong

Some feedback received from the doctor about our project's idea:

- In the scope of Traditional Chinese Medicine, the combinations to cure specific diseases are considered unique to each doctor, their prior and experience and the school of Traditional Chinese Medicine that they are following.
=> The feature of “an acupuncture point combinations recommendation system” is useless and also a very sensitive topic to be included
- In their everyday workflow, they do not need for a system like the one we are proposing. The reason is because in order to be a practitioner that can perform acupuncture treatment, normally, they all have remembered the important acupuncture points, their locations and their functionalities
=> The application is not a useful companion for the doctors
- In the scope of acupuncture, there are 12 main meridians and 8 extraordinary meridians. However, only 14 of them (including 12 main and 2 extraordinary) is

feasible to be illustrated in the model (explaining why all of the current charts and diagrams used in the field only showing those 14 ones)

=> **Focus on those 14 rather than aiming to show all 20 meridians in the model.**

II.2. CHANGE IN TARGET USERS

From the feedback received, my team has discussed within the team and also with our supervisor, suggested to our client for the change. We finally agreed that the target user for the project would be changed from the acupuncturists, as a companion in their everyday workflow, to the main focus of medical university students in Traditional Chinese Medicine.

The reason for this is because as the product seems to be useless for the everyday workflow of the acupuncturists, targeting a lower level user can be a better approach. And thus, it is a good fit to develop the final product for students in reviewing or self-learning about acupuncture.



Figure 4 - University of Medicine and Pharmacy at Ho Chi Minh City, where our group of target users are studying

II.3. FOLLOW-UP TASKS

II.3.1. RECOLLECT REQUIREMENTS

In recollecting requirements from the new group of target users, as suggested by our supervisor, we decided to apply some methods from Design Thinking technique. One of the selection of methods we decided was the Empathy Interview method, from which we could understand the students and be able to better collect information about what they are expecting from the products.

Those are the sum up of some of our results after Empathy Interviewing the medical students:

- The students normally study visually about the acupuncture points and meridians using the physical model at school. However, they have no access to that model out of the lectures, especially when they want to self-study and review.
- The students believed study about the acupuncture points and meridians with interactions is a much easier approach for study compared to study in the traditional method.
- Not all 5 of the students have accessed to the current 3D acupuncture applications in the market, and not all of them are willing to use during their study. Those are some important information defined as the not good points or concerns from those students:
 - Most of them required subscriptions for full features. Because of that, those products are not good matches for university students, who do not have very high budget to invest.
 - Concern about the trustfulness of the information from the applications
 - The designs are out-dated, difficult to use

From the information collected from Empathy Interviews, we also defined the Persona to present one representative of our group of target users for the product. The persona describes in general the same characteristics of our main target users (the medical university students) among with their shared biographies and some common pains and gains.

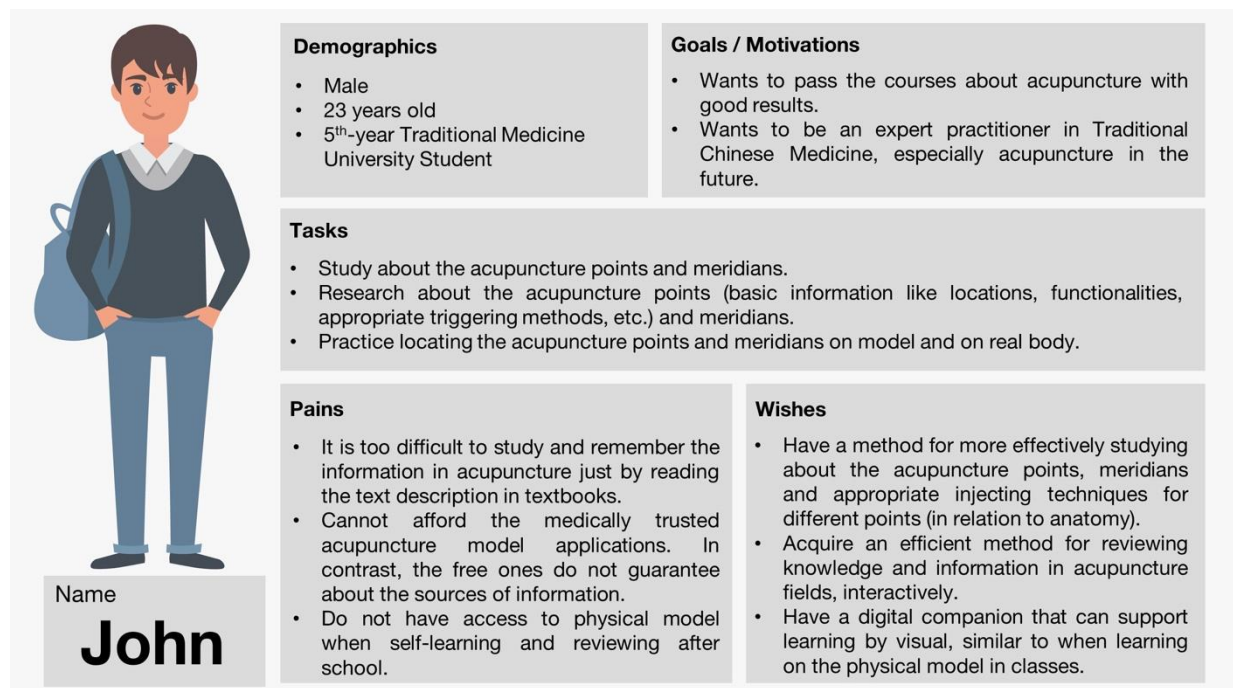


Figure 5 - Persona of target users for the final product

We also defined the Value Proposition Canvas, that shows our brainstorming ideas for what we are trying to provide in order to solve the pains of the users and fulfill their expected gains. The Value Proposition Canvas for the project is as follows:

VALUE PROPOSITION CANVAS

An acupuncture learning support system

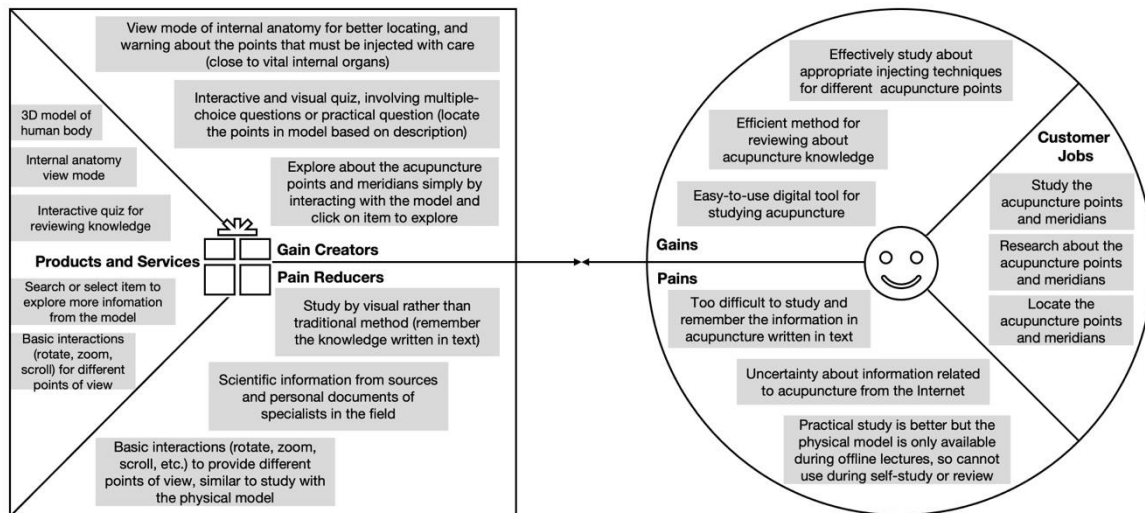


Figure 6 - Value Proposition Canvas for the final product

II.3.2. MARKET RESEARCH

One problem with the previous process of my team is that we were not able to reach as many medical students as expected (only 5 students decided to pursuing their future in acupuncture field and are likely to support the project). We discussed with our supervisor and agreed that we would analyze and propose our new list of requirements based also on one another method: market research of the existing similar product in the market

The following are our selections of similar applications on the market to be involved in the Market Research, including:

- **Visual Acupuncture:** A complete visual and interactive 3D acupuncture guide, which includes many search options, anatomy, internal tracts and more, available as a Desktop application or Mobile application.
- **Acupuncture 3D:** A Desktop and Mobile application that supports 3D interactive model, of 12 main meridians and up to more than 300 acupuncture points.
- **Easy Acupuncture 3D:** A paid mobile application supporting 3D visualization of the acupuncture points and meridians on human body, with some other basic functionalities.

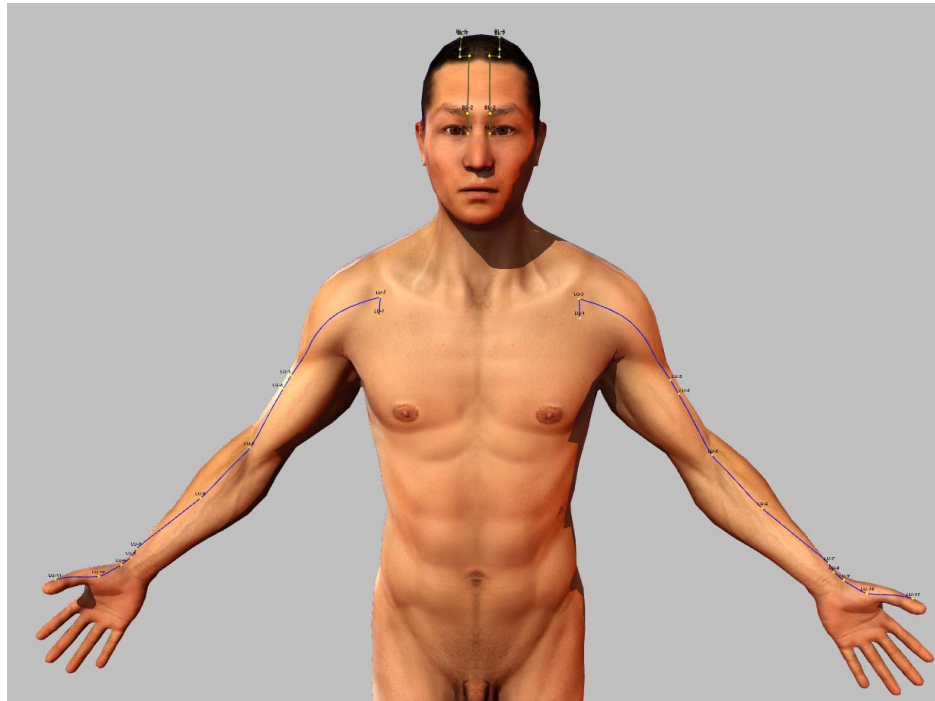


Figure 7 - Visual Acupuncture, one of the applications selected for Market Research

The results of our Market Research phase include some main points:

- Most of the applications shared the same basic set of features: display the 3D model of human body, with meridians and acupuncture points displayed.
- All of the selected applications does not work on Web platform, which can cause difficulties in updating information or accessing the site from different devices, operating systems.
- For all of the selected applications, none provide complete for all features free of charge, the subscriptions are required, which could be very costly.

II.4. RESULTS

Combining the results of Empathy Interview and Market Research, we redefined our new set of requirements for the project. The functional requirements for the project include of the followings:

Table 1 - Project's functional requirements

No.	Functional requirement
1	The system should allow users to view the 3-D model of human body.
2	The system should allow users to interact with the 3-D model with some basic options like spin, zoom-in, and zoom-out of the view space.
3	The system should allow users to view the 12 standard meridians and 2 extraordinary meridians (Ren Meridian and Du Meridian) on the 3-D model of human body.
4	The system should allow users to view the acupuncture points marked on the meridians on the 3-D model of human body.

5	The system should allow users to view the information about the meridians by clicking on them on the 3-D model of human body.
6	The system should provide a search functionality for users to search for the information of the field by keywords.
7	The system should support 2 different view modes for the 3-D model of human body: basic mode (viewing from the external skin) and anatomy mode (viewing also the internal organs and structures).
8	The system should provide a data management page for authorized users (administrators and the specialist consultants) to manage and insert, update the information of acupuncture points and meridians.
9	The system should allow users classified as students to attempt quizzes on the acupuncture points and meridians.

For the non-functional requirements, not many were changed from the initial list. We just added one more non-functional requirement based on the pains mentioned by the students, is that: The system should guarantee the trustfulness of the specialized information provided within the scope, with reference to trusted medical resources showed to the users.

In general, this requirement suggested that every specialized information included in the system should be based on a trustful source, and there should be clear references to them within the pages of the application.

III. NEW SCHEDULE AND PLAN

III.1. KEY MILESTONES

Although the project recorded a change in target users and requirements, the five main phases of the project would remained the same as initial. The Research phase, initially planned to be used for scanning article papers to collect data for the project, would be redefined as to be used for researching about the difficulties, conveniences and expectations of Traditional Chinese Medicine university students in learning and exploring about the sub-field of acupuncture.

For the remaining phases, the main target would remained same as planned in the beginning.

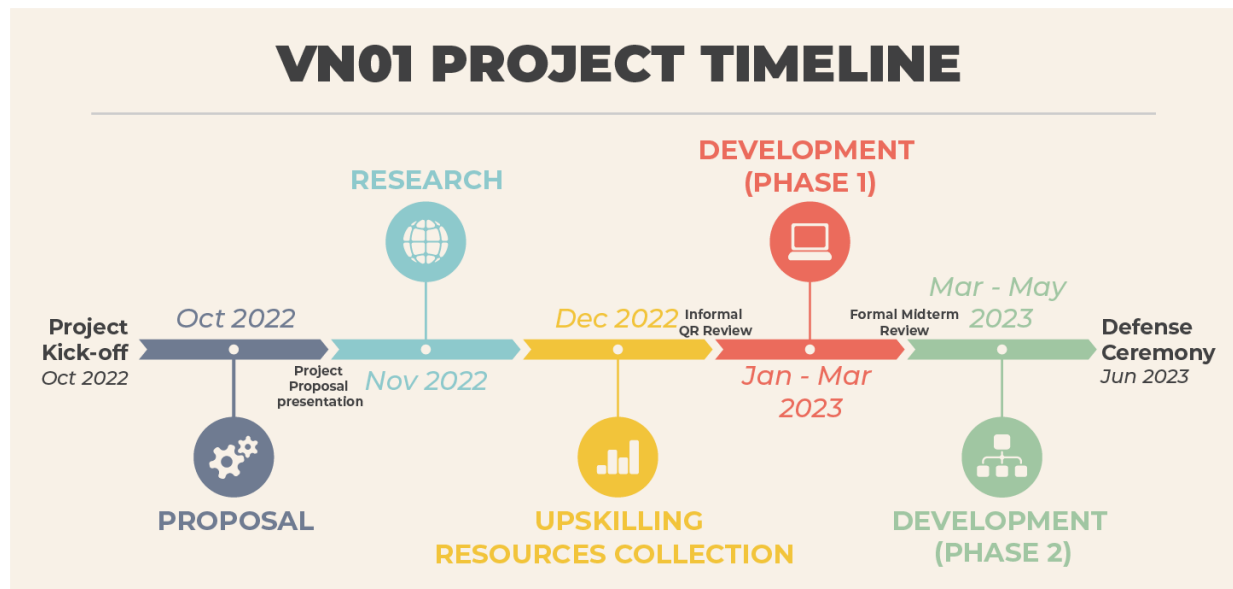


Figure 8 - 5 main phases defined for the Project

III.2. UPDATED TIMELINE

With respect to the updates, the detailed timeline of some of the main phases also recorded some minor changes.

- For the **Research** phase, we would stop the scanning and researching from scientific papers. Instead, the tasks would be defined for recollecting the requirements of the project, as well as for Market and Technical research, not only to seek for some suggestions about the set of requirements for the project, but also to evaluate the feasibility of the project interms of technical.

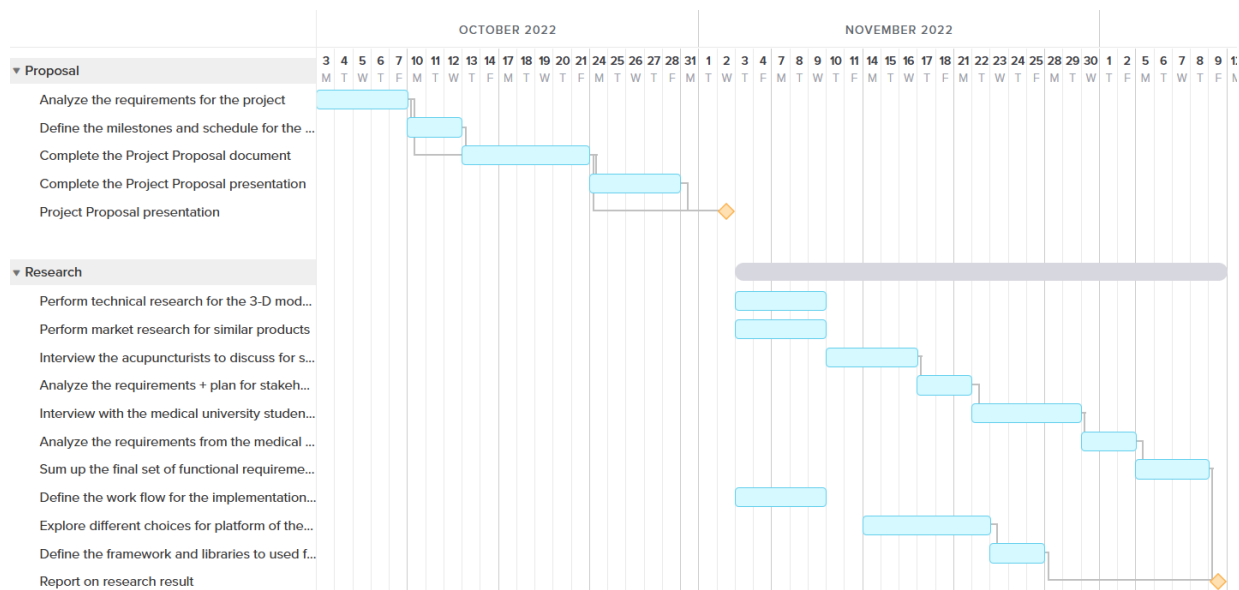


Figure 9 - Updated Research main phase

- For the **Upskilling and Resources collection** phase of December 2022, we added the tasks relating to collecting data. In specific, as the trusted specialized resources provided by the specialist consultants are mostly books (those very old

ones) and personal notes, documents, we have to digitalize the information from those to be ready for storing into our database. A significant amount of time is required for that, which we have processed through.

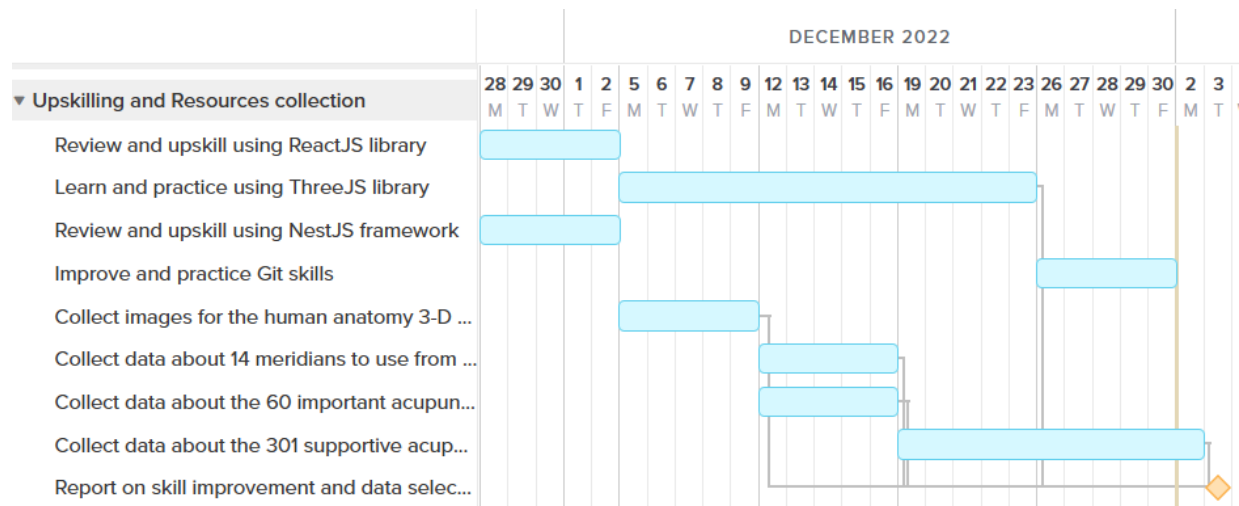


Figure 10 - Updated Upskilling and Resources Collection main phase

- In the **second Development** phase, we removed the initial feature of the acupuncture points combinations recommendation and added the feature of data management, covering also the quiz feature for the students. Besides, rather than testing within the development team only like in the initial plan, we added some tasks involving user testing with the medical students before wrapping up our project in May 2023.

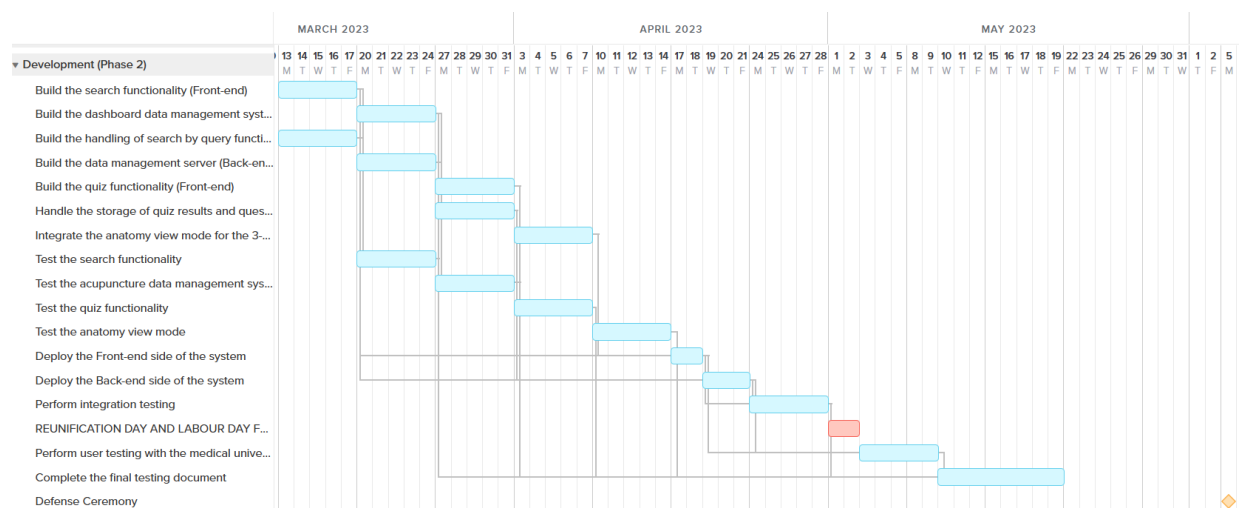


Figure 11 - Updated second Development main phase

IV. PROGRESS REPORT

IV.1. SUB-TEAM DIVISION

Since our team is a little bit behind the schedule, we decided to split our teams into two sub-teams for handling parallel tasks. The sub-teams are as follows:

Team	Members	Responsibilities
Technical team	Nhan Nguyen Cao (21142377)	<ul style="list-style-type: none"> Market research Technical resources collection Learning new technical skills Set up technical workspace for the project
	Trang Ho Ngoc Thao (21142358)	
Design team	Tan Le Tran Ba (21142355)	<ul style="list-style-type: none"> Handled the collection of requirements from the medical university students Data collection Design prototype and design thinking assets
	Chuong Pham Dinh (21142643)	

IV.2. SPRINTS

Up to the Project Proposal presentation, we have already finished our first 3-week Sprint of Project Proposal. From that timestamp until the Informal QR Review, we have successfully finished 5 more 2-week Sprints for handling different goals of the main phases of the project. The detailed plan and results of each of the five Sprint is included in the following sub-sections.

IV.2.1. SPRINT 2 – RESEARCH 1

Sprint Objectives:

- Scan and collect the acupuncture points combinations from research articles and papers.
- Prepare, contact and conducted the interviews with the acupuncturists.
- Define the detailed plan for 2 phases: Requirements gathering and Data collection.
- Analyze the results of interviewing with the acupuncturists and plan for the next phase.

Sprint Timeline:

Timeline: 31 Oct 2022 – 13 Nov 2022

Duration: 2 weeks

Table 1 - Sprint 2 timeline

Week	Timeline	Detail
1	31 Oct 2022 – 6 Nov 2022	Scan the research articles to collect the acupuncture points combinations for curing some common diseases.

		<p>Prepare the questions and try to contact the acupuncturists for interview.</p> <p>Conduct the interview with the acupuncturists (at the end of the week).</p>
2	7 Nov 2022 – 13 Nov 2022	<p>Analyze the results of interviewing with the acupuncturists.</p> <p>Define the new plan for next phases: Requirements gathering (from Medical university students) and Data collection.</p>

Sprint Details:

Table 2 – Sprint 2 details

Task ID	Task name	Story points	Estimated effort (h)	Assignee
1	Scan and collect data from 3 papers (Block 1)	2	8	Nhan Nguyen Cao
2	Scan and collect data from 3 papers (Block 2)	2	8	Tan Le Tran Ba
3	Scan and collect data from 3 papers (Block 3)	2	8	Trang Ho Ngoc Thao
4	Scan and collect data from 3 papers (Block 4)	2	8	Chuong Pham Dinh
5	Prepare questions for interviewing acupuncturists	2	8	Tan Le Tran Ba
6	Sum up the questions for interviewing acupuncturists	1	4	Nhan Nguyen Cao
7	Compose the email content for invitation with the acupuncturists (template)	1	4	Chuong Pham Dinh
8	Verify the email content for invitation the acupuncturists	1	4	Trang Ho Ngoc Thao
9	Contact the acupuncturists for invitation	2	8	Tan Le Tran Ba
10	Scan and collect data from 5 papers (Week 2) (Block 1)	3	12	Nhan Nguyen Cao
11	Scan and collect data from 5 papers (Week 2) (Block 2)	3	12	Tan Le Tran Ba
12	Scan and collect data from 5 papers (Week 2) (Block 3)	3	12	Trang Ho Ngoc Thao

13	Scan and collect data from 5 papers (Week 2) (Block 4)	3	12	Chuong Pham Dinh
14	Conduct the meeting with Dr. Minh	2	6	Nhan Nguyen Cao, Trang Ho Ngoc Thao, Chuong Pham Dinh
15	Conduct the meeting with Dr. Van	2	6	All
16	Analyze the results of interviewing with the acupuncturists	3	12	Chuong Pham Dinh
17	Define the new plan for collecting requirements from medical university students	3	12	Nhan Nguyen Cao
Total	17 tasks	37	144	

IV.2.2. SPRINT 3 – RESEARCH 2

Sprint Objectives:

- Research the books and define the pipeline for collecting data about acupuncture points and meridians in the next phase.
- Discuss with the supervisor and client about new target users for the project.
- Modify the Project Proposal document to match with the new approach for the project.
- Ask for contact information and tried to contact with 5 medical university students for interviewing.
- Prepare interview questions to ask the 5 medical university students.

Sprint Timeline:

Timeline: 14 Nov 2022 – 27 Nov 2022

Duration: 2 weeks

Table 3 - Sprint 3 timeline

Week	Timeline	Detail
1	14 Nov 2022 – 20 Nov 2022	Retrieve the contact information about 5 medical university students. Prepare the questions for interviewing with the 5 medical university students. Research for more books and documents from Medical University bookstore.
2	21 Nov 2022 – 27 Nov 2022	Interview with the 5 medical university students.

		<p>Analyzing the results of empathy interview with the 5 medical university students.</p> <p>Perform market research for some similar applications in the market.</p> <p>Summarize the results of market research and define the suggested set of functional requirements.</p> <p>(Early) Collect data of 17 meridians.</p>
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Sprint Details:

Table 4 – Sprint details

Task ID	Task name	Story points	Estimated effort (h)	Assignee
1	Research for books and documents from Medical University bookstore	2	8	Trang Ho Ngoc Thao
2	Redefine the functional requirements for the project	2	8	Chuong Pham Dinh
3	Redefine the research method and plan for the phases	2	8	Tan Le Tran Ba
4	Modify the Project Proposal document	2	8	Nhan Nguyen Cao
5	Report about interview results with the acupuncturists to supervisor	1	4	Tan Le Tran Ba
6	Find data sources to collect English information about the acupuncture points and meridians.	2	8	Chuong Pham Dinh
7	Discuss with Client (Dr. Liu) about new approach for the project	1	4	Nhan Nguyen Cao
8	Ask the acupuncturists through Zalo for contact information of 5 medical university students agreed to support	3	12	Tan Le Tran Ba
9	Prepare the questions for survey form to ask the medical university students	3	12	Trang Ho Ngoc Thao
10	Send new Project Proposal to Dr. Liu and ask for progress checking report frequency	1	4	Nhan Nguyen Cao
11	Find groups of traditional medical university students to look for stakeholders	3	12	Tan Le Tran Ba
12	Perform Market Research - Acupuncture3D	2	8	Trang Ho Ngoc Thao
13	Perform Market Research - Visual Acupuncture	2	8	Nhan Nguyen Cao
14	Perform Market Research - Easy Acupuncture 3D	2	8	Chuong Pham Dinh

15	Summarize the results of Market Research	2	8	Nhan Nguyen Cao
16	Collect data about 7 meridians: LU, LI, ST, SP, HT, SI, BL	3	12	Tan Le Tran Ba
17	Collect data about 7 meridians: KI, PC, TE, GB, LV, GV, CV	3	12	Chuong Pham Dinh
Total	17 tasks	36	144	

IV.2.3. SPRINT 4 – DATA COLLECTION

Sprint Objectives:

- Collect data about the 60 important acupuncture points.
- Sum up the outputs of Design Thinking process (Perona and Value Proposition Canvas).
- Collect data about 361 additional acupuncture points.
- Collect the 3D model to be rendered into the main screen of the final system.

Sprint Timeline:

Timeline: 28 Nov 2022 – 11 Dec 2022

Duration: 2 weeks

Table 5 - Sprint 4 timeline

Week	Timeline	Detail
1	28 Nov 2022 – 4 Dec 2022	Collect information about 60 important acupuncture points. Finish defining the Persona and Value Proposition Canvas for the project. Market research for the 3D model to be used in the 3D market.
2	4 Dec 2022 – 11 Dec 2022	Collect information about 361 additional acupuncture points. Define the final set of functional requirements and non-functional requirements for the project. Selection of the 3D model to be used in the final product.

Sprint Details:

Table 6 – Sprint 4 details

Task ID	Task name	Story points	Estimated effort (h)	Assignee
1	Collect data about 15 acupuncture points - Block 1	3	7	Nhan Nguyen Cao

2	Collect data about 15 acupuncture points - Block 2	3	7	Tan Le Tran Ba
3	Collect data about 15 acupuncture points - Block 3	3	7	Trang Ho Ngoc Thao
4	Collect data about 15 acupuncture points - Block 4	3	7	Chuong Pham Dinh
5	Collect data about 25 additional acupuncture points - Week 1 - Block 1	3	7	Nhan Nguyen Cao
6	Collect data about 13 additional acupuncture points - Week 1 - Block 2	2	5	Tan Le Tran Ba
7	Collect data about 13 additional acupuncture points - Week 1 - Block 3	2	5	Chuong Pham Dinh
8	Collect data about 25 additional acupuncture points - Week 1 - Block 4	3	7	Trang Ho Ngoc Thao
9	Collect data about 13 additional acupuncture points - Week 2 - Block 1	2	5	Nhan Nguyen Cao
10	Collect data about 25 additional acupuncture points - Week 2 - Block 2	3	7	Chuong Pham Dinh
11	Collect data about 25 additional acupuncture points - Week 2 - Block 3	3	7	
12	Collect data about 12 additional acupuncture points - Week 2 - Block 4	2	5	Trang Ho Ngoc Thao
13	Collect data about 12 additional acupuncture points - Week 3 - Block 1	2	5	Nhan Nguyen Cao
14	Collect data about 25 additional acupuncture points - Week 3 - Block 2	3	7	
15	Collect data about 25 additional acupuncture points - Week 3 - Block 3	3	7	Chuong Pham Dinh
16	Collect data about 13 additional acupuncture points - Week 3 - Block 4	2	5	Trang Ho Ngoc Thao
17	Collect data about 13 additional acupuncture points - Week 4 - Block 1	2	5	Nhan Nguyen Cao
18	Collect data about 25 additional acupuncture points - Week 4 - Block 2	3	7	Tan Le Tran Ba
19	Collect data about 25 additional acupuncture points - Week 4 - Block 3	3	7	Chuong Pham Dinh
20	Collect data about 12 additional acupuncture points - Week 4 - Block 4	2	5	Trang Ho Ngoc Thao
21	Create Persona from empathy interview result	2	4	Chuong Pham Dinh
22	Create Value Proposition Canvas from empathy interview result	2	5	Nhan Nguyen Cao

23	Find the 3D model from the market	3	6	Nhan Nguyen Cao
24	Sum up the list of requirements	2	5	Tan Le Tran Ba
Total	24 tasks	61	144	

IV.2.4. SPRINT 5 – UPSKILLING 1

Sprint Objectives:

- Learn the basic skillsets for using new library to render 3D into browser, Three.js library.
- Practice technical skills: Git flow skills and review skills related to required tech stack (React.js and Nest.js).
- Add texture of realistic skin color to the selected 3D model for putting into the product.
- Do some demo projects to practice different techniques within the library of Three.js, on React.js-based project.

Sprint Timeline:

Timeline: 12 Dec 2022 – 25 Dec 2022

Duration: 2 weeks

Table 7 – Sprint 5 timeline

Week	Timeline	Detail
1	12 Dec 2022 – 18 Dec 2022	Review and upskill using some basic ground selected frameworks and libraries: React.js, Nest.js. Learn basic technique about Blender to create realistic skin texture for the selected 3D model. Review the documentation of Three.js library to acquire some basic understandings.
2	19 Dec 2022 – 25 Dec 2022	Add the created skin texture to the 3D model and evaluate appropriate color tones. Do some demo projects with Three.js library to understand different techniques and skills sets.

Sprint Details:

Table 8 – Sprint 5 details

Task ID	Task name	Story points	Estimated effort (h)	Assignee
1	Review about Git and Github	2	8	Chuong Pham Dinh
2	Define the appropriate Git flow to be used for the project	2	8	
3	Review about Nest.js framework	2	8	Trang Ho Ngoc Thao
4	Review about React.js library	2	8	Nhan Nguyen Cao
5	Research about creating texture in Blender	3	12	
6	Acquire the appropriate color tones for realistic human skin color	1	4	Tan Le Tran Ba
7	Create the skin color texture for the selected 3D model	3	12	
8	Add the texture to the 3D model and evaluate the color tones	1	4	Nhan Nguyen Cao
9	Research – Initialize a Three.js project (dependently and integrated to React.js project)	2	8	Nhan Nguyen Cao
10	Research – Load existing 3D model to the site with Three.js	2	8	Trang Ho Ngoc Thao
11	Research – Render text and line in Three.js	2	8	Nhan Nguyen Cao
12	Do demo project with Three.js – Color geometric floor	3	12	Trang Ho Ngoc Thao
13	Do demo project with Three.js – Globe and universe	3	12	Nhan Nguyen Cao
14	Do demo project with Three.js – Car racing	3	12	
15	Set up databases (main and staging) for the project using MongoDB	2	8	Tan Le Tran Ba
16	Set up databases (main and staging) for the project using PostgreSQL	2	8	Chuong Pham Dinh
17	Experiment loading scene when displaying model into browser with Three.js library	1	4	
Total	17 tasks	36	144	

IV.2.5. SPRINT 6 – UPSKILLING 2

Sprint Objectives:

- Demo and evaluate connecting to database servers from a Nest.js back-end project.
- Examine loading the selected and modified 3D model into display.
- Add basic interactions for user to interact with the 3D model after successfully loaded into display.
- Examine displaying a complete meridian with acupuncture points marked on the 3D model.
- Sketch the layouts for the main scenes to be included in the project.
- Define the plan for using script to digitalize collected information about the acupuncture points and meridians into storage for the final product.
- Prepare for the Informal QR Review presentation.

Sprint Timeline:

Timeline: 26 Dec 2022 – 8 Jan 2023

Duration: 2 weeks

Table 9 – Sprint 6 timeline

Week	Timeline	Detail
1	26 Dec 2022 – 1 Jan 2023	<p>Examine loading the finished 3D model into display, using a Three.js-integrated React.js project.</p> <p>Define and add basic interactions to the 3D model after loaded into display in the browser.</p> <p>Examine connecting Nest.js project with the main and staging MongoDB database server.</p> <p>Create sketch versions of layouts for main scenes within the product.</p>
2	2 Jan 2023 – 8 Jan 2023	<p>Examine connecting Nest.js project with the main and staging MongoDB database server.</p> <p>Examine displaying acupuncture points and line for showing meridian on the 3D model after loaded into display of BL meridian.</p> <p>Prepare the presentation slide and content for the Informal QR Review presentation.</p>

Sprint Details:

Table 10 - Sprint 6 details

Task ID	Task name	Story points	Estimated effort (h)	Assignee
1	Design prototype sketch (of screens' layouts)	3	12	Tan Le Tran Ba
2	Load 3D model into display	2	8	Chuong Pham Dinh
3	Add scrolling, rotating and zooming interactions for the 3D viewport after loaded the 3D model	3	12	Nhan Nguyen Cao
4	Config the camera angles for the viewport after loaded the 3D model	2	8	
5	Add loading scene before rendering the model	1	4	Chuong Pham Dinh
6	Create demo test for connecting to MongoDB database (backup and main databases)	2	8	Trang Ho Ngoc Thao
7	Create demo test for connecting to PostgreSQL database (backup and main databases)	2	8	
8	Examine drawing acupuncture points of BL meridian into the 3D model	2	8	Nhan Nguyen Cao
9	Examine drawing the line illustrating the BL meridian (by connecting the acupoints) into the 3D model	2	8	Chuong Pham Dinh
10	Config the labels of the acupuncture points to always face the screen.	2	8	Nhan Nguyen Cao
11	Record demo video about the method for loading 3D model into browser and how the acupuncture points and meridians are displayed.	2	8	Trang Ho Ngoc Thao
12	Discuss with Client (Dr. Liu) about the current approach for loading 3D model and displaying important factors.	1	4	Nhan Nguyen Cao
13	Define the main content to be included in the Informal QR presentation	2	8	
14	Draft slide for Informal QR presentation	2	8	Trang Ho Ngoc Thao

15	Complete the presentation slide for Informal QR presentation	3	12	Tan Le Tran Ba
16	Create script for presenting the Informal QR presentation	2	8	Chuong Pham Dinh
17	Research about technique for using script to integrate collected data from spreadsheets to database servers.	3	12	Trang Ho Ngoc Thao
Total	17 tasks	36	144	

IV.3. FINISHED WORKS

IV.3.1. 3-D MODEL

Since the project has no budget, we have to find the free resources to be used for the final product. There are many free 3-D models of human body, but not many of them are accurate in terms of human body figures and ratio between the sections. Especially, for displaying some of the specific acupuncture points, the model needs to have some basic requirements in characteristics. We spent a few days and finally ended up with an 3-D model that was originally created for scripting learning purpose.

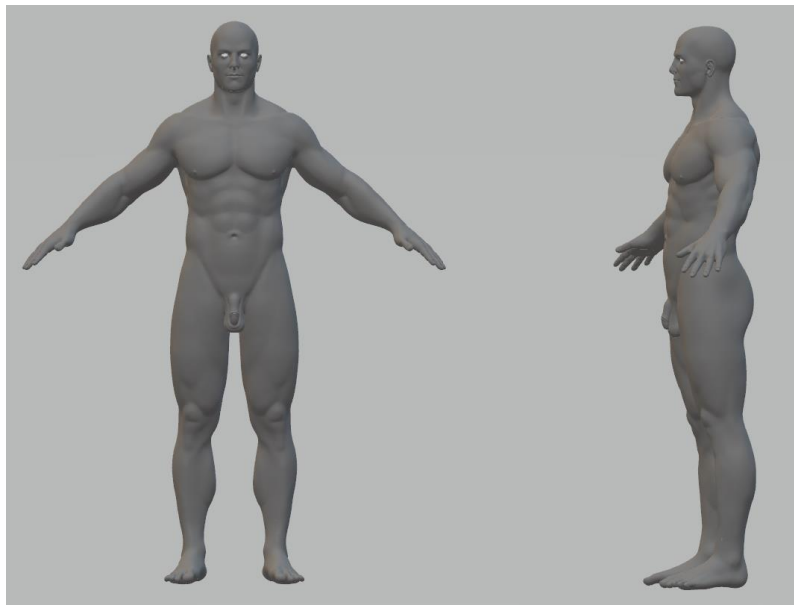


Figure 12 - Our selected free 3-D human body model

One problem with our selected 3-D model is that it has no texture, or no color, as the free distributed assets consisted of only the mesh for the model. Because of that, we had to manually added the realistic human skin color to our model. As all of our team members have no experienced editing 3-D model before, we had to spent some days learning about the basic usage of Blender, a very advanced 3-D editor, to be able to add the skin for our model. The final result of the model, to be included in the final product, is shown in the following image:

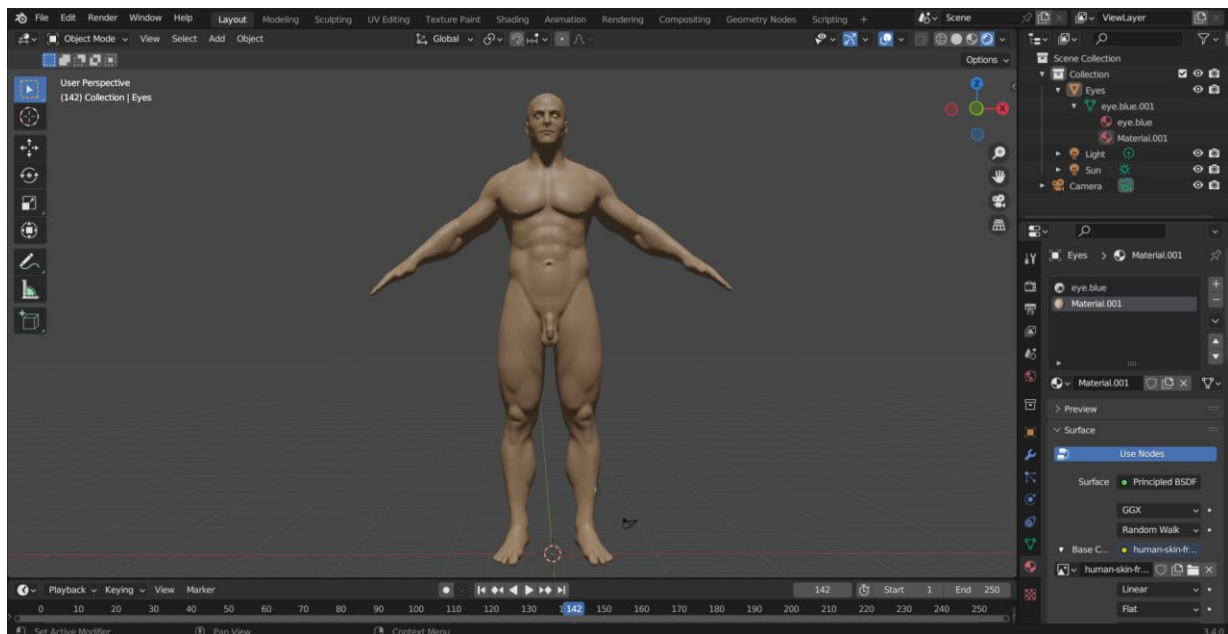


Figure 13 - Texture added to our 3-D model using Blender

IV.3.2. TECHNICAL FLOW

To account one of the major concerns of the medical university students, which is the trustfulness of the information involved in the final product, we decided to ask and collect data from the sources suggested by the specialists consultants, including of the personal documents (slides, books, articles, etc.) and some books.

Since the books were quite old and only the .pdf scanned versions of the books are accessible by our team, we had to collect the appropriate data by typing the specific piece of information, to later be integrated into our product. To handle that, our team defined the following pipeline:

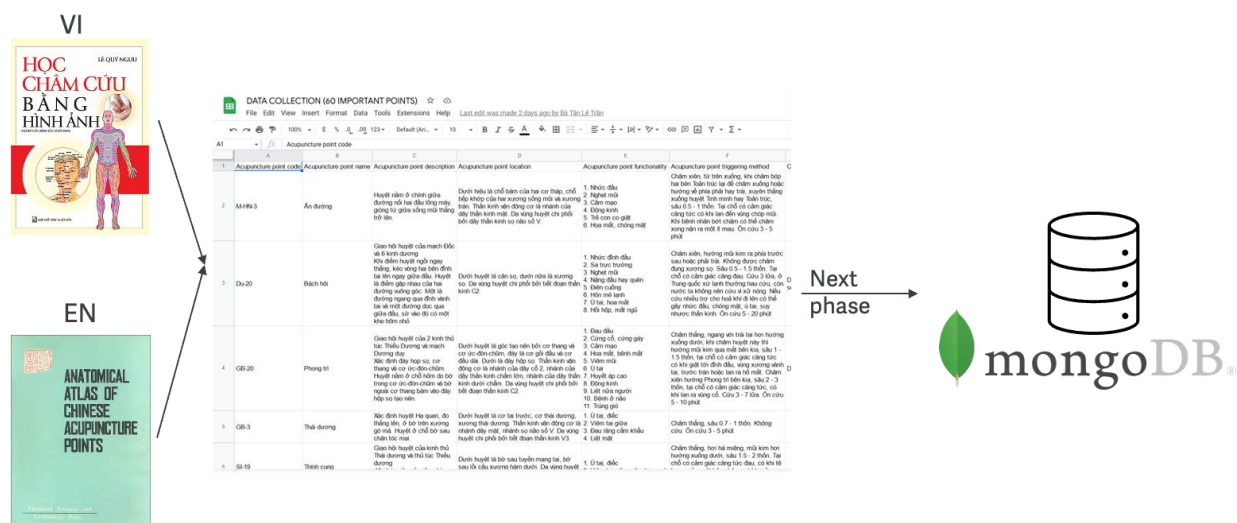


Figure 14 - Pipeline for Data Collection

Briefly describing, we chose 2 books for collecting information in two different languages (Vietnamese and English). We divide the block of items (acupuncture points

and meridians) for all team members, the results of which would be stored in a shared Google Sheets spreadsheet. Later, in the next Development phases of the project, some Python script would then be used to transfer those collected data from the spreadsheets to the MongoDB database instance of our system.

We also set up the code repositories for the project, with CI/CD flow integrated, for automatically running tests and deploying to staging server. We also defined database instances to be used for the final product.

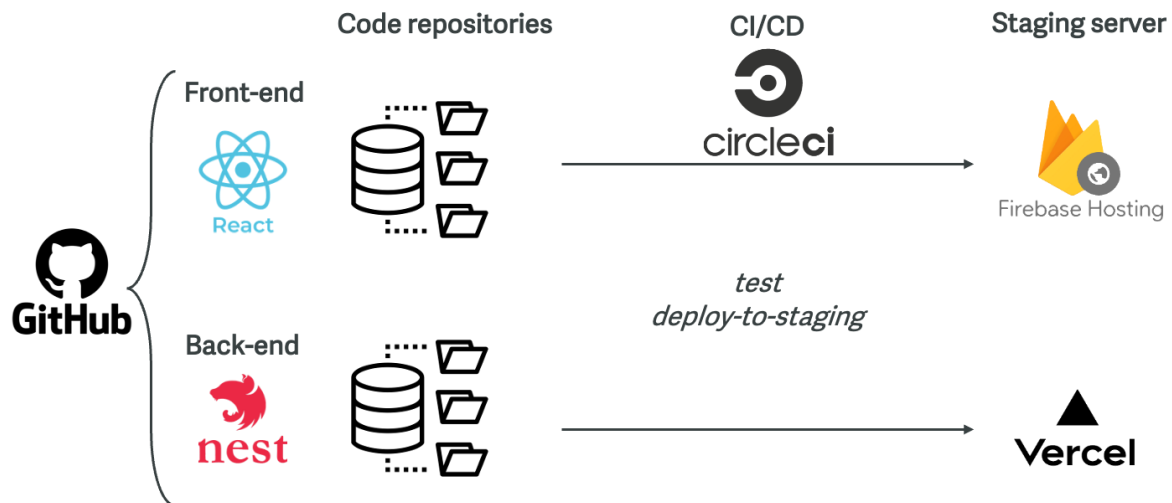


Figure 15 - Code workspace structure for the project

IV.3.3. UPSKILLING

Most of the time for Upskilling sub-phase was spent on learning about the library for rendering 3-D into browser, ThreeJS, which is completely new to our team members. As the best study method is to “practice”, we improve our understanding and skills to use the library by creating some demo projects, as follows:

- This project was built to have a deeper understanding about the shapes and color shadings within the library of ThreeJS.

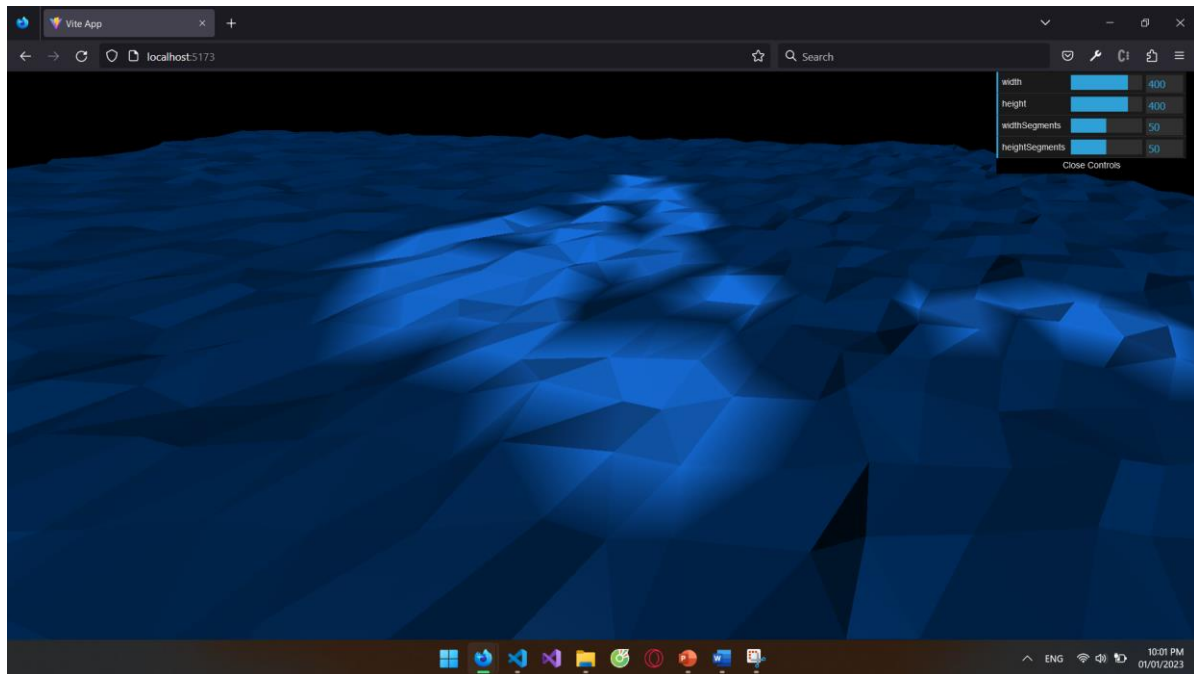


Figure 16 - Geometric shaded background demo project

- This project was built to understand how a 3-D object model could be loaded successfully into the browser space, and how to locate, resize, scale and interact with them.

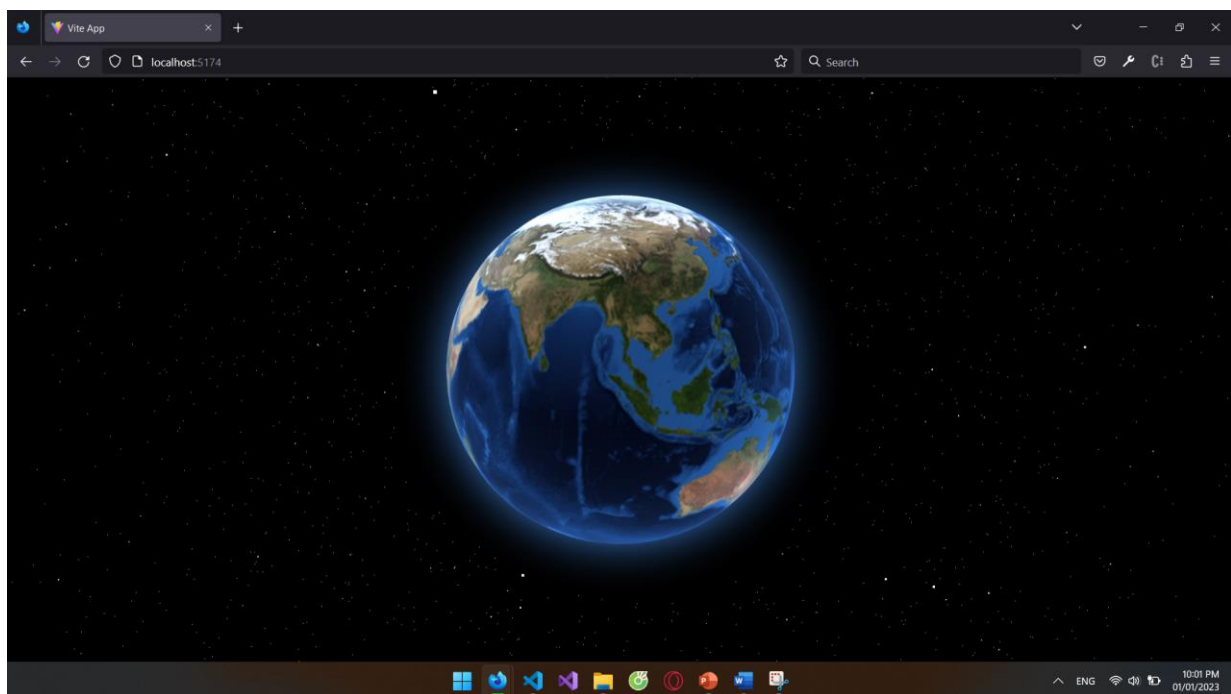


Figure 17 - Earth and the universe demo project

- This project was built to understand about the inclusion of Physics concept in 3-D browser space built with ThreeJS.

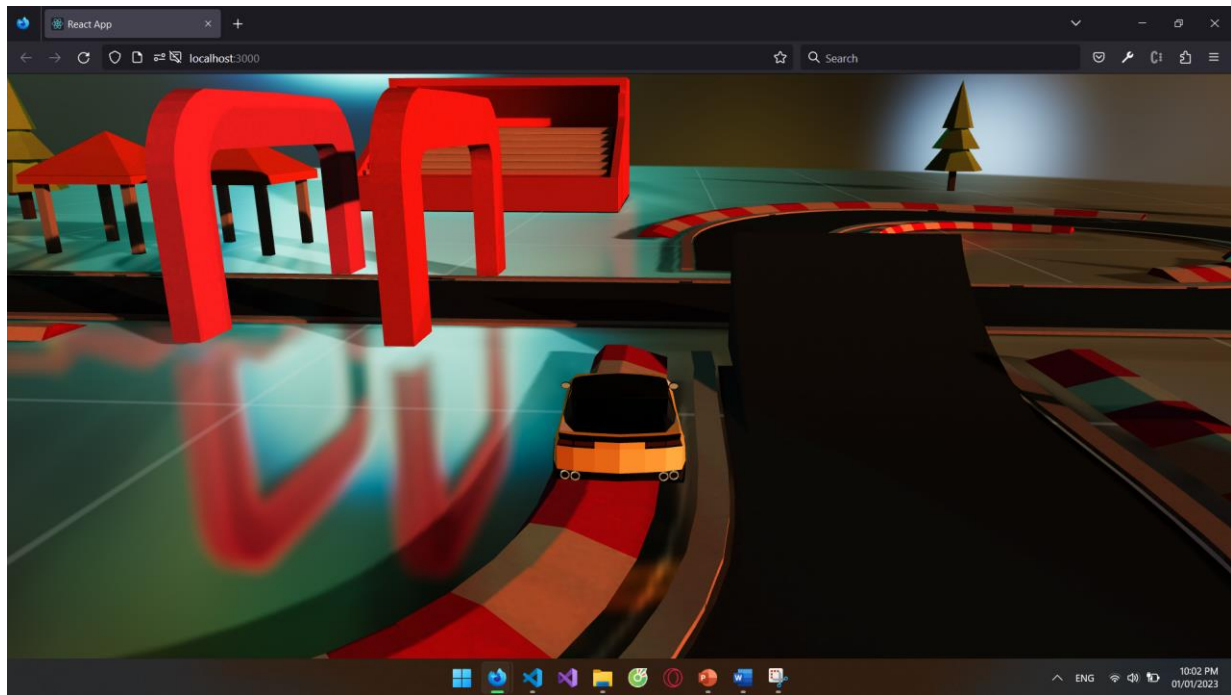


Figure 18 - 3D car control demo project

After about three weeks spent on studying about ThreeJS library, we were able to acquire the basic skills required to implement the project using the library. In the next section of the report, the technical experiments of loading the human body 3-D model into the browser and mark the acupuncture points and meridians would be provided.

IV.3.4. TECHNICAL EXPERIMENTS

We re-evaluate the feasibility of the project after Upskilling phase by trying to demoing the loading of the finished 3-D human body model into the browser, and mark some acupuncture points of one selected meridian as an example. This is the result:

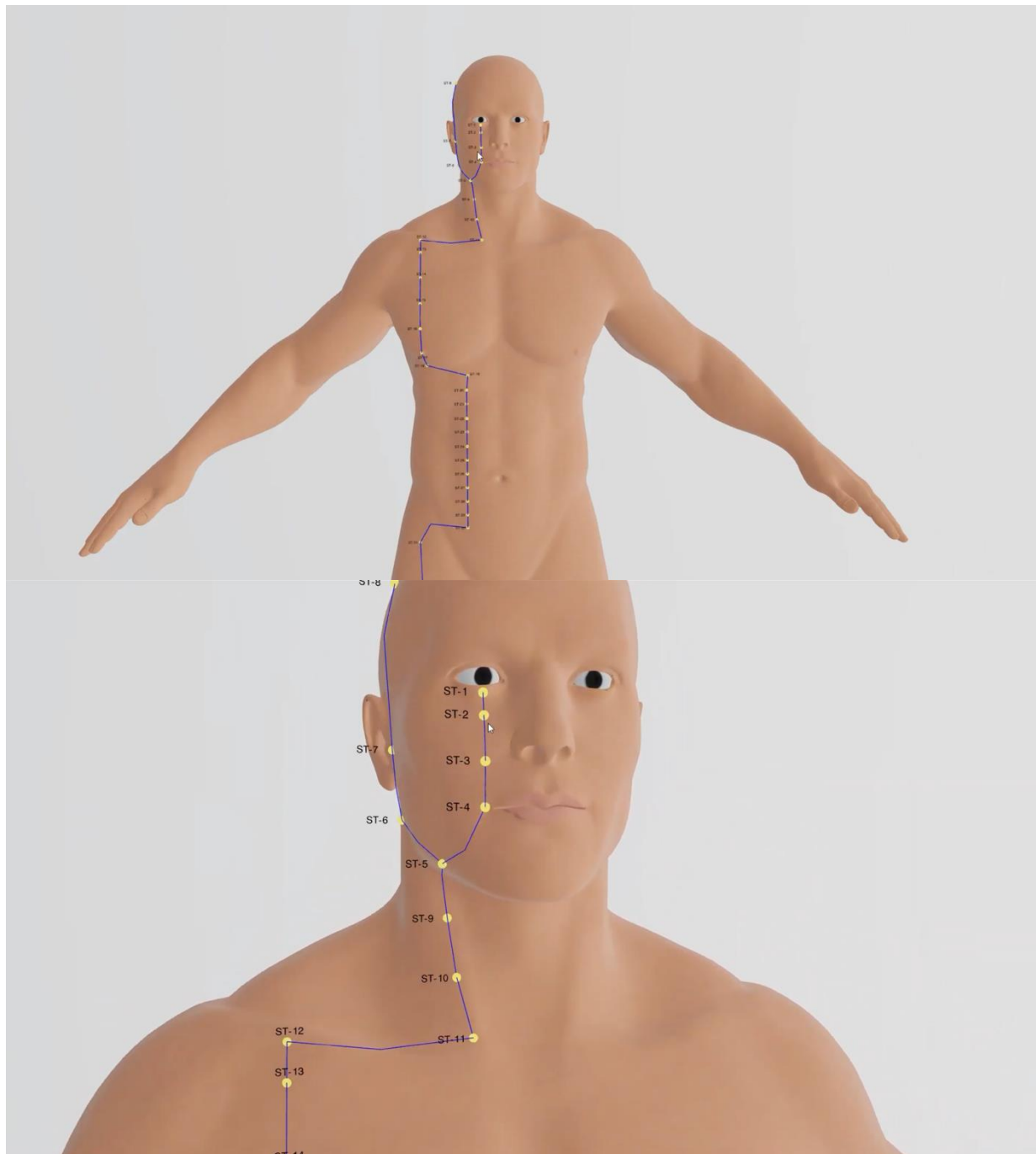


Figure 19 - Experiment loading the 3D model into the browser and mark the basic acupuncture points + meridians

IV.3.5. PROTOTYPES

For the design team, after finishing collecting the requirements, the team also started on designing the most basic scenes for the initial version of the Prototype. Those are some of our designs on the first Prototype version:

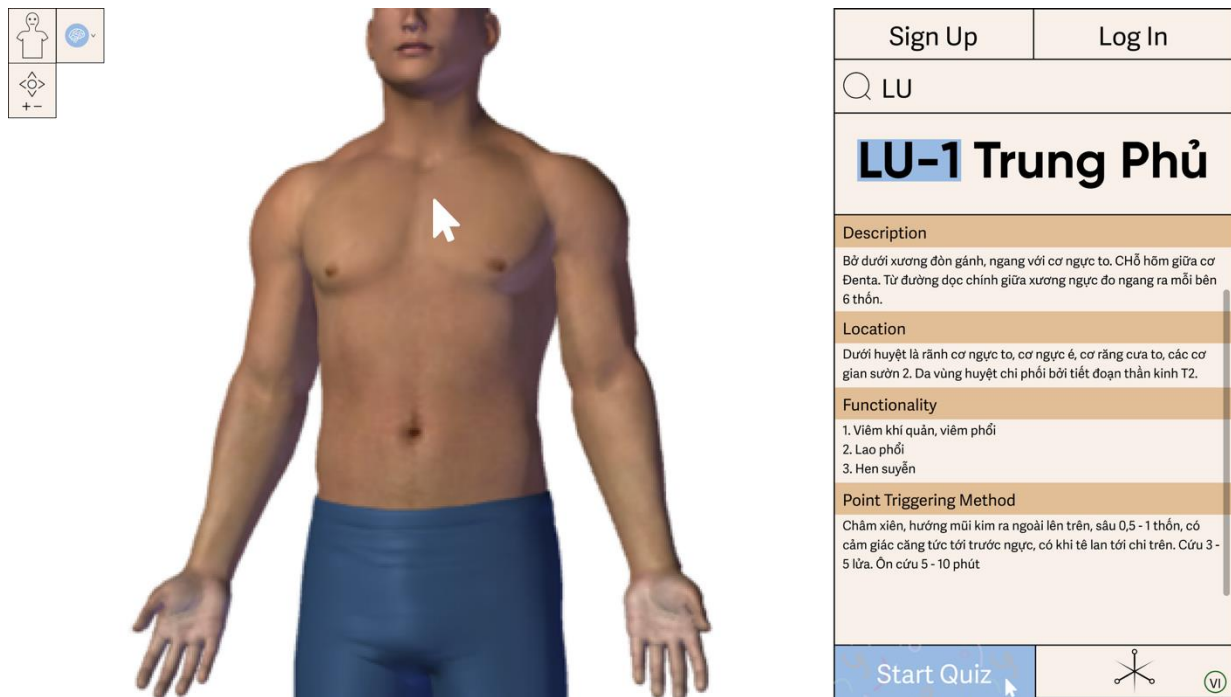


Figure 20 - Home screen in the initial Prototype

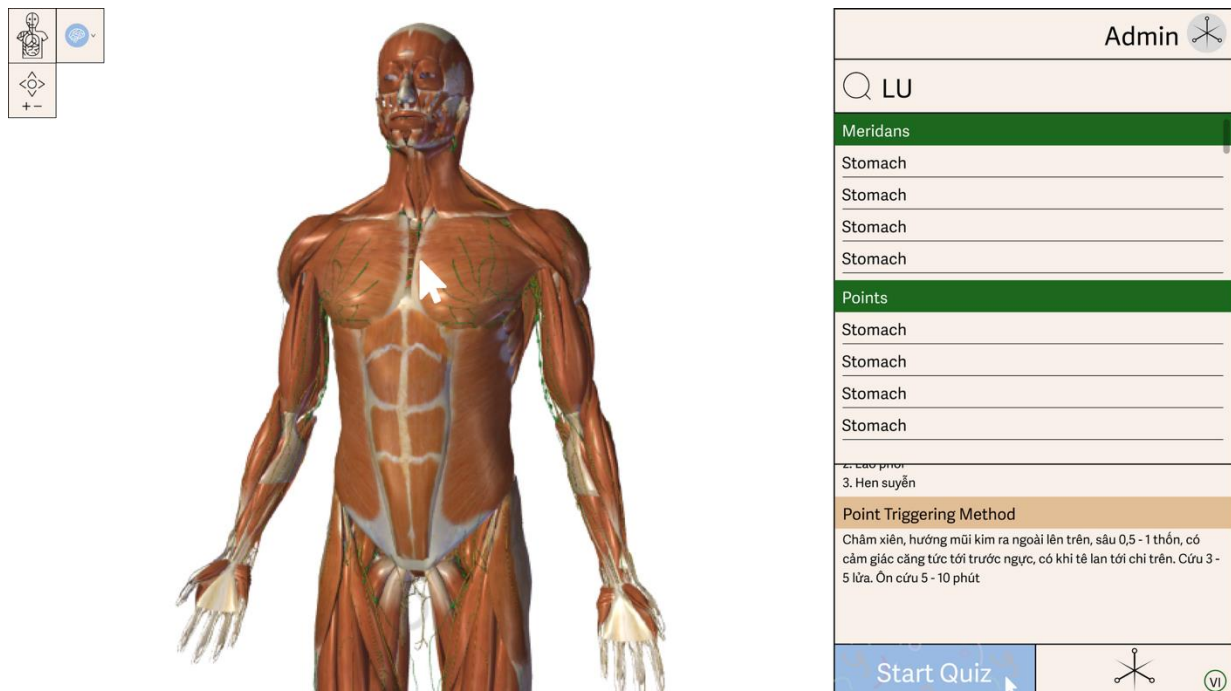


Figure 21 - Search functionality in the initial Prototype

V. PLAN FOR THE NEXT PHASE

Following our plan, we would take a 2-week gap for the Tet holiday in Vietnam. After the holiday, we would continue with the integration of the 3-D model into the system and marking the acupuncture points and meridians.

After the holiday, we plan to spend nearly 2 months for the completion of phase 1, including some basic functionalities:

- Finish labeling the acupuncture points and meridians on the 3-D model.
- Finish the authentication flow for the system.
- Finish filling up the database with collected data from previous phase.
- Finish unit testing and integration testing the functionalities.

We plan to also use some of our free time during the Tet holiday to start some of the features earlier than the plan, if possible, so that we would have a little bit more free time for preparation of the Formal QR Review and the Defense Ceremony at the end of the two development phases.

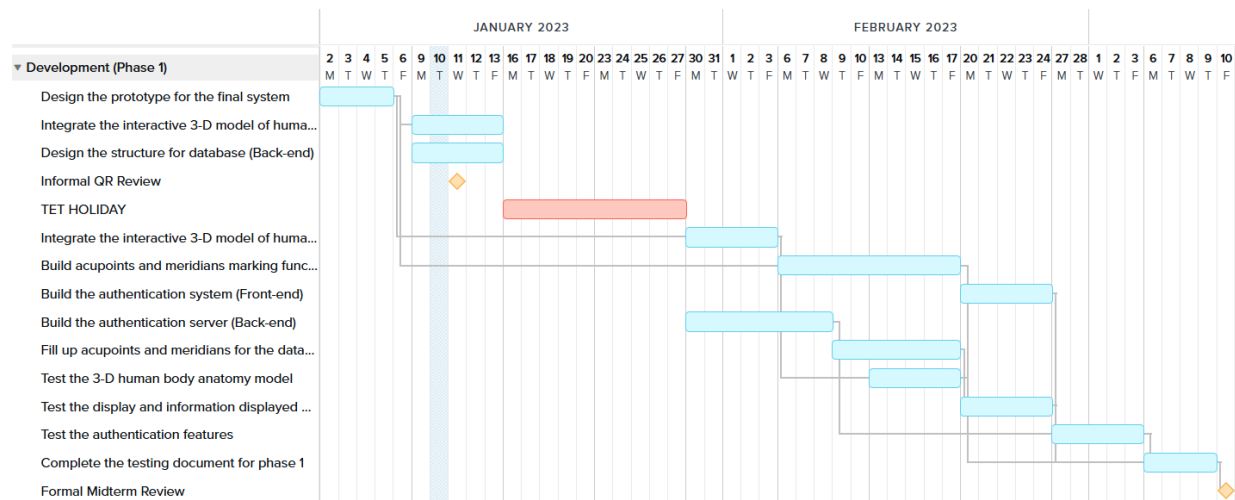


Figure 22 - Gantt chart detailing plans for the next phase

IX. APPENDICES

Auckland University of Technology Bachelor of Computer & Information Sciences

Research & Development Project

Disclaimer:

Clients should note the general basis upon which the Auckland University of Technology undertakes its student projects on behalf of external sponsors:

While all due care and diligence will be expected to be taken by the students, (acting in software development, research, or other IT professional capacities), and the Auckland University of Technology, and student efforts will be supervised by experienced AUT lecturers, it must be recognized that these projects are undertaken in the course of student instruction. There is therefore no guarantee that students will succeed in their efforts.

This inherently means that the client assumes a degree of risk. This is part of an arrangement, which is intended to be of mutual benefit. On completion of the project it is hoped that the client will receive a professionally documented and soundly constructed working software application, some part thereof, or other appropriate sets of IT artifacts, while the students are exposed to live external environments and problems, in a realistic project and customer context.

In consequence of the above, the students, acting in their assigned professional capacities and the Auckland University of Technology, disclaim responsibility and offer no warranty in respect of the “technology solution” or services delivered, (e.g. a “software application” and its associated documentation), both in relation to their use and results from their use.

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