Project Management Plan

Software Processes and Management
Assignment 2
SWEN90016_2022_S2
T10_01_Agile

Indigenous Languages: Revival and Reclamation

Online Research Tool

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2. Executive summary

An Indigenous language is one valuable property of the indigenous community, and it is currently facing the danger of extinction. The need for indigenous language recognition and reclamation is urgent. In order to facilitate and support indigenous language research, this project is assigned to a group of students(Group ID: T10_01) enrolled in SWEN90016 and aims to set up a detailed project management plan (PMP) and develop an indigenous languages online research tool prototype.

The goal of this project management plan is to develop an indigenous languages online research tool from September 16, 2022 to October 14, 2022, providing an online communication platform for researchers to communicate with each other, to facilitate their research needs of reviving and reclaiming indigenous Dhudhuroa language. The online tool is a clearly structured multilayer website that can store multiple data types. Key features of this project include user registration and login, indigenous language content displaying, restricted access control of each page, user groups and in-site searching functionality.

The team decided to use the scrum method under the agile concept as the Software Development Life Cycle, as scrum can make the project more flexible with faster delivery and provide better quality assurance. The team first assigns roles to each team member according to strengths and capabilities. Then the team analysed the project requirements to understand constraints and risks. Combining key features with development team capabilities, the team decided to use Wix.com as the primary tool for a speedy development and deployment of the project.

Into the planning stage, the team first made a releasing plan to provide a overwise of the whole project. Features that will be implemented in the upcoming sprints and approximate release date of the project are analysed and documented. Three five-days sprints were then designed to cope with the required timeframe and workload. In each sprint, sprint goals were defined, user stories were decomposed, tools such as Kanban board and burndown chart were documented to further monitor the project progress. At the end of each sprint, meetings were held to review the product and reflect teamwork to further improve the teamwork efficiency.

- In sprint 1, the team constructed the homepage and realised the user registration function.
- In sprint 2, the team realised the user group, text search and permission request function.
- In sprint 3, the team built most of the web pages that displayed contents related to indigenous and implemented the restriction access control function.

The development team pre-defined risks that could jeopardise the project outcome. Key risks including under-performing websites that lead to unsatisfied client and end users and project development exceeding the due date. Two new risks were identified including development tool capped capabilities and third-party plug-ins compatibility during the development process. The team carefully monitored the risk status and had risks under-control.

By strictly following the scrum method, and closely cooperating with team members, the development team successfully delivered the outcome as per the requirements, despite the remotely working constraint and risks. The team reviewed the development process and reflected the teamwork, to further strengthen the learning outcome of this project.

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4. Project Initiation

4.1 Key stakeholder analysis

Table 1. Stakeholder analysis

Stakeholders	Internal/ External	Power	Interest	Justification & Analysis
Cline - Dr. Susan Joyce	External	High	High	Dr. Susan Joyce, the project's sponsor, wants to protect and restore endangered indigenous languages and their cultures by developing an Online Language Research tool. Therefore, Susan has high power and high interest in this project since he/she can directly determine and impact the project's goals, scope, and success criteria. As a result, the development team will keep providing the up-to-date and critical information to the client and get the feedback from the client in time to ensure the project always meets the client's expectation.
The Dhudhuroa Community and its elders – Gary Murray	External	High	High	The Dhudhuroa Community and Gary Murray are directly relevant to this project. As the custodian of the languages, they possess the ownership of related indigenous languages. Accordingly, all researches regarding indigenous languages need permission from the community and its elder - Gary Murry. Therefore, the community could abort the project, indicating high power. The interest of the community and Gary Murry is also high since the purpose of this online language research tool is to revive and reclaim the indigenous language, which is one valuable property to them. The gains from this project could significantly benefit the community.
A client representative	Internal	High	High	As part of clients, the client representatives have both high power and high interest. They can directly influence the expectation and performance of the final product since the development teams need to improve and produce the final product based on their evaluation and feedback to meet the project goals and client satisfaction.
Development Team	Internal	High	Low	The development team is the contributor to the project and is responsible for developing the Online Language Research tool based on the sponsor's requirements. The power of the development team is high since the behaviour of the development team directly influences the quality of the delivery product - the web application. The interest of the development team is low since the development team cares more about the quality of the web application than the purpose and content of the web application.

Registered Users	External	Low	High	The registered users are highly interested in this project and will become the core user group of the web application. However, the registered users have only low power since, as the end users, they can only provide feedback on the final product but do not have the power to directly change the final product.
Admin User	Internal	High	Low	Admin user is one of the development team members who have the power of granting permission to the registered user to access the two restricted web pages - English Language - Dynamic Demonstration Example and Indigenous Dhudhuroa Language pages. Therefore, the power of the admin user is high. Compared with the purpose and content of the web application, the admin user cares more about the correctness of access authorization.
Unregistered Users	External	Low	Low	The unregistered users are one of the end user groups of this project but are not very interested in indigenous languages and culture. If a user chooses not to register, this user is not the target user of the web application. Therefore, the influence of unregistered users on this project is low.

4.2 In-scope feature

4.2.1 Product Backlog

The following groomed product backlog describes features to be achieved in this project. The priority ranks from 1 to 5, where 5 means the highest priority. For the column Sprint (the current product backlog has been updated with first Sprint planning only), it will be filled when the product owner decides to pick up which task to complete in the next Sprint.

Table 2. Product Backlog Table

ID	Product Backlog User Story	Epic user story points	Priority (1-5)	Sprint
1	As an unregistered user, I want to register as a valid member of the website so that I can use the service provided by this online research tool.	18	5	1
2	As a registered user, I want to login so that I can use the service provided by this online research tool.	15	5	1
3	As a registered user, I want to access the homepage so that I can see the latest significant research results.	18	5	1

4	As a client, I want to be able to access the privacy and copyright disclaiming page so that I could understand the website's copyright policy.	10	5	1
5	As a registered user, I want to request permission from the admin so that I can interact with the Dynamic Demonstration Example domain data provided on pages.	14	4	2
6	As a registered user, I want to manage my user subgroup so that I can only access the content that belongs to my user group.	28	4	2
7	As a registered user, I want to search text data so that I can find the information quickly.	9	4	2
8	As an admin, I want to approve or decline user permission requests so that I can control the website's access rights.	11	3	2
9	As a registered user, I want to click on a drop-down menu so that I can go to a certain web page.	8	3	3
10	As the client, I want to stipulate permission among the web pages so that only the user can access and operate certain web pages with permission.	9	3	3
11	As a permitted user, I want to access the indigenous dhudhuroa language page so that I can access the information on that page.	6	2	3
12	As a registered user, I want to access the dynamic demonstration example page so that I could view/ hear/ upload/ download data.	16	2	3
13	As an end user, I want to access the English language static example page so that I can access its content (variable data format) and enter its subpages.	10	1	3
14	As an end user, I want to access indigenous community knowledge pages so that I can see the content, such as place names, cultural sites, and tracks.	8	1	3
15	As an end user, I want to access culturally relevant perspective pages so that I could see the lived experience of indigenous people who value and respect their language.	8	1	3

4.2.2 Deliverables

The following table will describe the software, documents, and services for this project.

Table 3. Deliverable Table

TYPE	Name	DESCRIPTION
Software	Root user account	Root user account & password.
	Web page source code	A series of web page source code and project configuration files.
Document	Privacy and copyright	Document that gives the client the rightful owner of the software.
	Product instructions	Product instruction manual describes software functions and guides users to use and manage software.

4.3 Out-scope feature

As a website that helps language researchers and participants revive and recover their native cultures, here are some out-of-scope features beyond the client's initial requirement. Table 4 shows the out-scope feature types and the reasons for why the feature types are out-scope.

Table 4. Out-Of-Scope Table

ID	Out-scope feature type	Description & Reasons
1	Additional web page architect	No additional web page architect is to be set up. This product utilises a 3-tiered web application architecture, so the more complex web page architect is out of scope.
2	Additional user portal interface	No other user information pages need to be set up, except for one web portal user interface that includes all related user information.
3	User operation records storage.	No other information requires to be collected or stored, such as user operation records, except for the user profiles and data related to language research.
4	Data integrity module	No data integrity module needs to be configured for spam information.
5	Additional data type compatibility	No other data types (video, movie, interactive map) are not compatible except for the required data type (text, symbols, images, and songs).
6	Future enhancement	Not responsible for the implementation of future enhancement features, such as: 1: A search page to construct unstructured data searches using metadata tagging category technology. 2: A data analysis module to recognize speech patterns and understand language.

		3: A data format translation module to convert raw data to an internal system format.
7	Maintenance	The team is not responsible for the subsequent maintenance and future website upgrades since the requirement of case study only requires the development of the website.
8	Other language support	No other language support, except for English and Dhudhuroa.

4.4 SDLC delivery approach

The team decided to use the scrum method under the agile concept as the Project management methodology. Features of this project, advantage and disadvantage of the scrum method, and use case justification are shown in the following section.

4.4.1 Features of this project

a) **Product basic functionalities are clearly defined**
The client proposed a three-tier website with general web-based features such as user registration & authentication, multimedia data presentation & transferring, and dynamic communication between users. All three tiers and each web page's functionality are clearly defined in the provided documentation.

b) **However, product capability details are not provided**
Minimum details were given in the document to describe the expected capability of this product, such as database size requirements and website download/upload capability.

c) **High-quality end outcome takes priority**
The purpose of the product is to provide tools and a platform for indigenous language custodians and language revivers to communicate academically. Product quality is the highest priority in this project to better serve the target users.

d) **The development team requires working flexibly**
The development team members work part-time on this project and have different time schedules. A flexible development approach is a must for team members.

e) **Subject matter experts obtain domain knowledge while other developers do not**
The academic field of indigenous language knowledge is only obtained by one language expert, while other team members obtain minimum knowledge in this matter.

4.4.2 Description of Scrum method under Agile

Agile is an iterative approach to help with project management and software development and make the project more valuable and successful delivery[1]. Scrum is a method or framework to implement the agile concept that encourages team members to learn from experiences and reflect on what we keep improving during the process. At the mention of the scrum, the idea of the sprint cannot be ignored since sprints are at the heart of the scrum method to help the project be well-aligned and more effective, and a sprint is 1-4 weeks. Generally, the development team will divide the project into multiple sprints, and each sprint is a short, time-boxed period with predefined goals[2].

Refers to Figure 1, a successful scrum method implementation may include the following process.

- Product Owners take ideas and requirements from executives, stakeholders, customers, and users. Based on the requirements detail, the product owner will first do a release planning and generate a product backlog that contains the functionality of the project;
- The project team will hold sprint planning meetings to select some top goals to achieve in a sprint. According to the sprint goals, the sprint backlog will be generated as a subset of the product backlog and contain a list of the task breakout items to be completed.
- Within a sprint (1-4 weeks), the Scrum master will be important in leading daily scrum meetings (standup meetings). And a burndown chart will be generated to record the ideal task remaining and keep track of the actual task remaining.
- At the end of the sprint, finished work can be deliverable if the team follows the sprint goal and completes all tasks. A sprint review will be held to record the achievement and plan for the next sprint. A sprint retrospective will be held to make some improvements.

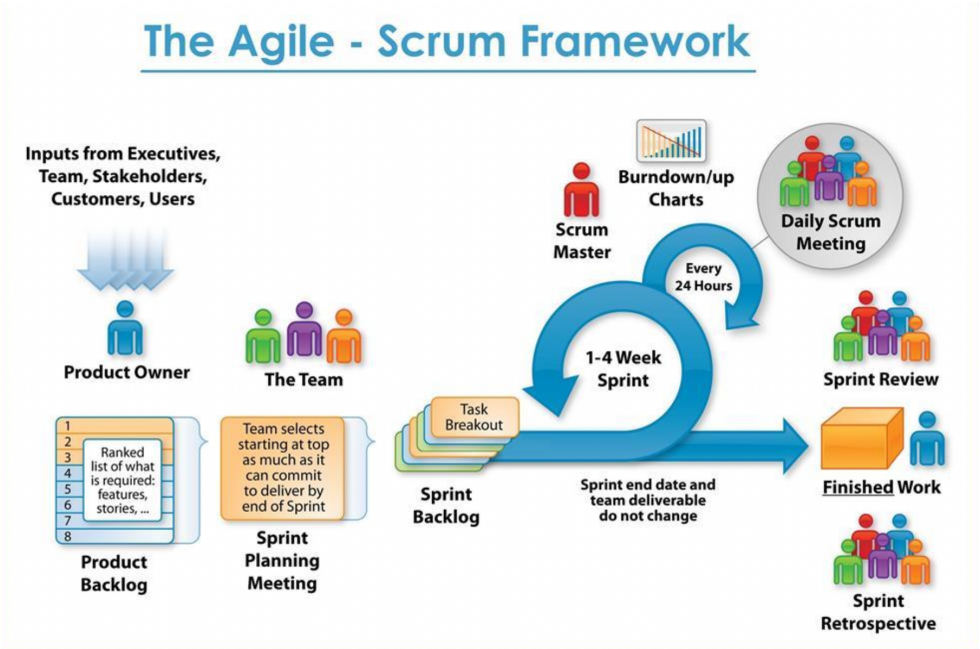

Figure 1. Scrum Framework. Adapted from [3]

The team has reviewed the project features and decided to use the scrum method over formal development management such as waterfall, mainly due to the flexibility of the development process, faster product delivery, and high-quality assurance. Detailed advantages and disadvantages analysis are listed below.

4.4.3 Advantages of Agile

a) **Flexibility**

First of all, the scrum method will perform well on this project since it is open to change and regular adaptation to change[1]. When the clients want to change some implementation or add some additional functions, the team can respond to the requirement as soon as possible. The client only provides a general requirement for this project without detailed information. Therefore, more detailed information might be provided during the project process. Unlike the waterfall method, once the plan is made, it is impossible to change during the implementation; the scrum can make the new requirement the goal for the next sprint. For example, in this project, the client needs permission access that only allows a specific group of people to access it. But later in the stage, in the second sprint, they might want to change the access group or make some changes on the page which is not in the initial scope. Under this situation, the development team can implement the change in sprint three, and the client gets the delivery at the end of sprint three. This kind of quick response to needs or changes will satisfy customers with the team's services and further give the team a good reputation.

b) **Faster delivery**

Meanwhile, the scrum method can lead to rapid and continuous delivery, which can make the partial deliverable publish early. In this case, the clients can decide to make the website available for any delivery and keep adding to it iteratively. This project, based on the requirement, can be divided into three parts, basic needs that include a welcome page, login page, home page, and so on; also, it has data integrity and security part, which include authorization requests, user groups and tests searching page and more; Permission restricted pages are also a part of the whole project. Therefore, the clients can choose to deliver the basic pages first to allow the user to register for the website and know some basic information about indigenous knowledge, and then add the authorization request page and permission-restricted pages on it after each delivery. In this way, the users can get a chance to use the website as soon as possible, and the client can achieve their goal of reviving and reclaiming endangered indigenous languages and cultures at an early stage. Agile allows more flexible release times and continuous updates than the waterfall method. Thus, agile is an excellent framework for implementing the project.

c) **Quality assurance**

Last but not least, the scrum method is an approach that provides early feedback, which allows early detection of problems and can be modified based on it. In waterfall, stakeholders can only find the problem in the last stage, so it will be costly to change any mistake. However, there will be delivery to stakeholders every sprint for the scrum method. The problem can be found earlier, so the cost to modify it will be much less, which is an advantage of using the agile concept[3]. In this project, some authorised pages only registered people can view and use. It is possible that the team forgot the authorization part or the wrong group is authorised to view the page. So, it is necessary to find the problem and fix it. Moreover, getting early feedback based on current delivery can be easy to locate the error if there are any. For example, suppose the restriction page has found some error by the stakeholder. In that case, it is hard to detect if the error is in the restriction condition or the identity verification part in the waterfall method. But the scrum method is easy to locate since the delivery might be separate, and the error will be in the latest change section.

4.4.4 Disadvantages of agile

a) **Constant communication required from clients**

One drawback of taking the scrum model project management is that the client needs to constantly give feedback to the development team, which could be a costly factor in this project[4].

The development team takes advantage of constant feedback from the client, revisiting and modifying previous work so that the final product can better meet the client's expectations. When the early designing and concept documentation is not clear enough, or the development team lacks professional domain knowledge, the project could get off track without constant feedback from the client.

As emphasised in the project feature analysis, the current given documentation only highlights the high-level illustration of this project without providing detailed requirements for each feature. For example, no estimation of data size was given in the case study document. So, it will be difficult for the developer to choose backend storage solutions based on the current information. Another example is that the requirement for developing the dynamic demonstration example page is not specified. The development team could only make decisions based on experience in the initial stage, build a prototype and expect further guidance from the client's feedback. If the communication between the client and the development team fails, scrum model management cannot work as expected.

The scrum model is still preferred in this project due to there being a dedicated client representative resource. We aim to obtain a clear communication channel and receive constant feedback from the client representative.

b) **Time demanding for developers**

Another disadvantage is that the users of the scrum model are expected to spend more time than a formal model such as the waterfall model[5].

Under the scrum project management model, regular sprint planning, daily scrum meeting, and continuous backlog updating are essential to keep the vibe of this project alive. Scope changes are expected and welcomed, meaning previous work needs to be revisited during the development. All these activities require more time. Hence, the scrum model is more time-demanding than other formal models.

Given the initial proposal provided in the document, the scope of this project is relatively small (a three-tier website structure with fairly standard web-based features). Besides, the development team size is capped at five people, and the time frame is quite rigid. Therefore, running a scrum model in this project would increase the time distribution percentage on planning and decrease the percentage of working (coding). Under limited time, this increases the work intensity among the developing team members.

The scrum model is still preferred in this project because the need for higher quality outcomes outweighs the drawback of increased cost. We are aiming to provide a high-quality end product to the client.

c) **Require experiences from developers**

Users are required to have experiences and knowledge with the scrum model to benefit from it. The project can go off track if the users struggle with the complicated processes of the scrum model.

The whole project development process is divided into several smaller feature developments during each sprint. The development team self-organizes to determine the best approach to deliver the features. Hence, it is essential that each sprint planning clearly defines the priority and states the attributes of the features, which requires managers to obtain professional domain knowledge and experience. For this project, most team members are not familiar with the concept of indigenous language reviving, nor have senior-level project development experience. Hence, running a scrum model in this project bears the risk that the development process could take a detour.

The scrum model is still preferred in this project due to the need for higher quality outcomes outweighing the drawback of lacking subject-related experience. We aim to investigate and learn the subject-related matters and deliver expected outcomes.

According to the above analysis, the scrum method of the agile concept is proven to be flexible and practical in this project. Moreover, it brings continuous delivery to the client so the team can

get early feedback. It comes with drawbacks such as increased complexity for development and time demand for the development team. However, quality is the project's priority, which outweighs the drawbacks. Therefore, it is a suitable method to use for the successful delivery of this project.

4.5 Constraints

a) **Time**

The rigid time frame for the development process is caused by a strict deadline (where the development team is required to submit their work by the due date). This differs from other projects where there may be some negotiation space available regarding time. Moreover, the team members' person-days are quite limited. All five members are taking 4 subjects, and are available a quarter of time spent on this project. Hence the available person days: 5 students * 15-days development * ¼ allocation = 19 person days. Therefore, delivering products on time is one of the major constraints of this project.

b) **Communication between developers and the expert**

Another constraint of this project is that the product is built to support "indigenous language reviving," targeting academic users. The current development team (excluding the language master) possesses limited knowledge of this topic. Hence communicating effectively between the language master and other team members would be challenging.

In detail, the language master needs to provide insights prior to the development and feedback during the development in plain language so the developers can understand and execute. Other team members need to ask questions in terms of website functionalities, elements, and style in plain language, so the language master can provide his judgement. Therefore, smooth and efficient communication between the language expert and other team members is one of the constraints of this project.

c) **Quality of product**

The product will be used in an academic environment for scholars. Compared to generic websites, this product requires high security to

- Preventing unpermitted access to unpublished works of researchers;
- Preventing data loss caused by unexpected server shutdown.
- Protect the copyright of language data produced by local indigenous language custodians.

Hence, Thorough tests need to be taken before releasing the product to ensure it meets the requirements above before more damage is caused during operation.

d) **Ability for future enhancement**

As required in the documents, the client wishes to add future enhancements to this project, such as language processing and searching functions. Hence the current

framework needs to be able to support future enhancement. Otherwise, it would be quite costly to reconfigure the product at a later stage.

e) **Benefits of product**

The client is proposing a website where language scholars could gather around and exchange knowledge and discoveries, while indIgenous languages reviving is gaining more attention from linguists, researchers, and governments. According to the FATSIL Guide [6], the number of indigenous language-related websites grew from 60 in 1996 to over 200 in 2004. According to the Narragunnawali resource guide [7], the Australian indigenous language has attracted international attention since 2019. Evidently, more indigenous language reviving websites are coming up (either pointed out by governments or proposed by indigenous language consultants), which would cause this website to compete with other similar websites. Therefore, this will be another constraint of this project to extract the most benefits from the proposed website.

5. Project Governance

5.1 Roles and responsibilities

There are five people in the project team, and the team members are assigned different roles with different responsibilities. Table x below shows the group members and the role they undertake, and the activities they need to participate in are listed.

Table 5. Roles and Responsibilities Table

Name	Role and Responsibilities	Activities
Liu Lei	**Product owner** Responsible for: ● Features determination of the websites. ● Direct communication with the client. ● Successful delivery of the product. ● Final quality assurance of the product.	● Initial connection with the client ● Periodically meeting with the client ● Product backlog grooming and efforts are estimated. ● Sprint backlog planning and efforts estimating. ● Feature priorities are adjusted before and during development. ● Product reviewing and providing feedback. ● Quality assurance. ● Final product delivery.
Siqi Zhong	**Subject matter expert** Responsible for ● Indigenous language and academic	● Assisting the development team with indigenous language matters. ● Assisting the development team with academic matters.

	matters guidance to the team during development. ● Product to be presented formally and respectfully.	● Discussing indigenous language matters with language custodians. ● Providing insights regarding proper presentation stylish of websites ● Providing feedback during and after each sprint. ● Reviewing products periodically.
Zixi Zhao	**Scrum Master** Responsible for: ● Scrum values enacting and daily scrum promotion to support the development team and to ensure effective team communication. ● Roadblocks/impediment removal for the dev team to ensure the team is fully functional and productive. ● Also, a part of the team for product development to test the features of websites.	● Preparing the sprint plan, goals, and backlog with the product owner. ● Hosting daily stand-up meetings and actively participating and monitoring in each sprint. ● Generating the sprint burndown chart to check the workflow ● Host the 30 minutes sprint reviews meeting to capture feedback at the end of each sprint. ● Hosting the 45 minute retrospectives meetings to find the improvement areas and action at the end of each sprint for future sprints. ● Serve as a member of the scrum team accordingly.
Ziyuan Chen	**Dev Team Member (Tester)** Responsible for: ● Make sure the correctness and usability of the website and detect any potential errors ● Analyse test results and prepare reports on all aspects related to software testing performed. ● Report bugs to the programmer if there are any	● Following each sprint planning, create the test plan and test scenario for the website's features. ● Prepare the test case, including the white box testing and black box testing for each web page's features, to find the bugs. ● Communicate with the programmer and report the bug, issues, or any improvements on stand-up scrum meetings.
Taylor Tang	**Dev Team Member(Programmer)** Responsible for: ● Development of required functions of the websites. ● Estimates possible release date of features ● Consult with the language expert about indigenous language-related matters. ● Fix any bugs that the tester reported to make sure the usability of the website	● Following each sprint planning, create the test plan and scenario for the website's features. ● Prepare the test case to find the bugs, including the white box testing and black box testing for each web page's features. ● Communicate with the programmer and report the bug, issues, or any improvements on stand-up scrum meetings.

5.2 Communication Plan

5.2.1 Shareholders communication

Table 6. Stakeholders Communication Table

Meeting Title	Owner	Audience (Stakeholder)	Objective	Frequency	Format (virtual/ face2face)
Sprint Planning Meeting	product owner	Development team, and clients	The goal of this meeting is to define the execution planning of the sprint, including the sprint goal, sprint backlog and details in the sprint. ● Review the product backlog during the meeting and decide what items to prioritise for the next sprint. ● Determine the sprint goal for the next sprint, which is a summary plan. ● Prepare a sprint backlog, the list of tasks the team will work on in the next sprint.	Once a week which is at the beginning of each sprint.	Virtual meeting via Zoom
Stand-Up Scrum Meeting	Scrum master	Scrum master, Subject matter expert	The goal of this meeting is to regularly review the status, plan one day's work and solve the obstacles during the sprint. ● Discuss the current task status, including which tasks are completed, which tasks are in progress, and which tasks are pending. ● Make a plan of a day's work ● Identify any obstacles that could impact the work. ● Determine the solution to the obstacles	At least twice a week	Virtual meeting via Zoom
Sprint review and retrospective Meeting	Sprint master	Product owner, clients, development team	The goal of this meeting is to review what has been done, what has not been done, and future improvement. ● Review the performance of the current sprint. ● Determine what worked well, what did not work, and how the team can improve the process during the next sprint. ● Get feedback from the clients.	Once a week which is at the end of each sprint.	Virtual meeting via Zoom

Client feedback meetings	Product owner	Client and client representatives	The goal of this meeting is to share the current project status and achievements with the clients and get feedback from clients. ● Review the project progress and status ● Present the current deliverables and tasks completed ● Gather the feedback from clients and seek which parts are done well and which parts still can be improved ● Ensure everything is in the right direction and discuss the next steps and directions.	This meeting will be hold when some core functions implemente d or goals achievement	Virtual meeting via Zoom
Up-to-date informatio n sharing meeting	Product owner	The end users that interested in the project	The goal of this meeting is to share up-to-date information about the project with the end users interested in the project, which can maintain their high interest. ● Provides up-to-date information on the progress of website production and offers them small previews. ● Gather feedback from possible end users to improve the user experience and create a user-friendly interface.	After finishing each sprint	Virtual meeting via Zoom
Cultural exchange meeting	Product owner	The Dhudhuroa Community	The goal of this meeting is to make close relationships with the Dhudhuroa Community and get feedback from the community. ● Introduction to the current progress of the website and offer them small previews. ● Discuss the culture and language shown on the website with the Dhudhuroa community and double check the information related to the Dhudhuroa provided on the website is correct.	After finishing each sprint	Virtual meeting via Zoom
Final product delivery meeting	Product owner	All stakeholders	This meeting aims to introduce the final delivery product to all stakeholders. ● Present the final project deliverables to all stakeholders, including the goals of this project, demonstration of the website, and introduction of its main functions. ● Answer the stakeholders' questions related to the final delivery product.	At the end of the project	Formal presenta tion via Zoom

5.2.2 Meeting Schedule

Table 7. Meeting Schedule Table

Meeting ID	Meeting Date & Time	Location	Goal	Escalation Trigger
1	August 27th, 16:00 - 18:00	Virtual meeting via Zoom	• Read customer requirements in detail to ensure all teammates have the same understanding of the requirements. • Assigned the different roles to each team member. • Divided the whole requirements of the project plan into small tasks and assigned small tasks to each team member. • Discussed which SDLC models should be used in this development process • The next meeting time is August 30th, 2022 21:00.	Before the second meeting, one team member wants the next meeting to be postponed to September 6th when it is close to the due date of Assignment 1. Due to objections from other teammates, the next meeting is still on August 30th. The team decided that the meeting time should not be easily postponed except for special reasons.
2	August 30th 21:00 - 23:30	Virtual meeting via Zoom	• Reviewed and discussed peers' work on the PMP's current status. • Discussed the improvement part of each section and determined the next step. • Before the next meeting, team members should improve their parts based on the discussion results and continue to complete the unfinished parts. • Next meeting time is September 6th 2022 21:00.	The time spent in the review process in the meeting is very long, but the efficiency is not high since the team members have not seen what others have written before the meeting. Therefore, the team decided that the team members should read what other members had written in advance before the meeting.
3	September 6th 21:00-0:30	Virtual meeting via Zoom	• Reviewed and discussed the work of peers on the current status of the PMP. • Change and improve the parts product backlog, out-of-scope, and execution plan. • Before the next meeting, team members should improve the part of risk and role. • The next meeting time is September 7th, 2022, 21:00.	None
4	September 7th 21:00-22:00	Virtual meeting via Zoom	• Peer review on the part of risk and role and improve on this part. • Discussion on the exclusive summary. • The next meeting time is September 8th, 2022 21:00	None

5.3 Risk Management

5.3.1 Specific Risk

Table 8. Specific Risk Impact Analysis Table
Prob = Probability (from 0 ~ 100%) / Imp = Impact (from 1 ~ 5) / Expo = Exposure (from 0 ~ 5)

Risk ID	Risk Type	Description	Prob	Imp	Expo	Justification
1	Product Risk	Unpermitted access to restricted content	40%	4	1.6	Unpermitted user access restricted web pages (such as demo page and group page) that are caused by admin user mistakes to handle permission could result in low-user satisfaction, low client satisfaction, data leakage and loss of users. The probability of this risk is relatively medium as most of the user accesses are granted manually by the admin user. Mistakes could happen when doing lots of things manually. The impact is relatively high due to the serious consequences.
2	Business Risk	Low-compatibility of the product	50%	2	1	Low compactibility of the online search tool (such as lack of support on mobile devices) that is caused by less thoughtful designs and testing may result in buggy software user experiences and disencourage users to use the product. The probability of this risk is relatively high as the team lacks mobile device compatible web content development experience. The impact is low as most users are using the desktop to conduct research.
3	Project Risk	Culture conflict in websites	10%	3	0.3	Cultural conflict within website content such as appropriate use of symbols or colours that is caused by a lack of content supervision may result in low user satisfaction, low client satisfaction and loss of users. The probability of this risk is relatively low as one team member is a language expert, however the impact is medium when considering the consequences.
4	Product Risk	Research data corruption	3%	5	0.15	Research data corruption or leakage that is caused by unsecured web storage may result in low user satisfaction and even lawsuit cases. The probability of this risk happening is quite low as the research topic is not attracting criminal behaviour. However, the impact is very high when considering the consequences..
5	Technology Risk	Web service provider failure	3%	5	0.15	The team chose Wix.com as the main service provider. However, web service falling-down that is caused by service provider failure could result in the online research tool cannot be accessed temporarily and low user satisfaction. The probability of this risk is low as the service provider is with a good reputation. Impact is very high because of catastrophic consequences.

5.3.2 General Risk

Table 9. Generic Risk Impact Analysis Table
Prob = probability (from 0 ~ 100%) / Imp = Impact (from 1 ~ 5) / Expo = exposure (from 0 ~ 5)

Risk ID	Risk Type	Description	Prob	Imp	Expo	Justification
1	Project Task	Additional scope	30%	3	0.9	Additional scope added during development (such as additional quests from client) that caused by client change of mind or additional clarification on certain features may result in the project failing to deliver on time and in quantity. The probability of this risk is relatively low as the current documentation is clear enough. The impact is medium as the time is fixed in this project.
2	Business Task	Product not meet user expectation	15%	5	0.75	Product below user expectation that is caused by unclear defined feature details could result in low user satisfaction and drive them away for other similar products. The probability of this risk is low as the development team is using agile SDLC and expecting to get timely feedback from the client. The impact is high as it determines business success
3	Product Task	Product not meet client expectation	10%	4	0.4	Product below client expectation that is caused by an inexperienced development team and low product quality could result in the client losing faith and cancelling the project. The probability of this risk is low as the development team is using agile SDLC and expecting to get timely feedback from the client. The impact is relatively high for the development team because this risk negatively affects clients' faith.
4	Project Task	Staff turnover / temporary leave	10%	3	0.3	Temporary team member leave or turnover that is caused by unforeseen illness or external issues could result in project development delay or even failure. The probability of this risk is relatively low and the impact is medium as the size of the group is five, which leaves a certain level of buffering for this risk.
5	Project Task	Slow developing progress	5%	5	0.25	A slow development speed that is caused by the inexperienced development team or unfamiliar development tools may result in the final product cannot be delivered on time. The probability of this is low as the team have done research regarding the load of the work and interview of team member capabilities. The impact of this risk is high as the time of this project is fixed and delivering product overdue means the project failure.

5.3.3 Specific Risk Control

Table 10. Risk Trigger in associate with table 8 - specific risks impact analysis

ID	Trigger	Owner	Response	Response Strategy	Resources Required
1	A record of unauthorised access to the web page in the user log	Admin user	Admin user to mitigate the mistake by manually configuring the correct user access permission.	Mitigate	Admin user to mitigate the mistake
2	A report from user that the websites are not displaying correctly on other devices	Development team / client	The development team discusses with the client to decide if this improvement is required to be implemented. The client should clearly draw the boundaries of in-scope work and out-scope work.	Mitigate / transfer	Development team to spend extra time configuring product / client to re-define scope of work
3	The team received cultural conflict complaints from stakeholder about website content	The client	The development team is only responsible for the construction of online research tools and will not review, manage or verify the information on the website. Therefore, it needs to be agreed with the client in advance that the customer is responsible for reviewing and managing the pre-populated content, and the development team is only responsible for changing or deleting the content at the technical level.	Transfer	The client is responsible for the rationality review of the website content.
4	A report from Wix.com that indicates the data leakage.	The client	Wix.com provides guranrentes of data security as part of the business core service. Hence, the client should directly contact Wix.com to evaluate the consequences and discuss the mitigation plan.	Transfer	The client acts accordingly by following Wix.com's data recovery policies.
5	Unable to open website (404 error) or admin user failed to login	The client and users	Wix.com provides data backup service by providing multiple backup servers. Therefore, for research data on corruption-related issues, customers should claim compensation from the Wix.com	Transfer	Users act accordingly by following Wix.com's data security policies.

5.4 Technology

The development team has chosen the online website building platform as the primary development tool for developing this online research tool. Advantages and disadvantages comparison of each technology tool, performances, eligibility criteria, development experiences and future enhancements are analysed below.

5.4.1 Developer's capabilities and experience

Before choosing one development tool for this project, it is essential to understand the development team's capabilities, experience and preferences. An over-powerful tool could be difficult to implement due to the lack of capability, and an over-simplified tool may not be able to accomplish the proposed functionalities. Therefore, we interviewed the website developers of this team as follows:

1) Website developer 1: has some experience of website development from previous work experience in a famous IT company. The developer has moderate skills of multiple web page tools including frontend and backend. The developer also has years of experience in other coding languages.

2) Website developer 2: only has preliminarily knowledge of website developments. The developer has some experience of website developing including online courses of web page development and sample index web page development. The developer has entry level skills of React, MySql and general coding languages. The developer is good at quick-learning, researching and testing.

In general, the developing team has an entry-level to middle-level knowledge of website development. The team can utilize traditional web development tools however there is a steep learning curve for one of the developers. The team can utilize compact web development tools or simplified online web development tools with no time sacrifice on product initializing and refining. The more experienced developer can help and guide the other developer during the development process.

5.4.2 Requirements

According to the provided document, the client proposed an online tool in 3-tier website architecture, with the capabilities include but not limited to:

- User registration and login
- Multimedia information and components displaying
- Permission application and approval
- User group Management
- Data search functionality
- Data upload and download

Table 11. Core Requirement Analysis

ID	Capability	Description	Difficulty
1	User Registration and Login	Unregistered users can only view the welcome page, which means they need to register as a member and login to use the functions of online research tools.	User profiles need to be stored in the database The security of user privacy needs to be guaranteed
2	Multimedia Information and Components Display	Various types of information and components need to be displayed on the web page. Information: text, image, multimedia, file etc… Components: button, checkbox, menu, list, form etc…	Various type of website information need to be stored in the database It is difficult to ensure the consistency of the internal UI of the website
3	Permission application and approval	Registered users cannot access pages that require higher permissions at first, which means they need to apply access permissions to the administrator and obtain approval before they can access these specified pages.	The method of notification for administrators needs to be established to remind there are some users applying for specific page access.
4	User group Management	The website can manage users by grouping. The information within the group is only visible to group members.	The binding relationship between group information and user information needs to be clearly established.
5	Data search functionality	Registered users can search the information shared with them.	A lot of effort and time need to be taken to implement a search function with fast response speed and strong search ability.
6	Data upload and download	Registered users can upload the file they want and download the displayed file on the specific page.	To implement the file upload and download function from scratch, the timeout and multithreading issues need to be considered

5.4.3 Choice of main strategies

There are three main strategies available to develop websites, namely:

- Building websites from scratch by using the combination of :
  - Web client development tools (Vue, React, JavaScript etc.),
  - Web server development tools (Springboot and Django, etc.),
  - and database tools (Redis, Mysql, etc.).
- Using online website builders, such as Wix.com and Squarespace.com;
- Using local website management platform, such as WordPress (local server);

1) **Build websites from scratch by using a combination of frontend and backend development tools.**

   Building websites from scratch refers to writing the codes for each part of the website, constructing website architecture, filling the content, and publishing it with its own domain name. The functions of building the website from scratch can be briefly divided into three main categories, namely web client, web server, and database. A web client is the interface that shows the GUI of the websites. It is mainly responsible for displaying the content of the website and achieving the user-website interaction. A web server is mainly responsible for processing the queries from the web client, and responding to the web client with corresponding content. A database is primarily used for actual data storage, including website contents, user profile and uploaded files.

   Advantage:
   The advantage of using this strategy in this case is that it provides high customizability for the proposed online website tools. By decomposing the website elements into smaller functions, building a website from scratch means the developer has the total control over the functions and format of the website. It also provides the possibilities for future website enhancement, since most functions can be replaced or improved in a way. The overall performance of the product by using this method is highest if it is done correctly.

   Disadvantage:
   The development difficulties by using this approach is high for this team. Although one developer has developing experience by using React and Vue (for web client), Django (for web server) and MySql and Redis (for database), the other developer has very limited knowledge of this. Our most optimal estimation is that it will take developer 2 five working days to catch up with developer 1.

2) **Online website builders**
   Using online website builders refers to using online website builders provided samples, tools, UIs and pre-packed function modules to build websites. The developer doesn't need to build website components from scratch, instead he can choose from current available samples and modify them. The developer could also publish the website through the website builder's domain name (or personal domain name with extra cost). Most popular online website builders include Wix.com, Squarespace.com and Weebly.com.

   Advantage:
   The biggest advantage of using online website builders in this case is the speedy development. Since almost all frequently used elements of a website are available for developers to choose and implement, only minimum modifications are required from the developers, the initial development speed is quite fast. With the given time frame of

development being only three weeks, a speedy development is a huge benefit that favors the development team's side. Another advantage is that it is very user friendly to the developer 2. In this way, both developers could start working collaboratively at the beginning.

Disadvantage:
The main disadvantage of using this approach is that it lacks the customizability of a certain feature or function. Since almost all available functions are pre-designed for general uses, it is highly likely that some specific features cannot be implemented. Also, future enhancements of the website such as data integrity or metadata search engine are difficult to be implemented by using this method.

3) **Local website management platform**
Local website building platform's position is in between building from scratch and using website builders, where it The most popular website building platform is WordPress.

Advantage:
The main advantage of using WordPress (local server) as the development tool is that it takes advantage of high capabilities and customizability while remaining relatively entry-level user friendly. In this project, wordpress is expected to be able to provide all current in-scope feature implementation and future out-scope enhancement.

Disadvantage:
Compared to online website builders, wordpress is more difficult to get started with. The initial local server configuration could be complex for entry-level users, such as developer 2. Our estimation is that it will take three days for development 2 to learn related knowledge. Moreover, by using the local server version of wordpress, the development team cannot publish the website without a owned domain name. Hence, it is difficult to work remotely while developing this project.

Above comparisons can be summarised into below table:

Table 12. Pros and Cons of Different Methods

	Pro	Con
Building from scratch	1. Highly customizable 2. Best performance if done right 3. Capable for future enhancement	1. Most costly approach 2. Most time-consuming approach 3. Overkill for small projects 4. High maintenance
Online website builder	1. Speedy development 2. Low cost for small projects	1. Least customizable

	3. Low maintenance	2. Future enhancement is limited by server provider
Local website builder	1. Good balance of development speed and cost 2. Customizable by using available plug-ins	1. Initial server & domain cost required to deploy websites 2. Require certain knowledge and research

As stated in section 5.4.1, the website developers of this team have experience in constructing websites by using all three technology tracks. However, the team has considered that the total workload of this project is relatively small, it would not be quite efficient to develop the project from scratch.

Using a local website management platform such as WordPress would still require additional time spent on learning for developer 2. Furthermore, the initial stage configuration could become problematic for someone using it at the first time.

Furthermore, upon an initial research, the development team found that using online website builders can implement the required functionalities as stated in section 5.4.2. (detailed analysis refers to section 5.4.4). Therefore, the team has taken consideration of time, cost and performance of each tool, and decided that an online website builder is the most efficient tool to use in this project.

5.4.4 Choice of online website builder

As concluded in section 5.4.3, in the initial research an online website builder is the most efficient tool for this project. The team then collected and researched two most popular online website builders.

Candidate 1: Wix.com
Candidate 2: Squarespace.com

Below is a quick comparison of these two candidates:

- Wix.com is powering many more websites than Squarespace according to marketing material.
- Squarespace provides better theme designs and data portability from general reviews..
- One major difference between these two is that Wix.com provides free-tier service that can publish the website, while only paid-tier service at Squarespace can publish the website.

As stated in section 5.4.2, below are the key requirements and supported functions by using Wix.com and Squarespace.com. Please refer to section 5.4.2 for details of the requirements.

Table 13. Core Requirement Analysis between Wix and Squarespace

ID	Capability	Wix.com	Squarespace.com
1	User Registration and Login	Natively supported	Natively supported
2	Multimedia content Displaying	Common multimedia content displaying are natively supported	Common multimedia content displaying are natively supported
3	Permission application and approval	Page restriction based on user profile is natively supported through the built-in admin control panel.	Page restriction based on user profile is natively supported in web page settings.
4	User group Management	Supported by importing plug-in.	Solution not found.
5	Data search functionality	Google search integration is natively supported.	Provide built-in searching engine.
6	Data upload and download	Natively supported	Natively supported

It is worthwhile to note that the team did not find a solution on Squarespace.com to support the user group management function required in this project. Therefore, the team has chosen Wix.com as the best candidate out of the three.

5.4.5 Conclusion

In conclusion, the team first analysed the developer's capabilities and experience of website development. Then the team listed and analysed the detailed requirements in this website-building project. Third, combined with the team capabilities and detailed requirements of this project, the team carefully compared the advantages and disadvantages of three different technology tracks for developing this project, and reached a conclusion that online website builders are the best choices in this case. Finally, the team collected and researched two online website builder candidates, compared their features, capabilities and performance, and decided Wix.com as the primary development tool due to its advantages of reduced development complexity, speedy development and satisfied functionalities.

5.5 Execution Plan

In this part, the execution plan will be made based on the process of the scrum method that was introduced in section 4.4. And the **product backlog** of this project is in section 4.2 (in-scope

feature), so it will not be included in this section. The following parts will be included as the plan to implement scrum methods and keep track of the whole project.

- **A Release plan** that reflects the features of the project into the backlog and provides the approximate date or approximate story points.
- **A sprint goal** that includes a brief explanation of what the team plans to achieve during the sprint. And it will consist of the sprint number, the goals, the method to meet the goal, and the metrics - successful criteria.
- **A sprint backlog** is a list of tasks determined to be completed during the sprint. For each user story defined in the product backlog, it requires multiple tasks to implement it.
- **The ideal burndown chart** is a line chart that shows the ideal amount of work completed in each stage in a sprint and the total work remaining. It can predict the likelihood of the whole team completing the workload in time.
- An outline for the **Scrum review process** will be held at the end of the sprint to summarise what has been completed and check the increment.
- An outline for **Scrum Retrospective** that gives the team members opportunities to inspect themselves in order to promote improvement in the next sprint.

5.5.1 Release Planning

5.5.1.1 Different between release planning and sprint planning

Release planning in scrum is mainly used to reflect the features will be implemented in the upcoming sprints and provides an approximate release date. Sprint planning is used to focus on detailed work in Scrum, which is used to describe the specific goals, work should be done, and successful criteria during each sprint.

5.5.1.2 Project Schedule

1.Time
This project will start on September 19th, 2022 and will end on October 14th, 2022.
There is a mid break from September 26th, 2022 to October 2, 2022.

2.Budget
There is no budget for this project.
3.Resources

a. The development team includes 5 people with different roles and responsibilities.
b. Each person should have a personal computer with the programming environment and network.

Due to the end date of the project being determined and the project must be finished before the end date, the Fixed-Date release planning will be chosen.

5.5.1.3 Determination of sprint numbers

The total duration for this project execution excluding the mid-break is 15 working days (5 working days per week). Therefore, the number of sprints is:
N = total duration / length of sprint = 15 days / 5 days per sprint = 3 sprints

5.5.1.4 Groom the product backlog

The detailed product backlog please refer to section 4.2.

5.5.1.5 Velocity range

The total user story points for the current product backlog is 188 and the number of sprints is 3.Therefore, the average number of user story points for each sprint is 188 / 3 ≈ 63 user story points per sprint.

To calculate the maximum and minimum velocity, we have the story points allowed to be floated within 10% for each sprint. As a result, the minimum velocity for each sprint is 57 story points (V_{min} = 57) and the maximum number of the velocity for each sprint is 69 story points (V_{max} = 69).

5.5.1.6 Minimum and maximum story points

The minimum story points is :
$SP_{min} = V_{min}$ * number of sprints = 57 * 3 = 171 story points

The maximum story points is:
$SP_{max} = V_{max}$ * number of sprints = 69 * 3 = 207 story points

5.5.1.7 Release Burndown Chart

The purpose of this release burndown chart is used to track and monitor the project progress by providing an overview. In addition, the release burndown chart can help the team to estimate the project completion time and boosts morale due to the transparency of the project progress.
We will include the sprint burndown chart for each sprint in the following sections, but there are some differences between the release burndown chart and sprint burndown chart. In general, the release burndown chart keeps track with the whole scrum project on the progress of the release, while sprint burndown charts focus on the relationship between remaining time and remaining workload within the sprint. But both of the charts help the team to monitor the progress and get things done in time.

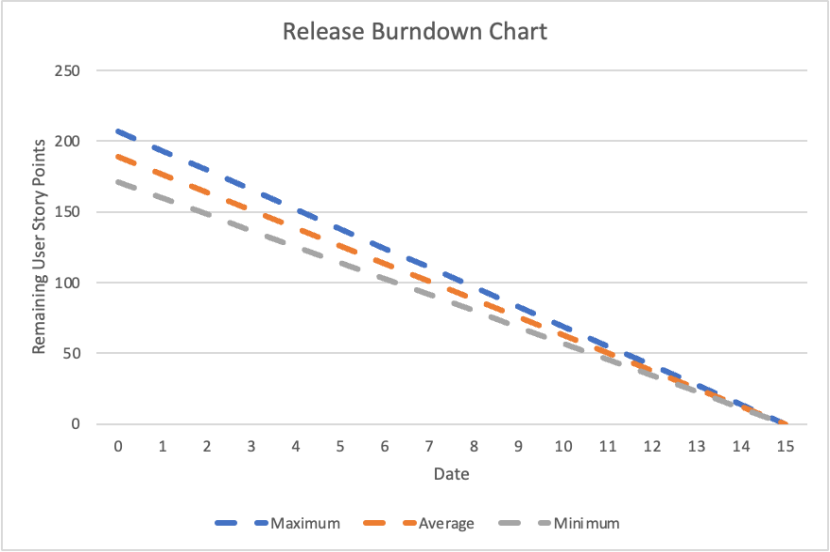

Figure 2. Release Burndown Chart

5.5.2 Sprint Goal

Table 14. Sprint Goal

Product Online Language Research tool	**Sprint No.** Sprint 1
Sprint Goal The welcome page is the basic page of this website to allow an unregistered user to register an account and then through the login page to log in and get permission to access the home page. Therefore, these three pages are the primary function and start of the web application. In addition, since the registered users only access some web pages, the welcome page and login page is necessary and have a high priority to be established first. Furthermore, the privacy and copyright page contains the copyright policy which is also of high priority and importance. Therefore, the main goals of the first sprint are to build the welcome page, login page, home page and copyright page, which allow new users to register an account, successfully log in with the registered account and view the home page.	
Successful Criteria 1. The welcome page is user-friendly and allows new users to register. 2. The login page can enable users to log in to their account in order to have access to the home page. 3. The home page has a clear theme and can provide the up-to-date significant research results to register users. 4. The database can successfully store user information and maintain data accuracy and security. 5. All actions that done on this website can be responded to in 1s 6. The web pages can be compatible with both mobile phones and computers (Mac/Windows)	

5.5.3 Sprint Backlog

The estimated effort in the kanban is measured in decomposed user story points 1-5 to represent the estimated efforts to complete the task. For example, creating the interface to connect the database with a web page is easy, so the user story point is 1, which means this task is relatively easy to complete.

Table 15. Sprint 1 Backlog

Epic user Story ID	Sprint level user story	Sprint level user story	Tasks	Story Point
1	As an unregistered user, I want to register as a valid member of the website so that I can use the service provided by this online research tool.	As an end user, I want to register a personal account and become a registered user of the webpage.	Create the register button and relevant function that allow users to input their personal information to register a membership of the website.	5
			Establish a database that stores user information.	
			Create a validation function of email address	
		As an end user, I want to use the register functions with user friendly interface and bug free	Create the user friendly front-end interface of user register function	13
			Build front-end interface of welcome page	
			Test the register function and report bugs	
			Fix the bugs on the welcome page	
2	As a registered user, I want to login so that I can use the service provided by this online research tool.	As a registered user, I want to login to the personal account to access the home page.	Finish the function that skip to home page automatically, after login	5
			Create interface to connect the user database and page	
			The complete function of checking email address and its password and relevant functions of login	
		As an end user, I want to use the login functions with user friendly interface and bug free	Build user friendly front-end interface of login page	10
			Test with the login function and report bugs	
			Fix the bugs on the login page	
	As a registered user, I want to	As an end user, I can see the latest significant	Make clickable buttons that lead to other sub-pages	

3	access the homepage so that I can see the latest significant research results.	research results on the home web page after login to the personal account.	Collect the latest significant research results	7
			Complete authorization function to restrict the unregistered person	
			Put latest significant research results on web	
		As an end user, I want to see the latest significant research result on the website with user friendly interface and bug free	Build front-end user interface of home page	11
			Test on the home page and report bugs	
			Fix the bugs on the home page	
4	As a client, I want to access the privacy and copyright disclaimer page so that I could understand the website's copyright policy.	As a client, I want to see the privacy and copyright information on the website	Put the privacy and copyright information on the home page	1
		As an end user, I want to access the privacy and copyright information on the website with a user friendly interface and bug free.	Build user friendly front-end user interface of FATSIL Privacy and Copyright page	9
			Test on the FATSIL Privacy and Copyright page	
			Fix the bugs on the FATSIL Privacy and Copyright page	

In each sprint backlog, the team needs to select comparatively important user stories to implement in the current sprint, which provide the team about “what to do” in this sprint. Therefore, based on the priority in the product backlog, the team chose to implement the “Welcome Page”, “Home Page”, “Login Page”, and “A FATSIL Privacy and Copyright page”. In order to use code or other technical methods to implement the user stories, and refer to Figure 2 each user story is divided into tasks and estimated the efforts as user story points by planning poker method. And these task details help the team with how to implement the user stories. Each web page has a user story point from 10 to 18, and based on the estimated team maximum velocity at 69 per sprint, this total workload of 61 story points is manageable. Moreover, according to the status of the tasks, the tasks are divided into three groups: “to do”, “doing,” and “done”.

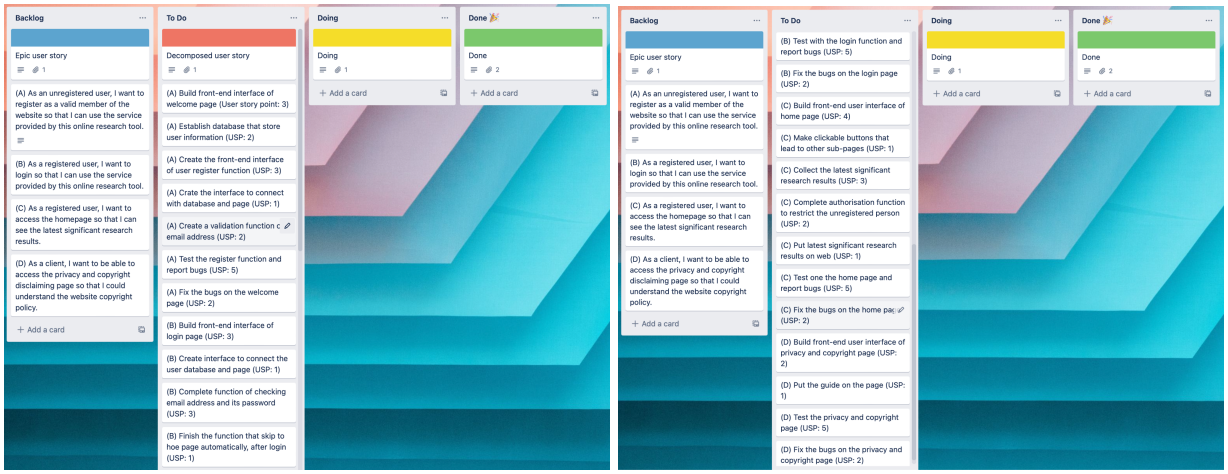

Figure 3. Kanban board

5.5.4 Ideal burndown chart

The burndown chart is a graphical representation of work left to do versus time that predicts the time to do each day and the estimated time to complete it.

Refer to Figure 3, in the burndown chart, the team uses the estimated remaining effort as a y-axis which quantifies the tasks that need to be done and the tasks that have been completed to measure the effort required for the remaining tasks or user stories. And more intuitively show the progress of the project. The x-axis represents the timeline of the whole project. Specifically, there are seven days in this sprint, so the team plans to divide the tasks/work evenly into days and finish all work before Day 7. The last day of the sprint (Day 7) is used to do sprint review and retrospective, which will be introduced in the next section.

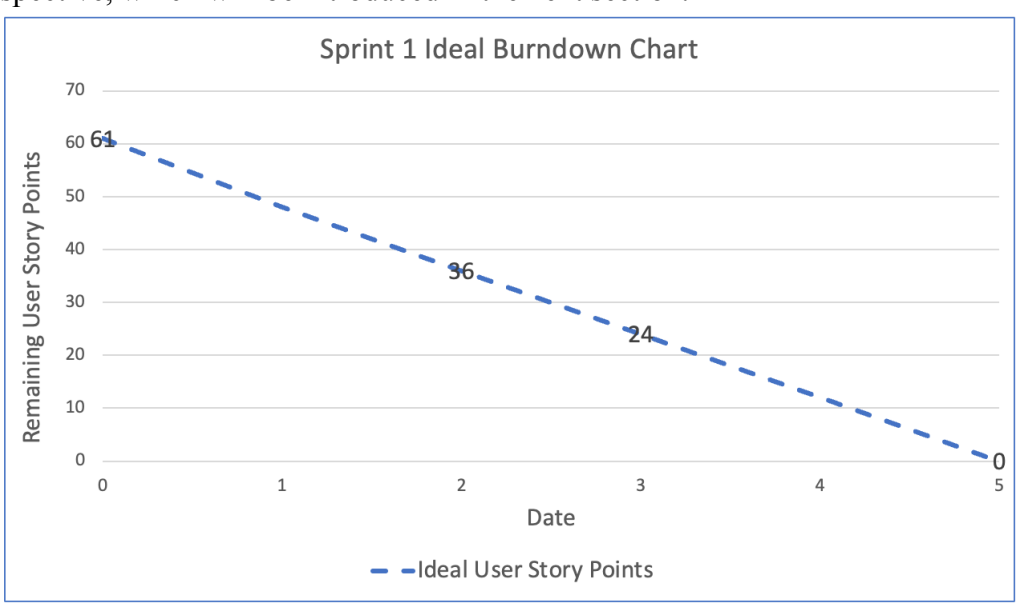

Figure 4. Sprint 1 Ideal Burndown Chart

5.5.5 Scrum review process

Figure 5. Sprint Review. Adapted from [4]

The sprint review is a casual gathering where the team showcases the product and decides what is and isn't done. The team needs to communicate and exchange with each other through meetings to follow up on the progress and achieve the final delivery.

According to Figure 4, all team members get together in a simple online meeting for about 60 - 90 minutes on September 25th (Day 7 of sprint 1) to communicate what they have done so far on the project, how everyone is responsible for the production process and update on the progress with each other. After the discussion, the product backlog is updated to facilitate further iterations. Finally, we will discuss the topic of the next meeting.

5.5.6 Scrum Retrospective

Figure 6. Sprint Retrospective. Adapted from [8]

We use a sprint retrospective to analyse what we worked well and what we need to improve for the following sprint. The Agile sprint retrospective is an essential part of the Scrum paradigm, it is mainly used for creating, delivering and controlling large projects.

According to Figure 5, the Product Owner and Scrum team will lead a retrospective session of about 45 - 60 minutes on September 25th (Day 7 of sprint 1). Team members sort out the current product progress and communicate their work tasks among the teams. Everyone needs to formally analyse the performance situation in the previous work, and the product owner leads the team members to analyse each other and give support to each other. During this meeting, everyone looked for areas that could be improved by reviewing past projects, and the team would get together to discuss how to find more ways to change.

6. Project Execution, Monitoring and Control

6.1 Project Status: Friday 30th September

In week 9, in order to improve the first version of PMP, the team had a meeting and discussed the feedback provided. The modification is implemented in the previous part, and the detail shows in section 6. Also, based on the feedback, we analysed the second part of the requirements and made some changes to the product backlog and also sprint backlog. We implemented all functions planned for this sprint and recorded the documentation and status of the user stories. The product backlog chosen to implement in sprint 1 is shown in the table below:

Table 16. Product Backlog Chosen in Sprint 1

Product Backlog ID	Description of the backlog	Status
1	Membership registration	Accomplish
2	Login to use the services	Accomplish
3	Use the homepage to see recently research	Accomplish
4	Privacy and copyright page	Accomplish

Based on the previous description, we implemented all functions planned for this sprint and recorded the documentation and status of the user stories. Therefore, the product is still in progress, and the project progress meets the expectation of the sprint goal. All backlog is completed at the end of the sprint with high quality.

However, we did discover the existence of some initially detected risk in this sprint: the technology we decided to use (Wix) can not cover all of the functions. The new detected risk happens in this sprint during the development of the website. To solve this risk, the team decided to use another website development tool, WordPress. Although this required additional effort to set up a new building platform, the similarities (as mentioned in the Section 5.4) made the transformation much easier. Therefore, the team successfully transformed to building on WP and kept the production process on track. Moreover, during the development of the administration

system, the registration email can not be sent successfully which is a product risk. The team solved this problem by finding another way to use Sendinblue's SMTP for mailbox-sending side configuration that makes the system working.

From the perspective of the team working, the team divided the workload evenly between team members and allocated it to members that have related skills. All members are satisfied with the current team working policy, which can play a positive role and keep the product development.

6.1.1 Process Related Artefacts

6.1.1.1 Sprint planning meeting outcomes

Detailed minutes can be found in Appendix A -Sprint 1 Planning Meeting Minutes.

- **What should be done during the meeting**
  The development team determined the sprint goal and successful criteria, identified the sprint backlog, estimated the user stories of the sprint backlog, analysed the tasks that should be completed within the sprint 1 and established the Kanban board based on the detailed tasks.

- **How did work done during the meeting**
  - Based on the in-scope product requirement, the team chose the higher level product backlog in order to determine the sprint goal.
  - Breaking down the product backlog into lower level backlog, the team generates a sprint backlog for the current sprint.
  - Further break down the sprint backlog into lower-level tasks, which makes the backlog easy to implement and available to be assigned.
  - Estimate the hours each task will take as the story points to the Planning Poker method, record each task and further calculate for each higher-level backlog.
  - Based on the assigned task, the sprint backlog and lower level tasks are recorded in the kanban board using Trello as the tool with the status and the owner.

- **Sprint goal**
  The detailed sprint 1 goal, please refer to section 5.5.2 Sprint Goal.

- **Successful criteria**
  The detailed sprint 1 successful criteria, please refer to section 5.5.2 Sprint Goal.

- **Relevant Product Backlog Item**
  ID-1. As an unregistered user, I want to register as a valid member of the website so I can use the service provided by this online research tool.
  ID-2. As a registered user, I want to log in so that I can use the service provided by this online research tool.

ID-3. As a registered user, I want to access the homepage so that I can see the latest significant research results.
ID-4. As a client, I want to be able to access the privacy and copyright disclaimer page so that I could understand the website's copyright policy.

- **Sprint backlog**
  The result of the detailed sprint backlog determined in the Sprint 1 Planning meeting is shown in section 7.1.1.2 Sprint Backlog.

- **Kanban board**
  The result of the detailed Kanban board determined in the Sprint 1 Planning meeting is shown in section 7.1.1.3 Kanban boards.

6.1.1.2 Sprint Backlog

The detailed sprint 1 backlog please refer to 5.5.3 Sprint Backlog.

6.1.1.3 Kanban boards (using Trello as the tool)

More detail can be found at: https://trello.com/b/UqyJHaJT/kanban-template

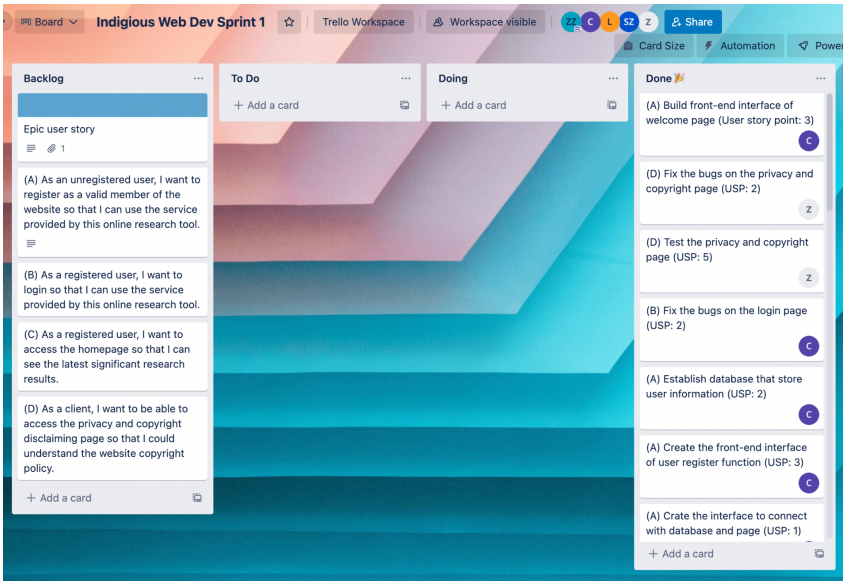

Figure 7. Kanban board of Sprint 1

6.1.1.4 Timesheets

The Timesheets are included in Appendix B - Sprint 1 Timesheet, which describes the activities done by each member.

6.1.1.5 Meeting Minutes

The Meeting Minutes for Sprint 1 are in Appendix A -Sprint 1 Planning Meeting Minutes and Appendix C - Sprint 1 Review Meeting Minutes, including a Sprint Planning meeting, a Sprint Review, and a Sprint Retrospective meeting. More information about the meeting is included in the following parts.

6.1.1.6 Screenshots of communications

We use Wechat as the daily communication tool, and for formal meetings, we use zoom as the platform. The communication screenshot can be found below.

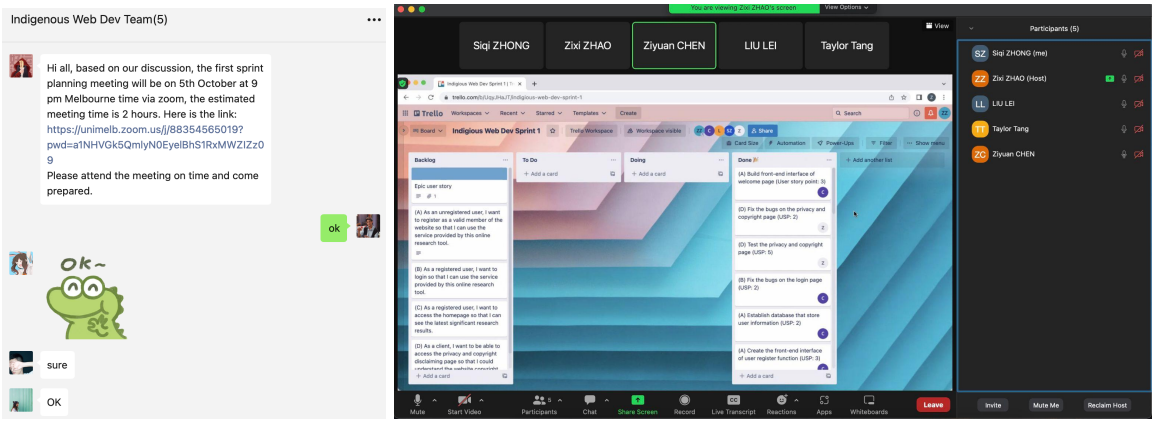

Figure 8. Sprint 1 Communication Screenshot

6.1.1.7 Burndown chart

In this sprint, 61 user story points are allocated and implemented. The actual user story points line is a bit off the ideal user story points since the development team tends to spend more time on this product one day and do less on the next day. However, the overall progress is the same as planned and all user stories are implemented.

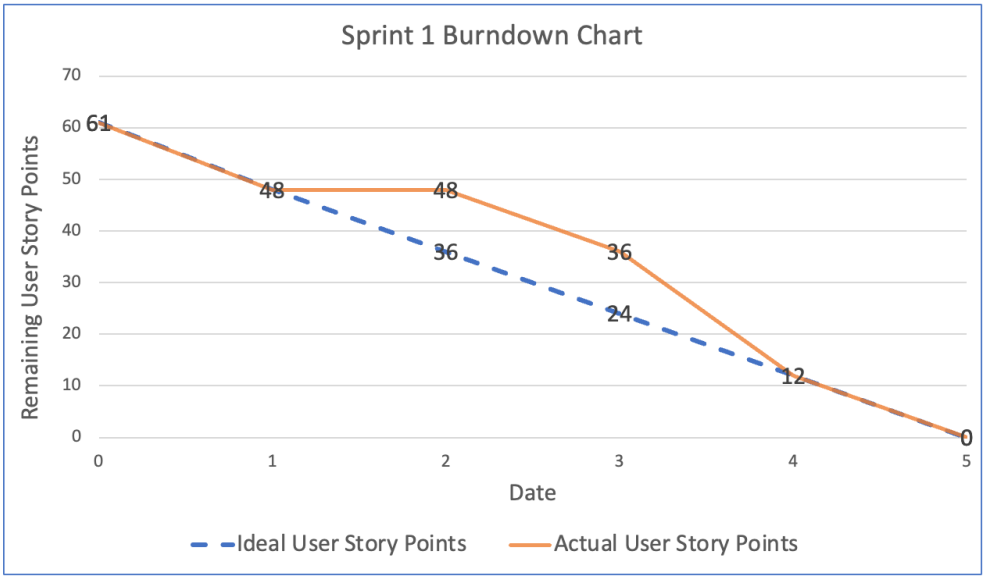

Figure 9. Sprint 1 Burndown Chart

6.1.1.8 Velocity estimations

Velocity = Number of story points completed / Time period over which they were completed
In Sprint 1, the completed number of story points is 61 and the time period is 1 sprint.

Therefore, according to the formula, the velocity is:
Velocity = 61 story points completed / 1 sprint = 61 story points per sprint

6.1.1.9 Sprint review inputs and outcomes

In the sprint 1 review meeting, the action items that we generated in the last meeting have been checked, and it shows that all members finish the corresponding part. And on our Trello board, the process of each task is being updated, and all tasks assigned in the last meeting have been completed on time. And all tasks related to the current product are shown on the website, so a demo is done by the development team for all the participants on the website. More detailed meeting content is included in Appendix C - Sprint 1 Review Meeting Minutes.

- **Inputs**
    1. The detailed completed tasks and user stories can be found in 5.5.3 Sprint Backlog and 7.1 Project Status: Friday 30th September.
    2. Putting the broken-down tasks assigned to each member together has generated the current version of the software, the website pages.
- **Outputs**
    1. The tasks assigned to each team member are completed with high quality.
    2. With high-quality completion, all parts meet the provided acceptance criteria.
    3. The product owner has approved the final release for this sprint.
    4. The product owner has approved the plan with no update on the product backlog in this sprint.
    5. The next sprint planning date is 3 October 2022 at 19:00 - 21:00 via Zoom.

6.1.2 Product-related artefacts

In sprint 1, the development team discussed that the welcome page (including the sign-in form) and login functionalities should be our priority. In addition, the home page and privacy & copyright page can be brought forward as the contents of these pages are static and can be conveniently configured. Besides, it provides a good anchor point for the rest of website development. According to the provided document (Case study) and web page that should be completed during the sprint 1, the team designed the website framework is shown in Figure 10.

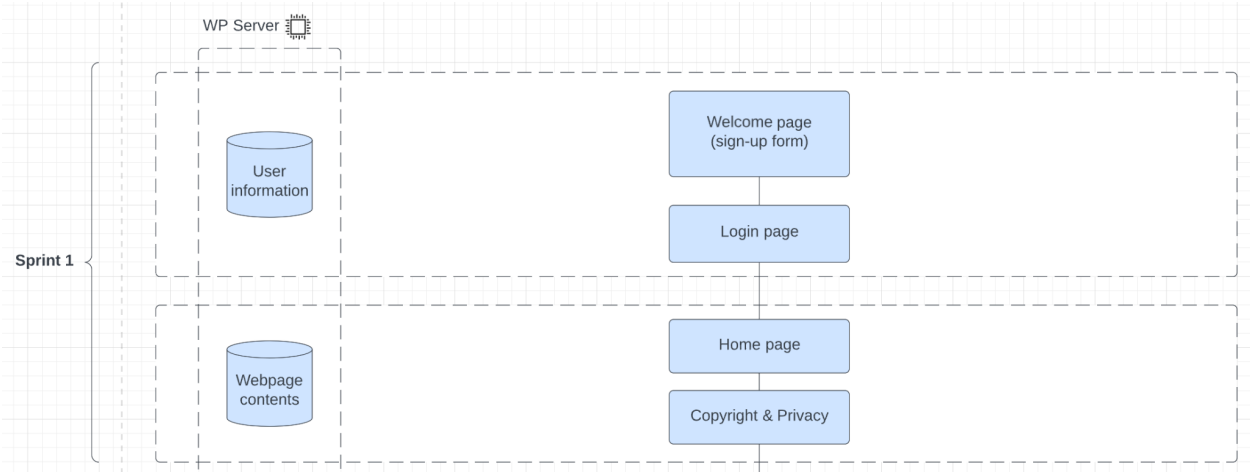

Figure 10. Sprint 1 Website framework

A detailed plan is shown in Figure 11. The team first configured the WordPress server's user registration to set, including required information, validation method, admin management, etc. Then the team makes the landing page including sign-up forms and a button links to the login page. A successful login process will take the user to the home page, where the team has preliminarily made a navigation bar and some static information examples. A button on the navigation bar is linked to the privacy & copyright page, which presents static content.

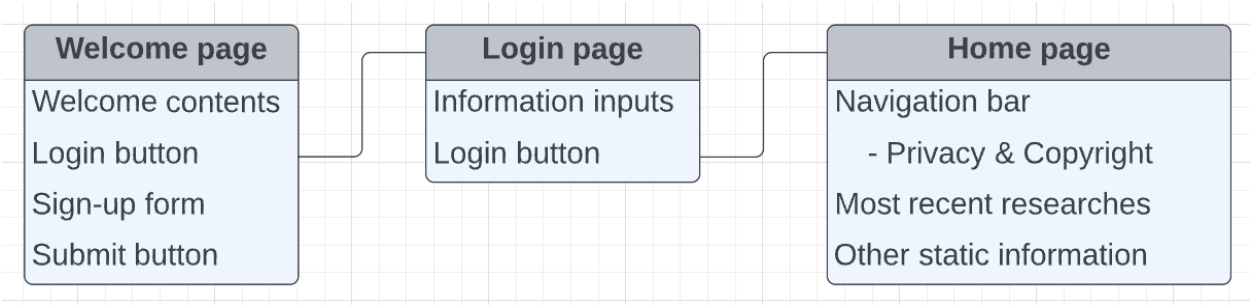

Figure 11. Sprint 1 Detailed Plan

Completed feature list:

1. Welcome page
    - A button links to the login page
    - A form (variable input boxes) that new users to fill information for registration
    - A button for submitting information for registration
    - Welcome and introduction content
    - Appropriate background image
    - Scaling and scrolling

2. Login page:
    - User name input box

- Password input box (default secure mode replacing password with dots)
- A remember me tick box
- A button to take a new user to the registration form
- A button to submit and login to the website

3. Home page
    - A navigation menu with buttons
        - A button to privacy & copyright page
    - A button to take registered users to the user portal
    - Static contents including most recent published research

4. Privacy & copyright page
    - A link to FATSIL guide website
    - Static content of website privacy & copyright policies

For completed website pages, please refer to Appendix D - Sprint 1 Product Development Process Screenshots for more details.

6.1.3 Risk Monitoring and Control

In sprint 1, we encountered a new risk that our team selected WIX as our website development tool. However, in the actual development process, our website developer gradually found the limitations of WIX. Some core requirements, such as file upload and download, and member grouping, are challenging to achieve, which may lead to uncontrollable project progress. In order to respond to this risk, the team decided to choose another development tool - WordPress. In section 5.4, when the team was doing the analysis on all development tools, WordPress is another good development tool that is suitable for our project. Our team has mitigated this risk by changing the development tool from WIX to WordPress. As a result, this is an effective solution that solves the problem and makes the development process more efficient.

Moreover, during the development, we discovered another detected product risk. When administrators want to use WordPress to send the registration email, the email cannot be sent successfully, leading to the final delivery product not achieving the expectation. After detecting this risk, the team mitigates this risk and solves the problem by searching online. Eventually, the team found a solution using Sendinblue's SMTP for mailbox-sending side configuration.

6.2 Project Status: Friday 07th October

In week 10, the team follows the product backlog and story point to arrange the workload in this sprint with the same velocity as the last sprint. This week, the team paid more attention to the product itself and completed the following product backlog that met the acceptance criteria.

From last week's risk, the works well with the solution, and the WordPress development tool is a good choice, and user-friendly that helps a lot when finishing the following product backlog decided at the beginning of the sprint:

Table 17. Product Backlog Chosen in Sprint 2

Product Backlog ID	Description of the backlog	Status
5	Request Permission function	Accomplish
6	Access to the content of the user group	Accomplish
7	Search text function	Accomplish
8	Control the website's access rights by admin	Accomplish

Besides the website, the team also spends time recording the process, controlling the velocity of the project, producing meeting minutes for each meeting, and recording the outcomes. Therefore, until now, the project worked well under the team's plan.

In this sprint, their key risks are detected, and the team will keep detecting new risks and doing risk monitoring. However, an initially detected risk occurred during the project development: "Staff turnover or on temporary leave" because of sickness. In order to respond to this risk, other members try their best to contact the person and do communication in order to take over the work. As a result, the team has solved the risk by actively communicating and by other members' dedication.

From the perspective of the team working, according to last week's experience, the team has better communication. All members will share the progress and current product, if anyone meets problems or troubles, other team members are willing to spend time-solving them together. With a good team working and all members' effort, the whole project is still in progress that met the initial goal for sprint 2.

6.2.1 Process Related Artefacts

6.2.1.1 Sprint planning meeting outcomes

Detailed minutes can be found in Appendix E - Sprint 2 Planning Meeting Minutes.

- **What should be done during the meeting**
  The development team determined the sprint goal and successful criteria, identified the sprint backlog, estimated the user stories of the sprint backlog, analysed the tasks that should be completed within sprint 2 and established the Kanban board based on the detailed tasks.

- **How did the work do during the meeting**
  - The team selected high-priority epic user stories as the sprint goal.
  - The team should break the epic user stories into sprint-level user stories and break them down into small tasks which could be finished within one day.
  - Estimate the hours each task will take as the story points to the Planning Poker method and record each task.
  - The detailed tasks are recorded in the kanban board using Trello to provide a view of project progress.

- **Sprint goal**

  The authorisation request page is related to the access permission of the dynamic data on the dynamic demonstration example page, and the authorisation admin page is related to the approval of this permission. Therefore, these two pages have a higher priority to be completed. In addition, the searching and user group functions are the advanced data integrity and security features.

  Therefore, the main goals of the second sprint are to build the authorisation request page, user group page and text searching page that allows users to request permission, create and manage the user group and search text data shared with them. In addition, building the authorization admin page is also one of the goals of sprint 2, which allows the admin to approve or reject the permission request manually.

- **Successful criteria**

  - The registered users can submit the request permission to the Dynamic Demonstration Example domain data on the authorisation request page.
  - The registered users can create and manage the user group on the user group page.
  - The users within that group can only access the data of the specific user group.
  - The registered users can search the text data shared on the text searching page.
  - The admin user can approve or decline the permission request on the authorisation admin page.
  - The website should respond to all actions within 1s.
  - The web pages can be compatible with mobile phones and computers (Mac/Windows)

- **Relevant Product Backlog Item**

  ID-5. As a registered user, I want to request permission from the admin so that I can interact with the Dynamic Demonstration Example domain data provided on the page.

  ID-6. As a registered user, I want to manage my user subgroup so that I can only access the content that belongs to my user group.

  ID-7. As a registered user, I want to search text data to find the information quickly.

  ID-8. As an admin, I want to approve or decline user permission requests so that I can control the website's access rights.

- **Sprint backlog**
  The result of the detailed sprint backlog determined in the Sprint 2 Planning meeting is shown in section 6.2.1.2 Sprint Backlog.

- **Kanban board**
  The result of the detailed Kanban board determined in the Sprint 2 Planning meeting, is shown in section 6.2.1.3 Kanban boards.

6.2.1.2 Sprint Backlog

In this part, Feature User Stories, Decomposed User Stories, Low-Level Tasks, and Story Points will be included to show the Sprint backlog.

Table 18. Sprint 2 Backlog

Epic level user Story ID	Sprint level user story	Sprint level user story	Tasks	Story Point
5	As a registered user, I want to request permission from the admin so that I can interact with the Dynamic Demonstration Example domain data provided on pages.	As a registered user, I want to request CRUD permission to the dynamic demonstration	Create a form for users to input their requested information.	6
			Add a regular expression that checks the validation of the email address.	
			Create a database to store the permission request data.	
		As a registered user, I want to use the request permission function with a user-friendly interface and bug-free.	Build user-friendly front-end user interface of Authorization Request page	8
			Test on the Authorization Request page	
			Fix the bugs on the Authorization Request page	
	As a registered user, I want to manage my user subgroup so that I can only access the content that belongs to my user group.	As a registered user, I want to create and manage my user group.	Create a group creation form for users to create a user group by filling in the information of the user group.	10
			Add a “Create a group button” that links the users to the form of group creation.	
			Create a management system that allows users to manage the membership within the users' group, such as add users or drop users.	

6			Create three user-friendly icons to show the posts, the last post time and the number of group members within the groups.	
			Create a sub-page to show the group information of each user group	
		As a registered user, I want the data belonging to my user group to be only shared with the users within the group.	Add the function that can check the access permission of the user group.	4
			Add the function that the users can share the information within the user group.	
		As a registered user, I want to see all the groups I belong to and all groups from all over the world.	Add a sub-page to show all groups over the world and add a button named ”All Groups” to link that page.	5
			Add a sub-page to show all the groups that the user belongs to and add a button named “My Groups” to link that page.	
		As a registered user, I want to create and manage the user group with a user-friendly interface and bug-free interface.	Build a user-friendly front-end user interface for the User Groups page.	9
			Test on the User Groups page.	
			Fix the bugs on the User Groups page.	
7	As a registered user, I want to search text data so that I can find the information quickly.	As a registered user, I want to search related text correctly and quickly.	Create a regular expression to ensure the user can search related text based on the key words.	5
			Create the sub page to show the search result of the users	
			Create the link to the search result that ensures the user can see the search result quickly.	
		As a registered user, I want to use the search text data function with a user friendly interface and bug-free.	Build user-friendly front-end user interface of Text Searching page.	4
			Test on the Text Searching page.	
			Fix the bugs on the Text Searching page.	
	As an admin, I	As a admin, I want to	Link the permission request database to the	

8	want to approve or decline user permission requests so that I can control the website's access rights.	approve or decline the user permission request on the Authorization Admin page	Authorization Admin page to ensure the Authorization Admin page can show the permission request information in order.	6
			Create two buttons (“Approve” and “Decline”) for each permission request to allow the admin to handle the permission request.	
			Create a double check window that asks the admin to check the choice again.	
		As an admin, I want to use the approve and decline function with a user friendly interface and bug free.	Build user friendly front-end user interface of Authorization Admin page.	5
			Test on the Authorization Admin page.	
			Fix the bugs on the Authorization Admin page.	

6.2.1.3 Kanban boards (using Trello as the tool)

More detail can be found in: https://trello.com/b/U7cVK3O0/indigious-web-dev-sprint-2

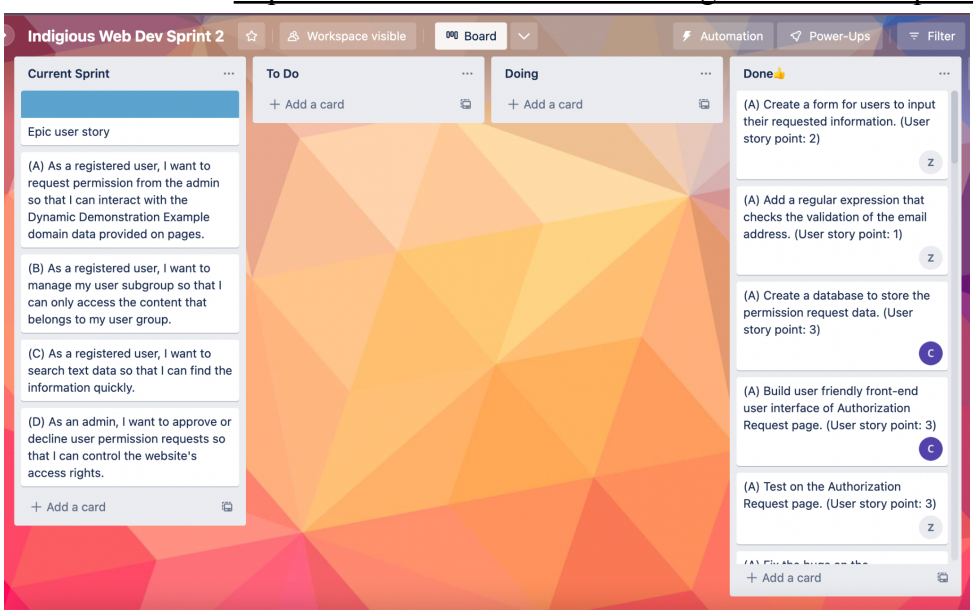

Figure 12. Kanban board of Sprint 2

6.2.1.4 Timesheets

The Timesheets are included in Appendix F - Sprint 2 Timesheet , which describes the activities done by each member.

6.2.1.5 Meeting Minutes

The Meeting Minutes for Sprint 2 is in Appendix E - Sprint 2 Planning Meeting Minutes and Appendix G - Sprint 2 Review Meeting Minutes, including a Sprint Planning meeting, a Sprint Review, and a Sprint Retrospective meeting. More information about the conference is included in the following parts.

6.2.1.6 Screenshots of communications

We use Wechat as the communication tool, and for communication meetings, we use zoom as the platform. The communication screenshot can be found below.

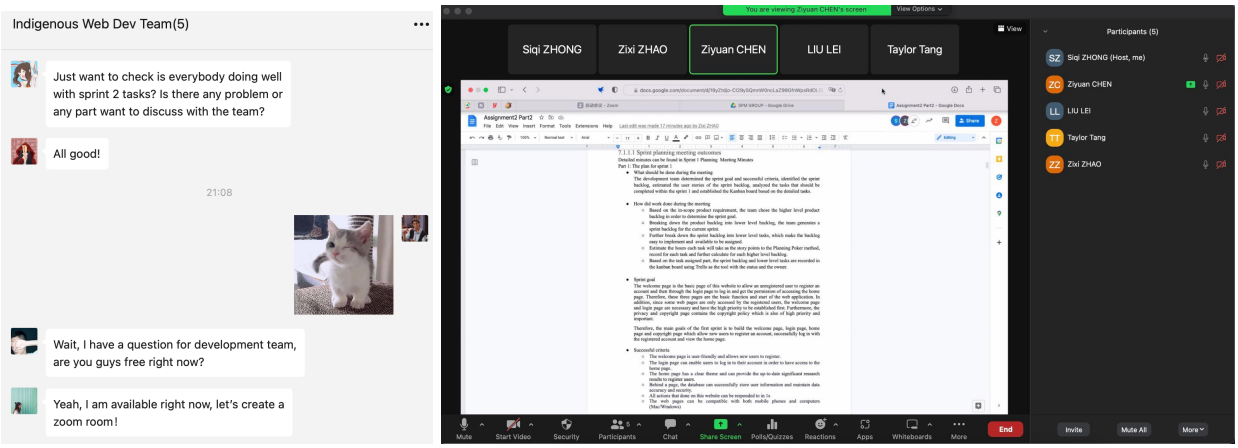

Figure 13. Sprint 2 Communication Screenshot

6.2.1.7 Burndown chart

The sprint 2 burndown chart is added to the sprint 1 burndown chart, and we have the chart below. In sprint 2, the velocity is a bit faster than in sprint 1, and we have 61 user story points. At the end of the sprint, the team accomplishes all tasks allocated and meets the plan.

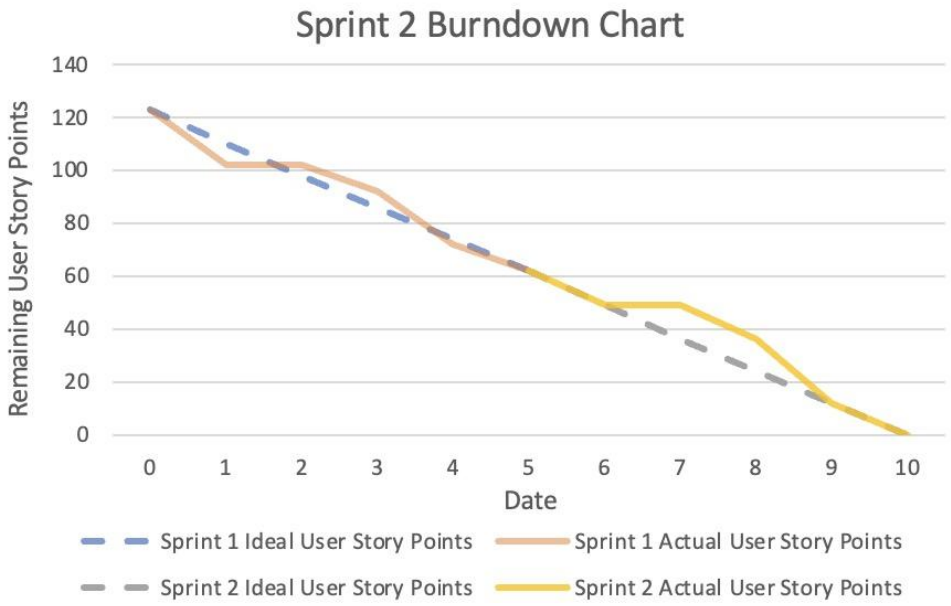

Figure 14. Sprint 2 Burndown Chart

6.2.1.8 Velocity estimations

Velocity = Number of story points completed / Time period over which they were completed
In Sprint 2, the completed number of story points is 62, and the time period is 1 sprint.

Therefore, according to the formula, the velocity is:
Velocity = 62 story points completed / 1 sprint = 62 story points per sprint

6.2.1.9 Sprint review inputs and outcomes

In the sprint 2 review meeting, all actions items from the previous meeting were checked, and made sure each member of the team finished the assigned part. After finishing each task on time, the Trello board is updated correctly. The progress of the product can be seen on the website. In order to make it understandable to all participants, a demo is made by the development team members with the explanation. More detailed meeting content is included in Appendix G - Sprint 2 Review Meeting Minutes.

- **Inputs**

1. The detailed completed tasks and user stories can be found in section 6.2.1.2 Sprint Backlog and 6.2 Project Status: Friday 07th October.
2. All members come prepared and finish the corresponding part of the product and project.

- **Outputs**
    1. All members finish their part on time.

2. All tasks and user stories met the provided acceptance criteria, which has high qualities.
3. The product owner approves the final release for this sprint.
4. There is no update on the product backlog for this sprint.
5. The next sprint planning date is on 10 October 2022 at 19:00 - 21:00 via Zoom.

6.2.2 Product-Related Artefacts

In sprint 2, the product owner discussed with the development team and plan to implement the user group management function, authorization request and search page function provided in the case study document. According to the functions that should be implemented in the sprint 2, the updated website framework is shown in Figure 15.

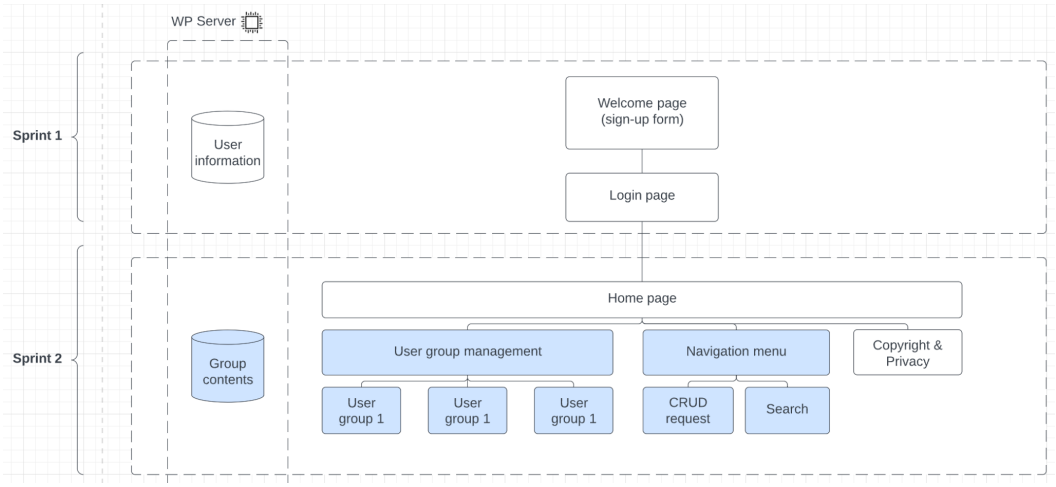

Figure 15. Sprint 2 Website framework

Under the user group management page, each user can browse and request to join a certain group as shown in screenshot below. The admin user then verifies the user's request and approves the user to be part of the group. Content posted on the website and group blog can be searched by the in-site text search engine. If a user has the accessibility to the content, the user can see the preview of it. Otherwise, it warns users that the content is restricted. The detailed plan is shown below in Figure 16.

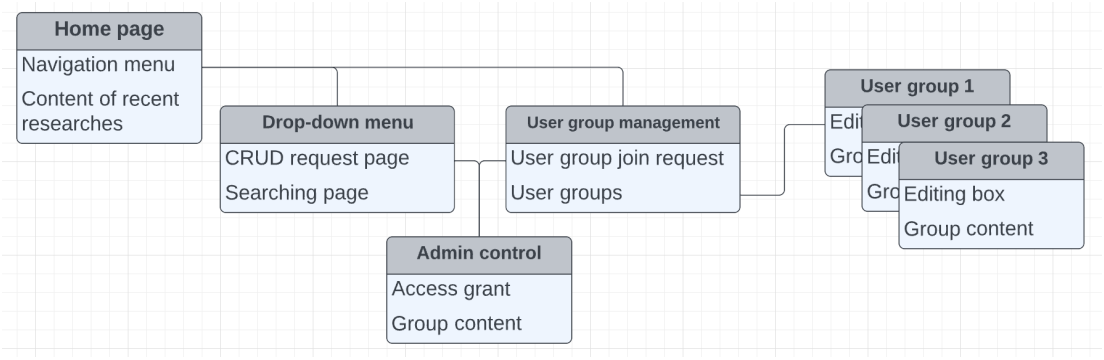

Figure 16. Sprint 2 Detailed Plan

Completed feature list:

1. Group management
    - A admin user management tab in the control centre
    - A group displaying page to display all groups
        - A button to open group portal
        - A mouse-hover function to see group posts
        - A mouse-hover function to see group last activity
        - A mouse-hover function to see group number of members
        - A button to request joining
2. Individual group portal
    - A tab to browse group information
    - A tab to browse member information
    - A filter to sort or filter recent posts
    - A post editing box, including various editing tools and a post button.
    - Displaying recent posts from other users sorted by time
3. Text-searching page
    - Input box
    - A button to search input through the website and take the user to search result page
    - Display search results
4. Authorisation request page
    - A form for the user to fill in information
    - A button to submit a request to the admin user
5. Authorization admin page
    - A button to approve user permission request
    - A button to decline user permission request

For completed website pages, please refer to Appendix H - Sprint 2 Product Development Process Screenshots for more details.

6.2.3 Risk Monitoring and Control

In sprint 2, the generic risk ID4 in section 5.3.1 is encountered. One website developer got ill during sprint 2. He wasn't able to accomplish tasks that were allocated in the Kanban board. The development process halted for two days since he is the key personnel to develop the key functionality of the navigation bar and CRUD request form. The rest of the team had a brief meeting to discuss the situation. They assessed the current workload left in this sprint and discussed that it is still possible to finish the required work in sprint 2 if the developer can recover in one day. The backup plan is to have the other team members to help with the

development process in order to recover the progress from the temporary leave of the developer. Fortunately, the developer did get better in time and helped the team to recover the development process.

In addition, there is a new risk discovered during the sprint 2 which is a technical risk of plugin conflict. During the development process, the development team decided to use BuddyPress to implement the user group functionality. However, since this is a third party plug-in, it could cause risks such as stability and compatibility issues. Later in the sprint 2, the team found that My Private Site plugin is not compatible with the BuddyPress plugin and caused the original registration function developed by the development team to stop working. This conflict is carefully monitored and controlled by the team in such a solution: 1) keep configuring the setting of both plug-ins to find a solution, 2) find another compatible plug-in to implement user-group function. 3) manually code this function, 4) roll-back to the original version and leave out this function. The team was able to mitigate this risk by finding another plug-in, Youzify, to implement the user group function.

6.3 Project Status: Friday 15th October

In week 11, the team started to work with sprint 3, and has worked smoothly based on the past experiences. Since this is the last sprint, the team needs to wrap off the whole product and make sure the final release is accomplished, so the velocity in this sprint is 65 user story points which is faster than previous sprints. According to the sprint backlog below, the team tried their best to complete all works on WordPress with high quality.

Table 19. Product Backlog Chosen in Sprint 3

Product Backlog ID	Description of the backlog	Status
9	Drop-down Menu	Accomplish
10	Stipulate Permission among the web pages	Accomplish
11	Indigenous Dhudhuroa Language Page	Accomplish
12	Dynamic Demonstration Example Page	Accomplish
13	English Language Static Example Page	Accomplish
14	Indigenous Community Knowledge Pages	Accomplish
15	Culturally Relevant Perspective Pages	Accomplish

In addition to the product itself, we think the project control is an important part, so the team spends some time on recording the workload and making the contribution balance between all

members. During all meetings in this sprint, the team members do some preparation and record the content of the meeting to make meeting minutes. And at the end of the sprint, collect each member's timesheet to ensure everything went well. Last but not least, the Product, related artefacts part, records the whole website's process, making the work visualizable and more structured. All of the works are critical to the release of the product and play important roles in the accomplishment of all user stories and the success of the whole project.

However, there is an original identified risk occupied, which the development team wants to add the additional out-of-scope feature and this risk is controlled by the product owner. The product owner stops the development team from adding the features that support the video data type on the website and lets the development team continue to focus on the uncompleted in scope features. In this way, the risk is mitigated, which ensures all of the in-score features are finished on time. In addition, there is a new risk that one development team member will ignore the warning and lock the admin accounts out of the website. Fortunately, this risk is mitigated by using the backup of the website to recover the admin permissions.

From this perspective of the team working, wjoy working as a team since we always divide the workload evenly and assign it to people who have related skills, which makes our teamwork effective. No one can deny that teamwork pushes all members ahead to make a better and more functional product.

6.3.1 Process Related Artefacts

6.3.1.1 Sprint planning meeting outcomes

Detailed minutes can be found in Appendix I - Sprint 3 Planning Meeting Minutes.

- **What should be done during the meeting**
  The development team determined the sprint goal and successful criteria, identified the sprint backlog, estimated the user stories of the sprint backlog, analysed the tasks that should be completed within sprint 3 and established the Kanban board based on the detailed tasks.
- **How did work do during the meeting**
  - The sprint goals will be set based on the selected epic user stories. The more detailed user stories of the sprint level will be split from the epic user stories.
  - The detailed task could be split based on the sprint-level user stories, and each task is small enough to be completed within one day.
  - Develop a risk monitoring and control plan of the potential risks that would happen in sprint 3.
  - Estimate the hours each task will take as the story points to the Planning Poker method and record each task in the kanban board by using Trello to monitor the project progress.

- **Sprint goal**

  The Indigenous Community Knowledge page and Culturally Relevant Perspective page can provide information about the culture and language introduction to the end users. In addition, the Dynamic Demonstration Example page allows end users to share and download the language data. Therefore, these three web pages are essential to be established and achieve the goal of reviving and disseminating endangered indigenous languages and cultures. In addition, the Indigenous Dhudhuroa Language page is used to put important information related to clients and the indigenous community, which is a significant web page for clients. Furthermore, there is a drop-down menu to link to these important pages and a Static Example page to show the UML and supported data type of these essential pages.

  Therefore, the main goal of the third sprint is to build the drop-down menu, Static Example page, Indigenous Community Knowledge sub-page, Culturally Relevant Perspective sub-page, Indigenous Dhudhuroa Language page and Dynamic Demonstration Example page to share the knowledge and information about the Indigenous cultures and languages. In addition, the permission restrictions of each web page are also an important goal of Sprint 3 to ensure the Indigenous Dhudhuroa Language page and Dynamic Demonstration Example page can only be accessed by the permitted users.

- **Successful criteria**
  - The registered users can click on the drop-down menu to go to a certain web page.
  - The end users can get the knowledge of visualisable generous community, such as culture and language introduction, on the indigenous Communplayowledge subpage.
  - The end users can get information about the culture of the indigenous from the Culturally Relevant Perspective.
  - Only the permitted users can access the Indigenous Dhudhuroa Language page and see the information on that page.
  - The client has the permission to add the information on the Indigenous Dhudhuroa Language page.
  - The permitted users can access the Dynamic Demonstration Example page and upload/download the dynamic data.
  - The permitted users can view/hear their language data on the lending page of the Dynamic Demonstration Example page.
  - The end users can see the UML information model of the data tier on the Static Example page.
  - The Static Example page should support and display 4 data types, including 2 sentences, 5 symbols, 3 images and 1 song.
  - The website should respond to all actions within 1s.
  - The web pages can be compatible with both mobile phones and computers (Mac/Windows).

- **Relevant Product Backlog Item**

ID-9. As a registered user, I want to click on a drop-down menu so that I can go to a certain web page.
ID-10. As the client, I want to stipulate permission among the web pages so that only the user can access and operate certain web pages with permission.
ID-11. As a permitted user, I want to access the indigenous dhudhuroa language page so that I can access the information on that page.
ID-12. As a registered user, I want to access the dynamic demonstration example page so that I could view/ hear/ upload/ download data.
ID-13. As an end user, I want to access the English language static example page so that I can access its content (variable data format) and enter its subpages.
ID-14. As an end user, I want to access indigenous community knowledge pages so that I can see the content, such as place names, cultural sites, and tracks.
ID-15. As an end user, I want to access culturally relevant perspective pages so that I could see the lived experience of indigenous people who value and respect their language.

- **Sprint backlog**
  The result of the detailed sprint backlog determined in the Sprint 3 Planning meeting is shown in section 6.3.1.2 Sprint Backlog.

- **Kanban board**
  The result of the detailed Kanban board determined in the Sprint 3 Planning meeting, is shown in section 6.3.1.3 Kanban boards.

6.3.1.2 Sprint Backlog

In this part, Feature User Stories, Decomposed User Stories, Low-Level Tasks, and Story Points will be included to show the Sprint backlog.

Table 20. Sprint 3 Backlog

Sprint 3 Backlog				
Epic user Story ID	**Sprint level user story**	**Sprint level user story**	**Tasks**	**Story Point**
	As a registered user, I want to click on a drop-down menu so that I can go to a certain web page.	As a registered user, I want to link to specific language pages by using the drop down menu	Add the link to the Static Example page in the drop-down menu	5
			Add the link to the Indigenous Community Knowledge sub page in the drop-down menu	
			Add the link to the Indigenous Dhudhuroa Language page in the drop-down menu	

9			Add the link to the Culturally Relevant Perspective sub page in the drop-down menu	
			Add the link to the Dynamic Demonstration Example page in the drop-down menu	
		As a registered user, I want to use the drop down menu with a user-friendly interface and bug-free.	Build user-friendly front-end user interface of drop down menu	3
			Test on the drop down menu	
			Fix the bugs on the drop down menu	
10	pageshe client, I want to stipulate permission among the web pages so that only the user can access and operate certain web pages with permission.	As a client, I want to have permission to add information on the Indigenous Dhudhuroa Language page.	Add permission to the client account that allows the client to add information on the Indigenous Dhudhuroa Language page	3.
			Build a user-friendly interface to allow clients to fill in the information on the page.	
		As a client, I want the Dynamic Demonstration Example page and Indigenous Dhudhuroa Language page only. be accessed by the permission users.	Create a sub-page to authorise the access permission for client, Dr. Susan Joyce, and community members	3
			Create a restrictions function to prohibit users without permission from accessing Dynamic Demonstration Example page.	
		As a client, I want the permission restriction function to be bug-free.	Test on the permission restriction function	3
			Fix the bugs of the permission restriction function	
11	As a permitted user, I want to access the indigenous dhudhuroa language page so that I can access the information on that page.	As a permitted user, I want to access the indigenous dhudhuroa language page	Create a function that allows the client, Dr. Susan Joyce, and community members to access the indigenous dhudhuroa language page.	2
		As a permitted user, I want to see the information on the indigenous dhudhuroa language page with a user friendly interface and bug free.	Build user friendly front-end user interface of indigenous dhudhuroa language page	4
			Test on the indigenous dhudhuroa language page	
			Fix the bugs on the indigenous dhudhuroa language page	

12	As a registered user, I want to access the dynamic demonstration example page so that I could view/ hear/ upload/ download data.	As a registered user, I want to download or upload the language data.	Add a function that allows the users to upload the language data.	6
			Add a function that enables users to download the language data.	
			Create a database to store the language data uploaded by users	
			Add a sub page to check whether the language uploaded by users is not harmful information.	
		As a registered user, I want to view/hear the language data on the landing page	Create a landing page that allows the user to view/ hear their language data.	3
		As a registered user, I want to view/ hear/ upload/ download language data with a user-friendly interface and bug free.	Build user-friendly front-end user interface of Dynamic Demonstration Example page	7
			Test all view/ hear/ download/ upload functions on the Dynamic Demonstration Example page	
			Fix the bugs on the Dynamic Demonstration Example page	
13	As an end user, I want to access the English language static example page so that I can access its content (variable data format) and enter its subpages.	As an end user, I want to see the data type and UML model on the English language static example page.	Prepare 2 sentences, 5 symbols, 3 images, and 1 song that will be displayed on the static example page	6
			Display the 2 sentences, 5 symbols, 3 images, and 1 song on the static example page.	
			Prepare a UML Model of the data tier.	
			Display a UML Information Model of the data tier on the static example page	
		As an end user, I want to see the data type and UML model with a user friendly interface and bug free.	Build user friendly front-end user interface of English language static example page	4
			Test on the culturally English language static example page	
			Fix the bugs on the English language static example page	

14	As an end user, I want to access indigenous community knowledge pages so that I can see the content, such as place names, cultural sites, and tracks.	As an end user, I want to see the knowledge of indigenous community on the indigenous community knowledge pages	Do the research on the indigenous community and prepare the picture related to the indigenous community to build the page.	4
			Put the research result and pictures on the indigenous community knowledge pages.	
		As an end user, I want to see the Knowledge of indigenous communities with a user-friendly interface and bug-free.	Build user-friendly front-end user interface of culturally relevant perspective pages	4
			Test on the indigenous community knowledge pages	
			Fix the bugs on the indigenous community knowledge pages	
15	As an end user, I want to access culturally relevant perspective pages so that I could see the lived experience of indigenous people who value and respect their language.	As an end user, I want to see the Indigenous culture information on the culturally relevant perspective pages.	Do the research on the Indigenous culture and prepare the picture related to the Indigenous culture to build the page.	4
			Put the research result and pictures on the culturally relevant perspective pages.	
		As an end user, I want to see the Indigenous culture information with a user-friendly interface and bug-free interface.	Build user friendly front-end user interface of culturally relevant perspective pages	
			Test on the culturally relevant perspective pages	
			Fix the bugs on the culturally relevant perspective pages	

6.3.1.3 Kanban boards (using Trello as the tool)

More detail can be found in: https://trello.com/b/vAIOEUHx/indigious-web-dev-sprint-3

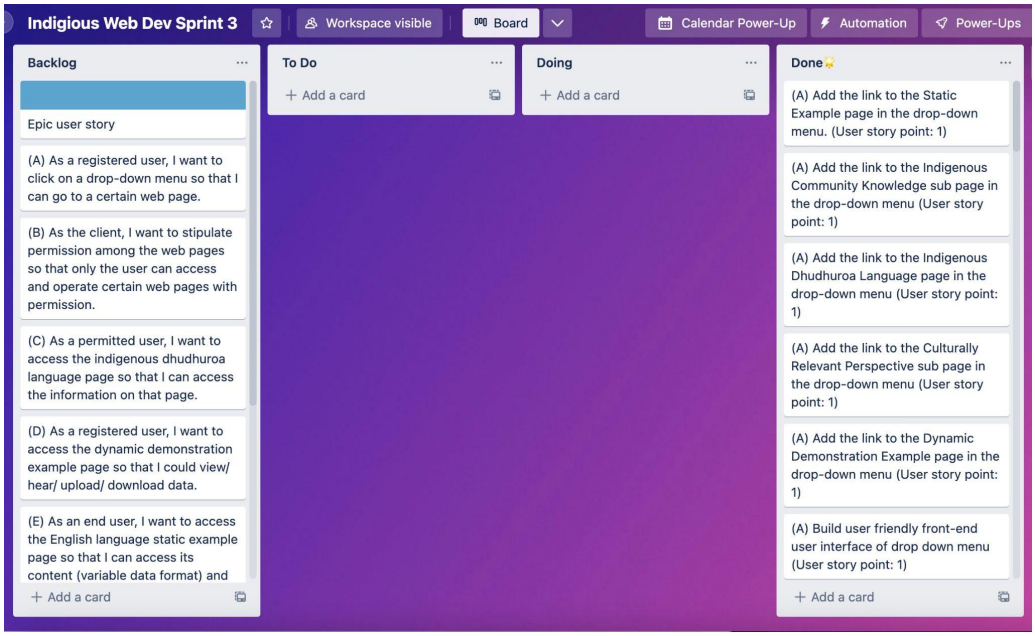

Figure 17. Kanban board of Sprint 3

6.3.1.4 Timesheets

The Timesheets are included in Appendix J - Sprint 3 Timesheet, which describes the activities done by each member.

6.3.1.5 Meeting Minutes

The Meeting Minutes for Sprint 3 are in Appendix I - Sprint 3 Planning Meeting Minutes and Appendix K - Sprint 3 Review Meeting Minutes, including a Sprint Planning meeting, a Sprint Review, and a Sprint Retrospective meeting. More information about the meeting is included in the following parts.

6.3.1.6 Screenshots of communications

We use Wechat as the communication tool, and for communication meetings, we use zoom as the platform. The communication screenshot can be found below.

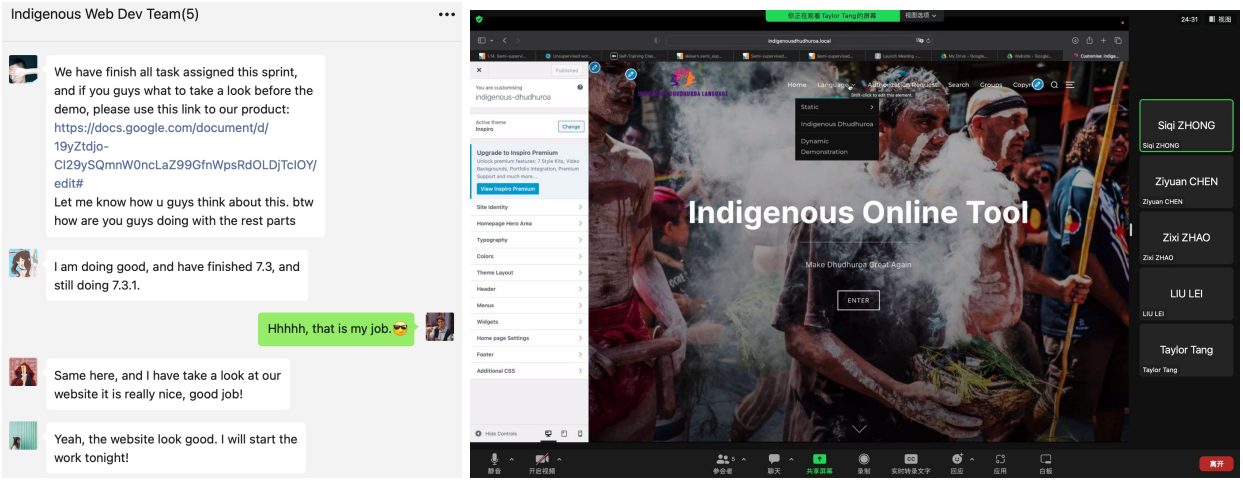

Figure 18. Sprint 3 Communication Screenshot

6.3.1.7 Burndown chart

The Ideal user story points and actual user story points for sprint 3 are shown in the following chart (added to the previous chart for sprint 1 and 2). Since this is the last sprint for the project, sprint 3 has higher velocity compared to the previous sprints, which is 65 user stories. This requires team members to contribute more time to reach the sprint plan. After the effort of all group members, the sprint plan is reached at the end of this sprint.

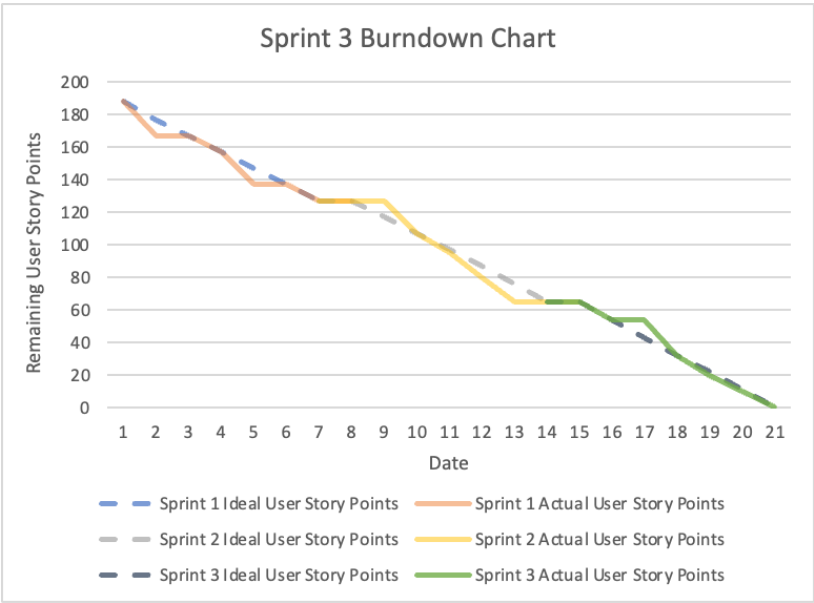

Figure 19. Sprint 3 Burndown Chart

6.3.1.8 Velocity estimations

Velocity = Number of story points completed / Time period over which they were completed
In Sprint 3, the completed number of story points is 65, and the time period is 1 sprint.

Therefore, according to the formula, the velocity is:
Velocity = 65 story points completed / 1 sprint = 65 story points per sprint

6.3.1.9 Sprint review inputs and outcomes

In the sprint 3 review meeting, the action items from the last meeting are completed by the assigned team members. And based on the process, the status of each task is updated successfully on Trello and is all in the "Done" section. All procedures related to the website itself are shown by demonstration with clear explanations, in which all members understand the content and think it is on the right track. More detailed meeting content is included in Appendix K - Sprint 3 Review Meeting Minutes.

- **Inputs**

1. The detailed completed tasks and user stories can be found in section 6.3.1.2 Sprint Backlog and 6.3 Project Status: Friday 30th September.
2. Based on the assigned part for each member, all members finish the corresponding part and have fully prepared for this meeting.

- **Outputs**
    1. Each member finishes the corresponding part within a period of time.
    2. The product owner's acceptance criteria have been met, meaning all work is done with high quality.
    3. The release for this sprint gets the approval of all participants.
    4. No update is needed for the product backlog for this sprint.
    5. The release for this sprint is the final release for this project, which the product owner also approves.

This is the last sprint, no other planning meeting is needed.

6.3.2 Product Related Artefacts

In sprint 3, the product owner discussed with the development team during the planning meeting and proposed implementing the variable language example pages as pre-defined in the provided case study document. This includes, but is not limited to, a drop-down menu with links to the indigenous Dhudhuroa page and its content, a dynamic demonstration page and its contents, a static example and a sub-page: indigenous community knowledge and culturally relevant perspective. Moreover, authorisation permission restriction function and user's accessibility related to these web pages is brought forward to be implemented. According to the features that should be implemented in this sprint, the updated website framework for sprint 2 is shown in Figure 20.

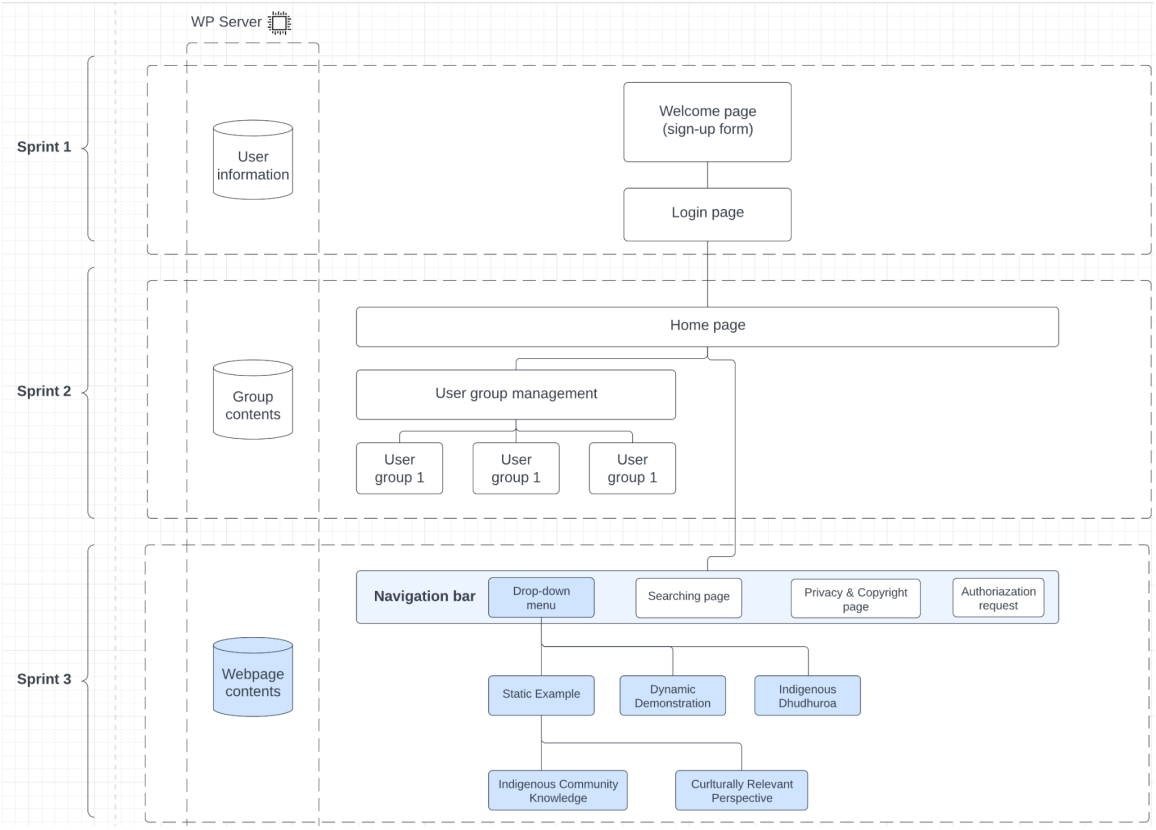

Figure 20. Sprint 3 Website framework

In this sprint, the development team ensures that the admin user can configure each user's accessibility to each page. In the static example page, the development team provided various content examples to demonstrate the static content capability of this website. Examples include multiple-paragraph texts, images and symbols. The team provides a photo gallery music player and upload/download functionality in the dynamic demonstration page. On the server side, the team also configures the server to store various types of uploaded files and provides the admin user with the ability to verify the content's eligibility. The detailed plan is shown below in Figure 21.

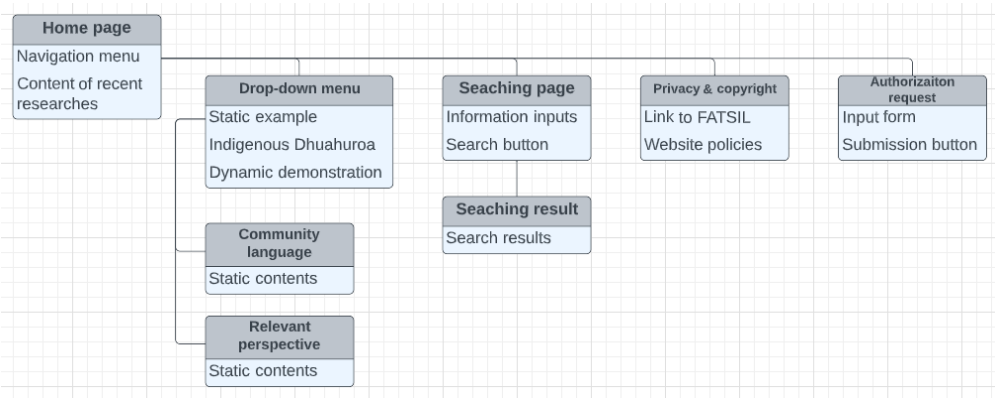

Figure 21. Sprint 3 Detailed Plan

Completed feature list during sprint 3:

1. Drop-down menu
    - A button to English static example page
    - A button to indigenous Dhudhuroa page
    - A button to dynamic demonstration page
2. English static example page
    - A button to indigenous community knowledge page
    - A button to relevant perspective page
    - Static content examples:
        - Multi-paragraph texts
        - Symbols
        - Images
        - A UML chart
3. Indigenous community knowledge sub page
    - Display the knowledge of indigenous community
4. Culturally relevant perspective sub page
    - Display the culture related to the indigenouos
5. Indigenous dhudhuroa language page
    - The permission restriction function that only the client and community member can access this page.
6. Dynamic demonstration example page
    - The permission restriction function
    - Upload and download data
    - User can view or hear the language data

For the screenshot of completed website pages, please refer to Appendix L - Sprint 3 Product Development Process Screenshots for more details.

6.3.3 Risk Monitoring and Control

In sprint 3, there is a general risk originally identified in section x occupied, which is scope creep during the development process (Risk ID 1 in section 5.3). The development members expected the website to support video data type which is one of the out-scope features identified in section 4.3. Although supporting the video data type can meet the further clients' expectations and increase the value of final delivery product, considering the remaining time is limited and there are still somes of the in scope features that haven't completed , the product owner decided to control this risks and stop development team to spend the time on supporting the video data type in the website. In this way, the development team can continuously focus on the in-scope features and avoid the potential impact that the all in-scope features cannot be completed on time due to scope creep.

Moreover, a new risk happened while developing the function of permission restriction on the website. The development team used the “My Private Site” plugin to achieve this function, and the plugin warns that the “Custom Lading Location” function may permanently lock the admin out of the website and if the admin locks himself out of the website, there is no way for the admin to recover. However, one development team member ignores that warning and uses that function which results in the admin account locked out of the website. The impact of this risk is serious since this risk resulted in the development team losing this website permanently and the final product cannot be delivered to the client on time. This risk was discussed in the stand up daily sprint meeting. Fortunately, another development member had the backup of the website which recovered the admin permissions of the website and mitigated this risk.

7. After the project

7.1 Project Retrospective

7.1.1 Teamwork

We chose the scrum method under agile as our SDLC model, and the choice of this model helped us adapt well to the changes in the project. The successful implementation of three sprints and timely sprint review helped the team to complete a high quality project on time. Good communication between team members facilitated team members to have consistent project goals. Each review and retrospective helps team members to communicate efficiently, rationalise their time and finally complete the project. We also setted up great communication and problem-solving principles for our group work, which also helped us achieve the success of our project.

7.1.2 Technology Choice

The focus of this project is website development. The team members initially chose the online version of WIX development software to carry out website development. However, in the process of using WIX, we found that WIX is not flexible enough to achieve some of the required functions, such as search within the website. This problem made us reflect that the detailed analysis of all technology tools at the beginning of the project and choosing the development platform carefully are important since unsuitable technology will make some functions that can not be implemented successfully and eventually lead to uncontrollable project progress. This problem was discussed during the meeting and the development team decided to change WordPress as the development tool. WordPress has many useful plugins to help us develop all required functions efficiently, which is a more suitable tool than that of the WIX for us to complete the project.

7.1.3 What did well and what could be improved

We had many areas of good performance and areas for improvement over the course of the project. First is that we deeply communicated with team members and assigned tasks by understanding each other's strengths. We read the group project's requirements together first and assigned different tasks. For example, people who are good at website design are responsible for website design, and people who are good at writing reports can be responsible for more written parts. This ensured that we could finish our group project efficiently. We do a project review after each sprint, in which we regularly share the progress of our tasks and exchange the problems we encountered in our work. Because of our timely communication and reasonable distribution of tasks, the development process of this project was relatively smooth and all members of the team were satisfied with the outcome.

However, our team could improve online work productivity. Due to Covid-19, some of our team members are studying in China while others are in Australia. So, the team needs to overcome the drawbacks of online communications. Compared to face to face-to-face communication, communicating online could cause more conflicts, thus reducing work efficiency. For example,our team members live in three time zones. So, it is harder for us to find a good time that suits all five team members when making a meeting schedule. Moreover, since we primarily communicate online using WeChat messages, response latency has become an issue. For example, one member may need to wait for hours before other team members reply. This influenced the efficiency of the work, which means that it is very difficult to get timely feedback on the work sometimes. In order to improve the efficiency of working online, a better online coordination work plan needs to be proposed at the start of the project. For example, setting up a communication scheme where each member needs to reply to the message or at least acknowledge that the message is received within half an hour. If failing to do so, the other member should try to communicate in another way, such as by phone call, to ensure the first member received the information.

Through this opportunity of group work, we have improved our communication skills and problem-solving skills. We will strengthen the efficiency of working online in the future.

7.2 Team Reflection

7.2.1 Team problem-solving and communication principles

During the development of this project, the team has learned and summarised a problem-solving scheme as follows:

- When encountering a problem, first think about it by yourself and then discuss it with team members if you cannot solve the problem.

- Describe the problem clearly, distinguish the most important problems and other problems, first solve the most important problems and then solve the secondary problems.
- Solve the problem in steps, do not complain about problems and seek help from team members in a timely manner.

This ensures that each team member puts other members' time to the best when seeking help and avoids inefficient communication.

Our team also has learned and summarised a communication scheme as follows:
For speakers:

- Speak clearly and organised, and do not react emotionally
- Be objective, sincere, and polite in expressing the opinion

For listeners:

- Take team members' views seriously and rationally
- Be responsive to the questions and comments from team members.

When working together, we need to follow problem-solving and communication principles, solve problems rationally, listen to others carefully, and treat group members' comments politely.

7.2.2 Reflection

In the whole group project, we work well together and have good communication with each other. When team members meet risks and conflicts, we can seriously discuss the encounter of risks and patiently solve our conflicts. We understand each other's work schedules and habits through routine meetings and building trust. Through the efforts of team members, we have a great group project.

Two main events help team members learn how to work together online and solve problems efficiently. The first is to manage our meeting time. At the beginning of our group project, we usually have more than 2 hours meeting, the meeting time is excessive and results in low effectiveness. When we found the problem, we tried to review other members' work before every meeting to solve the problem. Once we can read team members' work before meetings, we can finish our meetings in one hour. This change increases our meeting efficiency. Through this event, we learn that effective communication is important, only effective communication can help us handle different tasks efficiently at group work. The second is to assign work tasks reasonably. We have two team members responsible for website design. At the beginning of the project, they did not assign their own tasks, however, they found they always had conflicts in one part, such as selection of the website background and how the functions were implemented. Then, when they distributed their work into different parts, they improved their efficiency and had good communication. From this event, we learn that when we work together online, to reduce the cost of communication, we need to first assign work tasks reasonably. It can make team members smoothly complete the project schedule and reduce conflicts.

7.2.3 Influence

Through this group project, when we follow the problem-solving principles and communication principles, we have effective problem-solving skills and good communication skills. There are some positive influences in this group project:

- Help the team members to solve problems clearly and logically, and finally contribute to the success of the group project.
- Promote mutual understanding and deep communication between team members.
- Help team members manage the risks and conflicts encountered in our group project and deliver the project on time.

As a result, effective problem-solving skills and good communication skills play an important role in our agile team, it can assist us in more rapidly adjusting to working together online and increase our productivity.

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9. Appendix

Appendix A -Sprint 1 Planning Meeting Minutes

Held at: Zoom
Date: 19 September 2022, 19:00 - 21:00

Present
Taylor Tang, Ziyuan Chen, Zixi Zhao, Siqi Zhong, Liu Lei

Apologies
N/A

Approval of minutes
The minutes of the previous meeting were unanimously approved and distributed.

Agenda Items

1. Identify the goal of Sprint1 and divide the product backlog into the sprint backlog
2. Divide sprint backlog into detailed tasks and estimate user story
3. Identify risks and constraints that exist in this sprint
4. Draw a burndown chart that includes the ideal chart
5. Create a kanban board on Trello based on the determined backlog, and task

Action items

ID	Action Item	Owner	Deadline	Status
1	Identify the goal of Sprint1 and divide the product backlog into the sprint backlog	All team members	19/09/2022	Complete
2	Divide sprint backlog into detailed tasks and estimate user story	All team members	19/09/2022	Complete
3	Identify risk and constraint exist in this sprint	Liu Lei	21/09/2022	Assigned
4	Draw a burndown chart that includes ideal chart	Zixi Zhao	21/09/2022	Assigned
5	Create a kanban board on Trello for determined backlog, and task	Siqi Zhong	21/09/2022	Assigned

Next meeting
The next meeting will be held on 23 September 2022 19:00 - 21:00 via Zoom

Minutes submitted by: Siqi Zhong & Zixi Zhao
Approved by: Liu Lei

Appendix B - Sprint 1 Timesheet

Date	Activity	Planned Time	Actual Time
Member Name: Siqi Zhong		Record Date: 2022-09-23	
2022-09-19	Attend the Sprint 1 planning meeting	2	2
2022-09-20	Create kanban board of sprint 1 on trello based on the determined backlog and task	2	2
2022-09-21	Improve the documentation of Execution plan	3	2
2022-09-22	Finish the documentation of 7.1 & 7.1.1	3	4
2022-09-23	Attend the Sprint 1 review and retrospective meeting	2	2
Member Name: Zixi Zhao		Record Date: 2022-09-23	
2022-09-19	Attend the Sprint 1 planning meeting	2	2
2022-09-20	Draw a burndown chart that include ideal chart	2	2
2022-09-21	Improve the documentation of Execution plan	3	3
2022-09-22	Finish the documentation of 7.1 & 7.1.1	3	4
2022-09-23	Attend the Sprint 1 review and retrospective meeting	2	2
Member Name: Taylor Tang		Record Date: 2022-09-23	
2022-09-19	Attend the Sprint 1 planning meeting	2	2
2022-09-20	Do research on how the Wix is used and build the Welcome page.	3	4
2022-09-21	Build the login page & Test on the Welcome page	5	4
2022-09-22	Complete the Documentation of section 7.1.2	3	2
2022-09-23	Attend the Sprint 1 review and retrospective meeting	2	2
Member Name: Ziyuan Chen		Record Date: 2022-09-23	
2022-09-19	Attend the Sprint 1 planning meeting	2	2
2022-09-20	Do research on how the Wix is used & Build copyright page and test the usage.	5	4
2022-09-21	Test the login page & Build the home page.	3	3
2022-09-22	Test on the home page.	2	1

2022-09-23	Attend the Sprint 1 review and retrospective meeting	2	2
Member Name: Liu Lei		Record Date: 2022-09-23	
2022-09-19	Attend the Sprint 1 planning meeting	2	2
2022-09-20	Improve the documentation of out-of-score	2	2
2022-09-21	Identify risk and do the risk monitoring during sprint 1	3	3
2022-09-22	Complete the Documentation of 7.1.3	3	2
2022-09-23	Attend the Sprint 1 review and retrospective meeting	2	2

Appendix C - Sprint 1 Review Meeting Minutes

Held at: Zoom
Date: 23 September 2022, 19:00 - 21:00

Present
Taylor Tang, Ziyuan Chen, Zixi Zhao, Siqi Zhong, Liu Lei

Apologies
N/A

Approval of minutes
The minutes of the previous meeting were unanimously approved and distributed.

Agenda Items

1. Tracking the current project progress and tasks completed in the last sprint. All progress and tasks are recorded on Trello, and available to all members.

Updation of current project progress

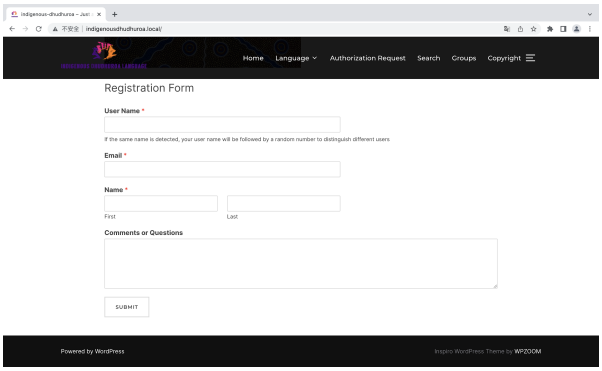
1. Taylor completed all tasks relevant to the establishment of the welcome page and login page by September 21st. Ziyuan completed all tasks relevant to the establishment of the copyright page and home page by September 22nd.
2. Siqi and Zixi finished the documentation of sprint 1 by September 22th.
3. Liu has done the risk monitoring and control process and finished the relevant documentation by September 22th.
4. Ziyuan and Taylor used integration and acceptance tests to test the performance of the welcome page, login page, home page and welcome page and fix the bugs that were found in the testing process to ensure a high quality and bug free website.
5. All functions done in the Sprint 1 have been approved by the product owner.

Next meeting

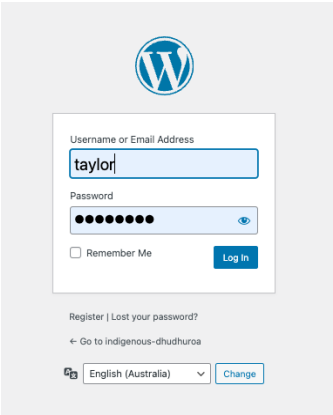
The next sprint planning meeting will be held on 3 October 2022 19:00 - 21:00 via Zoom
Minutes submitted by: Siqi Zhong & Zixi Zhao
Approved by: Liu Lei

Appendix D - Sprint 1 Product Development Process Screenshots

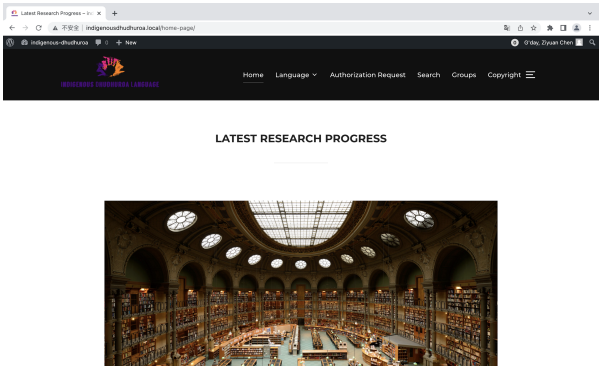
Welcome page and user registration form



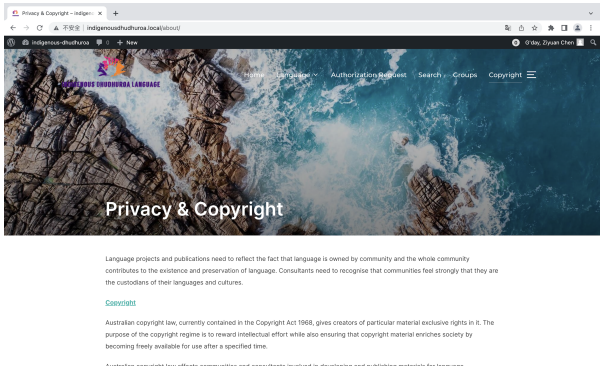
Login page



Home page



Privacy and copyright page



Appendix E - Sprint 2 Planning Meeting Minutes

Held at: Zoom
Date: 03 October 2022, 19:00 - 21:00

Present
Taylor Tang, Ziyuan Chen, Zixi Zhao, Siqi Zhong, Liu Lei

Apologies

N/A

Approval of minutes
The minutes of the previous meeting were unanimously approved and distributed.

Agenda Items

1. Identify the goal of Sprint 2 and determine the success criteria.
2. Break the product backlog down into lower-level backlogs as the sprint backlog.
3. Break sprint-level user stories down into tasks to be assigned.
4. Estimate the hours to finish tasks as the user story point.
5. Find any potential risk or constraint that exists in this sprint.
6. Update the sprint 2 burndown chart based on the last version.
7. Create a new kanban board on Trello based on backlog and tasks.

Action items

ID	Action Item	Owner	Deadline	Status
1	Identify the goal of Sprint 2 and determine the successful criteria	All team members	03/10/2022	Complete
2	Break product backlog down into lower level backlog as sprint backlog.	All team members	03/10/2022	Complete
3	Break sprint-level user stories down into tasks to be assigned.	All team members	03/10/2022	Complete
4	Estimate the hours to finish tasks as the user story point	All team members	03/10/2022	Complete
5	Find any potential risk or constraint that exists in this sprint	Liu Lei	07/10/2022	Assigned
6	Update the sprint 2 burndown chart based on the last version.	Zixi Zhao	07/10/2022	Assigned
7	Create a new kanban board on Trello based on backlog and tasks.	Siqi Zhong	07/10/2022	Assigned

Next meeting
The next meeting will be held on 07 October 2022 19:00 - 21:00 via Zoom
Minutes submitted by: Siqi Zhong & Zixi Zhao
Approved by: Liu Lei

Appendix F - Sprint 2 Timesheet

Date	Activity	Planned Time	Actual Time
Member Name: Siqi Zhong		Record Date: 2022-10-07	
2022-10-03	Attend the Sprint 2 planning meeting	2	2

2022-10-04	Create kanban board of sprint 2 on trello based on the determined backlog and task	2	1.5
2022-10-05	Finish the documentation of 7.2 & 7.2.1	3	4
2022-10-06	Make sure all team member work well and assist communication between team members	1	2
2022-10-07	Attend the Sprint review and retrospective meeting	2	2
Member Name: Zixi Zhao		Record Date: 2022-10-07	
2022-10-03	Attend the Sprint 2 planning meeting	2	2
2022-10-04	Update the burndown chart that include sprint 2	1	2
2022-10-05	Finish the documentation of 7.2 & 7.2.1	3	4
2022-10-06	As Scrum master, evaluate the progress and the quality of the product for this sprint.	2	1
2022-10-07	Attend the Sprint 2 review and retrospective meeting	2	2
Member Name: Taylor Tang		Record Date: 2022-10-07	
2022-10-03	Attend the Sprint 2 planning meeting	2	2
2022-10-04	Complete the functions of the User Groups page	5	6
2022-10-05	Test and fix the bug of User Group page	5	3
2022-10-06	Complete the Documentation of section 7.2.2	3	2
2022-10-07	Attend the Sprint 2 review and retrospective meeting	2	2
Member Name: Ziyuan Chen		Record Date: 2022-10-07	
2022-10-03	Attend the Sprint 2 planning meeting	2	2
2022-10-04	Complete the tasks related to the Authorization Request page and Authorization Admin page.	4	5
2022-10-05	Test on the Authorization Request page and Authorization Admin page	6	4
2022-10-06	Complete the Text Searching page and finish the test on this page	5	3
2022-10-07	Attend the Sprint 2 review and retrospective meeting	2	2
Member Name: Liu Lei		Record Date: 2022-10-07	
2022-10-03	Attend the Sprint 2 planning meeting	2	2

2022-10-04	Identify risk and do the risk monitoring during sprint 2	3	4
2022-10-05	Complete the Documentation of 7.2.3	3	3
2022-10-06	Prepare for the sprint review and retrospective	1	1
2022-10-07	Attend the Sprint 2 review and retrospective meeting	2	2

Appendix G - Sprint 2 Review Meeting Minutes

Held at: Zoom
Date: 07 October 2022, 19:00 - 21:00

Present
Taylor Tang, Ziyuan Chen, Zixi Zhao, Siqi Zhong, Liu Lei

Apologies
N/A

Approval of minutes
The minutes of the previous meeting were unanimously approved and distributed.

Agenda Items

1. Record the progress of this sprint, and compare it with the previous plan(sprint backlog). And any task should be recorded on Trello with the assigned member and the status.

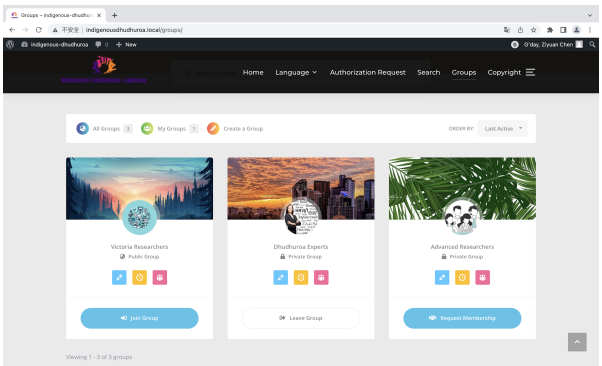
Updation of current project progress

1. Taylor completed all tasks relevant to the establishment of the User Groups page by October 4th.
2. Ziyuan completed all tasks relevant to the establishment of the Authorization Request page and Authorization Admin page by October 4th and completed all functions of the Text Searching page by October 6th.
3. Siqi and Zixi finished the documentation of sprint 2 by October 6th.
4. Liu has identified the potential risk and constraints and recorded them. Also, based on the identified risks, a risk monitoring and control process is created by October 6th.
5. Taylor completed the documentation of the 7.2.2 by October 6th.
6. Ziyuan and Taylor used integration and acceptance tests to test the performance of the Authorization Request page and Authorization Admin page, Text Searching page and User Groups page and fix the bugs that were found in the testing process to ensure the high quality and bug-free website.
7. All functions done in the Sprint 2 have been approved by the product owner.

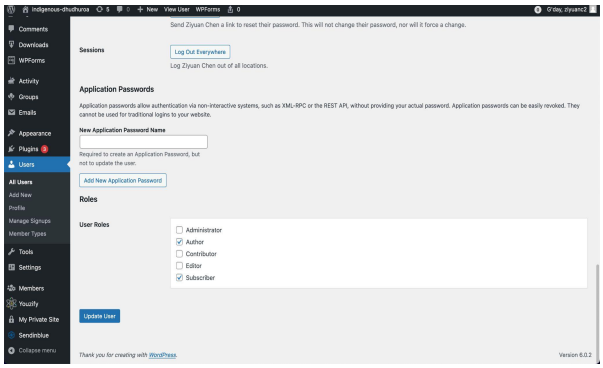
Next meeting
The next sprint planning meeting will be held on 10 October 2022 19:00 - 21:00 via Zoom
Minutes submitted by: Siqi Zhong & Zixi Zhao
Approved by: Liu Lei

Appendix H - Sprint 2 Product Development Process Screenshots

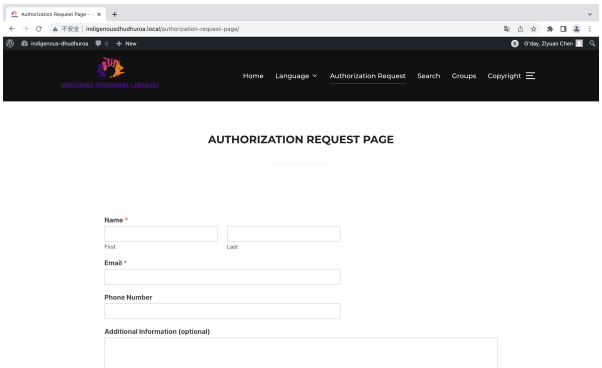
User group page



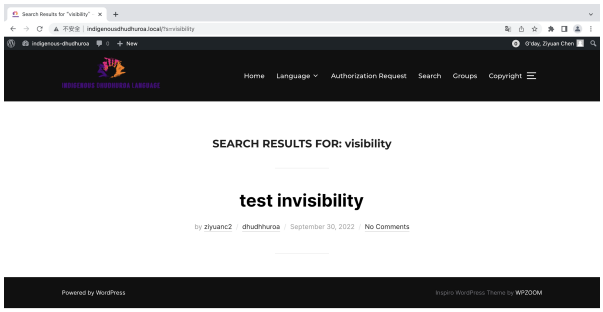
Authorization Admin page



Authorization request



Search page



Appendix I - Sprint 3 Planning Meeting Minutes

Held at: Zoom
Date: 10 October 2022, 19:00 - 21:00

Present
Taylor Tang, Ziyuan Chen, Zixi Zhao, Siqi Zhong, Liu Lei

Apologies
N/A

Approval of minutes

The minutes of the previous meeting were unanimously approved and distributed.

Agenda Items

1. Identify the goal of Sprint 3 and determine the success criteria
2. Choose the product backlog for this sprint and break it down into sprint level backlog.
3. Break the backlog into tasks to be assigned to each member.
4. Calculate the user story using the estimated hours of each task
5. Find the existing risk or constraint and generate the monitoring method.
6. Update the burndown chart and add an ideal chart for sprint 3.
7. According to the backlog, create a new Trello as the kanban board with tasks.

Action items

ID	Action Item	Owner	Deadline	Status
1	Identify the goal of Sprint 3 and determine the successful criteria	All team members	10/10/2022	Complete
2	Choose the product backlog for this sprint and break it down into sprint level backlog.	All team members	10/10/2022	Complete
3	Break the backlog into tasks to be assigned to each member.	All team members	10/10/2022	Complete
4	Calculate the user story using each task's estimated hours of each task	All team members	10/10/2022	Complete
5	Find the existing risk or constraint and generate the monitoring method.	Ziyuan Chen	13/10/2022	Assigned
6	Update the burndown chart and added an ideal chart for sprint 3.	Liu Lei	13/10/2022	Assigned
7	According to the backlog, create a new Trello as the kanban board with tasks.	Zixi Zhao	13/10/2022	Assigned

Next meeting

The next meeting will be held on 13 October 2022 19:00 - 21:00 via Zoom

Minutes submitted by: Siqi Zhong & Zixi Zhao

Approved by: Liu Lei

Appendix J - Sprint 3 Timesheet

Date	Activity	Planned Time	Actual Time
Member Name: Siqi Zhong		Record Date: 2022-10-13	
2022-10-10	Attend the Sprint 3 planning meeting	2	2
2022-10-11	Finished the documentation of 7.3 & 7.3.1	3	2
2022-10-12	Do more research on indigious community	2	2
2022-10-13	Attend the Sprint 3 review and retrospective meeting	3	3
Member Name: Zixi Zhao		Record Date: 2022-10-13	
2022-10-10	Attend the Sprint 3 planning meeting	2	2
2022-10-11	Finished the documentation of 7.3 & 7.3.1	2	2
2022-10-12	Do more research on indigenous community	2	2
2022-10-13	Attend the Sprint 3 review and retrospective meeting	3	3
Member Name: Taylor Tang		Record Date: 2022-10-13	
2022-10-10	Attend the Sprint 3 planning meeting	2	2
2022-10-11	Complete the drop-down menu and Static Example page.	5	6
2022-10-12	Complete the permission restriction functions of the Dhudhuroa Language page and Dynamic Demonstration Example page & Finish the relevant test	3	3
2022-10-13	Complete the Documentation of section 7.3.2 & Attend the Sprint 3 review and retrospective meeting	5	5
Member Name: Ziyuan Chen		Record Date: 2022-10-13	
2022-10-10	Attend the Sprint 3 planning meeting	2	2
2022-10-11	Complete the Indigenous Community Knowledge subpage and Culturally Relevant Perspective subpage and put the information on these pages.	5	4
2022-10-12	Complete the view/hear/download/upload language data functions of the Dynamic Demonstration Example page & Finish the relevant test.	3	4
2022-10-13	Attend the Sprint 3 review and retrospective meeting	3	3
Member Name: Liu Lei		Record Date: 2022-10-13	
2022-10-10	Attend the Sprint 3 planning meeting	2	2
2022-10-11	Identify risk and do the risk monitoring during sprint 3	3	4

2022-10-12	Complete the Documentation of 7.3.3	3	2
2022-10-13	Attend the Sprint 3 review and retrospective meeting	3	3

Appendix K - Sprint 3 Review Meeting Minutes

Held at: Zoom
Date: 13 October 2022, 19:00 - 21:00

Present

Taylor Tang, Ziyuan Chen, Zixi Zhao, Siqi Zhong, Liu Lei

Apologies

N/A

Approval of minutes

The minutes of the previous meeting were unanimously approved and distributed.

Agenda Items

1. Do a summary of what is done and isn't done compared with the sprint backlog in order to keep track of the current status. All progress should be included in the kanban board (Trello) and can be seen by all members.

Updation of current project progress

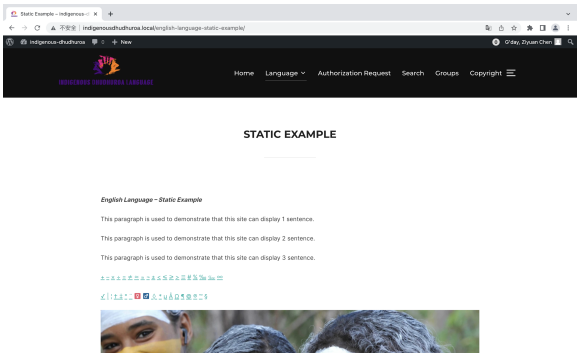
1. Zixi and Siqi completed the documentation of sprint 3 on October 12th and finished the research about the culture of indigenous and knowledge of the Indigenous community.
2. Liu has successfully identified the risks and constraints that exist in the sprint and recorded them by October 12th.
3. Taylor completed the drop-down menu and put the data types and UML model on the static example page by October 11th. In addition, Taylor completed the permission restriction functions of the Dhudhuroa Language page and Dynamic Demonstration Example page by October 12th.
4. Ziyuan completed all tasks relevant to the establishment of the Indigenous Community Knowledge subpage and Culturally Relevant Perspective subpage by October 11th and completed the view/hear/download/upload language data functions of the Dynamic Demonstration Example page by October 12th.
5. Ziyuan and Taylor used integration and acceptance tests to test the performance of completed web pages and fix the bugs that were found in the testing process to ensure the high quality and bug-free website.
6. All tasks and user stories were done in the Sprint 3 to get the approval of the product owner.

Next meeting

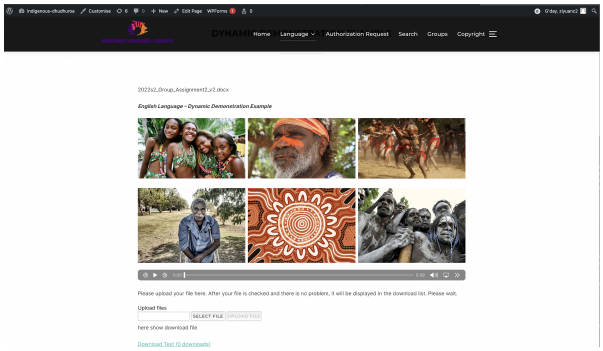
This is the last sprint meeting for this product so no more meetings will be held for this product.
Minutes submitted by: Siqi Zhong & Zixi Zhao
Approved by: Liu Lei

Appendix L - Sprint 3 Product Development Process Screenshots

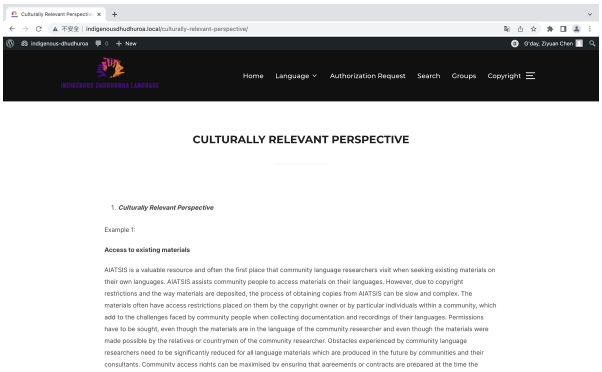
Static example



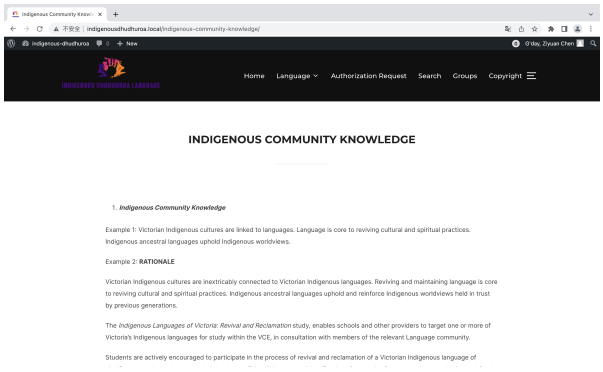
Dynamic demonstration



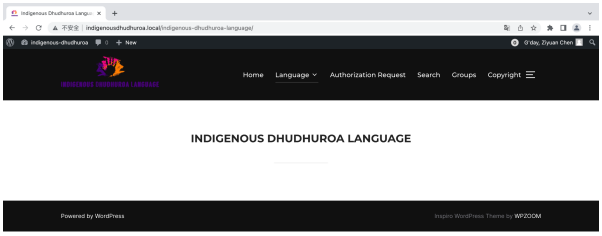
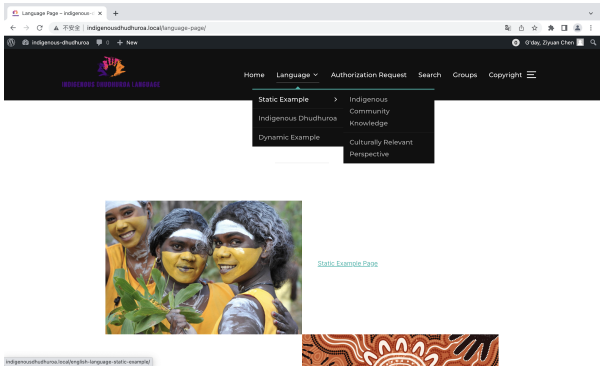
Culturally relevant perspective sub page



Indigenous community knowledge sub page



Indigenous dhudhuroa language page



Drop-down menu