

**ACCESSIBLE CHILD DEVELOPMENT SUPPORT PORTAL FOR BLIND
AND VISUALLY IMPAIRED (BVI) CHILDREN**

By

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A REPORT

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ABSTRACT

This proposal outlines the objective, significance, and methodology of the proposed project titled Accessible Child Development Support Portal for Blind and Visually Impaired (BVI) users. The main aim of this project is to develop an accessible portal for BVI children and parents to develop informative and accessible landing pages, user-friendly course registration system and a centralized learning resource management portal . In addressing this issue, the study seeks to support and contribute to the efforts of MAB by developing a structured and comprehensive early intervention support portal. The software methodology involved will be Agile Methodology as this will be the ideal methodology to be used to develop a software incremental with proper user feedback. This approach is chosen for its effectiveness in ensuring that the portal meets the end-user requirement and is accessible and comfortable to be used by people with different levels of visual impairment. The anticipated outcome is to have a fully functioning accessible portal, which may help parents and other stakeholders with tools they need to support the development of BVI Children. This proposal sets the foundation for further exploration and practical application in development of accessible portals or other modules for people with visual impairments.

Area of Study: Accessible Web-Based System

Keywords : User-Centered Design, Web Accessibility, Blind and Visually Impaired, User Portal, Learning Portal

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LIST OF ABBREVIATIONS

<i>OSSVIM</i>	One Stop System for the Visually Impaired in Malaysia
<i>BVI</i>	Blind and Visually Impaired
<i>WCAG</i>	Web Content Accessibility Guidelines
<i>MAB</i>	Malaysian Association for the Blind
<i>SEO</i>	Search Engine Optimization
<i>GCP</i>	Google Cloud Platform
<i>DM</i>	Development Milestone
<i>RBAC</i>	Role-Based Access Control
<i>ORDBMS</i>	Open-source Object-Relational Database System

CHAPTER 1

Introduction

According to [1], across the globe, at least 2.2 billion people have some form of near or distance vision impairment and strikingly, about half of these cases (1 billion) the vision impairment was either preventable or has not yet received the necessary attention. Among this billion, the leading causes of distance vision impairment and blindness are cataracts, refractive errors, age-related macular degeneration, glaucoma, and diabetic retinopathy, with presbyopia being the main cause of near vision impairment [2]. It is estimated that about 2% of people of all ages in Malaysia suffer from blindness in both eyes. Notably, the vast majority of these cases, roughly 17 out of 20 cases, could have been prevented, and nearly 60% could be treated [3]. These statistics highlight a pressing need for proactive strategies, particularly during early childhood when timely detection and support can significantly alter developmental outcomes.

The Malaysian Association for the Blind (MAB) has a strong history of advocating for and assisting people with visual impairments, offering services like early intervention, rehabilitation, job training, and inclusive education. However, families often struggle with scattered information, limited digital resources, and disjointed registration for support. To address this, this project responds to that gap by proposing a digital platform that builds upon MAB's foundational work, OSSVIM, while complementing broader national efforts, empowering parents and children through structured, accessible, and comprehensive early intervention support portal.

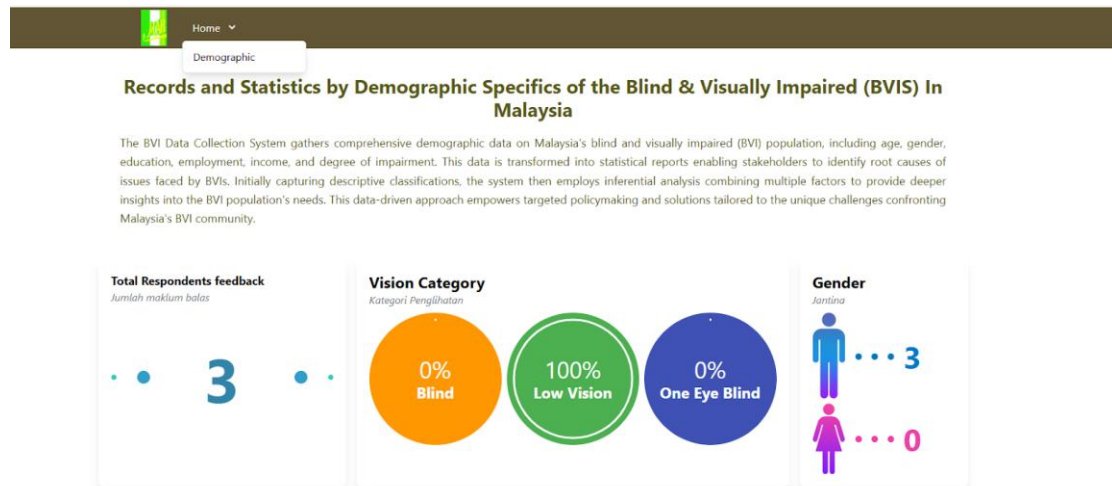


Figure 1.1 OSSVIM Landing Page

Figure 1.1 shows the Landing Page of the OSSVIM Portal of which the proposed Accessible Child Development Support Portal for the BVI Children will be built upon. [4]

The development of a digital platform that supports parents and guardians during the early stages of identifying and managing visual impairments in children is highly crucial. Building upon the Malaysian Association for the Blind's (MAB) current endeavours [5], this project wishes to offer a centralized and accessible location for information, guidance, and support for BVI children and their parents. By offering structured knowledge and empowering parents with the tools they need to act early, the project seeks to contribute meaningfully to improving developmental outcomes for children with visual challenges.

Moreover, the project aims to improve awareness and early parental engagement, acting as a bridge to connect families with essential resources, education, and intervention pathways. Thereby creating a sustainable and inclusive solution that complements the work of MAB and other organizations striving for a more inclusive society. The broader aim is to create a sustainable and inclusive solution that uplifts families while complementing the efforts of MAB and other stakeholders working toward a more inclusive society.

1.1 Problem Statement and Motivation

Problem Statement for this project are as follows:

- **Lack of Centralized and Accessible Information**

Despite ongoing efforts by the MAB, there is no centralized, accessible digital platform currently with all essential information for parents of children with visual impairments to support them. Because of that, many families are either unaware of the early signs of visual challenges or face difficulties accessing timely guidance and resources.

- **Inefficiencies in Service Registration and Coordination**

Due to a lack of integration between systems, the enrollment process for early intervention programs for children continues to be inefficient and often relies on manual paperwork. This lack of integration delays intervention and contributes to a confused and hassling experience for parents seeking help for their visually impaired children. There is a clear need for a unified digital system that streamlines registration and facilitates coordinated engagement between families and service providers.

- **Limited Structured Support for Parental Involvement**

While resources may exist, there is a noticeable gap in tools that actively guide and support parents throughout their child's developmental journey. Without structured support and consistent engagement mechanisms, parents may struggle to monitor progress or remain involved in early developmental training, which is a critical factor in the success of early intervention for BVI children.

CHAPTER 1

In Malaysia, early identification and intervention for children with visual impairments remain as a set back by a lack of centralized, accessible, and parent-friendly platforms. Despite the efforts of organizations such as the MAB, many parents face challenges in recognizing early signs of vision problems and navigating through fragmented support systems. The issue is that current resources are often too spread out, too technical, or hard for families with limited digital skills to access, especially in rural or less-served communities. Other than that, there's not enough clear guidance to help parents stay involved in their child's early development. These issues lead to delays in getting help, which can negatively affect a child's learning, social skills, and future ability to live independently. The motivation for this project stems from the urgent need to fill this digital and information gap by creating an inclusive platform that gives parents the knowledge, guidance, and access to necessary services as early as possible.

1.2 Research Objectives

The objectives of this project are as follows:

- **To develop an accessible and informative landing page** that provides parents with accurate, easy-to-understand resources related to early identification and support for BVI children.
- **To implement a reliable and user-friendly course registration system** that facilitates class enrollment, interview scheduling, offer letter access, and kit purchasing with a secure backend infrastructure.
- **To establish a centralized learning resource management portal** where parents can monitor their child's development progress, access educational guidelines, and download relevant reports.

1.3 Project Scope and Direction

The OSSVIM system currently offers a public-facing landing page (Module 1) that informs and navigates users through infographics and statistics about BVI persons in Malaysia. Expanding on this, Module 2, which will be the accessible child development support portal for BVI Children, wishes to increase the system's capabilities by enhancing the system with improved user interaction, more robust data management, and added support for both external users (like parents) and internal users (like administrators). The development of this project, aims to improve engagement and simplify access to personalized services as well as strengthen the OSSVIM portal for everyone involved.

Module 2 is designed to create a structured support platform for parents and children following the early identification of VIP symptoms as this module will offer essential educational materials through dedicated landing pages that address causes, early detection strategies, developmental milestones, and available support systems for multi-disabled or deafblind children. The goal of these resources is to give parents essential knowledge both before and during their child's early intervention process.

Beyond just providing information, the module will feature a secure and efficient course registration system, allowing parents to register for specialized classes, schedule interviews, access offer letters, and purchase necessary intervention kits. A learning management component will also be integrated, enabling both parents and administrators to track student profiles, course progress, and attendance. The project will prioritize user accessibility, system security, and scalability to support future improvement and developments.

1.4 Contributions

To improve early support for visually impaired children in Malaysia, this project designs and develops an accessible web-based intervention platform for families. Recognizing the current lack of centralized digital resources, the system provides reliable, structured information on early symptom detection, developmental advice, and available support services, thereby complementing the efforts of the Malaysian Association for the Blind (MAB) and national health and welfare bodies. This project also simplifies the process of signing up for early intervention programs through a digital system, making it easier and less intimidating for parents. Moreover, the platform includes features designed to encourage parents to stay actively involved in their child's development, which is crucial for achieving positive outcomes over time. Designed with scalability in mind, the system will eventually serve as a foundational module that can be expanded in the future to support other early intervention objectives through additional modules.

1.5 Report Organization

The details of this research are structured as follows. Chapter 2 provides a comprehensive literature review, outlining the related works and background studies that form the foundation of this project. Chapter 3 presents the proposed methodology and approach, which encompasses the system methodology, system requirements, system prototype, system architecture diagram, flowchart, and project timeline. Chapter 4 discusses the preliminary work undertaken, including system setup, skill refreshment and preparation, as well as the development progress achieved during this phase.

CHAPTER 2

Literature Reviews

2.1 Previous Works Related to Accessible Portals and Support for BVI Children or Similar Works

2.1.1 EnhAnced Government Learning (EAGLE) Portal: Production of Universally Accessible Open Educational Resources (OER)

The research on the Enhanced Government Learning (EAGLE) platform, which is backed by the European Commission, aims to support and improve the experience of local public administrators in different municipalities by providing universally accessible Open Educational Resources (OER) [6]. According to UNESCO [7], OER refers to learning and teaching materials that are intended for educational, instructional, and research purposes, existing in diverse formats and media which can be used, modified, and shared with others without needing to pay, as they exist in a public domain.

In an increasingly digital world, it is crucial to make sure online learning spaces and materials are accessible to everyone, not just helpful for visually impaired users but inclusive of all individuals. Accessibility is a core principle behind the EAGLE platform's design. The platform is rigorously tested to ensure compliance with established accessibility standards, including WCAG (Web Content Accessibility Guidelines), ATAG (Authoring Tool Accessibility Guidelines), and WAI-ARIA (Web Accessibility Initiative - Accessible Rich Internet Applications). The project embraces the principles of universal design, aiming to create a learning environment that is usable by all individuals, regardless of their abilities.

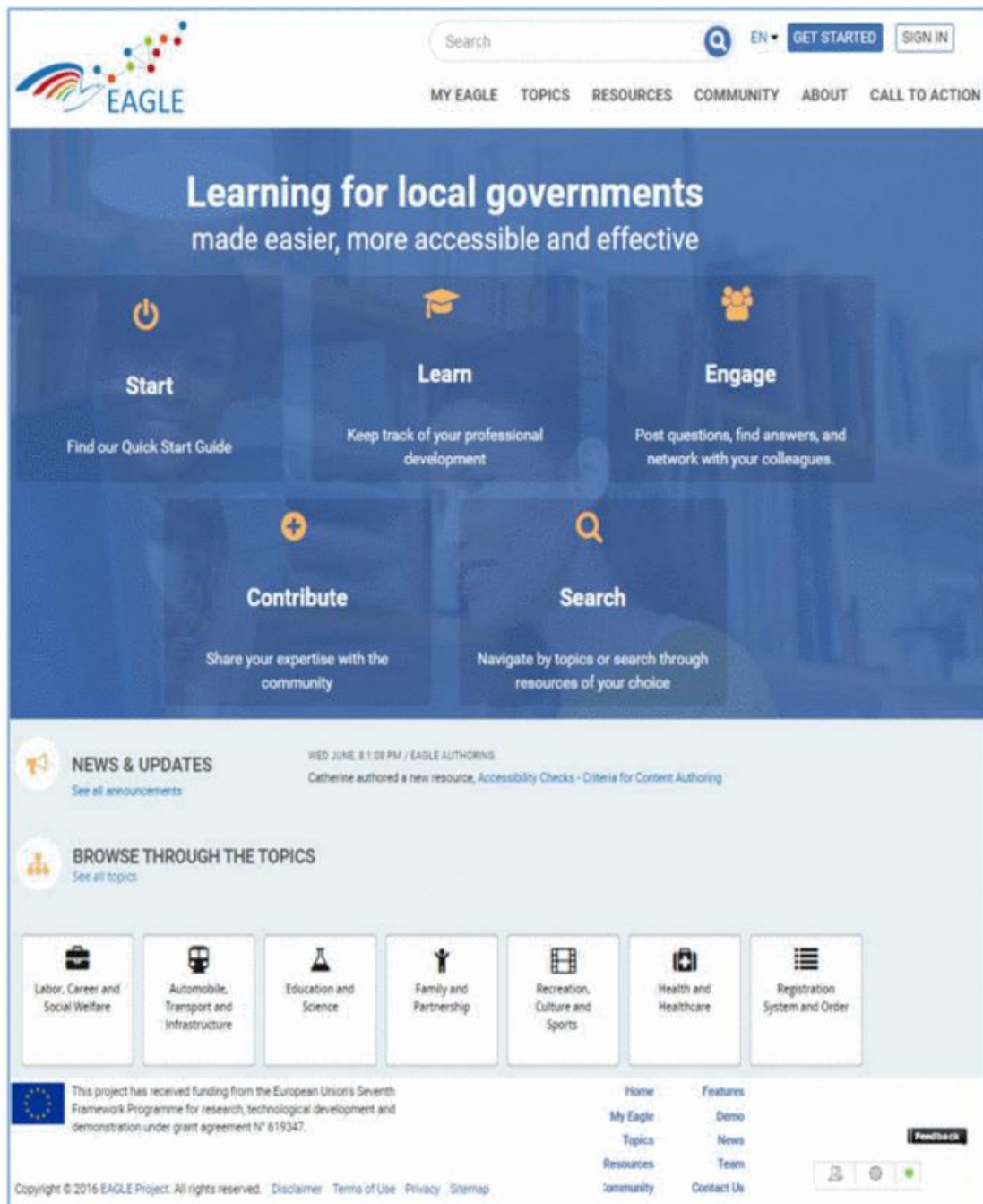


Figure 2.1 Main Components of EAGLE Portal

Figure 2.1 shows that the EAGLE Portal was designed with adherence to Universal Design concept so that portal is able to be used by all people, to the greatest extent possible, without the need for adaptation or specialized design.

Sample OER	
Type	Categories
Accessibility checks for tools evaluation	<i>Clarity and Structure, Search, User Guidance and Navigation, Currentness, Consistency and Robustness, Text and Language, Contact Information and Support, Graphics, animated Features and Multimedia, Links</i>
Content authoring criteria	Audio , Graphics and Animation, Video, Format Templates, Themes and Text, Integration with Social Media , Mobile compatibility

Figure 2.2 Accessibility evaluation criteria for OER tools and content authoring guidelines

Based on Figure 2.2, it is evident that the researchers of this project have carried out a proactive approach to ensure that the portal is accessible to all end-user and that stand is further reinforced by the platform's built-in accessibility checks, which evaluate both the platform itself and the OER created within it across visual, auditory, and cognitive domains. The research also provides specific accessibility criteria for content authors, offering guidance on clarity and structure, user guidance and navigation, text and language considerations, and the appropriate use of graphics and multimedia.

Finally, the design of the EAGLE platform carefully considers the needs of users who rely on assistive technologies. This includes ensuring compatibility with screen readers, enabling keyboard navigation, and providing accessible search functions. By prioritizing these accessibility features, the research underscores the EAGLE platform's commitment to creating an inclusive learning environment, ensuring that all public administrators can effectively access and benefit from its resources.

2.1.2 Development of an Online Digital Resource Accessible for Students with Visual Impairment or Blindness

The study by Almeida et al [8] presents the creation of "OSH! What a Bright Idea," an online educational tool developed for making Occupational Safety and Health (OSH) accessible to all students aged 14 to 18, including those with visual impairments or blindness. The development followed a Design-Based Research (DBR) method and the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), with the study focusing on the initial four stages.

The creation of the "OSH! What a Bright Idea" resource focused strongly on making it accessible to everyone. From the beginning, the development of this project has been factored in the challenges faced by users with visual impairments and focused on creating accessibility-centred design and used guidelines by the Web Content Accessibility Guidelines (WCAG) to address them.

OSH! What a Bright Idea has been developed with standard web tools like HTML5 and WordPress, along with special accessibility tools like Accessibility Spring, which offered features such as adjustable text size and keyboard navigation. Instead of making different versions for sighted and blind students, activities such as videos, games, and charts have been incorporated for ease of BVI children usage.

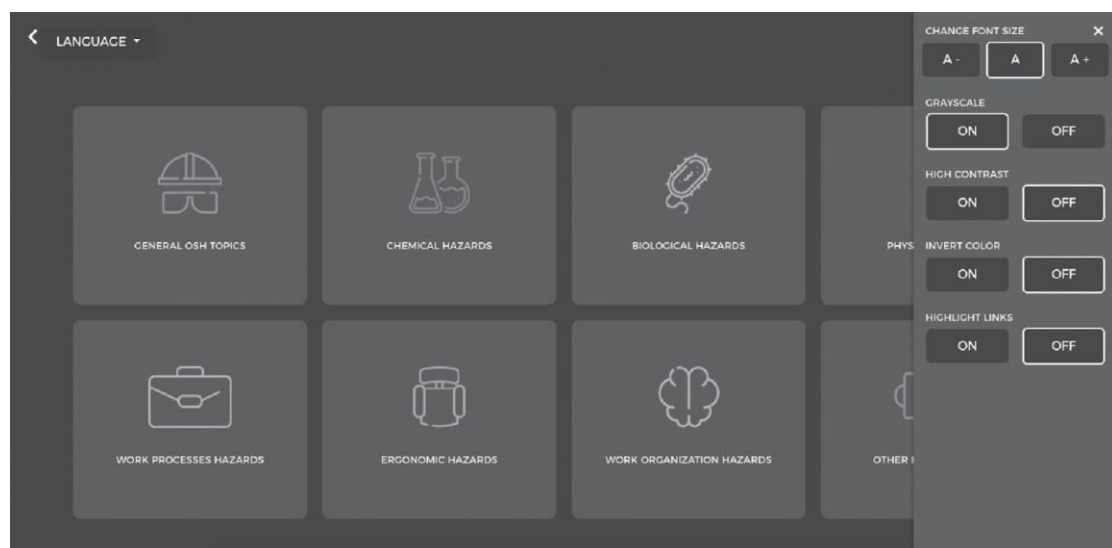


Figure 2.3 Interface and Sidebar of OSH! What a Bright Idea

Based on Figure 2.3 it is evident that the learning materials were also designed to be accessible. The fonts, colours and link selection can be highlighted as per user's desire. The content of the videos had voice explanations and descriptions for blind users and games could be used by touch as well as visual information like charts were coded so screen readers could understand it. This project showed that even subjects that often rely on visuals, like Occupational Safety and Health, can be made accessible to all students, including those with visual impairments, without making the learning less interactive or effective.

2.1.3 Methods and Techniques of Adaptive Web Accessibility for the Blind and Visually Impaired

The study by Raufi et al. [9], explores methods and techniques for improving web accessibility for blind and visually impaired users. This research emphasizes that despite the increasing amount of information on the web, it can be challenging for all users to navigate, especially those with disabilities. User adaptive systems are essential to bridge the gap between users and web information.

The central theme of the research discussed in this paper revolves around the necessity and development of adaptive web accessibility techniques. According to [10], and as also referenced by [9], the primary reason for BVI users to experience discomfort when accessing the web is when the website lacks in providing essential page context and

information overload due to excessive sequential reading. Users struggle to maintain navigational context when reading small sections of a page. Hence, incorporating semantic web techniques and annotations can help address this issue [9]. Web pages often contain excessive elements like links and menus that hinder reading. To solve that issue, concurrent speech methods and skimming can be included within the webpage to help users locate relevant information efficiently [11].

Building on the identified challenges and proposed solutions, the research explored five adaptive techniques to significantly improve web access for blind and visually impaired (BVI) users. These include adaptive presentation such as adaptive multimedia presentation, canned multimedia presentation, canned text presentation, and adaptation of modality as well as adaptive navigation support which is adaptive auditory link serialization [9].

Future works can be built upon this study with focus on implementing and testing the proposed adaptation techniques, evaluating their compliance with WCAG recommendations, and conducting usability studies.

2.2 Limitation of Previous Studies

2.2.1 EnhAnced Government Learning (EAGLE) Portal: Production of Universally Accessible Open Educational Resources (OER)

While the research presented in the EAGLE platform paper shares some similarities with my proposed idea, it's important to acknowledge several key limitations in their study which serves as a great opportunity for my proposed project to offer a distinct contribution.

Primarily, the EAGLE portal research paper presents the only results of Phase 1 validations. While these provide initial insights into user experience, it does not fully capture the long-term usability and effectiveness of the EAGLE platform. Though the study mentions that Phase 2 evaluations are ongoing, the paper however, doesn't include those results. Therefore, the generalizability of the findings might be limited.

Besides that, while the research findings does acknowledge the challenges faced by public administrations in adopting technology-enhanced learning, it does not, however, provide an in-depth discussion or the specific details of the obstacles encountered during the development and implementation of the EAGLE platform. Providing a more thorough explanation of these challenges and the specific strategies used to overcome them would offer significant value for future researchers and practitioners in the field.

The most significant limitation of this research would be that it places a heavy focus on the creation of Open Educational Resources (OER) within the EAGLE platform without consideration of other aspects. Although this is an important part of the project, the research could benefit from a more comprehensive exploration of other factors that contribute to effective online learning, such as teaching strategies, learner support, and community engagement.

2.2.2 Development of an Online Digital Resource Accessible for Students with Visual Impairment or Blindness

Although the "OSH! What a Bright Idea" project successfully created an accessible resource, it still has some significant limitations. The study by Almeida et al. [5], primarily focused on the initial stages of development which was the analysis, design, development, and initial implementation phase. The crucial evaluation phase, which involves testing the resource with the target users, particularly the BVI children, was not completed at the time of the study. As a result, fundamental questions about how well the resource functions in practice, how easy it is to navigate, and whether users are satisfied remain unanswered. Specifically, the usability of interactive features, the clarity and effectiveness of how content is presented, and the overall user experience are still unknown. Without this crucial feedback, it is quite difficult to definitively claim the resource as fully successful or working as well as it could. Future research would ideally involve thorough user testing to collect real-world data on these aspects and inform further refinements.

Besides that, this project was designed specifically to teach Occupational Safety and Health (OSH) topics. While its focus on accessibility and inclusive interaction is valuable, it is uncertain to know that the approaches presented here would directly work for other subjects as different subjects may present unique challenges in terms of content structure, the nature of visual aids, and the types of interactive elements that are academically effective. Therefore, although this project's design ideas are helpful, applying them to other areas of study would likely need careful adjustments and potentially new strategies tailored to the specific needs of those subjects. Future studies could look into how well these design ideas can be used for a wider range of topics.

2.2.3 Methods and Techniques of Adaptive Web Accessibility for the Blind and Visually Impaired

Though the research has presented some substantial findings, there are still some limitations present with the study.

To begin with, the generalizability of the study's findings is a consequential limitation. Research studies should typically involve user studies or evaluations with a sample group of users. The characteristics of these participants, including age, level of visual impairment, technological familiarity, and cultural background, can influence the study's results. Therefore, the findings might not be directly applicable to all BVI Individuals. Furthermore, evaluations conducted on specific types of web content might not fully represent the variability of the entire web. Hence, the effectiveness of the proposed techniques could vary across different websites, potentially limiting the generalizability of the research.

Besides that, technological advancements at the time of publication may represent a potential limitation. Given the publication year of 2015, the research might not fully account for the rapid evolution of assistive technologies, web development practices, and accessibility standards. Since then, there have been advancements in screen reader software, voice recognition technology, web frameworks, and the use of o Accessible Rich Internet Applications (ARIA) for dynamic web content. These advancements might introduce new accessibility techniques or refine existing best practices, which might not be thoroughly addressed in the paper. Hence, the information and recommendations presented in the paper should be considered in the context of more recent technological developments to ensure their continued relevance.

2.3 Proposed Solutions

This project aims to propose that the adoption of Universal Interaction Pattern and Design is highly necessary to create an accessible development support portal for BVI users as well as ordinary users. The accessible portal will have to be built using the latest WCAG Guidelines [12] and ensuring that the fundamental principles of WCAG which are perceivable, operable, understandable and robust are put into effect by the development support portal. A clear information hierarchy, established through the consistent use of headings and subheadings, is essential for screen reader users to navigate and understand the structure of the learning materials. Besides that, the developed portal must take into consideration ensuring sufficient color contrast between text and background is crucial for users with low vision, with WCAG recommending specific contrast ratios. Other than that, providing alternative formats for learning materials, large print, or audio versions, can further enhance accessibility for visually impaired students.

Besides that, the portal should be intuitive and provide efficient navigation as it is particularly designed for non tech savvy users and VIP users. Navigation within the portal needs to be straightforward, consistent, and easily noticeable for all users, and navigation elements, like menu options and links, should use consistent labels to help them understand their choices and move through it easily. Additionally, a well-organized main menu and a clearly visible search bar needs to be included, in order to allow the users to directly find specific information. Implementing breadcrumbs to show the user's current location within the portal's organization will significantly improve navigation and allow easy return to previous pages and developing a site map can also be helpful as it will be useful in providing an overview of the portal's structure. By structuring the site logically with content in well-defined categories and subcategories, finding relevant information will be simplified.

CHAPTER 3

System Method/Approach

This section outlines the overall approach for developing the proposed system. It presents the system methodology, detailing the necessary hardware and software specifications and timeline for project implementation.

3.1 System Methodology

This system will be developed using the Agile methodology framework as it is an iterative and flexible approach to software development that emphasizes continuous improvement, collaboration, and adaptability [13]. By following this development methodology, the project will be broken down into small, manageable iterations or sprints, typically lasting two to four weeks, which allows for regular assessment and adjustments based on feedback. This framework encourages close collaboration among the developers and the stakeholders, ensuring that the system evolves in line with user needs and expectations as it by ensuring user feedback and iterative refinements are provided in a timely manner. The methodology focuses on adaptability making it ideal for accounting for changes and overcoming challenges that may arise throughout the development process.

3.2 System Requirement

3.2.1 Hardware

The hardware which will be involved in this project is a computer (laptop) which is an essential requirement to design, develop, and to integrate various system components, including user interfaces, databases, and accessibility features. The laptop provides the necessary processing power, memory capacity, and graphics capabilities to efficiently run development tools and testing environments throughout the project.

Table 3.1 Specifications of laptop

Description	Specifications
Model	Acer Nitro V 15
Processor	Intel Core i7-1320H
Operating System	Windows 11
Graphic	NVIDIA GeForce RTX 2050 4GB GDDR6
Memory	16GB DDR5 RAM
Storage	1TB SSD

3.2.2 Software Specification

Several software technologies will be utilized in this project to ensure efficient system development, scalability, and accessibility for the visually impaired community. Each software plays a specific role in the development stack, from frontend interface creation to backend database management and cloud deployment.

3.2.2.1 TypeScript

TypeScript is a programming language that compiles into JavaScript. It helps catch errors while coding, provides suggestions, and organizes code for better readability, making large projects easier to maintain. [14].

3.2.2.2 Redis

Redis is an in-memory data store used for caching frequently accessed data. This reduces database requests, speeds up data retrieval, and improves system responsiveness. [15]. This is particularly important for improving the system's responsiveness and ensuring a smooth user experience, especially in the event of dealing with large datasets or real-time interactions.

3.2.2.3 React.js

React.js is a JavaScript library for building the system's frontend. Its component-based structure allows dynamic, responsive, and accessible interfaces while making updates easier.[16].

3.2.2.4 Next.js

Next.js, built on React, provides fast server-side rendering and built-in routing. This improves page load times, SEO, and ensures a smoother experience for users with visual impairments. [17].

3.2.2.5 MongoDB

MongoDB is a NoSQL database that stores both structured and semi-structured data. Its flexibility and scalability make it suitable for handling growing datasets and diverse system needs [18].

3.2.2.6 Google Cloud Platform (GCP)

GCP hosts the system on a secure, scalable cloud infrastructure. It supports deployment, data storage, and processing while ensuring high performance for many users. [19]

3.2.2.7 GitHub

GitHub will be used as the version control platform for managing the project's source code [20]. It will allow the facilitation of collaborative development provided version control, making it easy to revert to previous versions of the code if needed, and enabling efficient code review.

3.2.2.8 Material-UI(MUI)

Material-UI (MUI), is a library of pre-built React components, to create user interfaces of the system. It speeds up UI design while ensuring consistency and responsiveness [21].

3.2.2.9 TailwindCSS

TailwindCSS is a utility-first CSS framework that simplifies styling. It helps build modern, customizable, and mobile-friendly designs quickly [22].

3.2.2.10 PostgreSQL

Postgress is an open-source relational database management system (RDBMS) used for secure and scalable data storage. It supports complex queries and ensures data integrity. [23]

3.2.2.11 Bruno

Bruno is an open-source API client designed for testing and documenting API endpoints. It uses a local-first approach by storing collections directly in the filesystem, which enhances collaboration and version control integration [24]

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3.3 Timeline

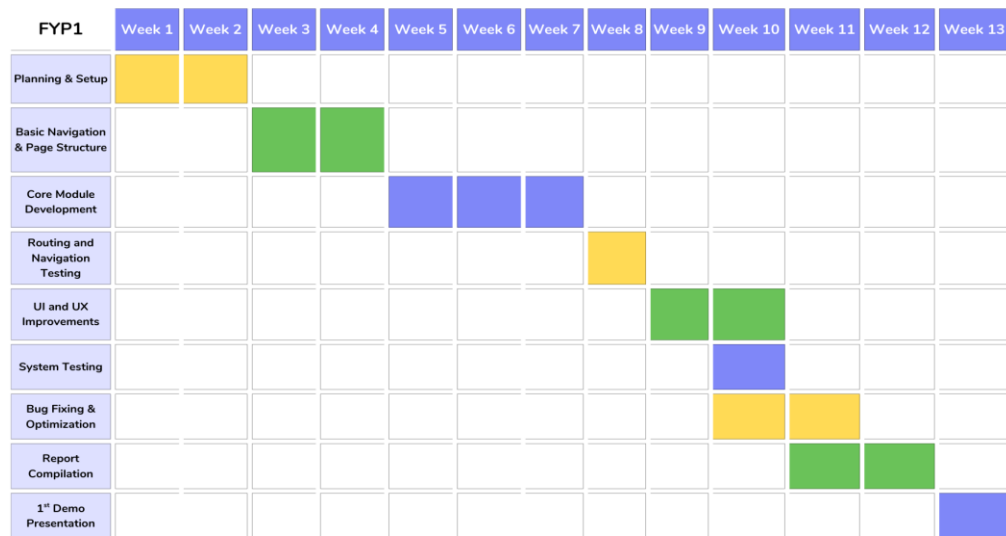


Figure 3.1 Timeline of FYP1

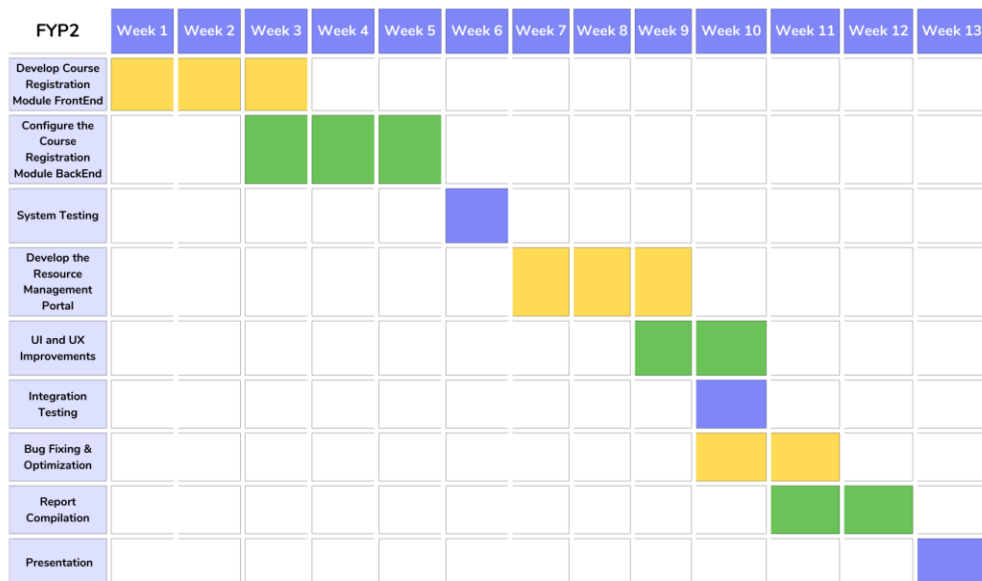


Figure 3.2 Timeline of FYP2

Figure 3.1 and Figure 3.2 show the timelines of FYP1 and FYP2 respectively. Weeks 1 to 10 will focus on system development, while Weeks 11 and 12 will be dedicated to bug fixing, optimization, and report completion. The system presentation is scheduled for Week 13 for FYP1 and FYP2.

CHAPTER 4

System Design

4.1 System Architecture Diagram

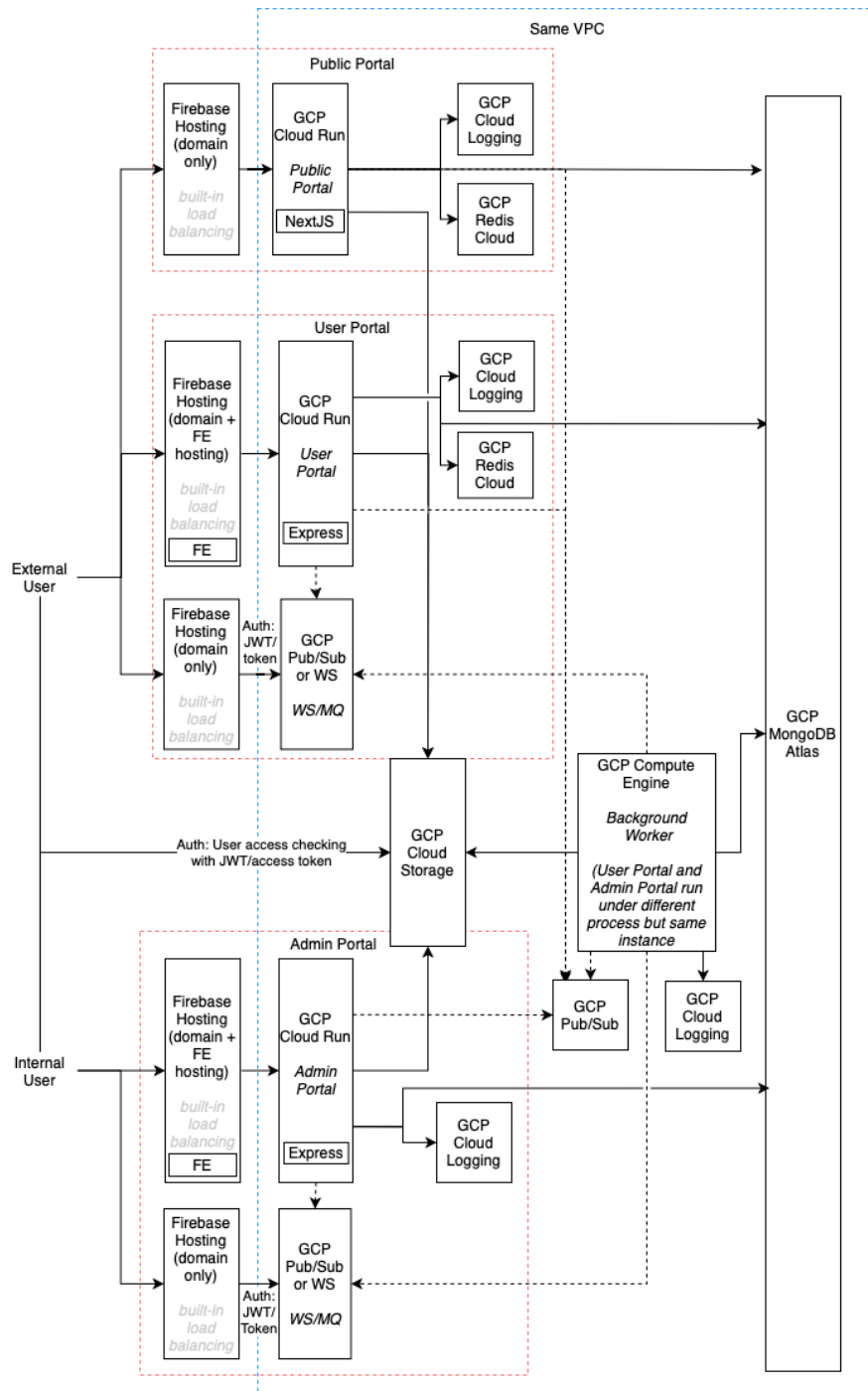


Figure 4.1 OSSVIM System Architecture Diagram

Figure 4.1 shows the System Architecture Diagram of the overall OSSVIM system. The system has three main parts which are the Public Portal, User Portal, and Admin Portal. Each part is set up separately for modular production and the system will be built in such a way that it can be locally run using Docker or native tools. The Public Portal uses a Next.js server, for better SEO, and is deployed in a container. The system will be using MongoDB for data organization, Cloud Storage for file organization, Cloud Logging for logs and Redis for faster data access. The User and Admin Portals use a React frontend which will be hosted using Google Cloud Platform. A background worker runs tasks like processing data or handling requests in the background and communicates with the portals through the Publish and Subscribe method.

4.2 System Interface Design

4.2.1 Public Portal

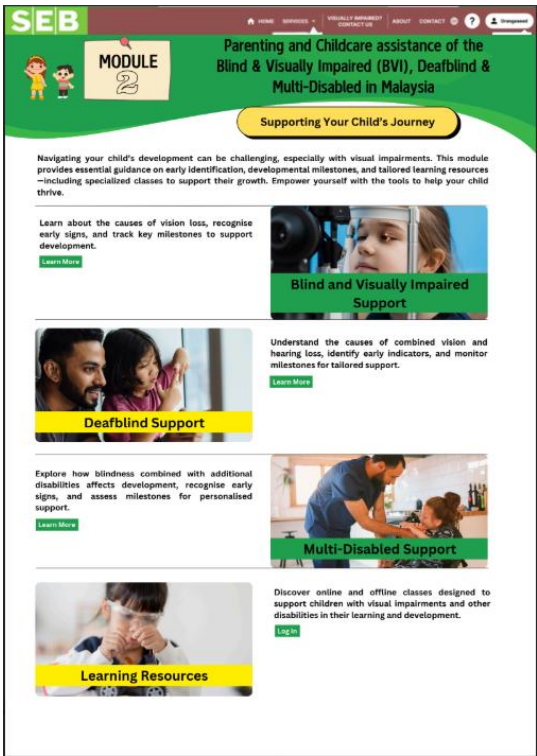


Figure 4.2 Landing Page of Module 2

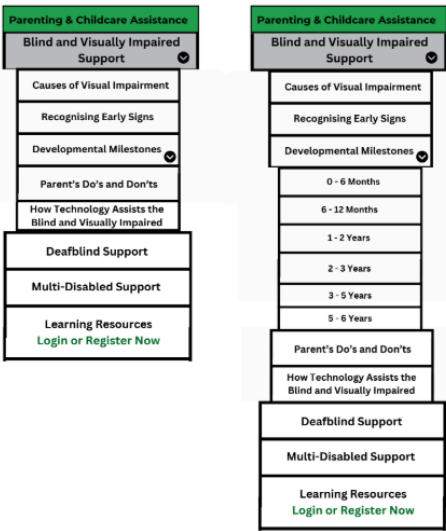


Figure 4.3 Sidebar Menu of Module 2

Figure 4.2 shows the landing Page of Module which would help users navigate to the 4 main submodules of Module 2, which are Blind and Visually Impaired Support, Deafblind Support and Multi-Disabled Support and Learning Resources.

Figure 4.3 shows prototype design of the Sidebar Menu of Module 2 which has a hierarchical layout, allowing users to navigate from general categories to more specific subtopics. The sidebar includes key areas such as causes of visual impairment, early signs, developmental milestones, and supportive technologies, which are critical for parents and caregivers. When the "Developmental Milestones" section is selected, it expands to show age-specific guidance, which reflects an understanding of the different stages of child development and the varying needs associated with each stage.

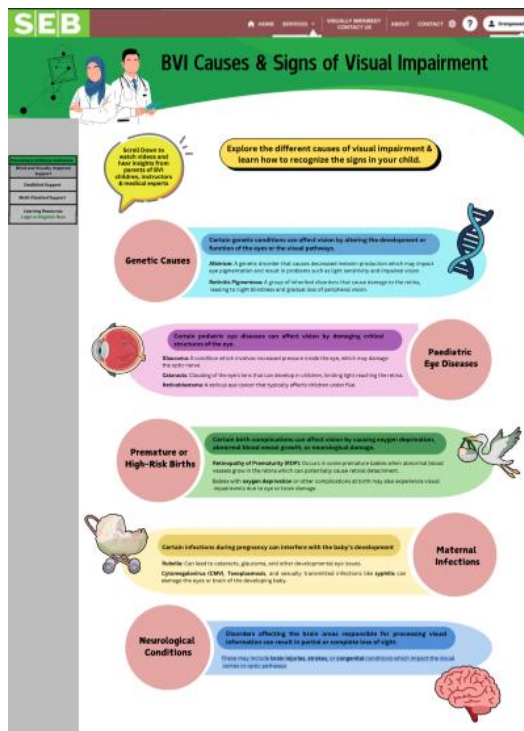


Figure 4.4 BVI Causes and Visual Impairment Info Page

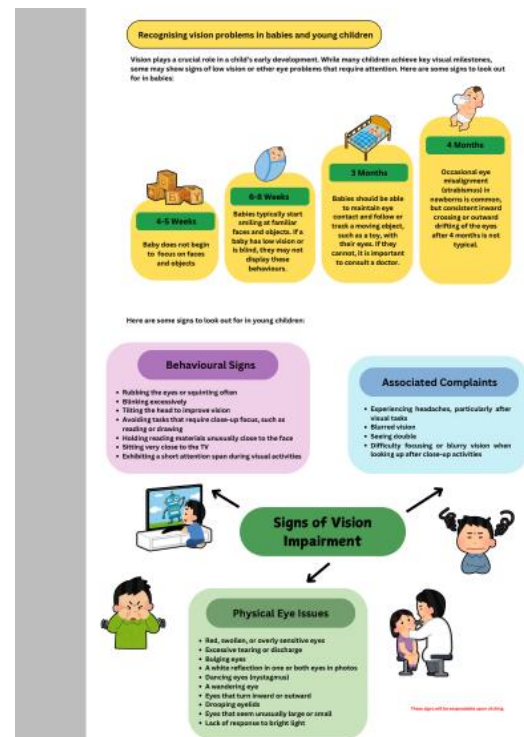


Figure 4.5 Recognising Early Signs Page

Figure 4.4 shows the prototype Page of BVI Causes and Visual Impairment Info Page wherein users can get the relevant information on main causes of Vision Impairments in babies and young children. The page has 6 main causes which are genetic causes, paediatric eye diseases, premature or high-risk births, maternal infections, and neurological conditions. Each cause includes a short explanation to help users easily understand the condition.

Figure 4.5 displays the Recognising Early Sign pages, whereby it highlights the babies normal vision and what they should look for from 4 weeks to 4 months. The page also lists behavioural signs, common complaints, and physical eye issues that may indicate a vision problem in clear layout for users to follow and understand the information.

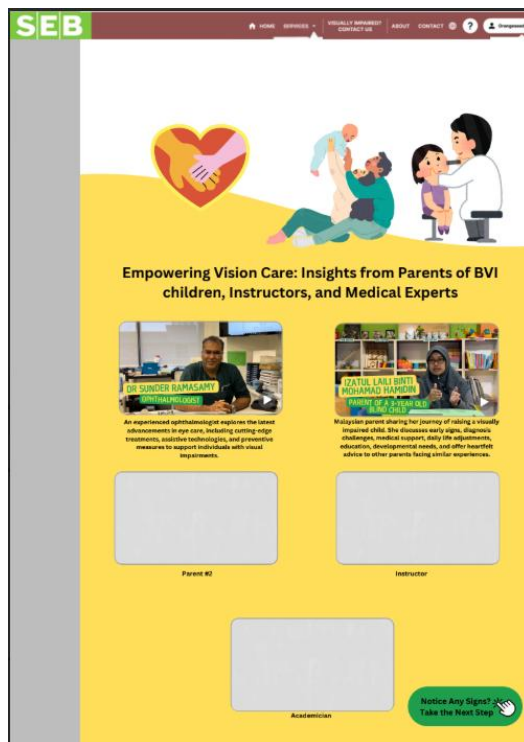


Figure 4.6 Instructional Videos section
from Recognising Early Signs page

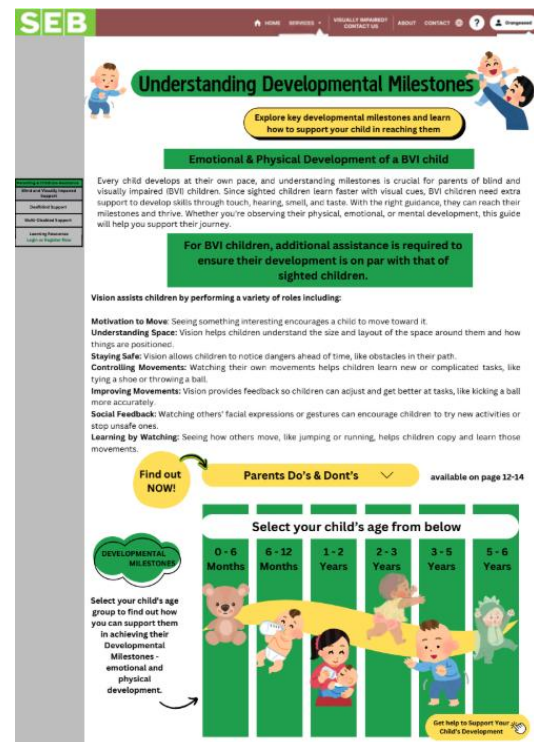


Figure 4.7 Development Milestone page

Figure 4.6 displays Instructional Videos section from Recognising Early Signs page wherein it features video insights from parents of visually impaired (BVI) children, instructors, and medical experts who provide real-life experiences, expert advice, and emotional support to guide other users in identifying and managing early signs of vision problems.

Figure 4.7 shows the Developmental Milestones page, which helps users in understanding the emotional and physical development of BVI children as it highlights the importance of vision in activities such as movement, learning, and social interaction. The page includes a visual age selector (0–6 months to 5–6 years) that allows users to explore milestones and get guidance specific to the child's age group.

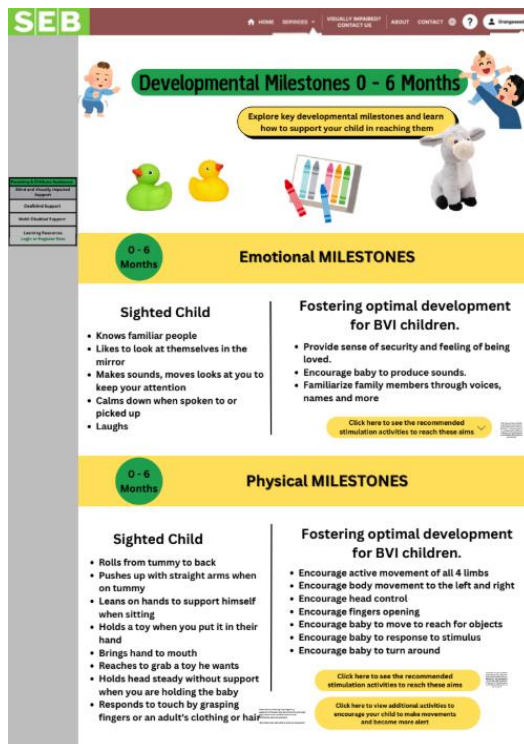


Figure 4.8 Development Milestones 0-6 Months

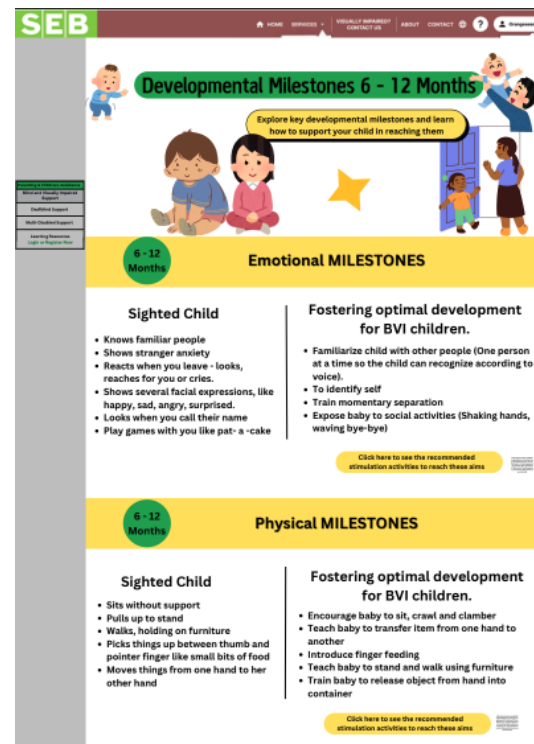


Figure 4.9 Development Milestones 6-12 Months

Figure 4.8 and Figure 4.9 show the Developmental Milestones pages for 0–6 months and 6–12 months, respectively. These pages compare the typical emotional and physical milestones of sighted children with suggestions for supporting the development of blind and visually impaired (BVI) children in the same age group. Each section includes practical guidance for parents, such as how to encourage bonding, sound recognition, movement, and exploration in a layout that uses simple visuals and clear headings to make the information easy to follow.

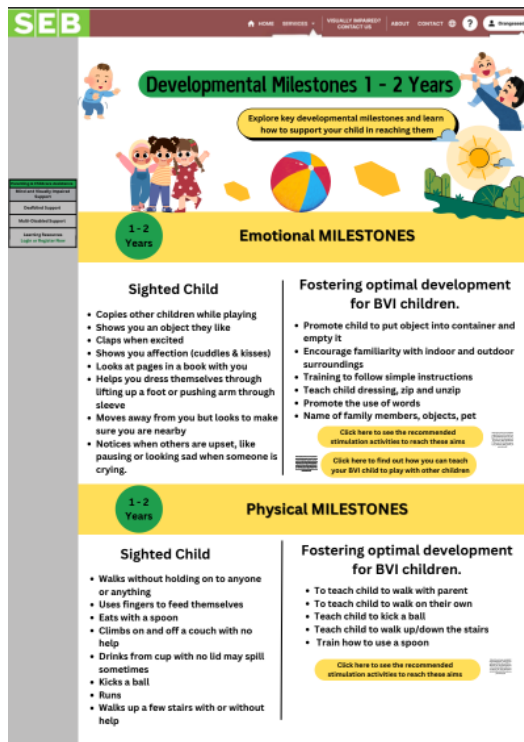


Figure 4.10 Development Milestones 1- 2 Years

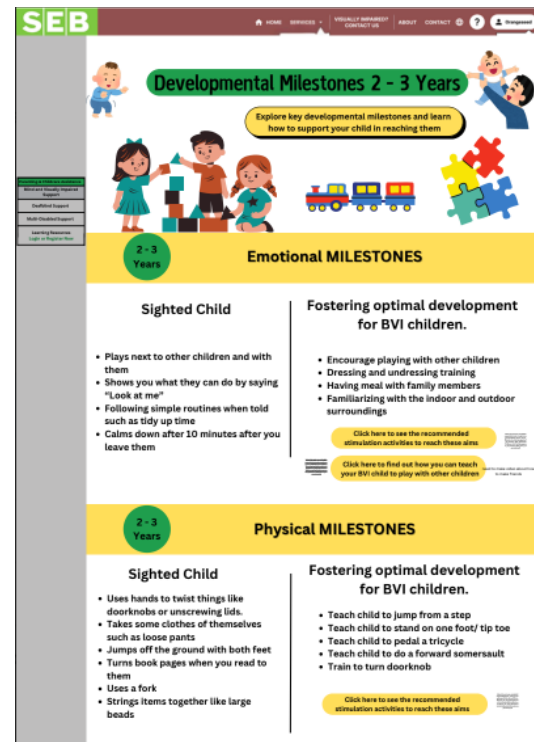


Figure 4.11 Development Milestones 2-3 Years

Figure 4.10 and Figure 4.11 show the Developmental Milestones pages for 1–2 years and 2–3 years, respectively, which compares the typical emotional and physical milestones of sighted children with those of BVI children. The structure and content are similar to the previous milestone pages shown in Figure 3.7 and Figure 3.8.

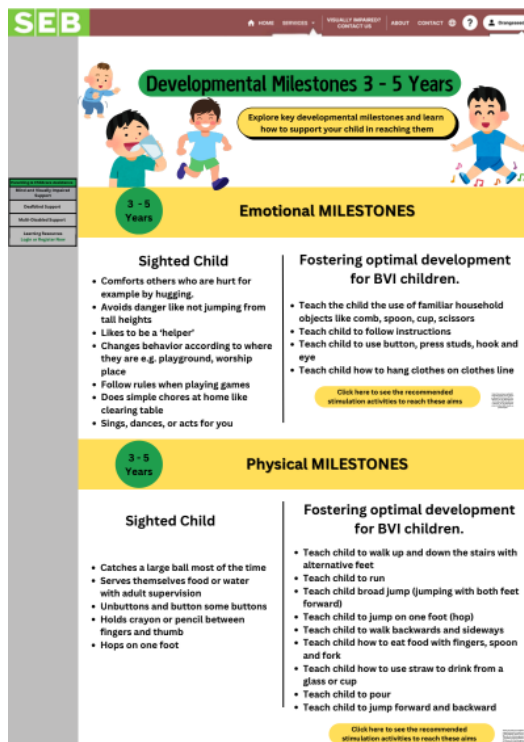


Figure 4.12 Development Milestones 3- 5 Years

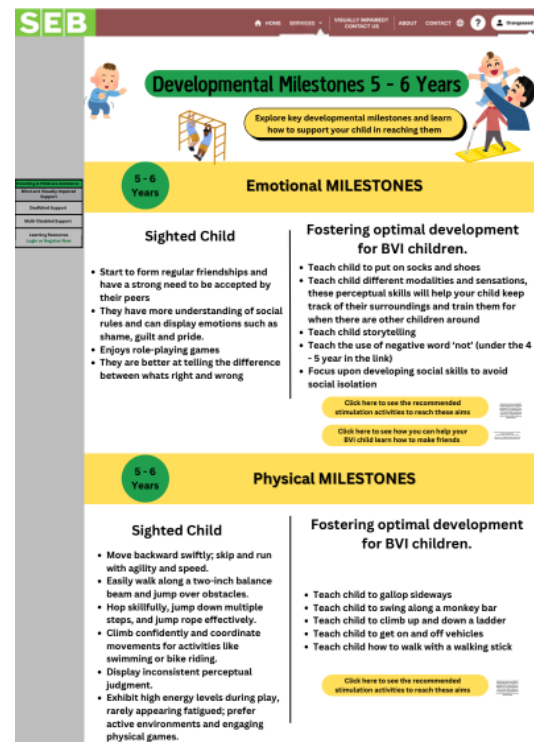


Figure 4.13 Development Milestones 5- 6 Years

Figure 4.12 and Figure 4.13 show the Developmental Milestones pages for 3-5 years and 5-6 years, respectively, which compares the typical emotional and physical milestones of sighted children with those of BVI children. The structure and content are similar to the previous milestone pages shown in Figure 3.7 to Figure 3.10.

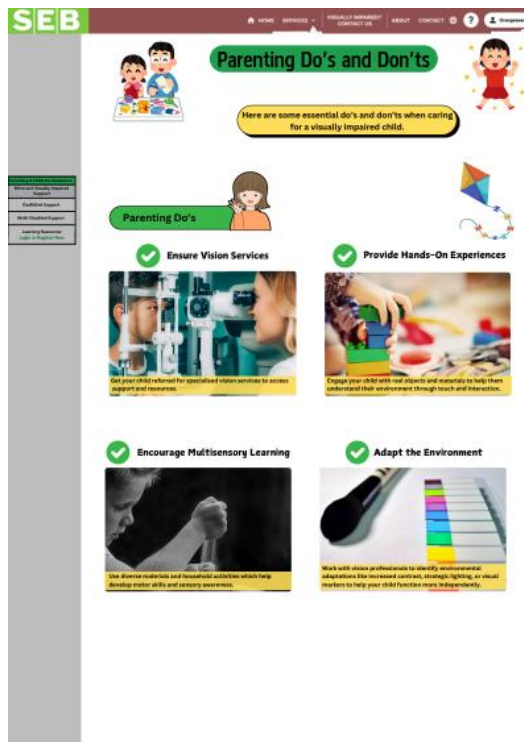


Figure 4.14 Parenting Do's and Don'ts
Page



Figure 4.15 Continuation of Parenting
Do's and Don'ts Page

Figure 4.14 and Figure 4.15 shows the contents of the Parenting Do's and Don'ts Page which focuses on what should be done and what should be avoided when caring for blind or visually impaired (BVI) children. The page encompasses visuals with brief descriptions to keep the user engaged while reading and help users follow the content easily.

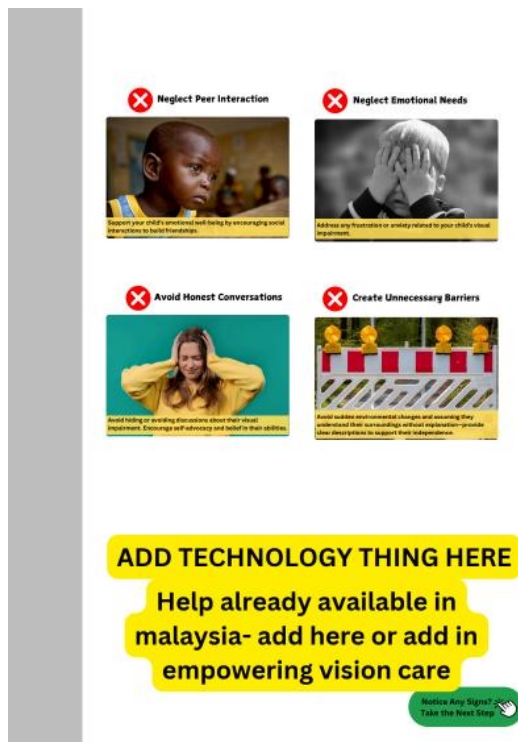


Figure 4.16 Further Continuation of Parenting Do's and Don'ts Page



Figure 4.17 How Technology Supports the BVI and Multi Disabled Page

Figure 4.16 is a further continuation of the Parenting Do's and Don'ts page, highlighting common mistakes to avoid when caring for BVI children, contents and structure of which are almost similar to Figure 3.13 and Figure 3.14.

Figure 4.17 presents the page on How Technology Supports the Blind, Visually Impaired, and Multi-Disabled which encompasses braille displays, magnifiers, screen readers, and more. The aim of the page is to help users understand and apply these technologies to support the child's daily life and developmental needs effectively.

4.2.2 User Portal



Figure 4.18 User Portal Log in Page



Figure 4.19 User Portal Sign Up Page

Figure 4.18 displays the dual-pane interface for registered users to access their accounts using email credentials. The interface includes a "Remember Me" feature and a password recovery link to ensure a smooth and accessible authentication process for the user.

Figure 4.19 presents the Sign Up page of the User Portal where new users can register by providing their basic details and agreeing to the platform's terms. Similar in structure to the login page with consistent UI to provide a direct path for existing members to switch back to the sign-in screen once registered.



Figure 4.20 Common Header for User Portal

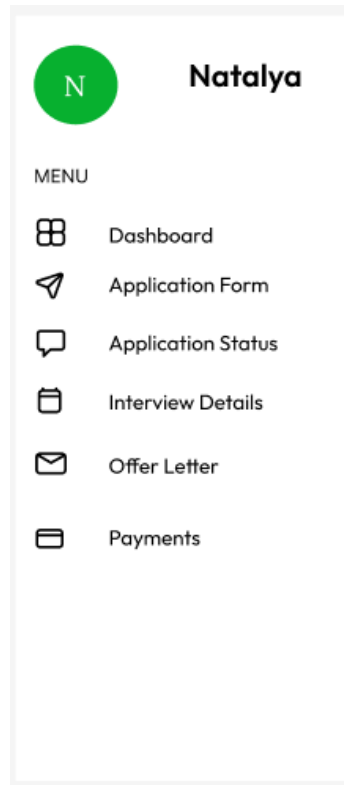


Figure 4.21 Sidebar Menu for Parent Module of User Portal

Figure 4.20 displays the common Header which will be used commonly across the User Portal. It has a consistent navigation across with links to the Homepage, Language, and My Course which is where the course materials for the students will be at. It features a prominent "Log Out" button and a collapsible menu icon for the sidebar to ensure users can navigate the platform efficiently.

Figure 4.21 presents the sidebar menu designed for the Parent Module which has a vertical layout to easily navigate through the portal's core features. The sidebar includes important administrative links such as the Application Form, Application Status, Interview Details, and Payments, which are critical for parents managing their child's enrollment process. The button highlights in light yellow and transforms into right green when clicked

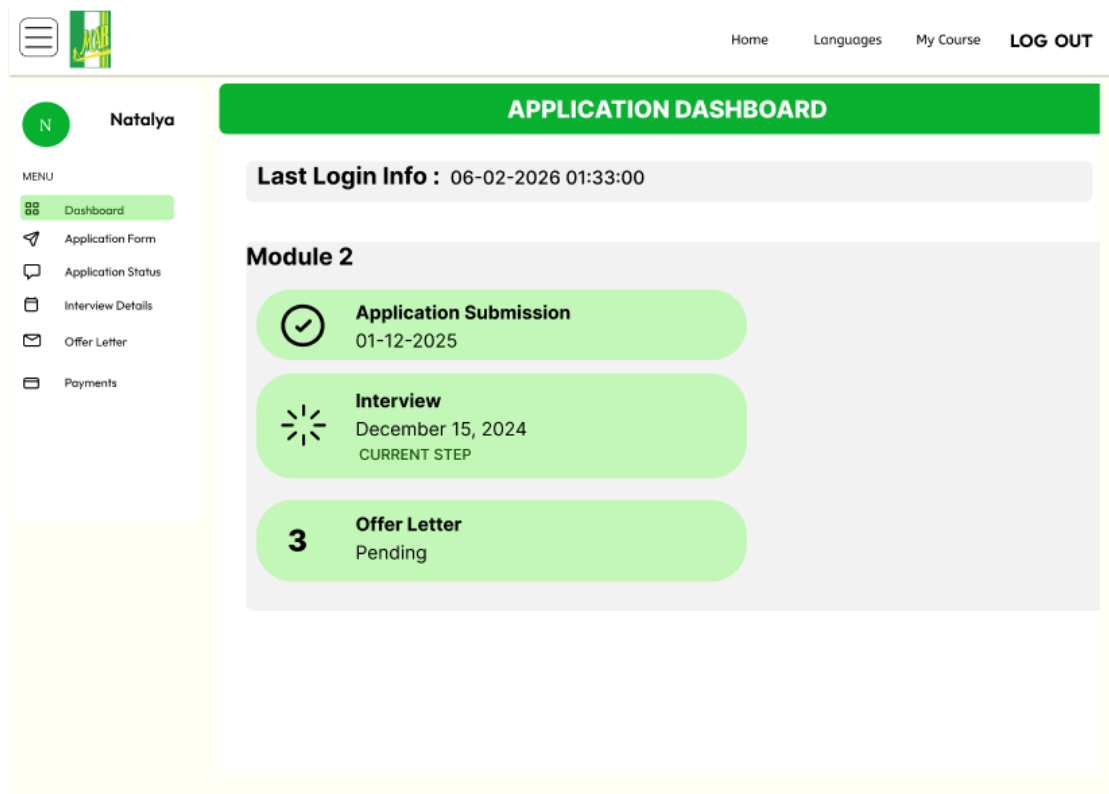


Figure 4.22 Dashboard Page of Parent Module in User Portal

Figure 4.22 This dashboard helps parents see how their enrollment is going and what they have done recently with their account. The page has a step-by-step system for "Module 2". It shows what tasks are done, like Application Submission and where they are in the enrollment process. This Page helps users see their application status easily and also able to view when they last logged in and what they still need to do such as getting their Offer Letter.

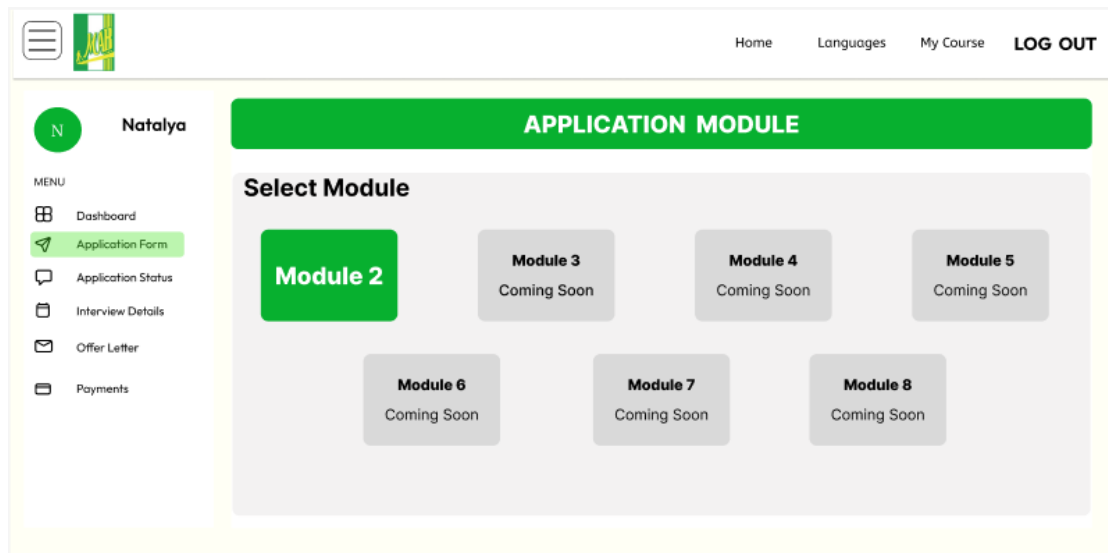


Figure 4.23 Module Selector Page in Application Form SubModule

Figure 4.23 illustrates the Module Selector interface, which will be the starting point for the enrollment process within the Application Form sub-module. The grid-based selection design enables users to choose their specific program, with "Module 2" currently active and available for selection. To manage user expectations and outline the platform's future development, additional modules are displayed with a "Coming Soon" status and disabled temporarily.

APPLICATION FORM - MODULE 2

Child's Personal Details

Child's Name

Child's Gender ☒ Male ☐ Female

Child's D-O-B

Child's IC Number

Child's Additional Medical Records

[Click to Upload Additional File](#)

ABOUT THE FILE SIZE OF your documents should not exceed 10MB

Guardians Personal Details

Guardian 1 Name

Relationship with Child

Guardian 1 IC Number

Guardian 1 Phone Number

Guardian 2 Name

Relationship with Child

Guardian 2 IC Number

Guardian 2 Phone Number

Address 1

Address 2

City

State

Postcode

Save

Figure 4.24 Application Form Page for Module 2

Figure 4.24 shows Application Form which will be collecting the primary data for registration through organized sections for child and guardian personal details. The form includes specialized input fields which are designed in light green rings specifically for BVI friendly UI. This will ensure all necessary enrollment information is captured.

The screenshot displays the 'APPLICATION FORM - MODULE 2' interface. On the left, a sidebar menu includes 'Dashboard', 'Application Form' (highlighted), 'Application Status', 'Interview Details', 'Offer Letter', and 'Payments'. The main content area is divided into sections for 'Child's Personal Details', 'Child's Additional Medical Records', and 'Guardians Personal Details'. The 'Child's Personal Details' section includes fields for 'Child's Name' (John Doe), 'Child's Gender' (Male selected), 'Child's D-O-B' (20/05/2018), and 'Child's IC Number' (20/05/2018). Below this is a section for 'Child's Additional Medical Records' with a 'Click to Upload Additional File' button. The 'Guardians Personal Details' section includes fields for 'Guardian 1 Name' (Natalya Doe), 'Guardian 1 IC Number' (990202-02-1234), 'Guardian 1 Phone Number' (016-4241234), 'Guardian 2 Name' (Peter Doe), 'Guardian 2 IC Number' (890412-02-1258), 'Guardian 2 Phone Number' (012-345 1234), 'Address 1' (1, Jalan 2), 'Address 2' (Taman ABD), 'City' (Kampar), 'State' (Perak), and 'Postcode' (31200). A green 'Save' button is located at the bottom of the form. A yellow banner at the bottom of the page displays the message: 'Note : Your application is successfully saved!'.

Figure 4.25 Application Form Page after Information is Saved

Figure 4.25 shows Application Form after users have keyed in their respective details and clicked. The system will then display a Note in yellow saying that their information is now successfully saved. The saved information cannot be edited and should there be any changes within the form, the users shall need to contact the representative of MAB for further assistance. rings specifically for BVI friendly UI. This will ensure all necessary enrollment information is captured.

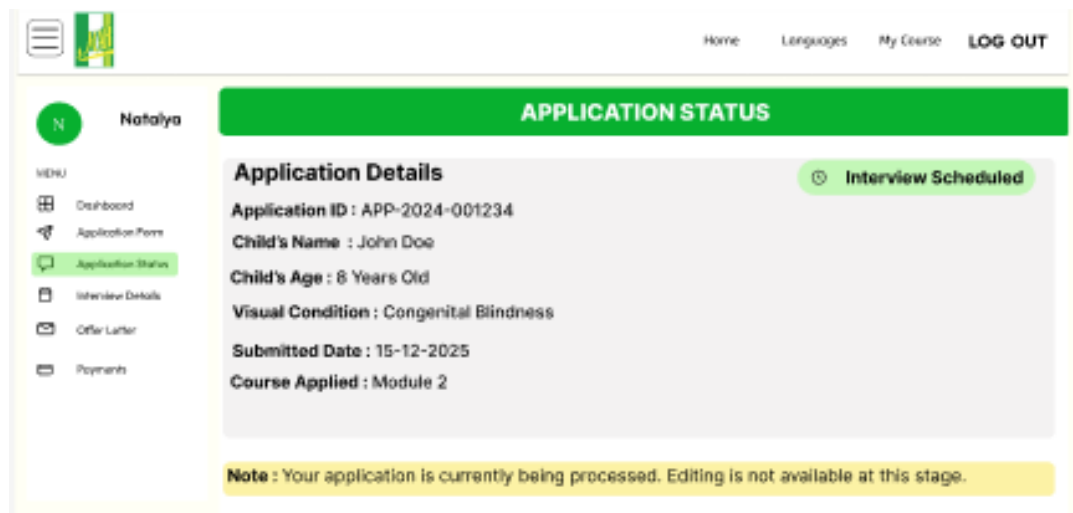


Figure 4.26 Application Status Page

Figure 4.26 displays the Application Status page, which will provide a summary of the user's submitted application. Here, it will include the Application ID which will be auto generated by the system. The child's details, and the specific course applied for will be displayed to view extracted data from the application. A status badge such as "Interview Scheduled" will be displayed to keep the parents informed of their current phase in the enrollment process.

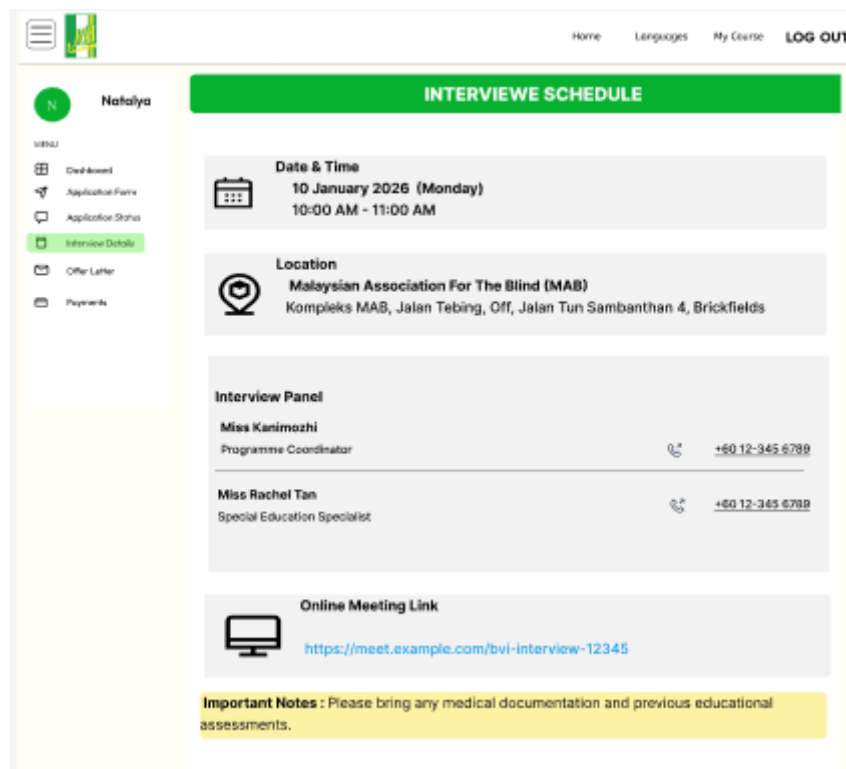


Figure 4.27 Interview Details Page

Figure 4.27 presents the Interview Schedule page, which will be showing the users with all necessary information regarding their upcoming appointment, including the specific date, time, and physical location for their interview. Should they not be able to attend the physical interview, an Online Meeting Link will also be given. The interface also lists the interview panel members with their contact details for assistance. A friendly reminder is also included in the "Important Notes" section at the bottom to remind parents to bring relevant medical and educational documentation for the session.

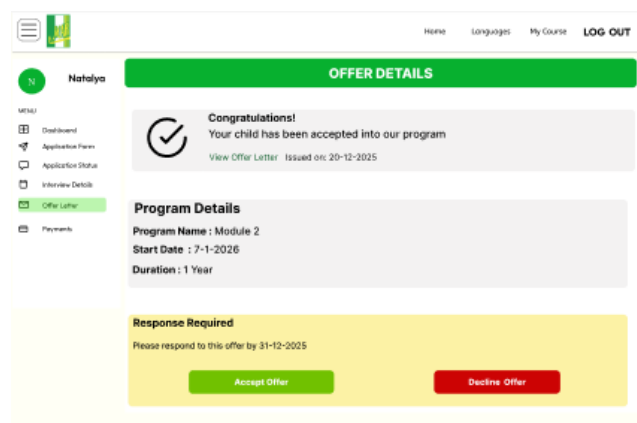


Figure 4.28 Offer Details Page

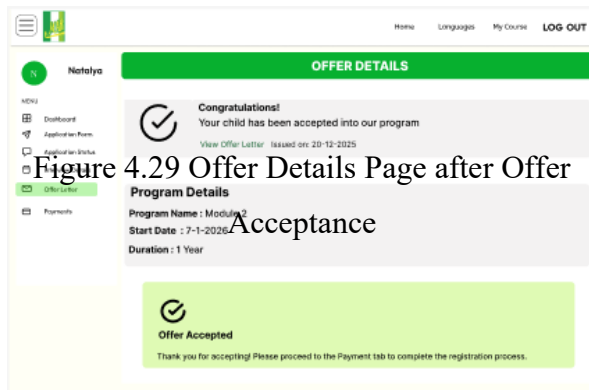


Figure 4.29 Offer Details Page after Offer Acceptance

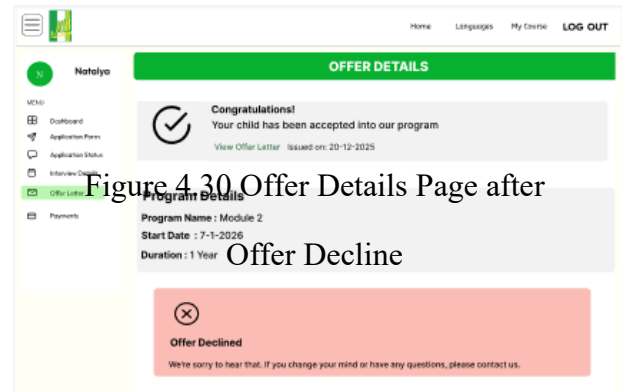


Figure 4.30 Offer Details Page after Offer Decline

Figure 4.28 shows the Offer Details Page where users are notified of their child's acceptance into the program, providing specific program details such as start date and duration. They can also view the offer letter and provide their answers via action buttons displays to either accept or decline the offer Figure 4.29 and Figure 4.30 shows the respective notes which will be displayed if and when the users click Accept Offer or Decline Offer respectively.

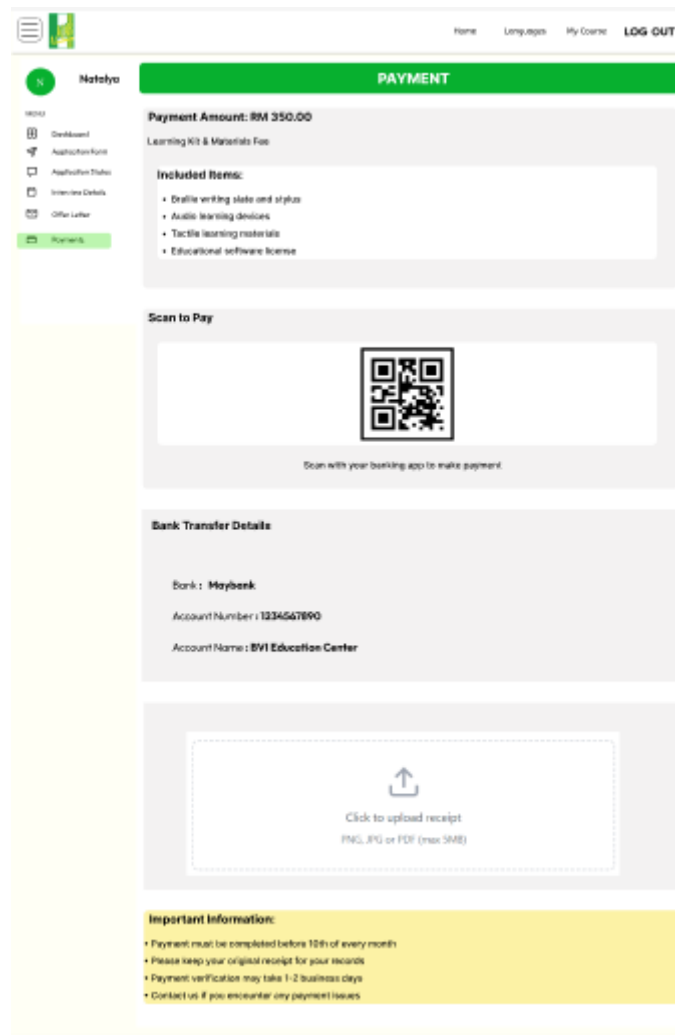


Figure 4.31 Payment Page

Figure 4.31 is the Payment page, which will display the fees for the Learning Kit and materials. The page will be providing multiple transaction methods such as a QR code for scanning and manual bank transfer details. The page will also include a specific file upload area for users to upload their transaction receipts for verification. At the bottom of the page, a "Important Information" section is present to provide clear guidelines regarding payment deadlines and processing times to ensure a smooth administrative workflow.



Figure 4.32 Sidebar Menu for Student Module of User Portal

Figure 4.32 presents the sidebar menu for the Student Module, which provides the navigation menu for the submodule which are available in the Student Module. The sidebar menu includes important sections such as the student Dashboard, Report Card & Assessments, and Attendance tracking to help students monitor their educational progress. It will also contain a dedicated link to the Parents Guidelines for parents to view instructional videos pertaining to their children's education matters.

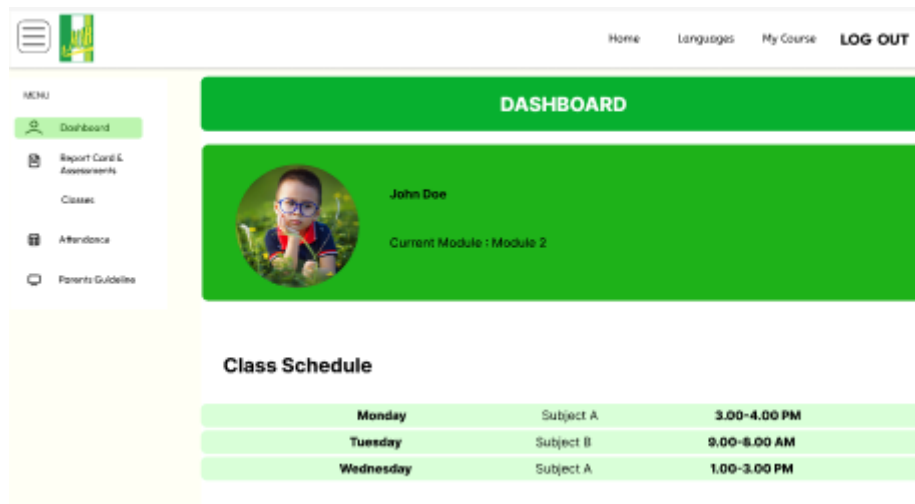


Figure 4.33 Dashboard Page of Student Module in User Portal

Figure 4.33 presents the student dashboard, which will display the student's profile information and current module enrollment at the top of the page. The student's class schedule will be displayed below the student's profile section. This layout allows students to quickly check their upcoming lessons and manage their daily learning routine effectively within the portal.

REPORT CARD

Module 2 Past Assessment Results

Assessment Name	Result	Assessment Date and Time	Parent Verification
Age Group 1	Pass	04/01/2025 10:00:00	Done
Age Group 2	Fail	03/06/2025 10:00:00	Done
Age Group 3	Pass	08/07/2025 10:00:00	Done

Module 2 Current Assessment Results

Assessment Name	Result	Assessment Date and Time
Age Group 4	Pass	01/04/2026 10:00:00

Trainer Feedback

Excellent progress in all areas. Shows strong comprehension and communication skills.

☐ I have reviewed and verified the assessment results for Level 1. I understand that upon submission, the trainer will advance my child to the next level.

SUBMIT VERIFICATION

Figure 4.34 Report Card and Assessment Page

Figure 4.34 shows the Report Card and Assessments Page, which will be displaying a detailed record of the student's past and current assessment results within Module 2. The page will also have a "Trainer Feedback" section where teachers can give students evaluations. There will also be a parent verification block where the parents will have to click the Submit Verification button to acknowledge the results so that the child can move to the next level. These will allow both students and parents to track the child's academic performance, review specific assessment dates, and confirm completion of educational milestones

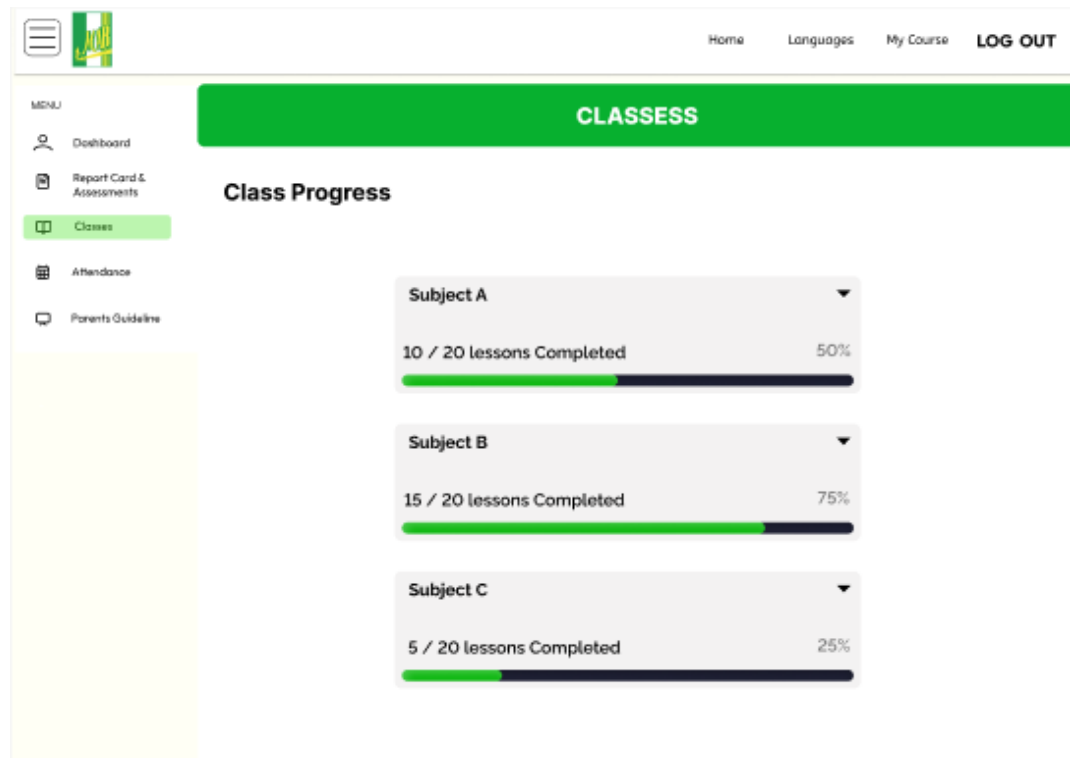


Figure 4.35 Classes Page

Figure 4.35 presents the Classes page, which tracks the student's academic progress across various subjects through progress bars. The total number of lessons completed alongside a percentage breakdown will be displayed, enabling students to monitor their workload and their advancement at a single glance.

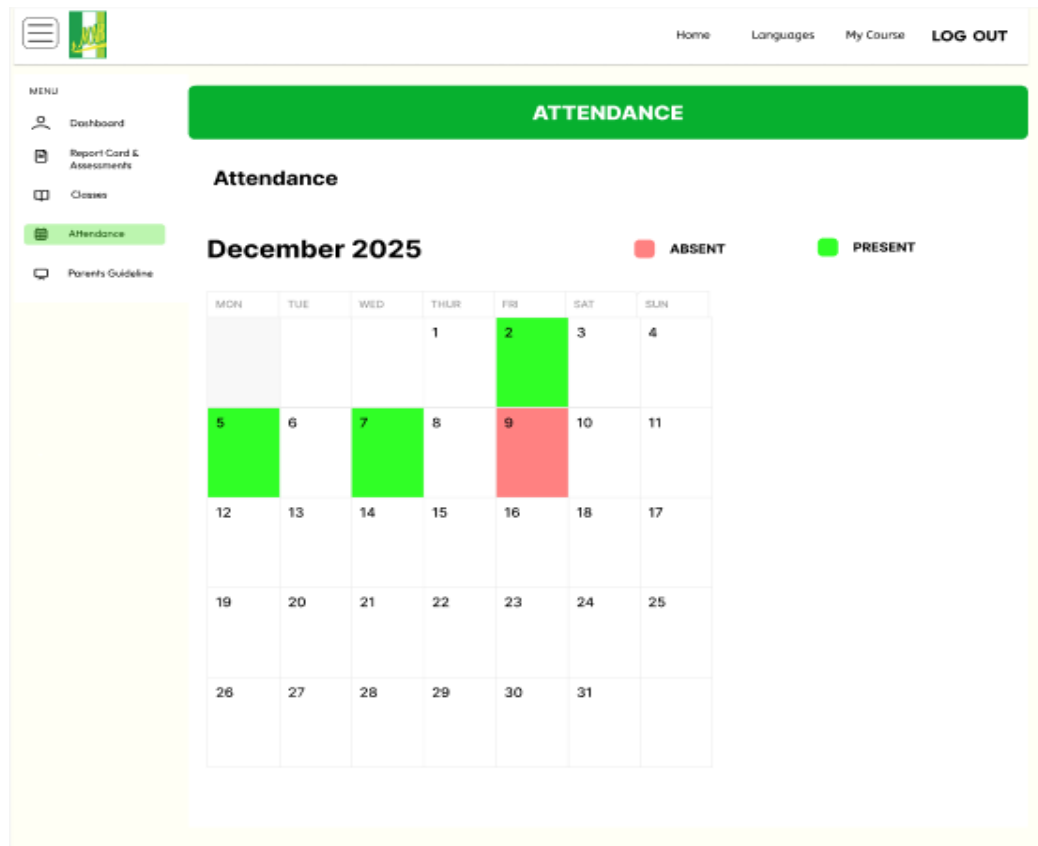


Figure 4.36 Attendance Page

Figure 4.36 shows the content for the Attendance Page. This page will display a colour-coded calendar view to provide a clear record of the student's monthly presence. The days which are marked in green indicate that the student was present, while the ones in red will indicate absences. This will allow parents and students to monitor their attendance patterns at a glance.

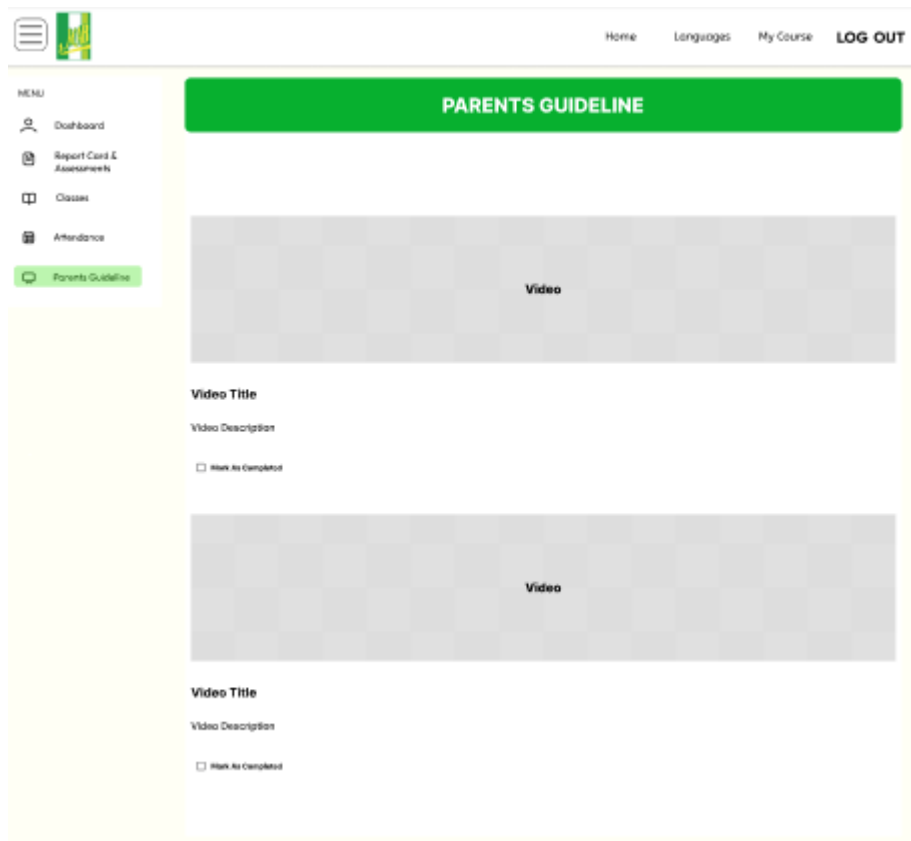


Figure 4.37 Parents Guideline Page

Figure 4.37 displays the Parents Guideline page. This page will be displaying series of instructional videos with its respective brief description. Each video will have a "Mark As Completed" checkbox, which will allow users to track their progress of watched video. The aim of this page is to provide parents with necessary guidance and support in a structured.

4.2.3 Admin Portal

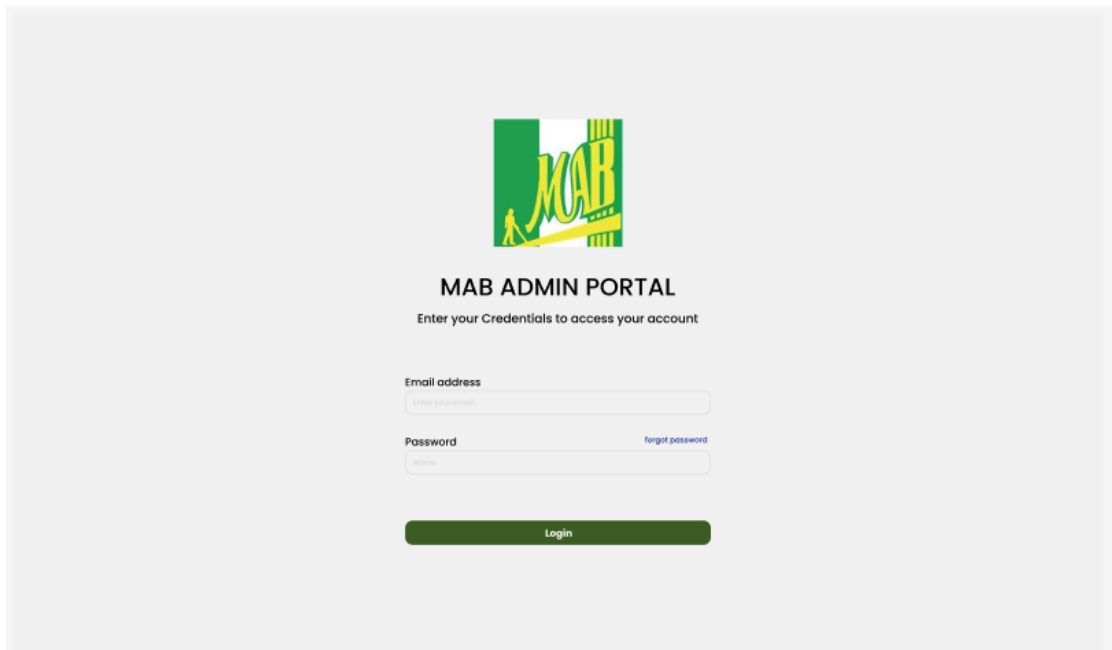


Figure 4.38 Admin Portal Sign In Page

Figure 4.38 illustrates the login page for the MAB Admin Portal. It will have a centralized layout with fields for users to key in their email address and password as an entry point for administrative staff to access and manage system data.

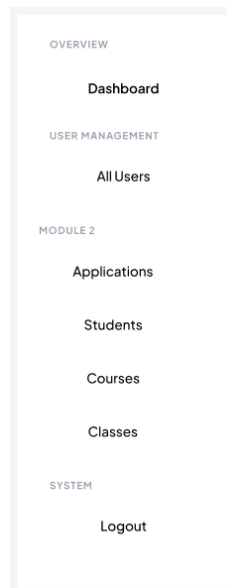


Figure 4.39 Sidebar Menu for Admin Portal



Figure 4.40 Header Menu for Admin Portal

Figure 4.39 displays the sidebar navigation for the Admin Portal, which is organized into submodules such as User Management, Module 2 administration, and System settings while Figure 4.40 shows the top header bar of the Admin Portal, which will be responsible in to perform search functions and other account management.

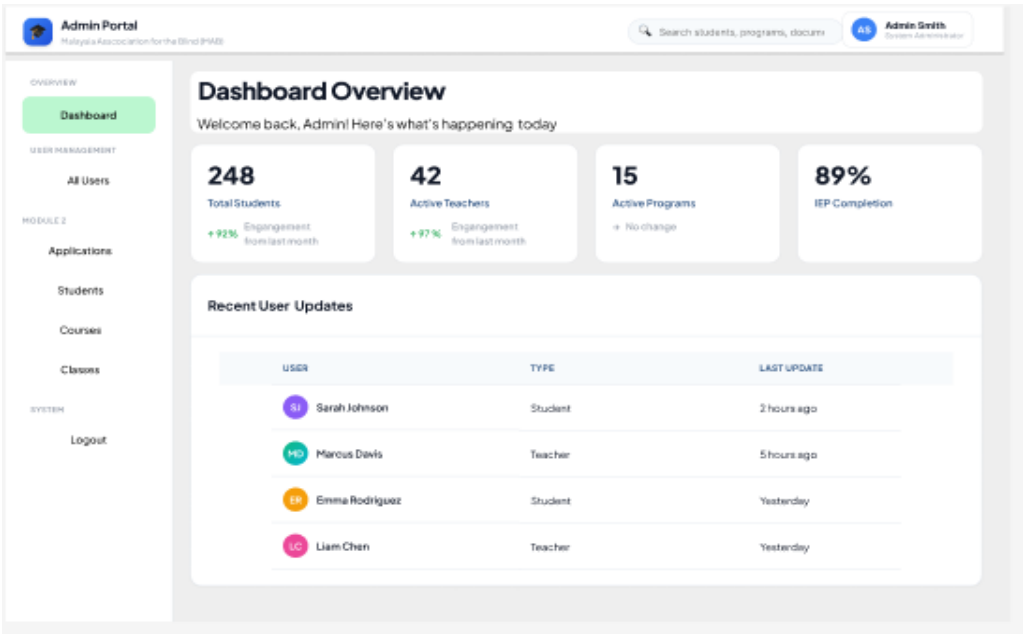


Figure 4.41 Admin Portal Dashboard Page

Figure 4.41 illustrates the Admin Dashboard, which will allow the Admin to monitor the system activity at a glance. Key performance tiles such as total students, active teachers, and program completion rates will be displayed and a "Recent User Updates" table will be displayed below that. The dashboard purpose is to provide a summary of the portal's status and recent changes on a brief look.

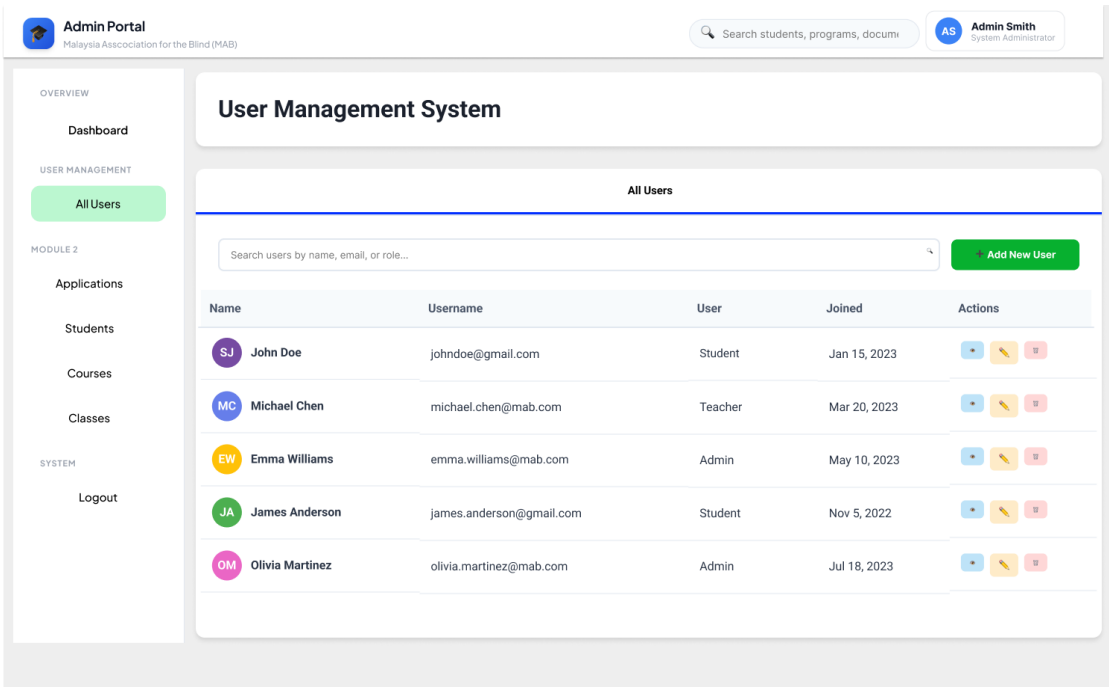


Figure 4.42 User Management Page

Figure 4.42 shows the User Management System Page, which will allow admins to view and manage all registered accounts, including students, teachers, and staff. The page will have a search bar to display a list of users with their respective details such as roles and date joined. Each row in the table action buttons for viewing, editing and deleting profiles. This design helps to keep it easily accessible for administrative tasks. New users can be added when the New Users button is clicked, where they will be directed to the a New User Registration Form

The screenshot displays the 'New User Registration' form within an 'Admin Portal'. The portal header includes the logo, name, and search bar. A sidebar on the left lists navigation options like 'Dashboard', 'All Users', and 'Applications'. The main content area is titled 'NEW USER REGISTRATION' and contains a 'User Details' section with input fields for Username, Email, Phone Number, Account Type, Password, and a pre-filled Registered Date. A 'Save New User' button is located at the bottom right.

User Details	
Username	Account Type
Email	Password
Phone Number	Registered Date
	2024-11-03 07:45:00

Save New User

Figure 4.43 New User Form Page

The screenshot shows the 'User Registration' form in the Admin Portal. The form is titled 'User Registration' and is located under the 'VIEW REGISTERED USER' section. The form contains the following fields:

- Username: johndoe@gmail.com
- Account Type: Student
- Email: johndoe@email.com
- Phone Number: +6000000000
- Last Login: 2024-11-03 07:45:00
- Registered Date: 2024-11-03 07:45:00

An 'Edit' button is located at the bottom right of the form.

Figure 4.44 View existing User Form Page

Figure 4.43 displays the forms to register new accounts in the systems while Figure 4.44 shows the form’s look when it is in view mode, which will allow admins to modify existing user information as needed. The layout is similar and consistent across the 2 different types of form mode.

The screenshot shows the 'Module 2 Application Form' masterlist page. The page displays a table of submitted applications. The table has the following columns: Name, Form Type, Status, Submitted At, and Actions. The data is as follows:

Name	Form Type	Status	Submitted At	Actions
John Doe	Parent Training Course Registration	Pending	Jan 15, 2023	
Michael Chen	Parent Training Course Registration	Pending	Mar 20, 2023	
Emma Williams	Parent Training Course Registration	Approved	May 10, 2023	
James Anderson	Parent Training Course Registration	Rejected	Nov 5, 2022	
Olivia Martinez	Parent Training Course Registration	Rejected	Jul 18, 2023	

Figure 4.45 Application Form Masterlist Page

Figure 4.45 displays the Application Form Masterlist within the Admin Portal. This page will provide an overview of all submitted Module 2 applications and enable

CHAPTER 4

admins to efficiently track applicant names, form types, submission dates, and current statuses easily. Status will be such as pending, approved, or rejected. The built-in search bar and direct action buttons, will allow the administrative process to be smoother. Admin can review the application by clicking the “Eye” button and “Folder” button to manage enrollment requests.

Admin Portal
Malaysia Association for the Blind (MAB)

Search students, programs, documents

AS Admin Smith
System Administrator

APPLICATION FORM - MODULE 2

Child's Personal Details

Child's Name: John Appleseed

Child's Gender: ☒ Male ☐ Female

Child's D-O-B:

Child's IC Number: John Appleseed

Child's Additional Medical Records: [medical_record.pdf](#)

Guardians Personal Details

Guardian 1 Name: James Appleseed

Guardian 1 IC Number: 231233-21-2313

Guardian 1 Relationship with Child: Father

Guardian 1 Phone Number: 012-2324 0904

Guardian 2 Name: James Appleseed

Guardian 2 IC Number: 232343-10-4324

Guardian 2 Relationship with Child: Mother

Guardian 2 Phone Number: 012-2324 0904

Address 1: 1, Jalan 2

Address 2: Taman ABC

City: Kampar

State: Perak

Postcode: 30100

Figure 4.46 Application View Page

Figure 4.46 presents the Application View Page, which is a read-only view of a submitted Module 2 Application within the Admin Portal. This page will be redirected from the View Button on the Application Masterlist page. Here the admin will be able to review all child and guardian details entered by the parent, including identity

numbers, contact information, and a direct link to any uploaded medical records by the parent. This page is important as it will be the primary reference point for admins to verify information accuracy before accepting or rejecting application.

Admin Portal
Malaysia Association for the Blind (MAB)

Search students, programs, documents | Admin Smith
System Administrator

Application Admin Matters

PROCESS APPLICATION - ID: REG-20240512

Use this page to process workflow actions. Steps are unlocked based on current application status.

1 Interview Setup **Completed** 2 Interview Result **Current Step** 3 Payment Verification **Locked**

1. Interview Setup

Interview Mode: In-Person / Offline Interview Date: 06/15/2024, 10:00 AM

Interview Venue: Conference Room B, Block C

2. Interview Result

Interviewee Attendance: Confirmed: Attending Setup Remark: Candidate confirmed attendance via email.

Final Result: Pass Enrollment Type: Full-Time

Remarks: Strong technical background. Highly recommended.

3. Payment Verification

Medical record: Uploaded with application View Medical Record

Payment receipt: Uploaded by applicant View Receipt

☐ I confirm that the payment has been verified and received.

Reject Application

Reject is handled as a dedicated action outside the stepper workflow.

Reject Reason (optional): Explain why this application is rejected...

Reject Application

Submit Interview Result

Figure 4.47 Application Management Page

Figure 4.47 illustrates the Application Management page, which allows admins to process enrollment through a three-step workflow which will be Interview Setup, Interview Result, and Payment Verification. This page will be the page where admins can record interview details for parents to view at User Portal, update interview results, and verify uploaded payment receipts all in one place. The will also has a rejection section with a reason field, which ensures a transparent and documented decision-making process for every applicant.

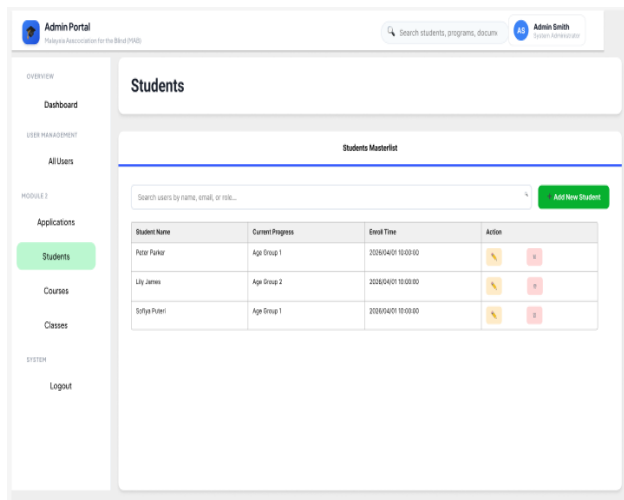


Figure 4.48 Students Masterlist Page

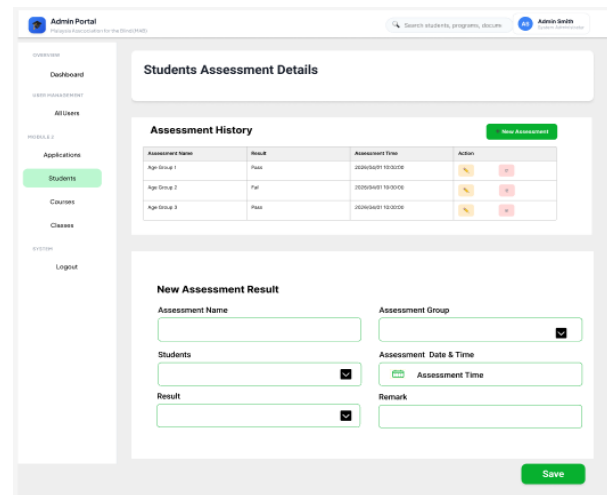


Figure 4.49 Students Assessment Management Page

Figure 4.48 displays the Students Masterlist Page which shows the students name, age group and Assessment time for the students.

Figure 4.49 illustrates the Student Assessment Page, admin can access the details in detail to review the students past assessment results and input new assessment data, including specific grades and remarks for that assessment. Students Assessment Management Page can be navigated by clicking the Edit Button in the Student Masterlist Page

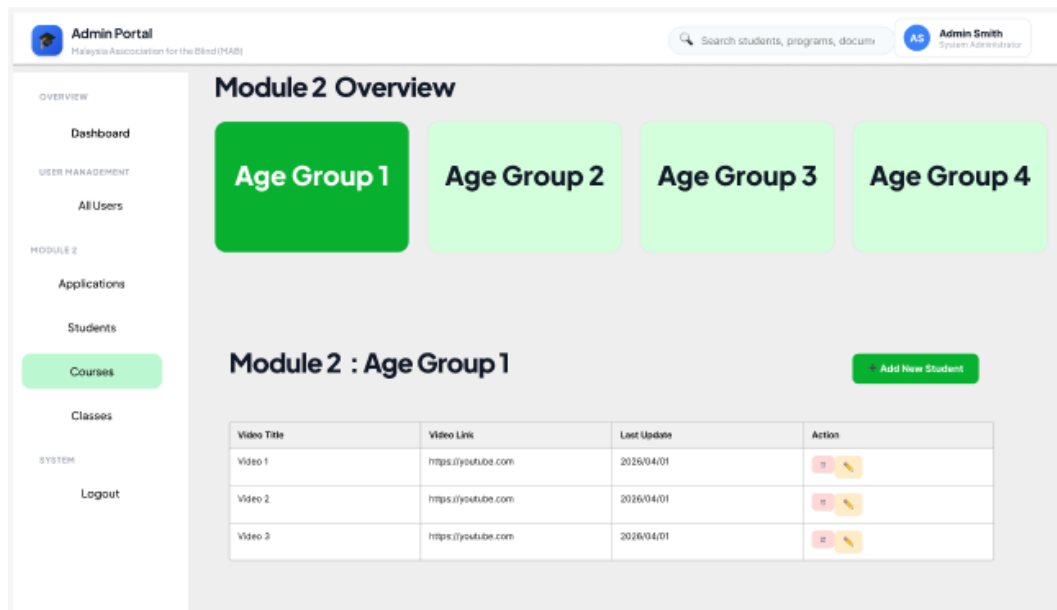


Figure 4.50 Courses Page

Figure 4.50 Courses Page shows Courses Page, which allows admins manage Module 2 content categorized by specific age groups, which are primarily videos. Admins will be able to navigate across the Age Groups to access and update associated course materials by clicking the respecting Age group button to set, edit and delete the video links.

CHAPTER 4

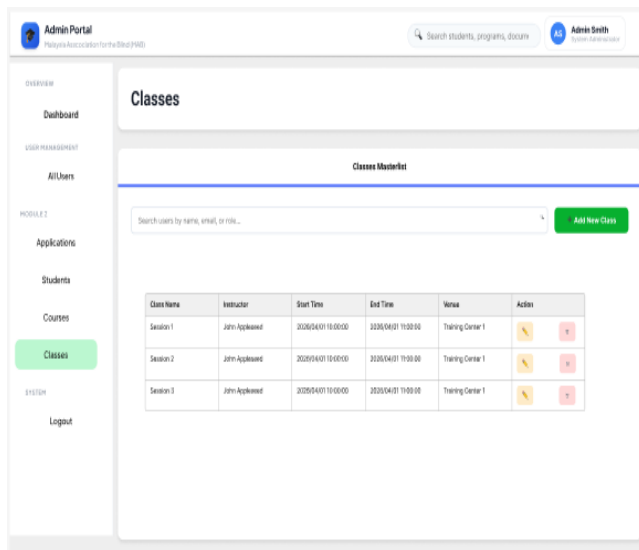


Figure 4.51 Classes Masterlist Page

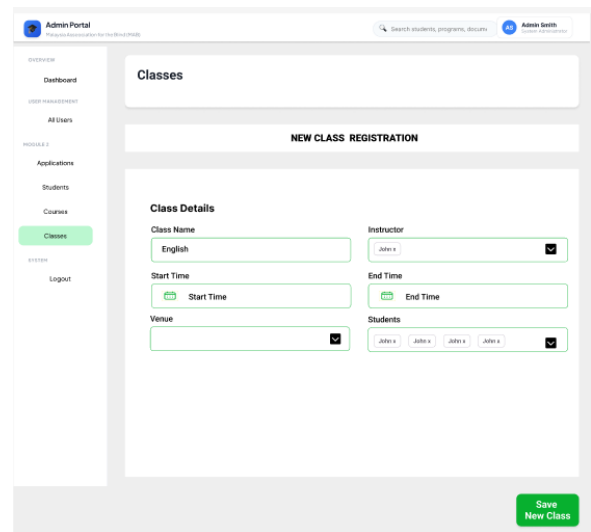


Figure 4.52 Classes Management Page

Figure 4.51 displays the Classes Masterlist which provides an overview of all scheduled sessions, including instructor names, venues, and timing

Figure 4.52 illustrates the Classes Management Page, where admin can access existing class details to modify them, add new class or delete existing class. The admin can select Instructure, Venue and Students via the respective dropdown inputs.

4.3 Flowchart for Course Registration Module

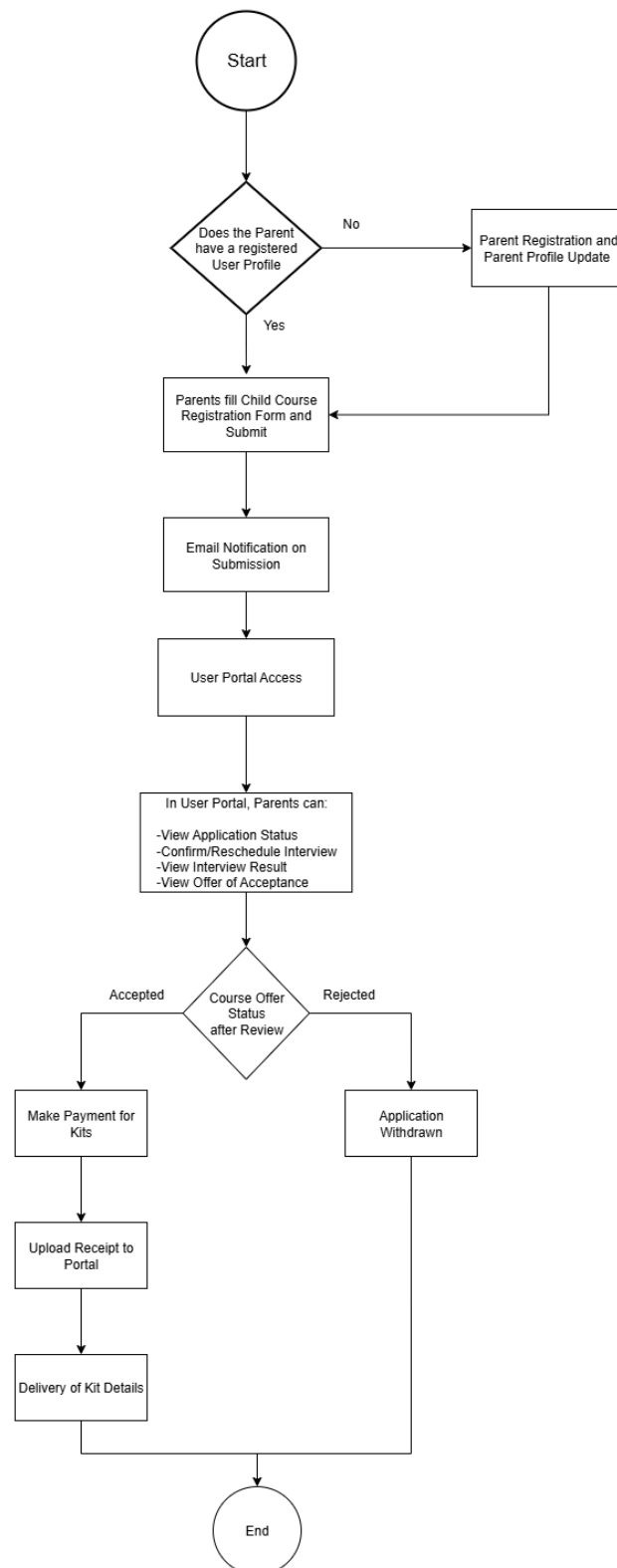


Figure 4.53 Course Registration Module Flowchart

Figure 4.53 shows the Course Registration Module Flowchart for parents to register their BVI child for a course. The process begins by checking if the parent is a registered user of the system, if they are not registered, they will be redirected to a page where they can register themselves and enter their child information as well. Once registered, parents fill out and submit the child's course registration form. If they have successfully registered, the system will send an email notification to confirm their registration. After that, they will be able to access the User portal, where they can view the application status, confirm or reschedule interviews, view interview results, and see the offer of acceptance for the registered course. Once their application is reviewed, and their application is accepted, parents can proceed to make a payment for the course kits, upload the receipt to the portal, and receive the delivery information of the kits. If the application is rejected, the process ends with the application being withdrawn.

CHAPTER 4

4.4 ERD for OSSVIM Module 2

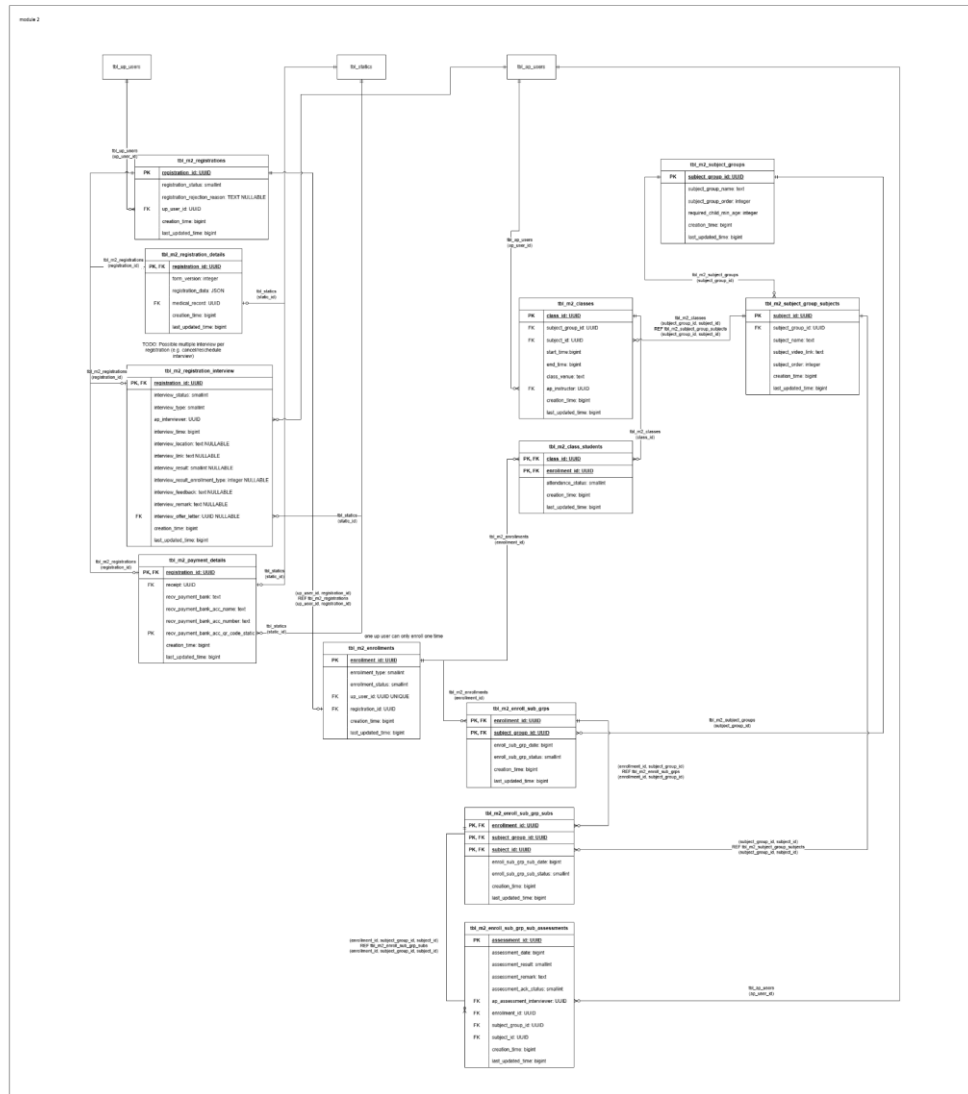


Figure 4.54 Snippet of OSSVIM Entity Relationship Diagram

Figure 4.54 illustrates a snippet of OSSVIM relational database schema designed to manage the lifecycle of a student from initial registration to final academic assessment. The flow begins with the Registration and Interview phase, centered around `tbl_m2_registrations`, which tracks the base status of a newcomer. This entity is linked to `tbl_m2_registration_interview` for documenting interview scheduling, modes, and outcomes, as well as `tbl_m2_payment_details` to verify the financial requirements for enrollment.

Once the administrative requirements are met, the data transitions into the Enrollment and Tracking phase. The `tbl_m2_enrollments` table serves as the primary hub, connecting the user to their specific academic path. This is further broken down into `tbl_m2_enroll_sub_grps` and `tbl_m2_enroll_sub_grp_subs`, allowing the system to monitor progress at both the overarching subject group level and the individual subject level.

The final section of the ERD handles Class Management and Assessment. Classes are defined in `tbl_m2_classes`, which organizes instructors, venues, and schedules, while `tbl_m2_class_students` acts as a junction table to manage student attendance. The culmination of this data flow is captured in `tbl_m2_enroll_sub_grp_sub_assessments`, where specific results, assessment times, and remarks are permanently recorded to track the student's success within the module.

CHAPTER 5

System Implementation (For Development-Based Project)

5.1 Setting up

5.1.1 Software

For the development of OSSVIM Module2, the necessary software and tools used are as follows

1. Visual Studio Code (2025 Edition) with necessary extension such as
 - a. For Programming Language and Frameworks
 - i. JavaScript and TypeScript Nightly
 - ii. ES7 React/Redux/GraphQL/React-Native
 - iii. Material UI
 - iv. Node.js & npm/yarn
 - v. Vite - for vue.js
 - b. Extensions & Formatting Tools
 - i. Prettier – Code Formatter
 - ii. Tailwind CSS IntelliSense
 - c. Version Control Tools
 - i. GitHub
 - ii. GitHub Desktop
2. Figma for System Interface Design
3. Docker & Docker Desktop for frontend-to-backend integration
4. Bruno for local storing APIs in plain text files
5. PostgreSQL for ORDBMS

5.2 Skill Refreshment and Preparation

5.2.1 Revisiting Core Concepts

As part of the preparation process, the fundamentals of web development were reviewed, including HTML, CSS, and JavaScript with DOM (Document Object Model), Vue.js framework to reinforce foundational knowledge. This involved revisiting the structure and syntax of HTML for building web pages, using CSS for styling and layout, and understanding JavaScript basics for adding interactivity. Through hands-on practice, key concepts were refreshed to ensure a solid base before proceeding to more advanced tasks.

```

1 <!DOCTYPE html>
2 <html>
3   <head>
4     <meta charset="utf-8">
5     <meta name="description" content="This is an awesome website">
6     <meta name="author" content="Jaysaree">
7     <meta name="keywords" content="HTML, Tutorial">
8     <meta name="viewport" content="width=device width , initial-scale=1.0">
9     <title>JS Website</title>
10  </head>
11  <body style="background-color: #lavenderblush;">
12    <header>
13      <nav>
14        <!--nav tag-->
15      </nav>
16      <h1>JS Website</h1>
17      <hr>
18    </header>
19
20    <main>
21      <!--article tag-->
22      <article>
23        <!--section tag-->
24        <section>
25          <!--section tag-->
26          <div>
27            <p><b>This</b> <i>is</i> <small>a</small> <small>small</small> <b>paragraph</b></p>
28            <p><small>sub2</small></p>
29            <p><sup>2</sup></p>
30          </div>
31          <a href="https://www.google.com" target="blank"><h1>Google Homepages</h1></a>
32          <!--target="blank" opens the link in a new page-->

```

Figure 5.1 HTML Practice Code

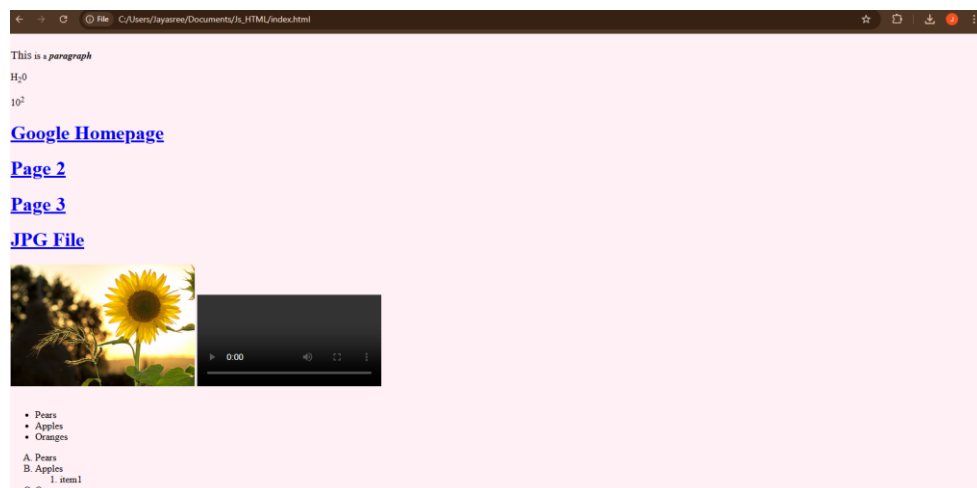


Figure 5.2 HTML Rendered Output

Figure 5.1 shows a sample HTML code that demonstrates the usage of various tags including header, section, image and video. The corresponding Figure 5.2 displays the rendered output in the browser, confirming that the elements were implemented correctly.

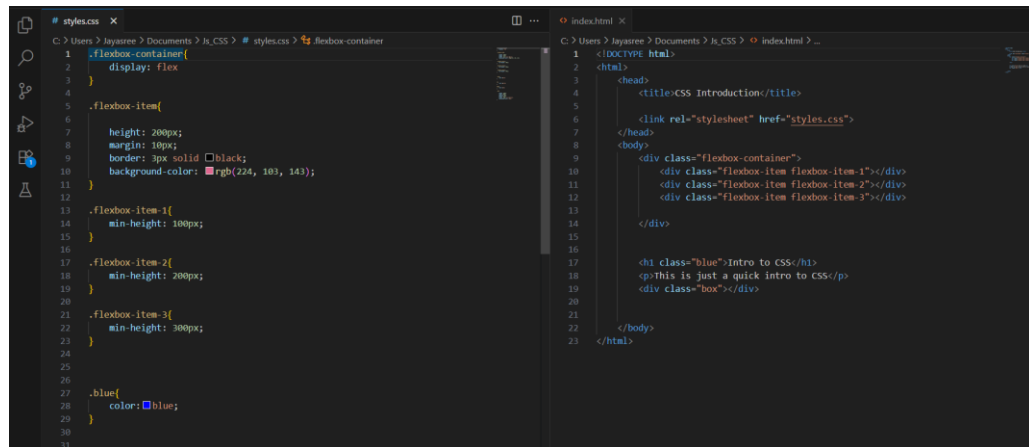


Figure 5.3 HTML with CSS Practice Code

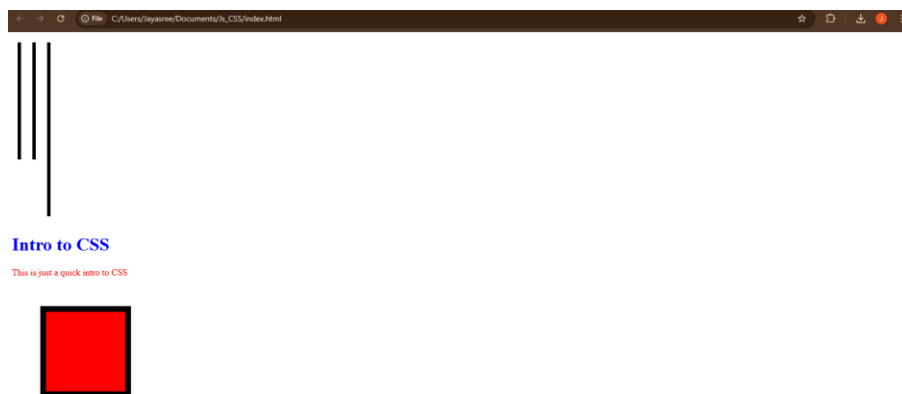
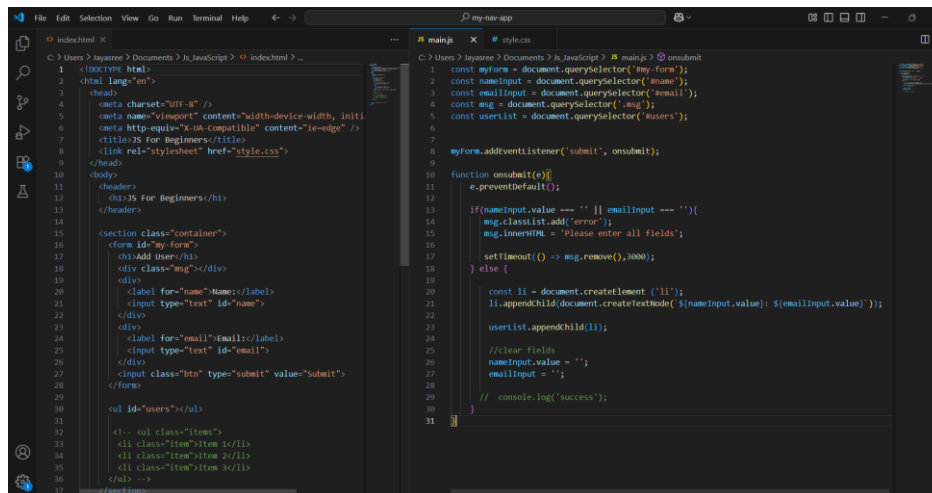


Figure 5.4 HTML with CSS Rendered Output

Figure 5.3 shows the use of external CSS to style HTML content, focusing on the application of Flexbox layout and class-based styling. The CSS code shown uses a flexible container with individual items of varying heights, styled with margin, border, and background color. The corresponding rendered output is displayed in Figure 5.4, where the layout is demonstrated and how the elements are aligned using Flexbox, a styling method which will be used to enhance the structure and readability of a page.



```

1 <doctype html>
2 <html lang="en">
3 <head>
4 <meta charset="UTF-8" />
5 <meta name="viewport" content="width=device-width, initial-scale=1.0" />
6 <meta http-equiv="X-UA-Compatible" content="ie=edge" />
7 <title>JS For Beginners</title>
8 <link rel="stylesheet" href="style.css">
9 </head>
10 <body>
11 <header>
12 <h1>JS For Beginners</h1>
13 </header>
14 <section class="container">
15 <div id="my-form">
16 <div id="form">
17 <div class="mg"></div>
18 <div>
19 <label for="name">Name:</label>
20 <input type="text" id="name">
21 </div>
22 <div>
23 <label for="email">Email:</label>
24 <input type="text" id="email">
25 </div>
26 <div>
27 <input class="btn" type="submit" value="Submit">
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33 <div class="items">
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```

Figure 5.5 JavaScript with DOM Practice Code

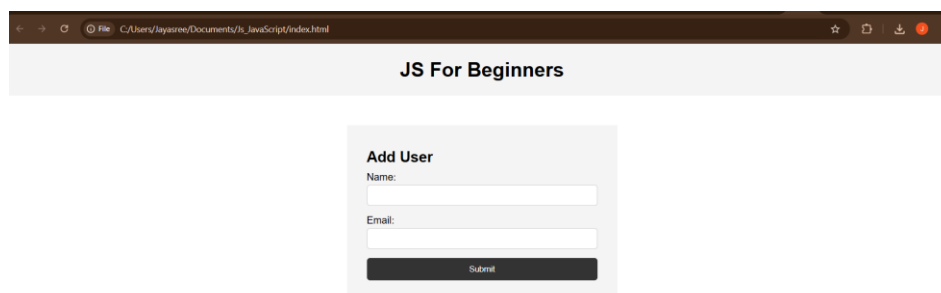


Figure 5.6 JavaScript Rendered Output

Figure 5.5 shows a JavaScript-based with DOM form handling, where users can input their name and email and the system will capture form submissions, validate input fields, and dynamically update the user list without refreshing the page. If fields are left empty, an error message is displayed. Figure 5.6 displays the rendered output of this

CHAPTER 5

functionality, confirming the successful integration of HTML, CSS, and JavaScript to build interactive web features.

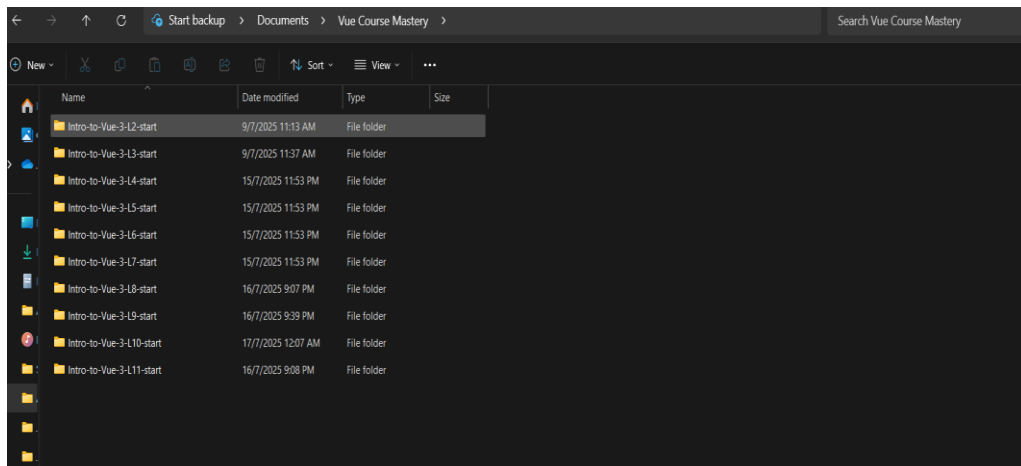


Figure 5.7 Overview of the Vue.js micro-course file structure

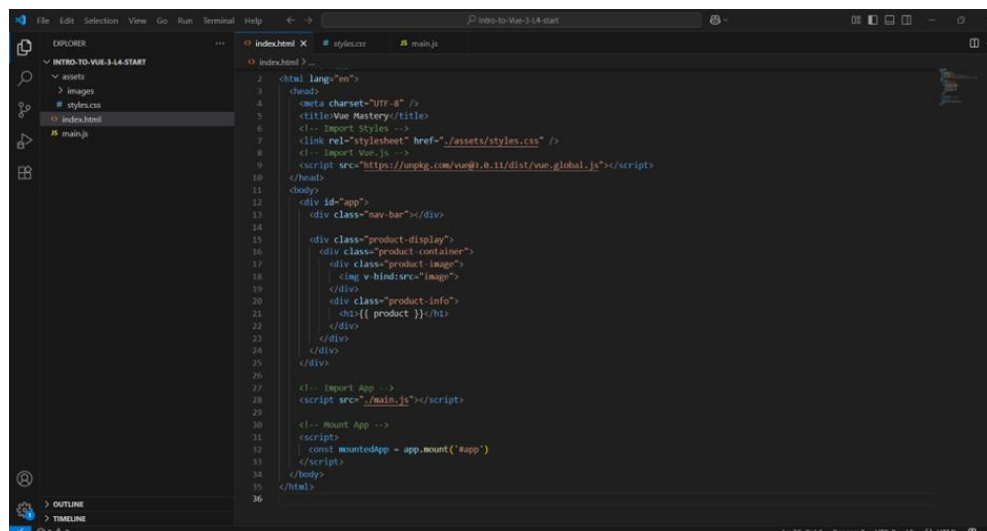


Figure 5.8 Code Snippet of L4 Course of Vue.js

Figure 5.7 shows an overview of the micro-course file structure and highlights the Vue.js courses that were completed to build foundational knowledge.

Figure 5.8 shows the basic Vue.js setup and concepts which were learnt such as data binding and component structure, during the micro-course.

5.2.2 Understanding and Setting up Node.js and Next.js



Figure 5.9 Setting Up [Node.js](#) to run [Next.js](#)

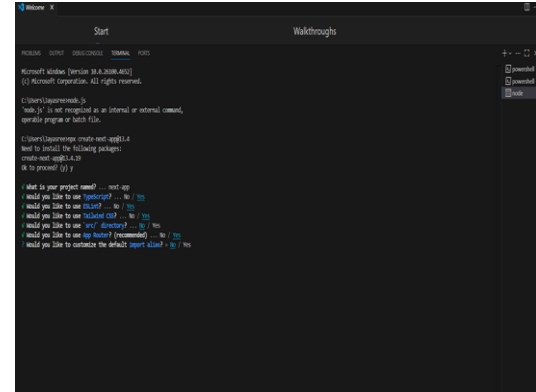


Figure 5.10 Initializing A TypeScript App with Next.js Project and other Dependencies

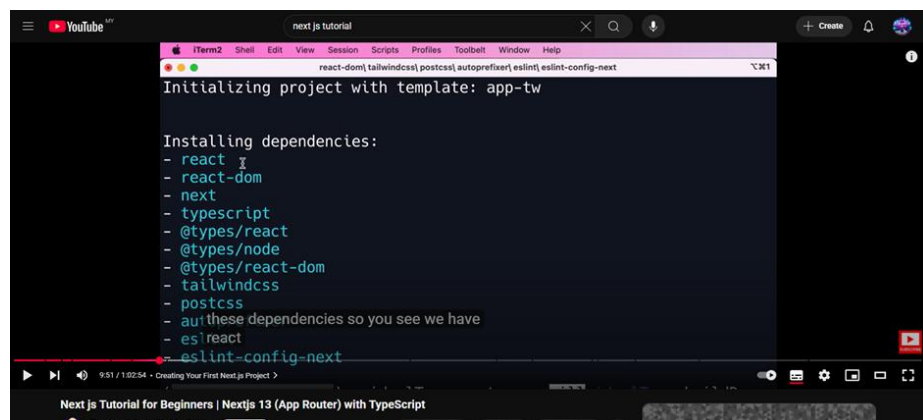


Figure 5.11 Setting Up Dependencies in a Next.js Project (Tutorial Snapshot from Youtube)

Figures 5.9 to 5.11 shows the initial setup process for developing a Next.js project using TypeScript. Figure 5.9 shows the installation of Node.js, which is a prerequisite for running any Next.js application while Figure 5.10, shows the process of initializing a new TypeScript-based Next.js project, along with the automatic setup of essential dependencies such as React, React DOM, and type definitions. Figure 5.11 displays a moment from a YouTube tutorial that guided the configuration of additional

dependencies like TailwindCSS, PostCSS, and ESLint, further strengthening the understanding of setting up a professional and scalable development environment.

5.2.3 Familiarisation with Existing Applications

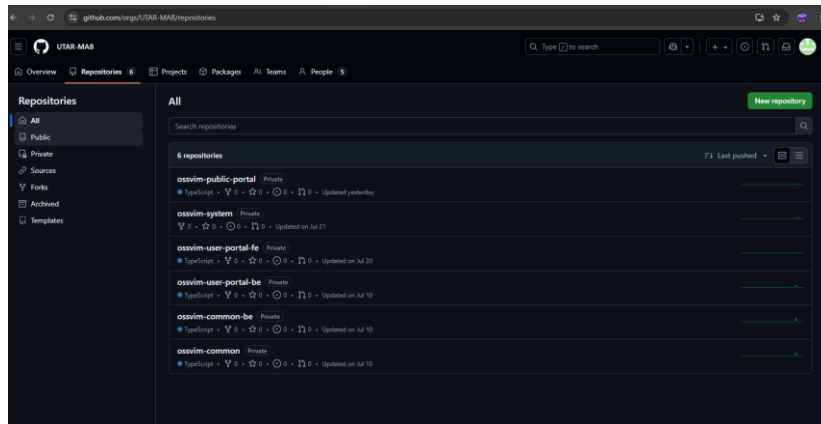


Figure 5.12 Overview of GitHub Repositories in OSSVIM Project

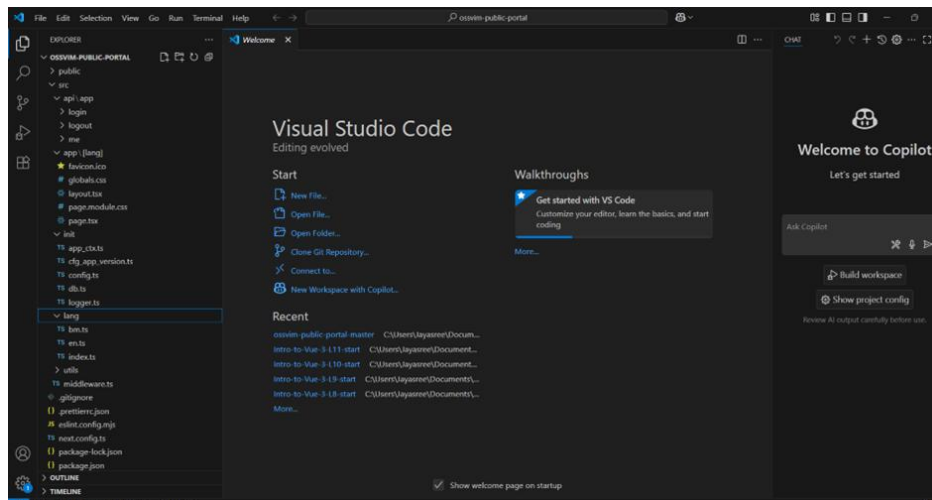


Figure 5.13 Project Structure of ossvim-public-portal in Visual Studio Code

Figure 5.12 displays the Overview of GitHub Repositories in OSSVIM Project which highlights how different components such as the public portal, user portal (frontend/backend), system module, and shared code are structured and maintained.

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Figure 5.13 shows the structure of the `ossvim-public-portal` opened in Visual Studio Code. Reviewing these codes in this file helped in understanding how the application is organised, including key directories like `public`, `src`, and how to configure them.

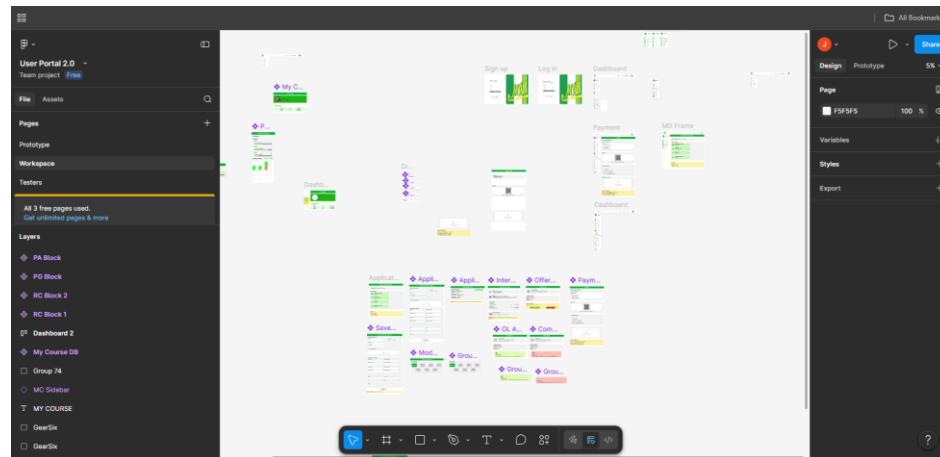


Figure 5.14 User Portal wireframe workspace in Figma

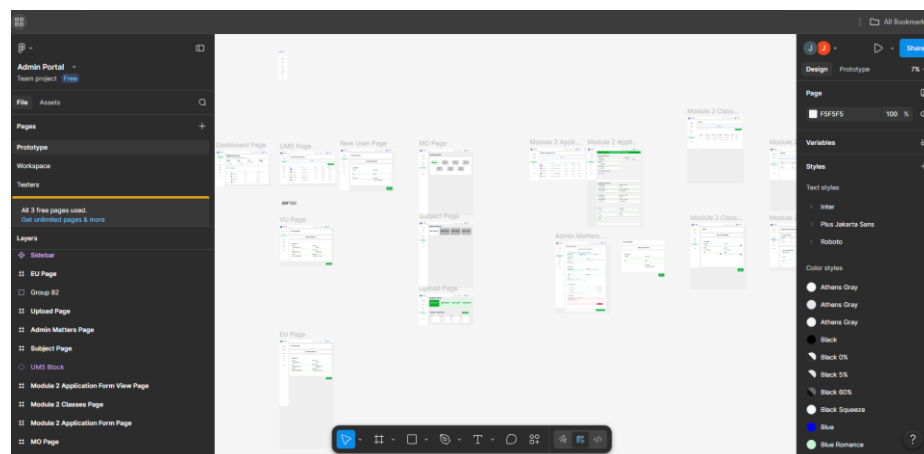


Figure 5.15 Admin Portal wireframe workspace in Figma

Figure 5.14 shows the User Portal and Figure 5.15 shows the Admin portal wireframes. For the development of User Portal and Admin Portal for OSSVIM Module 2 development. Familiarization with software such as Figma was also highly necessary to ensure proper development process. As the system methodology is agile methodology, multiple iteration will be carried out, from Interface Design, then coding

and eventually testing. The cycle will be repeated numerous times until the flow content is accurate, therefore mastery of the basics is a must.

5.3 Public Portal System Development

This section presents the development progress of the system to date. It documents the features implemented, supported by screenshots of the interface and components developed for the system.

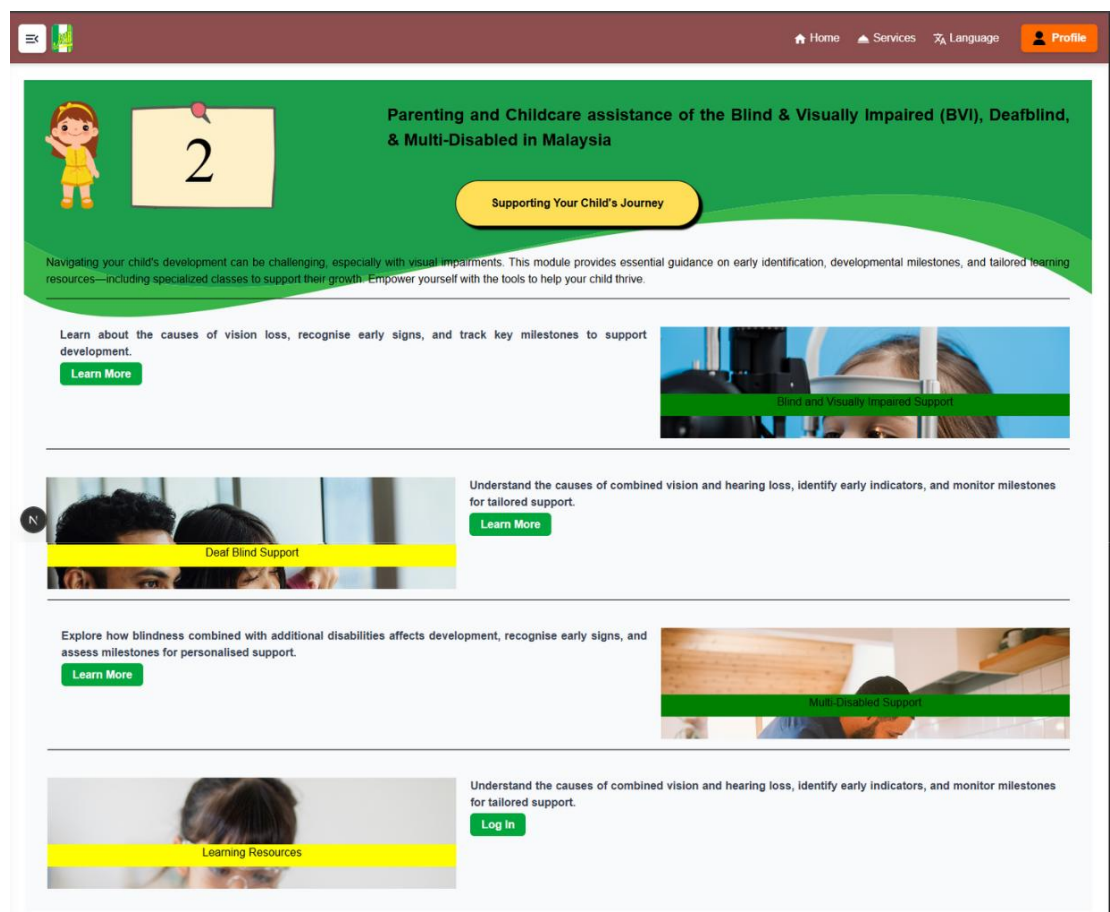


Figure 5.16 Module 2 Landing Page

Figure 5.16 displays the Landing Page of Module 2 of the OSSVIM system. The layout includes structured content blocks with informative descriptions for the 3 main

CHAPTER 5

components of Module 2 which are BVI Support, Deafblind Support and Multi-Disabled Support with a Registration component.

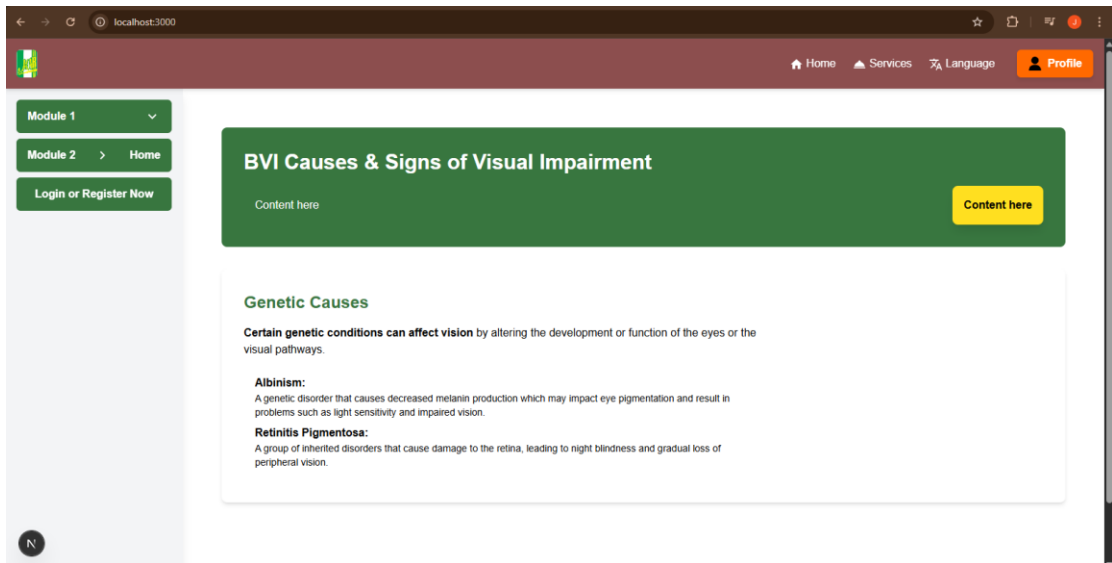


Figure 5.17 Mock Homepage

Figure 5.17 shows the overall system layout of the existing application, featuring a functional sidebar, a header with navigation links, a logo, and a profile button. It also includes a mock homepage, serving as a placeholder for future content updates. This layout reflects a modular UI design approach, aiding in understanding the application's structural components and user interface flow.

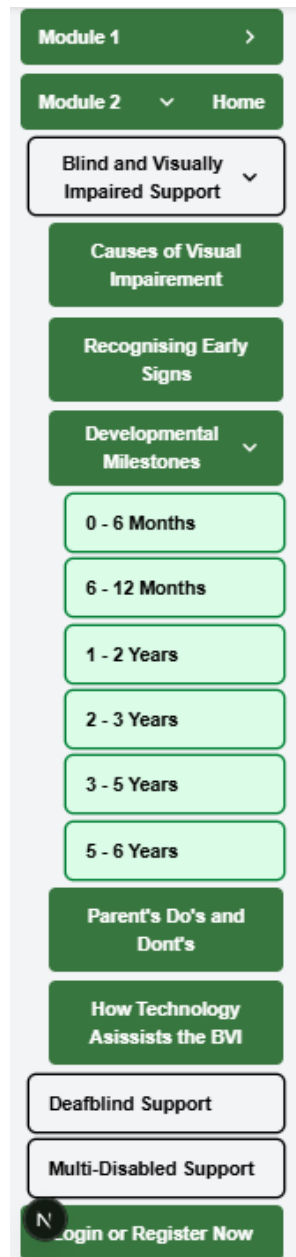


Figure 5.18 Sidebar Navigation of Public Portal

Figure 5.18 shows a Sidebar Navigation for the Public Portal system which encompasses collapsible sections and clearly segmented content, enabling intuitive access to modules such as developmental milestones, parental guidance, and assistive technologies. This structure provides insights into the system component-based layout and user-centric navigation

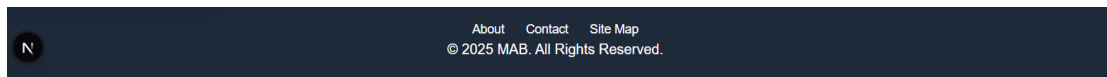


Figure 5.19 System Footer of Public Portal

Figure 5.19 shows the System Footer of the Public Portal system with the essential navigational links such as About, Contact, and Site Map, along with copyright information.



Figure 5.20 BVI Causes and Signs of Visual Impairment Page

Figure 5.20 shows a detailed page of BVI Causes and Signs of Visual Impairment Page, within Module 2, wherein the page is organized with key medical categories such as genetic causes, pediatric eye diseases, neurological conditions, and maternal infections into color-coded pill-sections for clarity better readability.

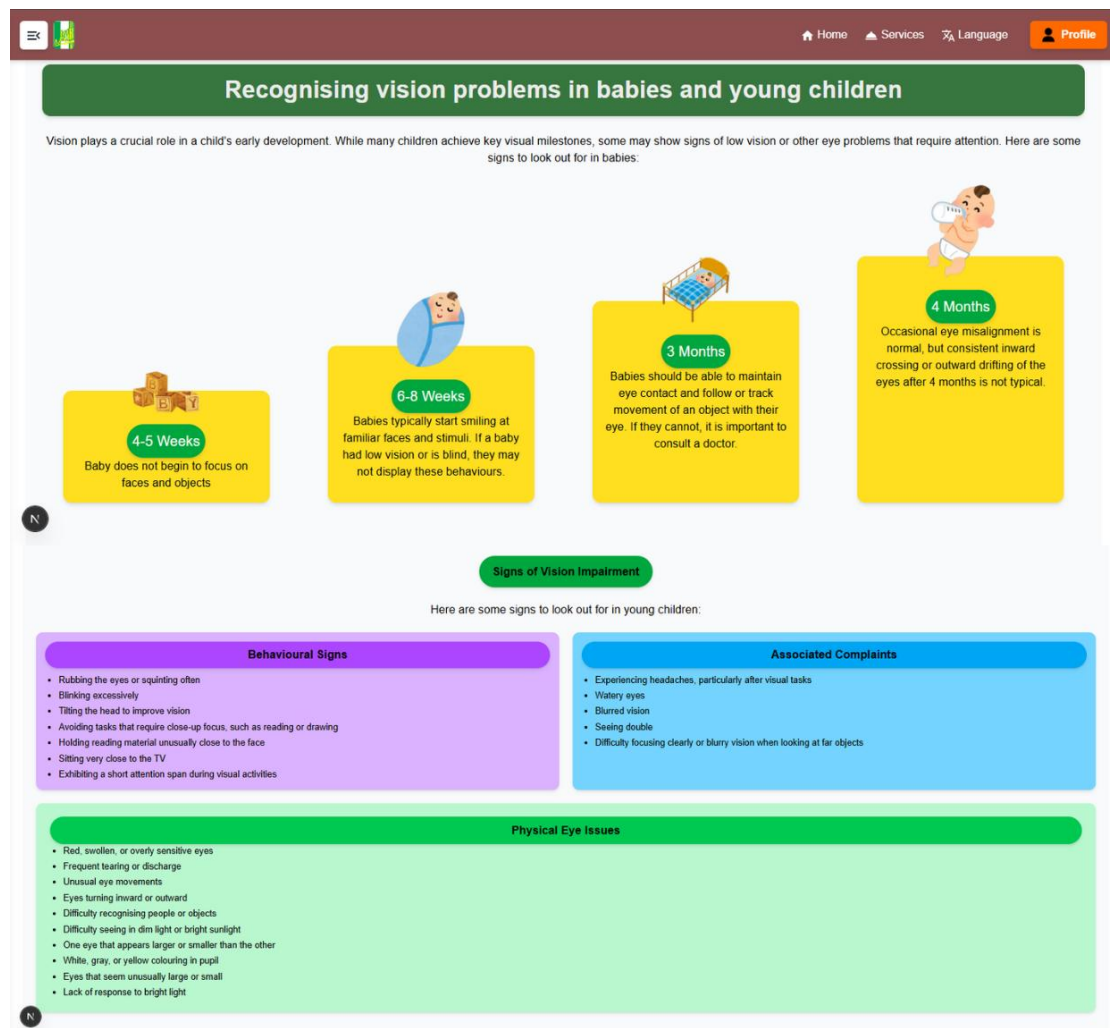


Figure 5.21 Recognising Early Signs Page

Figure 5.21 shows a detailed page of Recognising Early Signs Page, whereby it displays the information in a steps layout with icons and timelines to represent developmental milestones (4–5 weeks to 4 months), followed by segmented sections for behavioural signs, physical eye issues, and associated complaints for Signs of Vision Impairment.

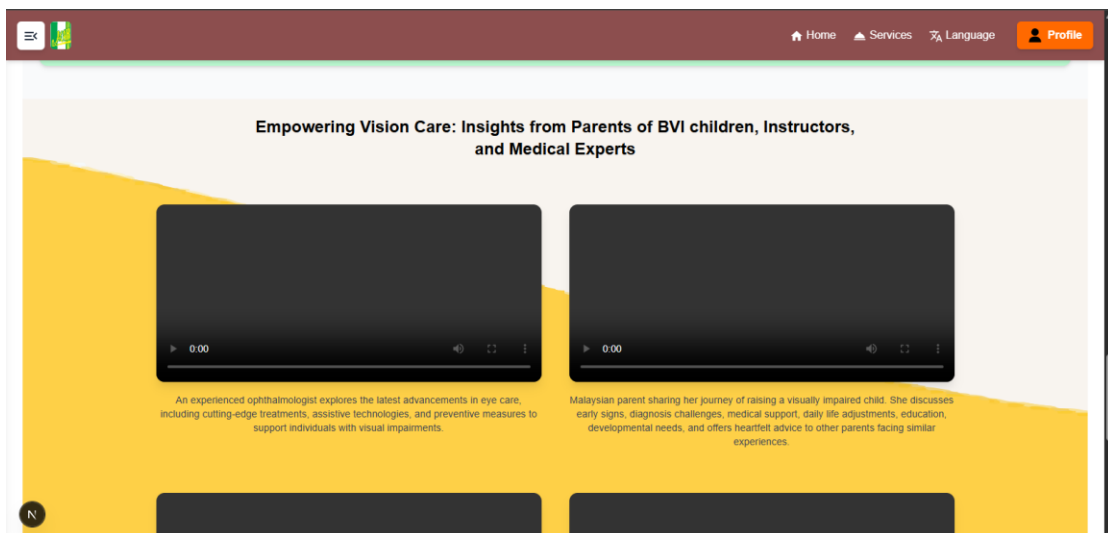


Figure 5.22 Video Page

Figure 5.22 shows a Video Page which will display the informational videos related to vision care. The layout includes embedded video players arranged in a grid with descriptive captions providing context such as expert insights on eye care advancements or personal stories from parents of visually impaired children. This will enable an engaging and educational multimedia experience.

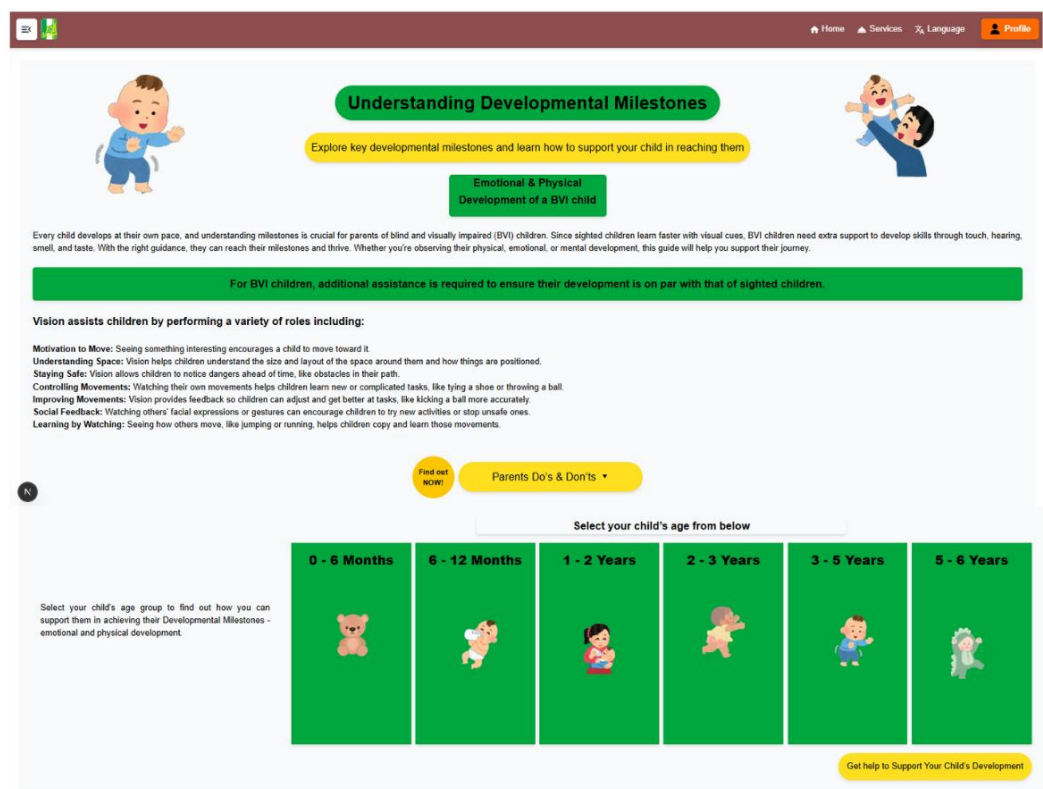


Figure 5.23 Development Milestone MainPage

Figure 5.23 displays the Main Page of the Development Milestones (DM) Main Page. This page provides a brief overview of the milestones needed to be achieved by sighted child and BVI child. The page also provides buttons to navigate through the other Pages to due the Development Milestones DM) between 0-6 Months to 5-6 Years.



Figure 5.24 Development Milestone 0-6 Months

Figure 5.24 displays the (DM) Page of 0-6 Months. The layout is divided into two main sections which are Emotional Milestones and Physical Milestones, with comparisons between sighted children and strategies for fostering optimal development in BVI (Blind or Visually Impaired) children. To enhance usability and help caregivers access targeted developmental support resources easily, the use of icons, clear headings, and call-to-action buttons such as ‘Click here to see the recommended simulated activity’ are developed.

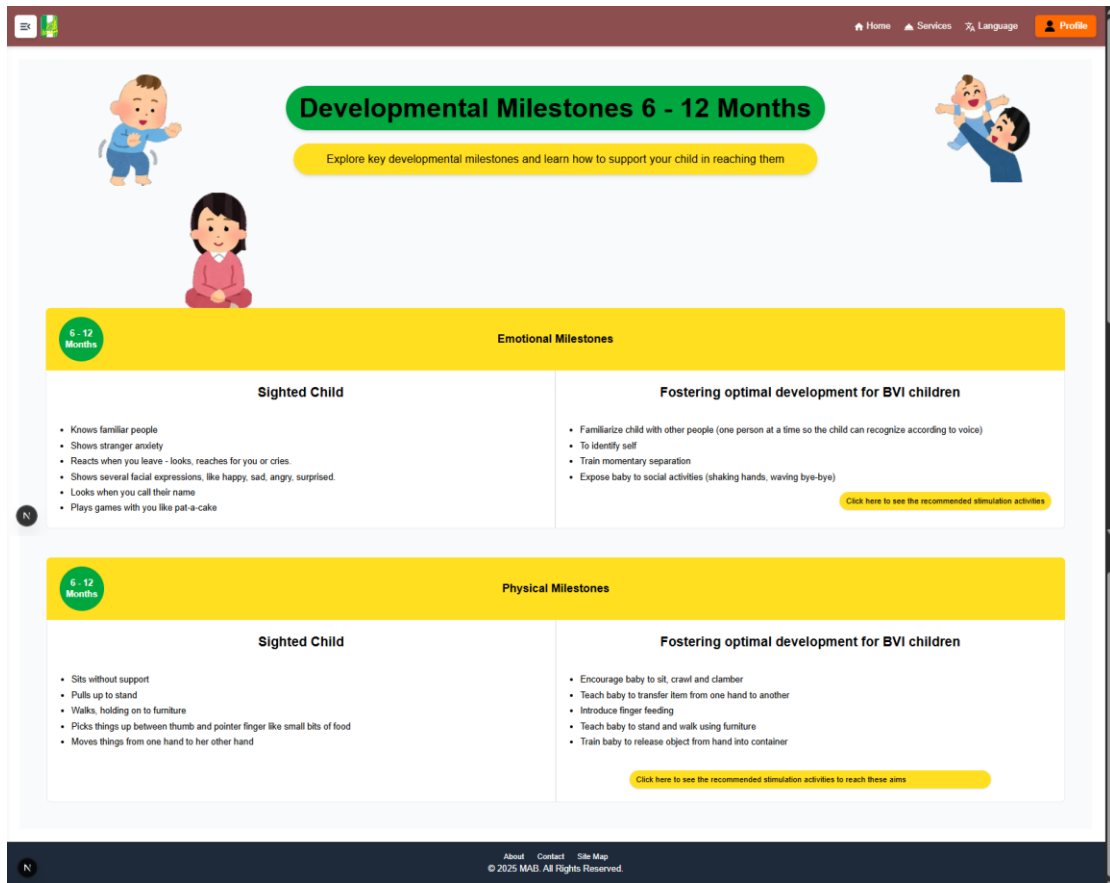


Figure 5.25 Development Milestone 6-12 Months

Figure 5.25 displays the (DM) Page of 6 - 12 Months. The layout is similar to Figure 5.24, with content tailored to the developmental milestones of children aged 6 to 12 months.

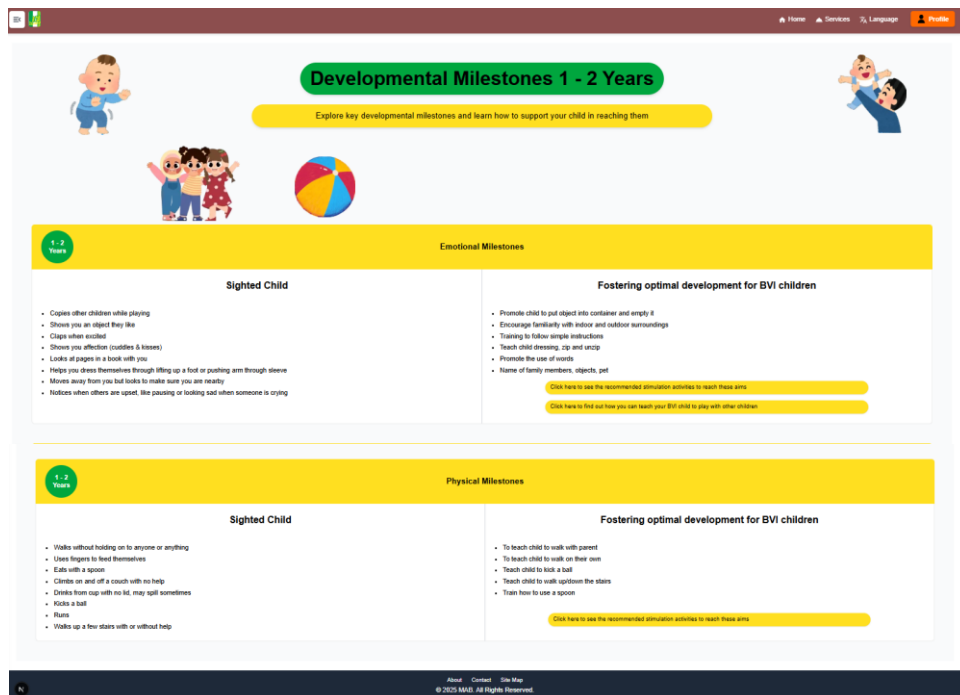


Figure 5.26 Development Milestone 1-2 Years



Figure 5.27 Development Milestone 2-3 Years

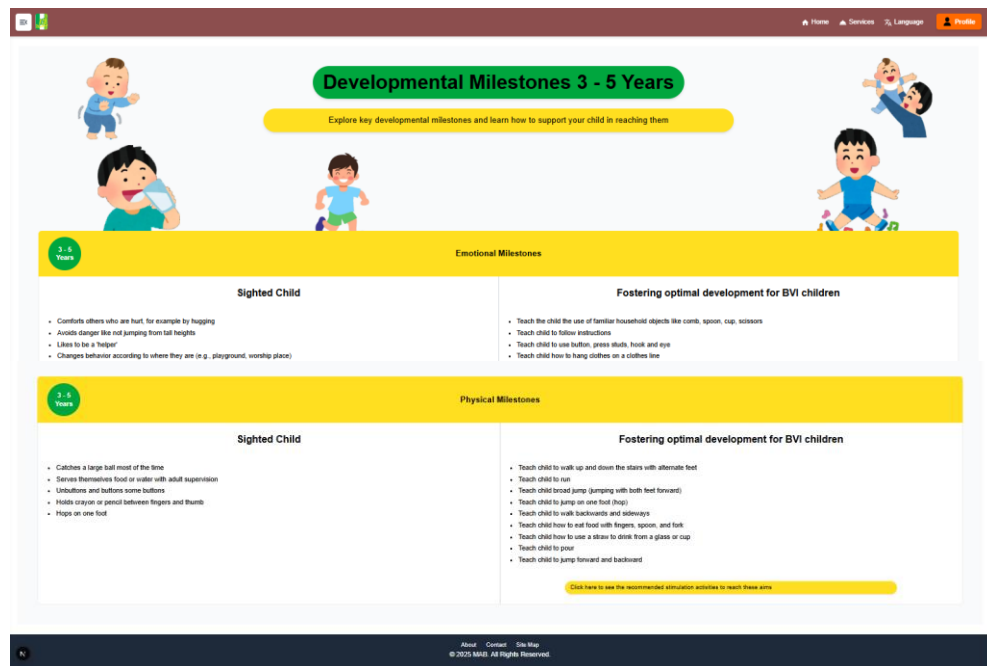


Figure 5.28 Development Milestone 3-5 Years

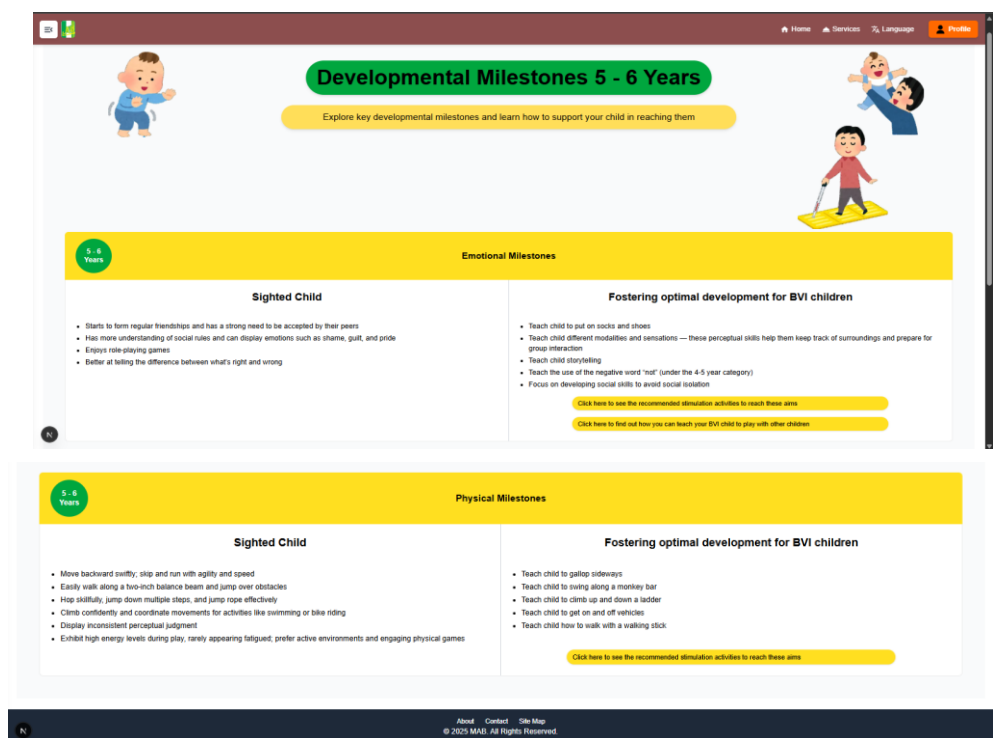


Figure 5.29 Development Milestone 5 - 6 Years

Figure 5.26, Figure 5.27, Figure 5.28 and Figure 5.29 displays the (DM) Pages of 1-2 Years, 2-3 Years, 3-5 Years and 5-6 Years respectively . The layout is similar to Figure 4.22, with content tailored to the developmental milestones of children of varying ages.



Figure 5.30 Parenting Dos and Dont Page

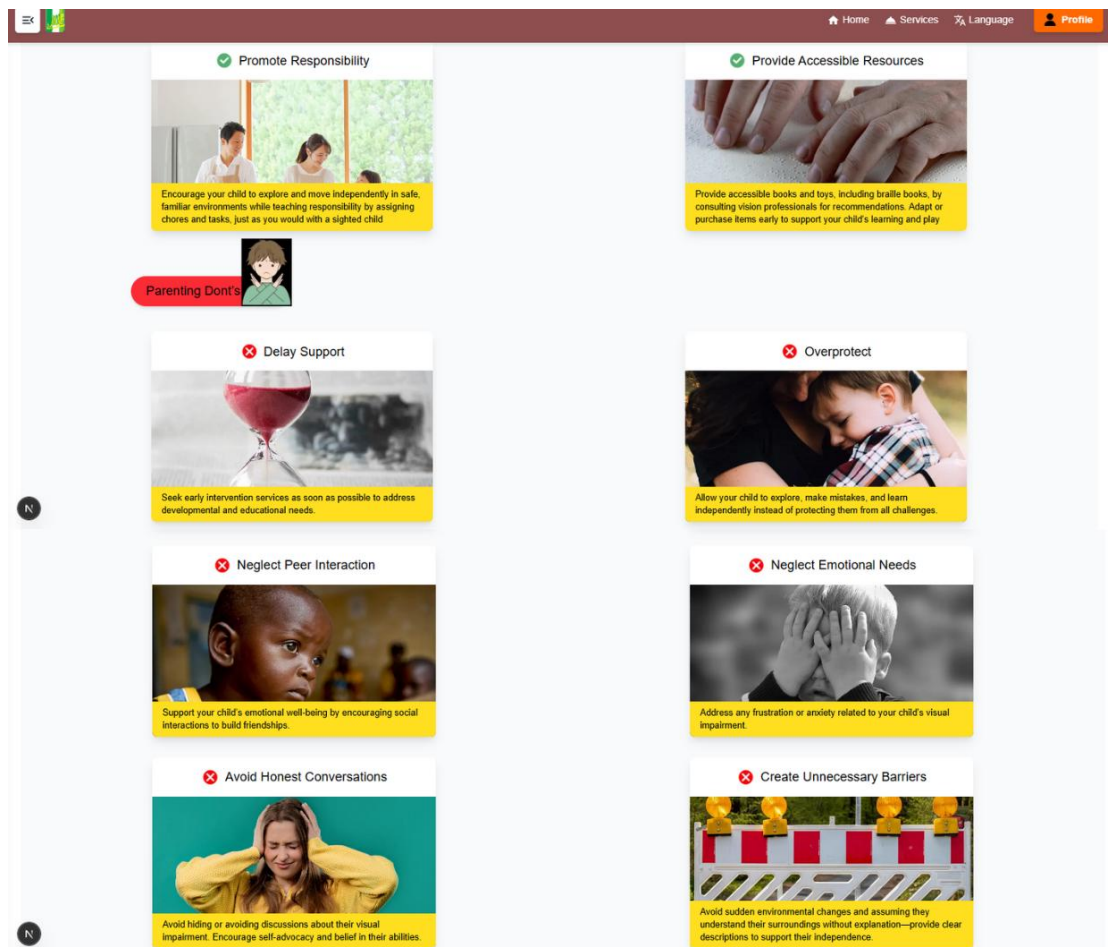


Figure 5.31 Continuation of Dos and Dont Page

Figure 5.30 and Figure 5.31 displays the outline Parenting Do's and Don'ts for visually impaired children. The UI uses a card-based layout with images, icons, and short captions to deliver content in a clear and engaging format. This design enhances readability and promotes quick understanding of the content by just glancing through.



Figure 5.32 BVI Technology Page

Figure 5.32 BVI Technology Page designed to educate parents on assistive technologies that support children with visual or multiple disabilities. Each tool in this Page includes an image and a brief explanation, making the interface user-friendly, informative, and visually engaging for parents and caregivers exploring tech-based solutions.

5.4 User Portal System Development

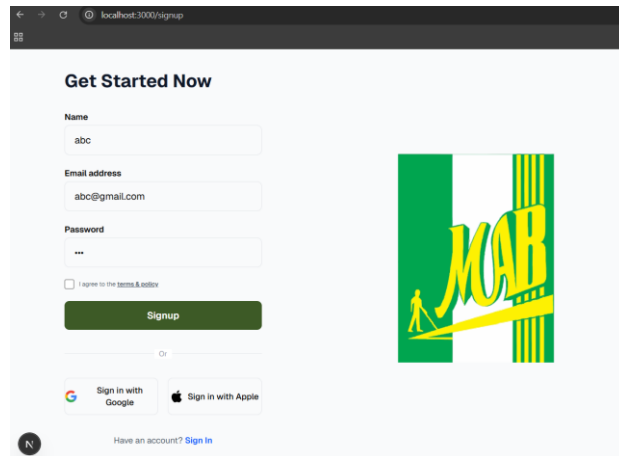
A screenshot of a web browser showing a sign-up page. The browser's address bar displays 'localhost:3000/signup'. The page has a light gray background. On the left, under the heading 'Get Started Now', there are three input fields: 'Name' with 'abc', 'Email address' with 'abc@gmail.com', and 'Password' with three dots. Below these is a checkbox labeled 'I agree to the terms & policy'. A green 'Signup' button is positioned below the checkbox. Underneath the button is an 'Or' separator. Below the separator are two buttons: 'Sign in with Google' and 'Sign in with Apple'. At the bottom left is a small circular icon with the letter 'N'. At the bottom center, it says 'Have an account? Sign in'. On the right side of the page is a large green and yellow graphic featuring the letters 'MAB' in a stylized font, with a yellow figure running on a path.

Figure 5.33 User Portal Sign Up Page

The Figure 5.33 shows the Sign Up page developed for the User Portal which shows the registration interface for new users. It features a official MAB branding with a simple layout for entering their name, email, and password. The page also includes a temporary mock button which will be used for signing up via Google or Apple accounts in the future. Once the users have keyed in their details they can proceed to Sign In by clicking sign in blue hyperlink.

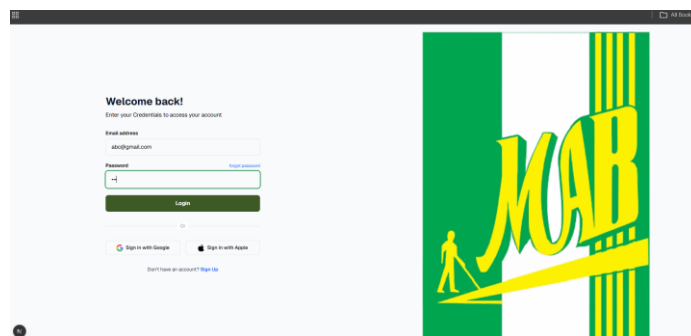
A screenshot of a web browser showing a sign-in page. The browser's address bar displays 'localhost:3000/signin'. The page has a light gray background. On the left, under the heading 'Welcome back!', there is a sub-heading 'Enter your Credentials to access your account'. Below this are two input fields: 'Email address' with 'abc@gmail.com' and 'Password' with three dots and a 'Forgot password' link. A green 'Login' button is positioned below the password field. Underneath the button is an 'Or' separator. Below the separator are two buttons: 'Sign in with Google' and 'Sign in with Apple'. At the bottom left is a small circular icon with the letter 'N'. At the bottom center, it says 'Don't have an account? Sign Up'. On the right side of the page is a large green and yellow graphic featuring the letters 'MAB' in a stylized font, with a yellow figure running on a path.

Figure 5.34 User Portal Sign In Page

The Figure 5.34 displays the registration interface for new users, featuring a clean layout for entering a name, email address, and password, almost similar UI to the Sign Up page.

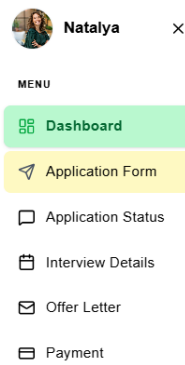


Figure 5.35 Sidebar for Parent Module in User Portal



Figure 5.36 Common Header in User Portal

Figure 5.35 and Figure 5.36 illustrates the primary navigation elements for the User Portal, specifically tailored for the Parent Module. The sidebar menu provides direct access to features such as the application form, application status, and payment matters. The common header maintains a consistent layout with global links throughout the User Portal.

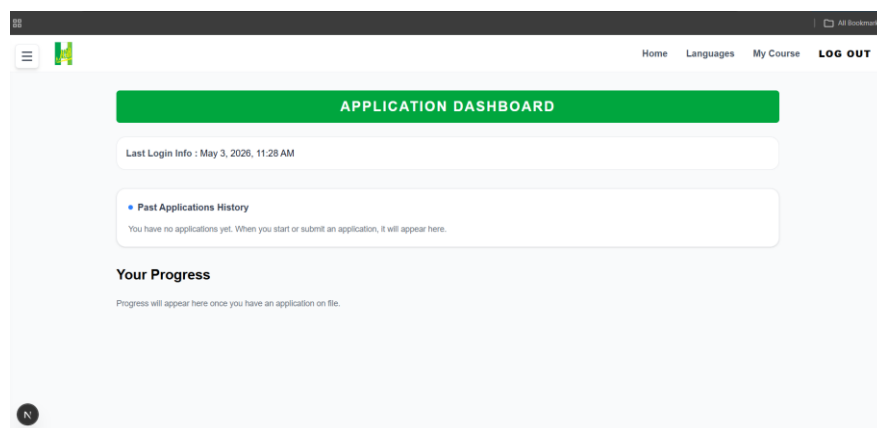


Figure 5.37 Dashboard Page after Signing In

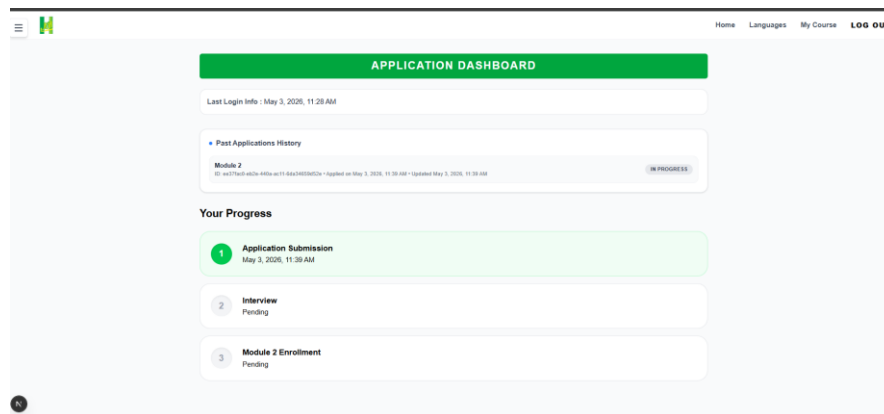


Figure 5.38 Dashboard Page after submitting Application Form

The figures above highlights the evolution of the Dashboard Page for the Parent Module in User Portal. Figure 5.37 displays the initial interface immediately after signing in, which shows a clean UI before any applications have been made. Figure 5.38 illustrates the updated dashboard Page after an application has been submitted, and a summary of the user's "Past Applications History" as well as progress tracker to keep the user updated on the status of each enrollment stage.

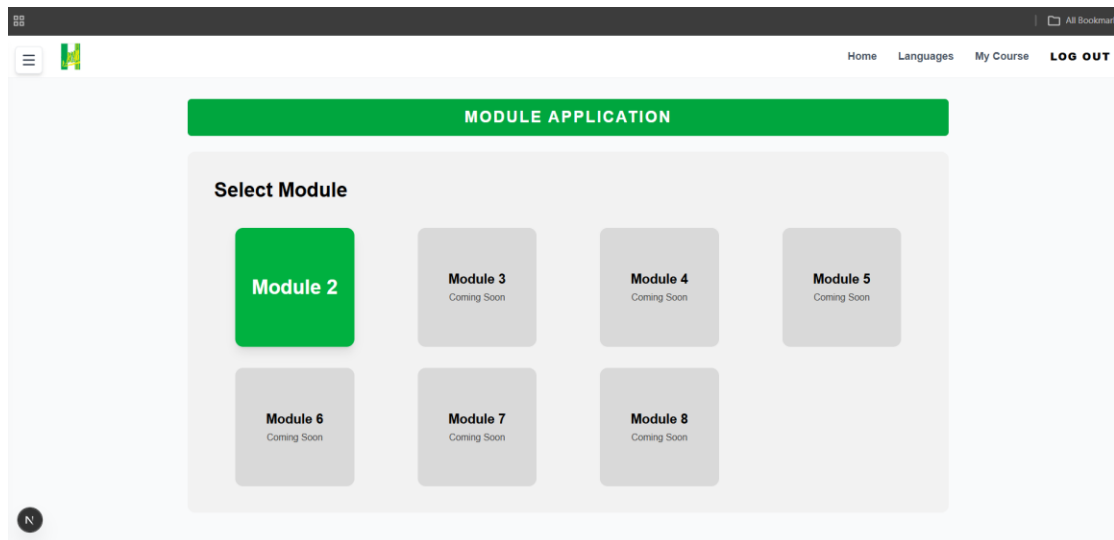


Figure 5.39 Module Selector Page in Application Form Page

The Figure 5.39 above shows the Module selector page. This page has only the Module 2 Active button. This page will then allow other Modules to be activated once they have been developed in the future. The users for now will be able to click on Module 2 and then will be navigated to the Application Form to Module 2 Enrollment.

The screenshot shows a web application interface for 'APPLICATION FORM - MODULE 2'. The page has a dark header with navigation links: Home, Languages, My Course, and LOG OUT. The main content area is titled 'APPLICATION FORM - MODULE 2' in a green bar. Below this, there are two main sections: 'Child's Personal Details' and 'Child's Additional Medical Records'. The 'Child's Personal Details' section includes fields for 'Child's Name', 'Child's Gender' (Male/Female), 'Child's D-O-B' (dd/mm/yyyy), and 'Child's IC Number'. The 'Child's Additional Medical Records' section has a dashed box with a link to 'Click to Upload Additional files' and a note: 'Attach file. File size of your documents should not exceed 10MB'.

Figure 5.40- a Application Form Page - a

This screenshot shows the 'Guardians Personal Details' section of the application form. It contains two columns of fields. The left column includes 'Guardian 1 Name', 'Guardian 1 IC Number', 'Guardian 2 Name (optional)', 'Guardian 2 IC Number (optional)', 'Address 1', and 'Address 2 (optional)'. The right column includes 'Relationship with Child', 'Guardian 1 Phone Number', 'Relationship with Child (optional)', 'Guardian 2 Phone Number (optional)', and 'Address 2 (optional)'. All fields are represented by text input boxes.

Figure 5.40-b Application Form Page - b

This screenshot shows the application form with a dropdown menu open for the 'Select State' field. The dropdown list includes the following states: Johor, Kedah, Kelantan, Melaka, Negeri Sembilan, Pahang, Perak, Perlis (highlighted in blue), Pulau Pinang, Sabah, Sarawak, Selangor, Terengganu, W.P. Kuala Lumpur, W.P. Labuan, and W.P. Putrajaya. Below the dropdown, there is a 'Save' button. The form also shows fields for 'Guardian 2 Name (optional)', 'Guardian 2 IC Number (optional)', 'Address 1', 'City', and 'Postcode'.

Figure 5.40-c Application Form Page - c

Figure 5.40-a - Figure 5.40-b illustrates the multi-section Module 2 Application Form, which will require the parents to enter the child's personal details, guardian contact information, and residential address in order to apply to Module 2 Course. The UI will have dedicated input fields for parents to upload Child's medical records. The DOB field will be a date picker, the gender is a radio button, the State in residential data collection section will be a dropdown and the rest are just text input fields.

The screenshot shows a web application interface for the 'Child's Personal Details' section. At the top, there is a navigation bar with links for Home, Languages, My Course, and a LOG OUT button. The main content area is titled 'Child's Personal Details' and contains several input fields. The 'Child's Name' field is filled with 'John Doe'. The 'Child's Gender' section has two radio buttons, with 'Male' selected. The 'Child's D-O-B' field is a date picker showing '04/04/2018'. The 'Child's IC Number' field is filled with '180404-01-1245'. Below these fields is a section for 'Child's Additional Medical Records' with a dashed box for file uploads and a 'Click to Upload Additional files' link. A file named 'MedicalRecordChild.pdf' is listed below the upload area with a 'Remove' button. The bottom of the form shows the start of the 'Guardians Personal Details' section.

Figure 5.41 View of application data filled Application Form Page

Figure 5.41 shows a snippet of the Application Form page specifically the the Child's Personal Details section of the Module 2. It shows filled-in fields for name, date of birth, gender, and identification number, as well as an area for uploading medical records that are working well as intended.

The screenshot shows a web application interface. At the top, there is a navigation bar with a menu icon, a logo, and links for Home, Languages, My Course, and LOG OUT. The main content area is a form titled 'View Application Form Page'. It contains several input fields: 'Address 1', 'Address 2 (optional)', 'City', 'State' (a dropdown menu with 'Select State' as the selected option), and 'Postcode'. Below these fields is a yellow notification box with the text: 'Note : Your application is successfully saved! We will contact you with the next steps.' At the bottom of the form is a green 'Save' button.

Figure 5.42 View Application Form Page on application submitted

Figure 5.42 illustrates the view of Application Form Page once an application is submitted by clicking the Save button. The system will display a note indicating the application data is sent successfully. This page marks the conclusion of the application process.

The screenshot shows the 'APPLICATION STATUS' page. At the top, there is a green header bar with the text 'APPLICATION STATUS'. Below this, there is a dropdown menu labeled 'Application' with a 'Show all contexts' link. To the right of the dropdown is a green button with a clock icon and the text 'No Active Application'. Below the dropdown is a section titled 'Application Details' with the text 'No application history available.' and a yellow notification box with the text: 'No application status data is currently available for the selected context.' At the bottom of the page is a yellow notification box with the text: 'Note : Your application is currently being processed. Editing is not available at this stage.'

Figure 5.43 View of Application Status Page before application submitted

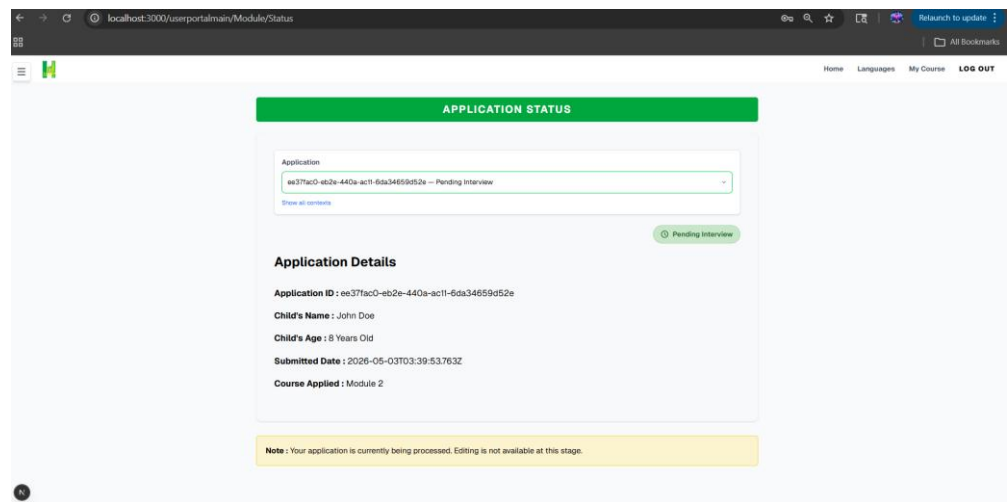


Figure 5.44 View of Application Status Page after application submitted

Figure 5.43 and Figure 5.44 illustrates the Application Status page, displaying the empty interface before a submission and after a submission respectively. Figure 5. xx shows the filled up view with the relevant application details after an application has been successfully sent and approved by the Admin for an Interview. The post-submission UI provides necessary tracking information, including the Application ID, child’s details, and the current processing stage, such as "Pending Interview."

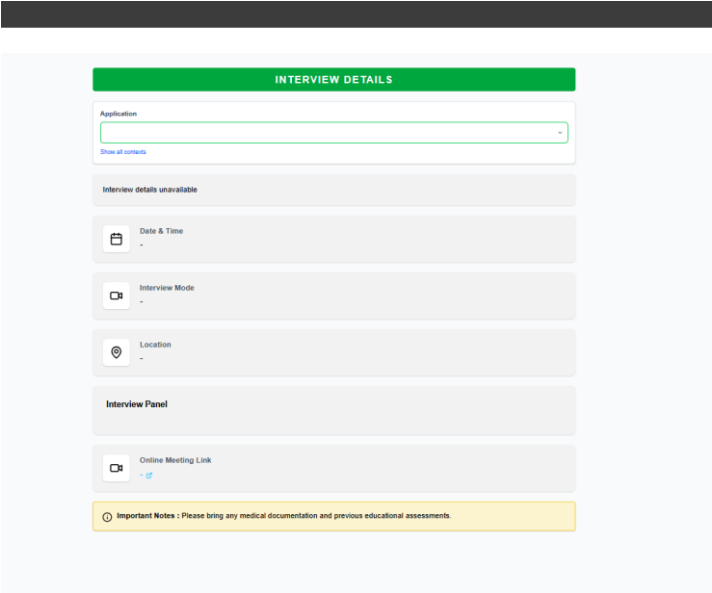


Figure 5.45 View of Interview Details Page before application submitted

The screenshot shows the 'INTERVIEW DETAILS' page. At the top, there is a green header bar with the text 'INTERVIEW DETAILS'. Below this, there is a dropdown menu for 'Application' with the value 'ee37fac0-eb2e-440a-ac11-6da34659d52e — Pending Interview'. A link 'Show all contexts' is visible below the dropdown. The page is divided into several sections: 'Date & Time' showing 'May 3, 2026, 3:00 PM', 'Interview Mode' showing 'ONLINE', and 'Location' showing a location pin icon. Below these is the 'Interview Panel' section, which lists two members: 'Miss Kanimochi' (Programme Coordinator) and 'Miss Rachel Tan' (Special Education Specialist), both with contact numbers '+60 12-345 6789'. There is also an 'Online Meeting Link' section with a Zoom link 'https://zoom.us/jab0-daf-daf-0'. At the bottom, there is a yellow box with 'Important Notes : Please bring any medical documentation and previous educational assessments'.

Figure 5.46 View of Interview Details Page after application submitted

Figure 5.45 and Figure 5.46 showcases the Interview Details UIs, illustrating both the empty state prior to application submission and the populated view once an interview is scheduled respectively. In the active view, parents can access critical information including the date and time, interview mode, assigned interview panel members with contact details, and a direct link for online sessions, so they are fully prepared for the next stage of the enrollment process.

The screenshot shows the 'OFFER LETTER' page. At the top, there is a green header bar with the text 'OFFER LETTER'. Below this, there is a dropdown menu for 'Application' with the value 'ee37fac0-eb2e-440a-ac11-6da34659d52e — Pending Interview'. A link 'Show all contexts' is visible below the dropdown. The page is divided into a 'Program Details' section, which lists: 'Program Name : Module 2', 'Start Date : 7-1-2026', and 'Duration : 1 Year'.

Figure 5.47 View of Offer Letter Page before interview results configured by Admin

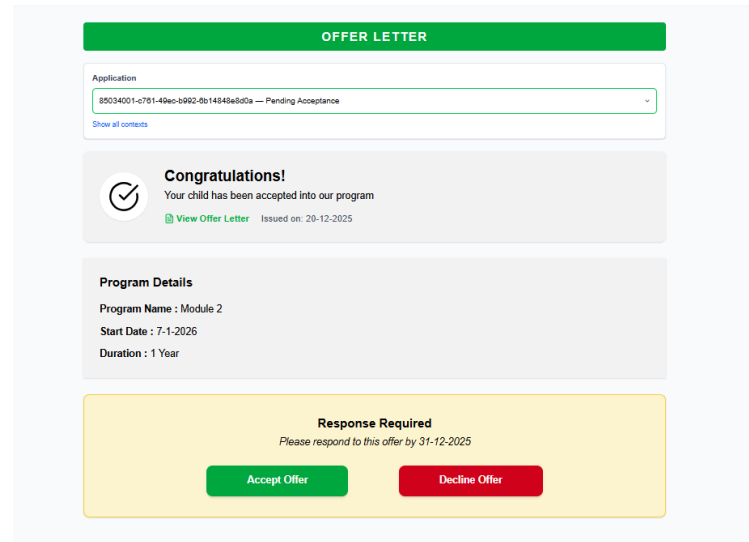


Figure 5.48 View of Offer Letter Page before interview results interview is Passed

Figure 5.47 displays the Offer Letter interface, showing the transition from the initial program details to the official acceptance stage. The top view represents the page while the application is still in the "Pending Interview" phase, displaying general program information such as the start date and duration. Figure 5.48 illustrates the updated interface once the interview is Passed, with a congratulatory message, link to view the official offer letter, and active buttons for the parent to either "Accept Offer" or "Decline Offer" by the specified deadline. The user will also be directed externally to view the offer when they click the View Offer Letter green hyperlink.

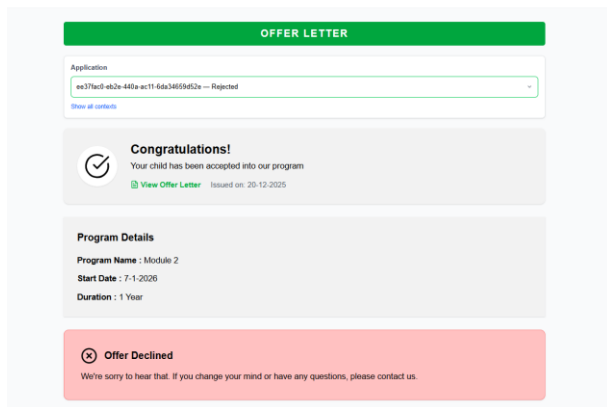


Figure 5.49 UI after Offer Declination

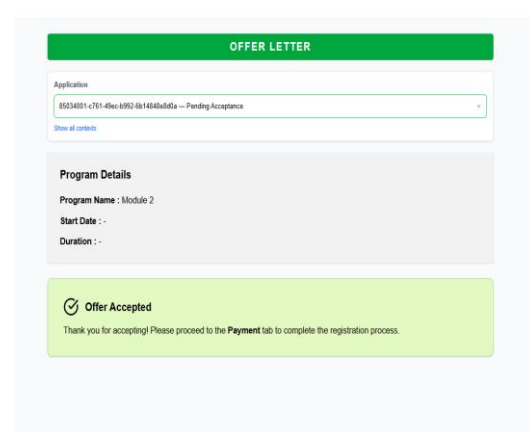


Figure 5.50 UI after Offer Acceptance

Figure 5.49 and Figure 5.50 illustrate the Offer Details Page after the user has declined and accepted the enrollment offer respectively. When the user chooses to reject the offer, the system will display a clear notification confirming the decision, with a supportive message inviting the user to contact the administration should they have further questions or wish to reconsider. However when the user clicks the accept offer, the system will display a page that features a green confirmation notification and provides actionable guidance, directing the user to navigate to the Payment tab to finalize the registration process. The user will also be directed externally to view the offer when they click the View Offer Letter green hyperlink. The user will also be directed externally to view the offer when they click the View Offer Letter green hyperlink as be shown in Figure 5.48

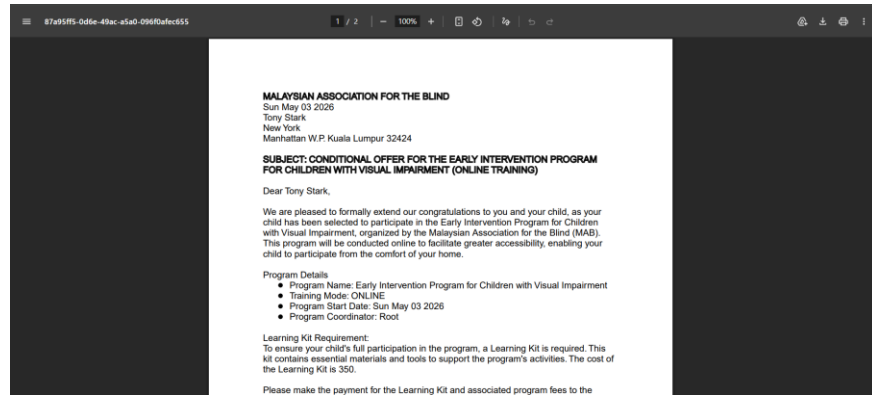


Figure 5.51 Snippet of Offer Letter

Figure 5.51 presents the offer letter from the Malaysian Association for the Blind (MAB), detailing the conditional enrollment for the Early Intervention Program. The document outlines key program information, including the online training mode, start date, and specific learning kit requirements for the student. The user will be directed to this page as per what was mentioned in elaboration of Figure 5.48 - Figure 5.50

PAYMENT

Application:

Payment Amount: RM 350.00
Learning Kit & Materials Fee

Included Items:

- Braille writing slate and stylus
- Audio learning devices
- Tactile learning materials
- Educational software licenses

Scan to Pay

QR Code unavailable

Scan with your banking app to make payment

Bank Transfer Details

Bank:

Account Number:

Account Name:

Click to upload receipt
(PNG, JPG or PDF (max. 5MB))

No pending payment registration was found. Please contact support.

Important Information:

- Payment must be completed before 10th of every month
- Please keep your original receipt for your records
- Payment verification may take 1-2 business days
- Contact us if you encounter any payment issues

Figure 5.52 Payment Page view when Offer is Decline/Rejected

PAYMENT

Application:

Payment Amount: RM 350.00
Learning Kit & Materials Fee

Included Items:

- Braille writing slate and stylus
- Audio learning devices
- Tactile learning materials
- Educational software licenses

Scan to Pay

QR Code available

Scan with your banking app to make payment

Bank Transfer Details

Bank:

Account Number:

Account Name:

Click to upload receipt
(PNG, JPG or PDF (max. 5MB))

Click to upload receipt
(PNG, JPG or PDF (max. 5MB))

Important Information:

- Payment must be completed before 10th of every month
- Please keep your original receipt for your records
- Payment verification may take 1-2 business days
- Contact us if you encounter any payment issues

Figure 5.53 Payment Page view when Offer is Accepted

Figure 5.52 and Figure 5.53 illustrates the Payment Page interface under two different application states which are declined and accepted respectively.. In the declined view, transaction details such as the Scan to Pay section, QR code and bank information are hidden, indicating that the payment process is closed for that application. Meanwhile, for the Accepted Offer cases, the accepted view is fully functional, providing the necessary QR code, bank details, and a dedicated upload section for proof of payment, allowing parents to finalize their child's enrollment. Once the proof of payment is uploaded, and submitted, the system will display a note to indicate proof of payment has been received.

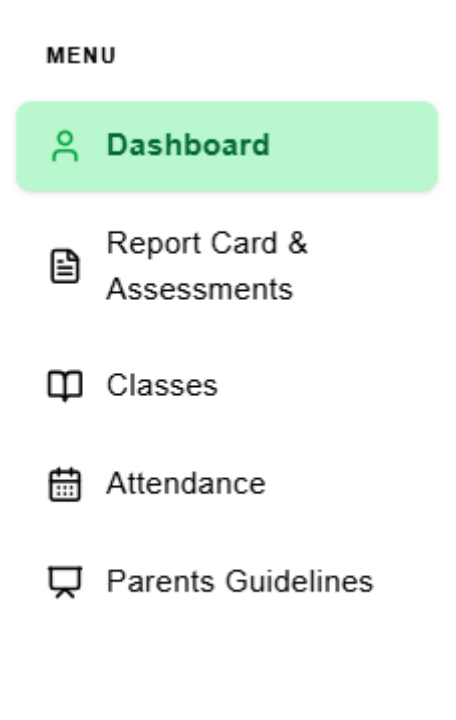


Figure 5.54 Sidebar Menu for Student Module of User Portal

Figure 5.54 presents the navigation sidebar for the Student Module, providing quick access to academic features such as the Dashboard, Report Card & Assessments, and Classes. It also includes sections for tracking Attendance and viewing Parent Guidelines, ensuring all essential student-related resources are centrally managed.

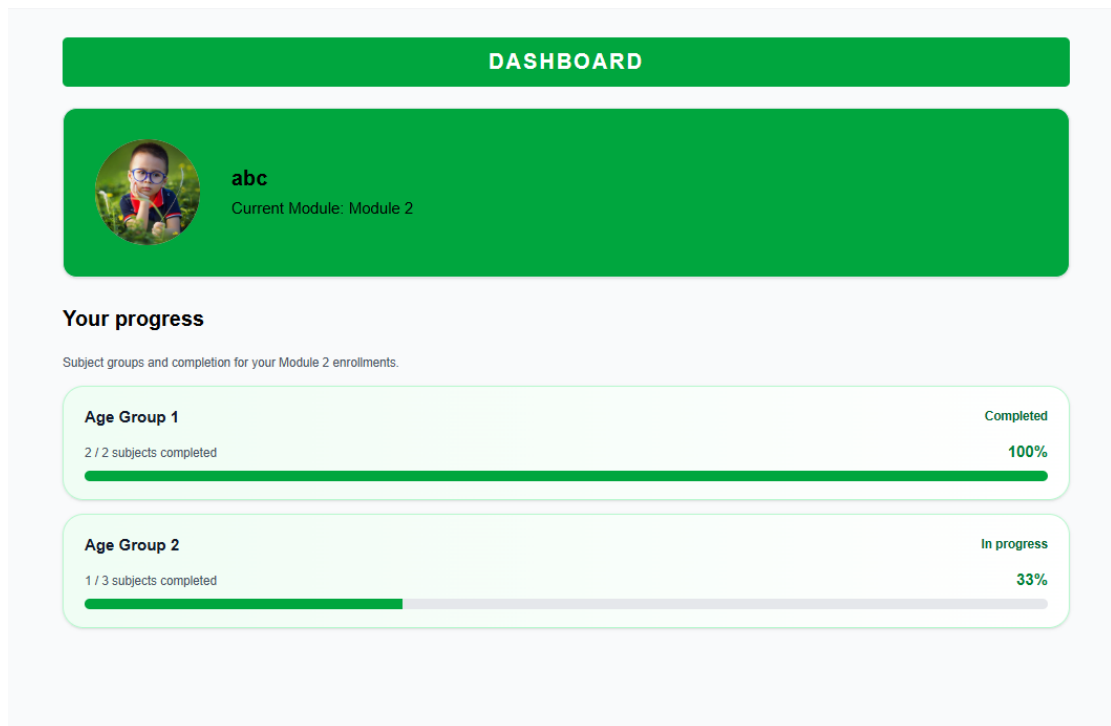


Figure 5.55 Dashboard Page for Student Module of User Portal

Figure 5.55 illustrates the Student Module Dashboard, which has a personalized overview of the student's progress. The interface has a profile header displaying the student's name and current enrolled module, followed by a "Your Progress" section that uses a visual progress bar to track the completion of subjects within their specific age group.

REPORT CARD

Module 2 Past Assessment Results ^

Assessment Name	Result	Assessment Date and Time	Parent Verification
Age Group 1 — Learn The ABCs - Part 1	Pass	03/05/2026, 20:00:00	Done

Module 2 Current Assessment Results

Assessment Name	Result	Assessment Date and Time
Age Group 1 — Our Favorite Numbers - Part 2	Pass	04/05/2026, 20:13:00

Trainer Feedback

No feedback yet

Parent Verification

☐ I have reviewed and verified the assessment results for Level 1. I understand that upon submission, the trainer will advance my child to the next level.

SUBMIT VERIFICATION

Figure 5.56 Report Card and Assessment Page in Student Module before Parent Verification

REPORT CARD

Module 2 Past Assessment Results ^

Assessment Name	Result	Assessment Date and Time	Parent Verification
Age Group 1 — Our Favorite Numbers - Part 2	Pass	04/05/2026, 20:13:00	Done
Age Group 1 — Learn The ABCs - Part 1	Pass	03/05/2026, 20:00:00	Done

Module 2 Current Assessment Results

Assessment Name	Result	Assessment Date and Time
No current assessment results.		

Trainer Feedback

No feedback yet

Figure 5.57 Report Card and Assessment Page in Student Module after Parent Verification

Figure 5.56 and Figure 5.57 illustrates the Report Card and Assessment page before and after parent verification respectively. Figure 5.56 displays a section for parent verification and sections for past and current assessment results and also a trainer feedback section. Once the parent clicks the checkbox, the details from Current Assessment Results will be transferred to Past Assessments Results after providing a note indicating successful verification.

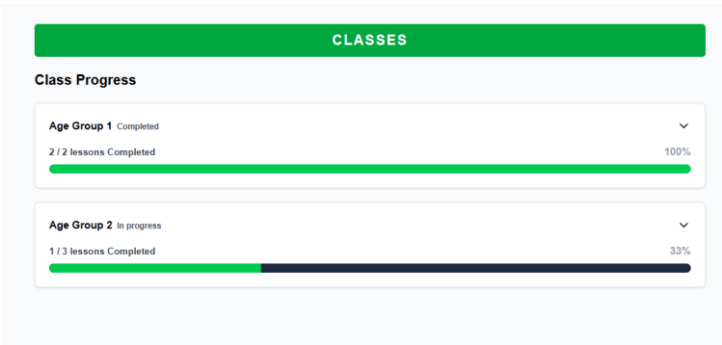


Figure 5.58 Classes Page in Student Module of User Portal

The figure above illustrates the Classes Page within the Student Module of the User Portal, specifically focusing on the tracking of the class progress interface. Each entry features a visual progress bar and numerical data to indicate completion status which categorizes the progress by age group. This allows students to easily monitor their work done and identifies remaining number tasks.

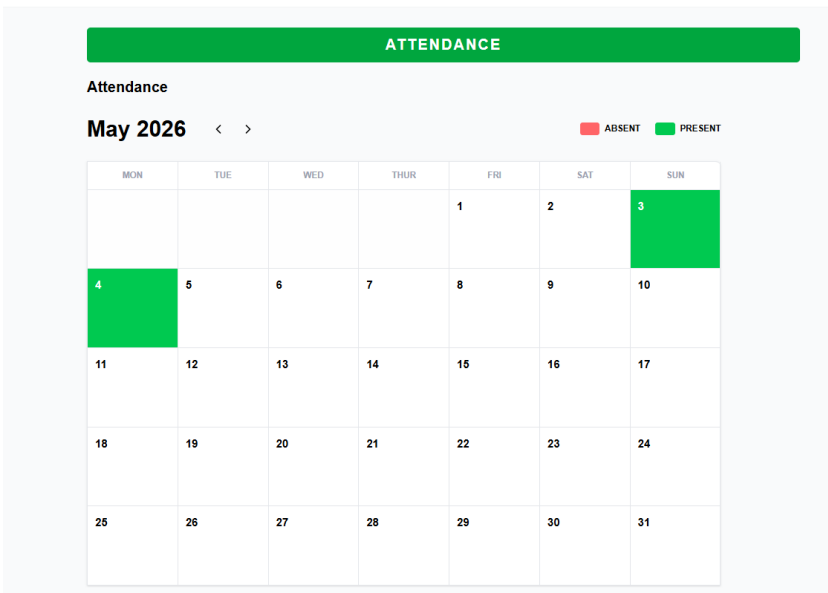


Figure 5.59 Attendance Page

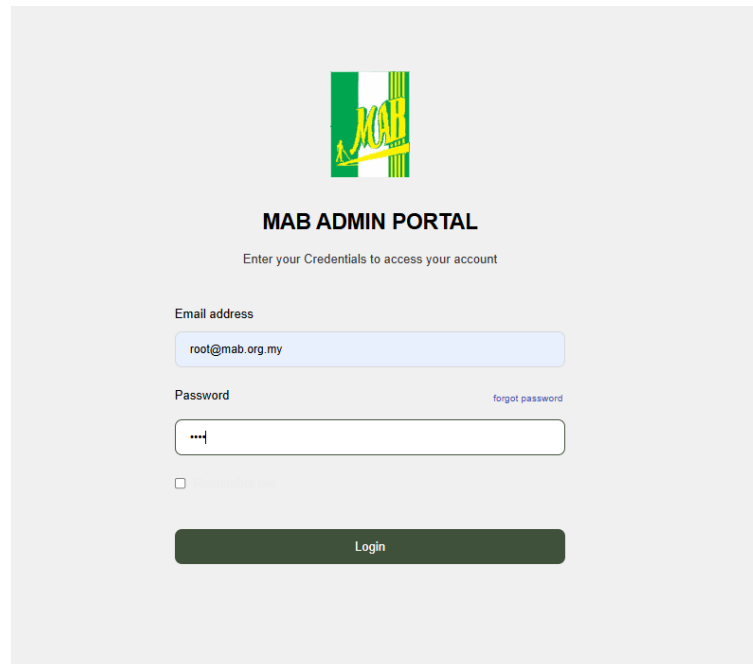
The Figure 5.59 illustrates the Attendance Page within the Student Module of the User Portal. The page has an attendance tracking system which enables the students to monitor their daily attendance records through a clear, color-coded system where green blocks signify present and red blocks indicate absence.



Figure 5.60 Parents Guidelines Page

Figure 5.60 shows the interface features and videos which support instructional learning. It includes a Videos Watched counter for progress tracking and a Mark As Completed checkbox to allow parents to manually validate the viewing session. A visible overlay will be displayed on top of the video thumbnail once it is checked which provides immediate visual feedback on the current activity status.

5.5 Admin Portal System Development



The image shows a login page for the MAB Admin Portal. At the top center is the MAB logo, which consists of a green and yellow square with the letters 'MAB' in white. Below the logo, the text 'MAB ADMIN PORTAL' is displayed in bold. Underneath that, a subtitle reads 'Enter your Credentials to access your account'. The form contains two input fields: 'Email address' with the value 'root@mab.org.my' and 'Password' with masked characters. To the right of the password field is a link that says 'forgot password'. Below the password field is a checkbox labeled 'Remember me'. At the bottom of the form is a dark green button labeled 'Login'.

Figure 5.61 Admin Portal Log In Page

The Figure 5.61 shows the Log In page developed for the Admin Portal which has MAB Logo and a title which says MAB Admin Portal. The page after the users click the submit button, the system will receive the email address and password for authentication via the text input.



Figure 5.62 Admin Portal Header

Figure 5.xx, displays the Admin Portal Header, which has the essential navigation and search functionality across the platform. The interface includes a global search bar for locating students, programs, or documents, alongside a user profile section that confirms the administrator's login status.

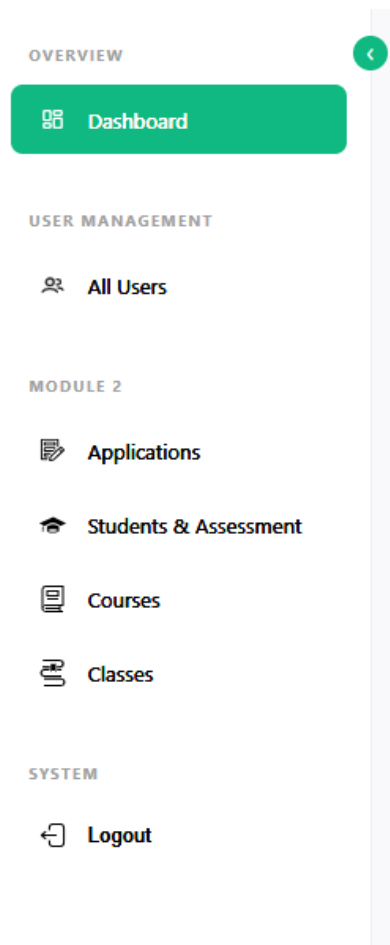


Figure 5.63 Admin Portal Sidebar

Figure 5.63 illustrates the Admin Portal Sidebar, which serves as the primary navigation menu for administrative users. The sidebar is organized into logical sections such as Overview, User Management, Module 2, and System, providing quick access to essential tools like the Dashboard, All Users, and Logout functions.

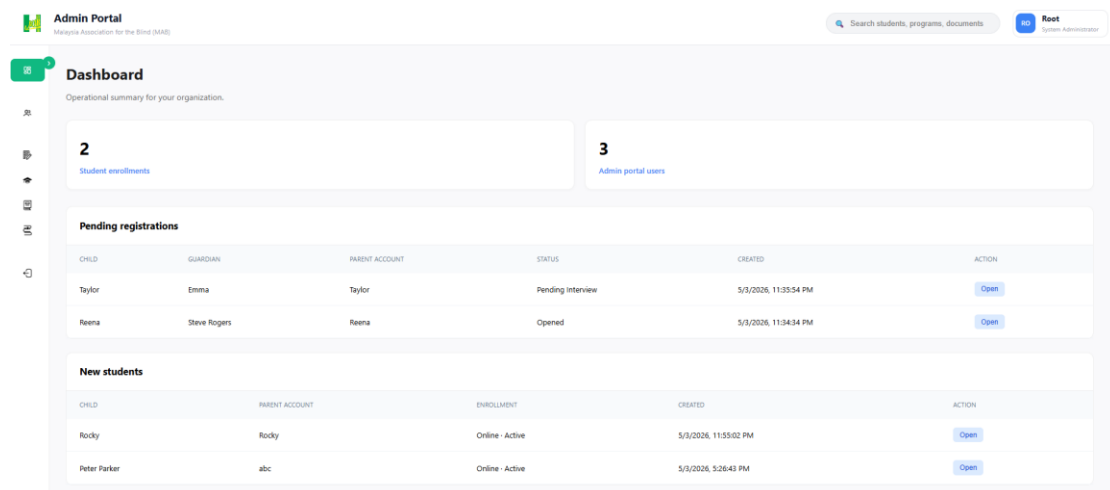


Figure 5.64 Admin Portal Dashboard

Figure 5.64, presents the Admin Portal Dashboard, providing an operational summary of the organization. The top section features quick-glance metrics for student enrollments and admin portal users, while the main body includes tables for managing Pending registrations and New students. Each entry allows administrators to monitor status updates, such as Pending interview or Online - Active and provides an "Open" action button for further processing where they can view the students data in detail. This centralized interface ensures that staff can efficiently track progress across various enrollment and registration stages.

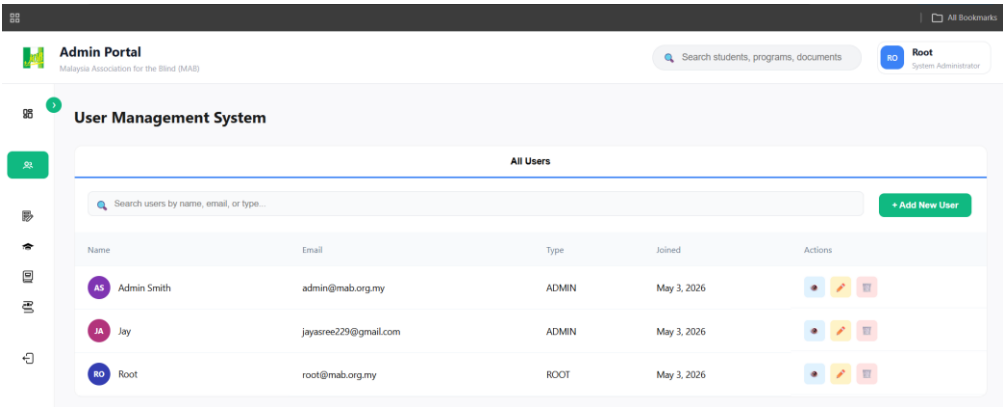


Figure 5.65 User Management System in Admin Portal

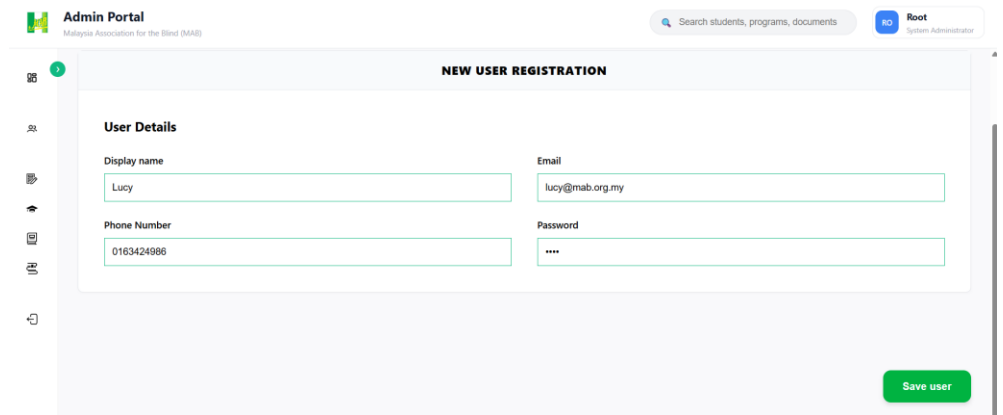


Figure 5.66 New User Admin Account Registration

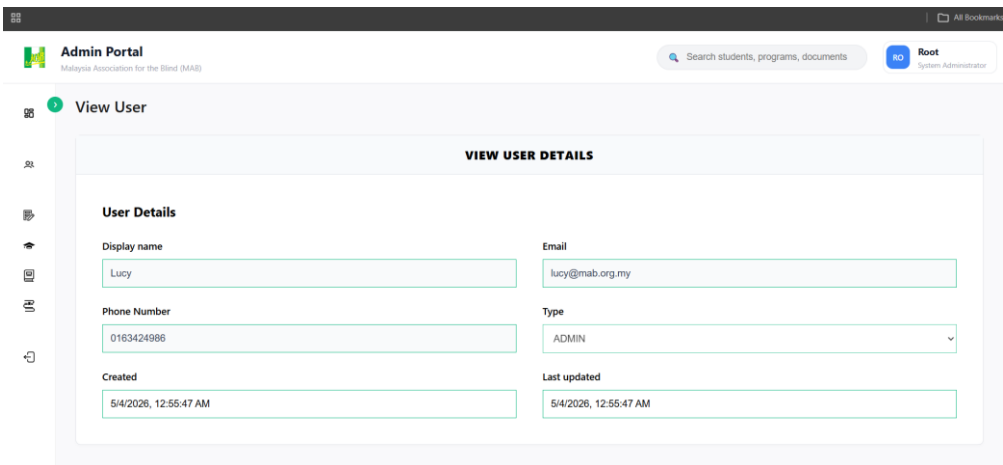


Figure 5.67 View Existing user Account Registration

The figures 5.65 - 5.67 shows the overall flow of the User Management System within the Admin Portal. Figure 5.65 highlights the All Users table, where administrators can view a detailed list of registered accounts and their complete details such as email addresses, roles, and the date they joined the system. This table includes a search function for quick filtering and an "Add New User" button that leads to Figure 5.66 which is the New User Admin Account Registration page. This registration page provides a form for entering essential User Details, which includes name, email, phone number, and password. Clicking "Save User" would then save the account. The View Existing User Account Registration page as per Figure 5.67, allows administrators to examine specific account details in a read-only or editable format, displaying timestamps for when the account was created and last updated to maintain accurate administrative records.

Name	Form Type	Status	Submitted At	Remarks	Actions
Taylor	Parent Training Course Registration	Pending Interview	May 3, 2026	-	[View] [Edit] [Delete]
Renea	Parent Training Course Registration	Opened	May 3, 2026	-	[View] [Edit] [Delete]
Roddy	Parent Training Course Registration	Pending Payment	May 3, 2026	-	[View] [Edit] [Delete]
Peter Parker	Parent Training Course Registration	Success	May 3, 2026	-	[View] [Edit]
John Doe	Parent Training Course Registration	Rejected	May 3, 2026	-	[View] [Edit]

Figure 5.68 Module 2 Application Form Masterlist

The Figure 5.68 above, presents the Module 2 Application Form Masterlist within the Admin Portal. This centralized interface provides administrators with a comprehensive table of all submitted forms, including key details such as the applicant's name, submission date, and current status which ranges from "Pending Interview", "Pending Payment", "Success" or "Rejected". Each entry is equipped with a set of action icons, allowing staff to view, edit, or manage individual applications as they move through the enrollment process. By utilizing the search bar at the top of the list, administrators can quickly filter results by name or email to efficiently handle large volumes of student data.

Admin Portal
Manage applications for the BSc (Hons)

Search students, programs, documents **Reet** System Administrator

Application Admin Matters

PROCESS APPLICATION - ID: 473E5241-6519-4977-8457-ABCFE8BC646A

Use this page to process workflow actions. Steps are unlocked based on current application status.

1. Interview Setup

Interview Mode: Interview Date:

Interview Venue:

Figure 5.69-a Application Admin Master - a

Admin Portal
Manage applications for the BSc (Hons)

Search students, programs, documents **Reet** System Administrator

Application Admin Matters

PROCESS APPLICATION - ID: 473E5241-6519-4977-8457-ABCFE8BC646A

Use this page to process workflow actions. Steps are unlocked based on current application status.

2. Interview Result

Interview Mode: Interview Date:

Meeting Link:

Interview Attendance:

Setup Remark:

Final Result: Enrollment Type:

Remarks:

Figure 5.69-b Application Admin Master - b

Admin Portal
Manage applications for the BSc (Hons)

Search students, programs, documents **Reet** System Administrator

Application Admin Matters

PROCESS APPLICATION - ID: 473E5241-6519-4977-8457-ABCFE8BC646A

Use this page to process workflow actions. Steps are unlocked based on current application status.

3. Payment Verification

Offer letter:

Payment Receipt:

☐ I confirm that the payment has been verified and received.

Reject Application

Reject is handled as a dedicated action outside the stepper workflow.

Reject Reason (optional):

Figure 5.69-c Application Admin Master - c

Admin Portal
Manage applications for the BSc (Hons)

Search students, programs, documents **Reet** System Administrator

Application Admin Matters

PROCESS APPLICATION - ID: 473E5241-6519-4977-8457-ABCFE8BC646A

Use this page to process workflow actions. Steps are unlocked based on current application status.

Reject Application

Reject is handled as a dedicated action outside the stepper workflow.

Reject Reason (optional):

Figure 5.69-d Application Admin Master - d

The screenshot displays the 'Admin Portal' interface. At the top, there is a search bar and a 'Reset' button. A progress bar shows the current step in the workflow. The main content area is divided into sections: 'Offer letter' with a 'View Offer Letter' button, '3. Payment Verification' with a 'View Receipt' button, and 'Reject Application' which includes a text area for 'Reject Reason (optional)' and a 'Reject Application' button. A 'No Available Actions' button is visible at the bottom right.

Figure 5.69-e Application Admin Master - e

The figures above, illustrate the comprehensive workflow of the Application Admin Master page, which guides admins through the stages of processing a student application for Module 2. The process is managed via a progress stepper at the top of the interface, which transitions through Interview Setup, Interview Result, and Payment Verification one by one.

Figure 5.69-a shows that the flow will begin with the administrator configuring the interview details, including the Interview Mode which are online or offline with the Interview Date. If the Interview is Online, the system will automatically change the textfield to input the online meeting link and if it is Online to textfield to input the location.

Figure 5.69-b & c will be the part for admins to key in the interview result details. Once the interview is conducted, the administrator records the outcome in the Interview Result section. The Interviewee Attendance is automatically set to Confirmed Attending the moment the Interview Setup details are keyed in and saved. Additionally, an Offer Letter will be automatically generated by the system if the Final Result is Pass and the system will not allow modification besides not generating Offer letter if the Final Result is Fail.

Figure 5.69 - d & e would be The final stage involves Payment Verification, where the administrator reviews the uploaded Payment Receipt. Upon confirming the funds have been received, the admin checks a verification box to finalize the enrollment.

Throughout this flow, a dedicated Reject Application section remains available at the bottom of the page. This allows administrators to exit the standard workflow by providing a Reject Reason if the applicant does not meet the necessary criteria at any stage.

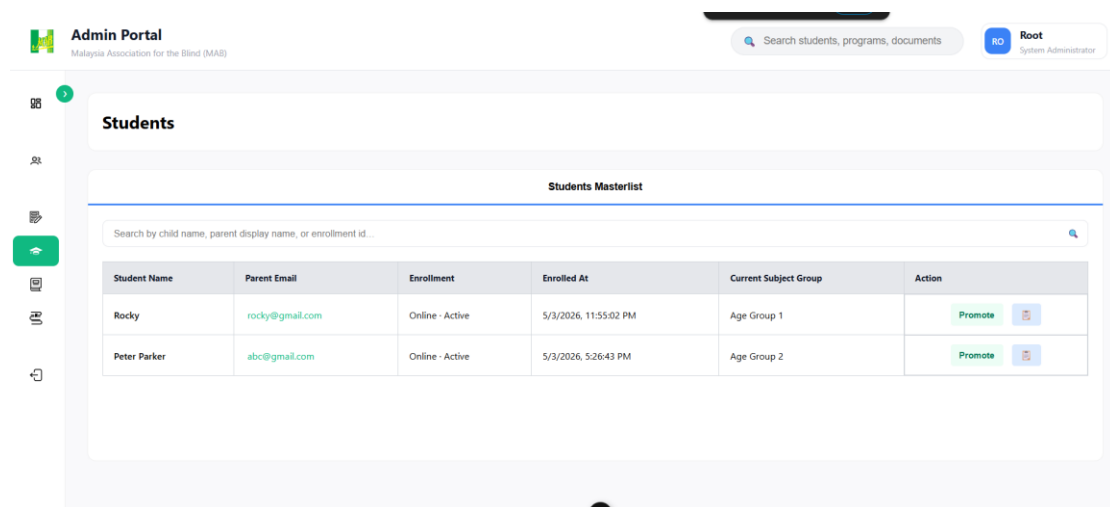


Figure 5.70 Student Masterlist Page

Figure 5.70 showcases the Students Masterlist interface within the Admin Portal, where administrators can view essential student data such as enrollment status and subject groups. The table provides actionable options for each student entry, including a Promote button to advance the next Age Group and Clipboard icons for viewing detailed profiles.

CHAPTER 5

Admin Portal
Malaysian Association for the Blind (MAB)

Search students, programs, documents

Students Assessment Details

Enrollment summary

Child	Peter Parker
Parent	abc
Email	abc@gmail.com
Phone	—
Enrollment method	Online
Enrollment status	Active
Registration ID	85834801-c761-49ec-b992-601484ed809a
Enrollment ID	18239ecf-c875-4c59-9f69-87120f75d709
Created	5/3/2026, 5:2643 PM
Last updated	5/3/2026, 5:2643 PM

Subject group progress

Figure 5.71-a Student Assessment Details - a

Admin Portal
Malaysian Association for the Blind (MAB)

Search students, programs, documents

Last updated: 5/3/2026, 5:26:43 PM

Subject group progress

Subject group	Subject	Progress
Age Group 1	Learn The ABCs - Part 1	Completed
Age Group 1	Our Favorite Numbers - Part 2	Completed
Age Group 2	Days of the week	Pending
Age Group 2	Shapes	Completed
Age Group 2	Colours	Pending

Assessment history

Subject	Result	Assessment Time	Parent Verification
Age Group 1 / Our Favorite Numbers - Part 2	Pass	5/4/2026, 8:13:00 PM	Acknowledged
Age Group 1 / Learn The ABCs - Part 1	Pass	5/3/2026, 8:00:00 PM	Acknowledged

[+ New Assessment](#)

Figure 5.71-b Student Assessment Details - b

Assessment history

Subject	Result	Assessment Time	Parent Verification
Age Group 1 / Our Favorite Numbers - Part 2	Pass	5/4/2026, 8:13:00 PM	Acknowledged
Age Group 2 / Days of the week	Pass	5/4/2026, 2:13:00 AM	Acknowledged
Age Group 2 / Days of the week	Fail	5/4/2026, 12:14:00 AM	Acknowledged
Age Group 1 / Learn The ABCs - Part 1	Pass	5/3/2026, 8:00:00 PM	Acknowledged

[+ New Assessment](#)

New Assessment Result

Assessment Group:

Subject:

Assessment Date & Time:

Result:

Remark:

[Save](#) [Cancel](#)

Figure 5.71-c Student Assessment Details - c

The figures Figure 5.71-a - c above outline the comprehensive Student Assessment Details page within the Admin Portal, which shows the administrative flow for monitoring and recording student academic performance.

Figure 5.71-a, illustrates the Enrollment Summary of the student where the page begins with a high-level overview of the student's profile, including their name, parent contact information, and enrollment specifics such as status, registration ID, and relevant timestamps.

The Subject Group Progress as shown in Figure 5.71- b, provides a tracking table that lists various subjects assigned to the student, categorized by age group. It allows administrators to quickly identify which videos are Completed and which remain Pending ensuring a clear view of the student's learning trajectory.

Below the progress overview, as shown in Figure 5.71-b & c, is the Assessment History where there is a table that logs every evaluation attempt. It details the specific subject, the result such as Pass or Fail, the assessment time, and the status of parent notification which are Acknowledge or Pending.

To update a student's record, the admin uses the "New Assessment" button, as displayed in Figure 5.71-c, to trigger the New Assessment Result form. This interface allows the user to select the appropriate Assessment Group and Subject, set the date and time, record the Result, and add specific Remarks before saving the entry to the student's permanent history.

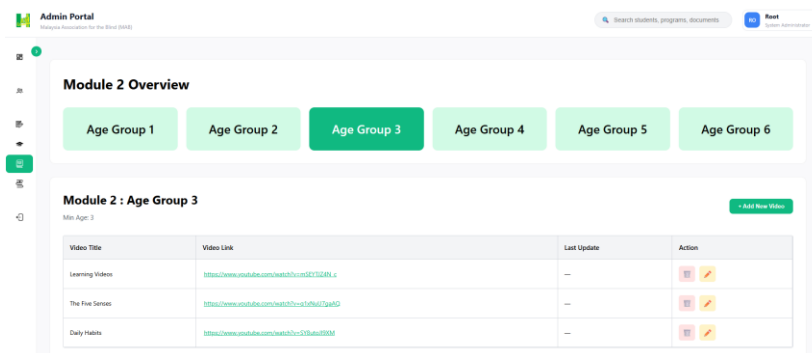


Figure 5.72 Courses Page to Manage Age Group Videos

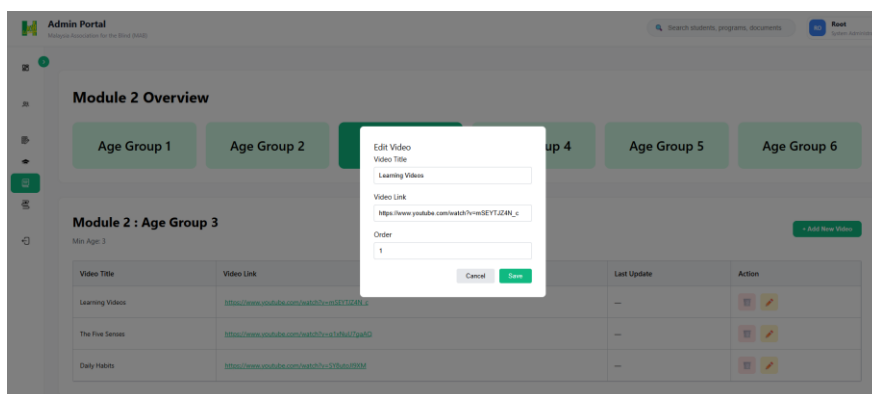


Figure 5.73 Pop up Form to Add or Edit Age Group Videos

Figure 5.72 showcases the Courses Page for managing curriculum videos across different age groups in the Admin Portal. Administrators can select a specific category, such as Age Group 3, to view a masterlist of video titles and their corresponding YouTube links. The interface includes an Add New Video button and action icons for deleting or modifying existing content. A pop-up form as shown in Figure 5.73 enables users to input the video title, link, and display order before saving the changes to the module. The pop-up form appears for Adding New Video or modifying existing video.

Admin Portal
Malaysia Association for the Blind (MAB)

Search students, programs, documents

Classes

Classes Masterlist

Search Classes by Name, Instructor, Venue, or Id...

Add New Class

Class Name	Instructor	Start Time	End Time	Venue	Action
Moral	Rozit	5/1/2026, 12:10:00 AM	5/5/2026, 12:10:00 AM	Zoom	Add Edit Delete
English Class	Rozit	5/3/2026, 9:00:00 AM	5/3/2026, 11:00:00 AM	Zoom	Add Edit Delete
Verse 1	Rozit	5/3/2026, 10:00:00 AM	5/3/2026, 11:00:00 AM	Online	Add Edit Delete
Verse 2	Rozit	5/4/2026, 10:30:00 PM	5/3/2026, 11:00:00 PM	Online	Add Edit Delete

Figure 5.74 Classes Masterlist Page

Admin Portal
Malaysia Association for the Blind (MAB)

Search students, programs, documents

NEW CLASS REGISTRATION

Class Details

Class Name:

Instructor:

Start:

End:

Venue:

Subject group:

Subject:

Students:

Add New Class

Figure 5.75 New Class Registration Page

The figures 5.74 illustrate the Classes Masterlist Page and Figure 5. displays New Class Registration flow within the Admin Portal. The Classes Masterlist provides an overview of scheduled sessions, including class names, instructors, start and end times, and venues, with an Add New Class button to initiate the registration process. Selecting this option opens the New Class Registration Page as shown in Figure 5.75, where administrators can input specific Class Details such as the instructor from the dropdown menu, venue with subject group and specific subjects via the dropdown menu. Besides that, the form includes a Students selection field, allowing admins to manually add multiple students via selecting their through the dropdown menu to the new class before saving the record to the portal.

5.6 System Integration and Configuration

To ensure the OSSVIM system functions as a cohesive ecosystem, it relies on the simultaneous operation of multiple interconnected project files and repositories. The architecture is primarily split between the User Portal Frontend (FE) and the Admin Portal Frontend (FE), both of which serve as the primary user interfaces for different type of users.. While the User Portal manages student-facing features like class progress and attendance, the Admin Portal handles high-level management tasks such as user registration and application processing.

The structural backbone of this system is the OSSVIM Portal Backend (BE), which works together with OSSVIM Common. The backend manages the core logic, API requests, and database interactions necessary for the frontends to display real-time data. Meanwhile, OSSVIM Common acts as a shared resource library, housing essential utilities, shared types, and transport protocols that ensure both the backend and frontends are communicating using the same data structures.

Without all four of these components, which are the two frontends, the backend, and the common library running together, the system will not be able to function as needed. For instance, an admin attempting to view a student's assessment in the Admin Portal would be unable to retrieve that information if the backend were offline, or if the common library were missing the data definitions required to provide the response. This interdependency ensures that updates to the core system logic are reflected accurately across every user interface.

Finally, it is worth noting that OSSVIM Public is currently designed as a tentatively standalone module. While it may eventually be integrated more deeply into the main ecosystem, it presently operates independently of the primary portal-backend-common pipeline. This modularity allows for specific public-facing features to be maintained or updated without necessitating a full deployment of the entire administrative and student-facing infrastructure. The full system is planned to be deployed when several modules are developed in the future.

5.7 Implementation Issues and Challenges

A number of problems emerged throughout the development of the system. One major challenge was the page navigation within the system. Some should be able to be reached directly with a URL while also being part of a larger, parent section. This sometimes caused pages to go missing (404 errors), and folder structure had to be rearranged in order to fix it. Besides that, the sidebar navigation was also tricky and caused a small implementation issue as it had to handle nested menus, expand as well as collapse properly and also needed to correctly highlight the current page, even when accessed directly through the main menu.

Using TypeScript also presented some hurdles. This is because, while it is a flexible language, supporting both front-end and back-end development, grasping the language took some time. This therefore meant that implementation issues were created every now and then when there were type mismatches between different libraries and the system components. Finally, getting the images to display correctly was a very time-consuming part of the project. The prototype had images placed inconsistently, making the layout look random and misaligned on the system. It took a lot of extra effort and adjustments to make sure the design was clean, uniform, and still worked well on different screen sizes.

Besides that, the most challenging part was in regards to managing the complexity of the modern web frameworks used for the portal. As the application grew, maintaining the UI synchronization with the backend data became slightly complicated. Issues such as "hydration errors", where the server and the client disagreed on what should be displayed caused rendering bugs. To address this, the development process was adjusted to include more robust state management patterns, ensuring that data flowed predictably through the components and that the user experience remained smooth across different browsers.

Beyond the technical code, managing the project's timeline alongside other commitments proved to be a constant balancing act. The desire to include advanced features often conflicted with the need to meet strict deadlines, leading to the risk of scope creep. To overcome this, a modular development strategy was adopted, focusing first on the core functionalities essential for the system's operation.

CHAPTER 6

System Evaluation and Discussion

6.1 System Functional Testing and Results

This section describes the testing strategies used, such as Black Box Testing for unit modules and manual user acceptance testing. It also outlines the metrics used, such as test pass rates and system response times.

According to [26], Black box testing is a software testing technique in which the tester evaluates the functionality of a system without having any knowledge of its internal code, structure, or implementation. The main objective is to verify whether the software behaves according to the specified requirements

Table 6.1 System Testing and Performance Metrics for Sign Up Page

Field	Details
Test Case ID	TC_001
Module Name	User Sign Up
Test Title	Verify New User Registration functionality with valid and invalid data.
Pre-requisites	1. Application is deployed and accessible via localhost:3000 .2. The database is connected and operational.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	UI elements verification.	N/A	Name, Email, Password fields, Checkbox, Signup button, Google/Apple buttons, and Logo must be visible.	Pass
2	Signup with empty fields.	All fields null	The system should trigger "Required" validation messages for all three input fields.	Pass
3	Enter invalid email format.	abc@invalid	The system should show an error: "Bad Request Format" error	Pass
4	Data entered but checkbox unchecked.	Valid name, email, pass	"Signup" button should either remain disabled or show a message: "You must agree to the terms."	Pass
5	Verify password masking.	P@ssword123	Characters should appear as dots (...) to ensure privacy.	Pass
6	Perform successful registration.	Name: John Doe Email: test@gmail.com Check: Accepted	User is redirected to the Sign In	Pass

Table 6.2 System Testing and Performance Metrics for Sign In Page

Field	Details
Test Case ID	TC_002
Module Name	User Sign In
Test Title	Verify User Authentication functionality with valid and invalid credentials.
Pre-requisites	1. Application is deployed and accessible via localhost:3000 .2. The database is connected and operational.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	UI elements verification.	N/A	Email Address field, Password field, Login button, Social Icons, and "Sign Up" link must be visible.	Pass
2	Login with empty fields.	Both fields null	System should trigger "Required" validation messages for Email and Password.	Pass
4	Enter correct email but wrong password.	Correct Email, Wrong Pass	System should show an error: "Bad Request Format"	Pass
5	Verify password masking.	MySecret123	Characters should appear as dots (...) to ensure privacy.	Pass
6	Verify Forgot Password link	Forgot Password link	Redirected to page to reset password	Fail
7	Perform successful login.	Email: test@gmail.com Pass: ValidPassword	User is redirected to the dashboard	Pass
8	Verify "Sign Up".	Click "Sign Up" link	User is redirected from Login Page to the Sign Up Page.	Pass

Table 6.3 System Testing and Performance Metrics for Sidebar Bar in Parent Module

Field	Details
Test Case ID	TC_003
Module Name	Sidebar in Parent Module
Test Title	Verify Sidebar navigation and functionality.
Pre-requisites	1. User is logged in 2. Sidebar is open on the screen.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	UI elements verification.	N/A	Profile name, Menu Buttons , and 'X' close button are visible.	Pass
2	Verify UI functionality.	Click each button	Application should redirect to the corresponding page (Dashboard, App Form, Status, etc.).	Pass
3	Test navigation links.	Click 'X' icon	The sidebar should collapse and active page should be visible	Pass
4	Test Button Hover function	Hover on all Button	Selected item should be highlighted in yellow	Pass
5	Test Button Click function	Click each button	Clicked button should be in green and stay green	Pass

Table 6.4 System Testing and Performance Metrics for Common Header in Parent Module

Field	Details
Test Case ID	TC_004
Module Name	Common Header in User Portal
Test Title	Verify Header navigation and Logout functionality.
Pre-requisites	1. User is logged in 2. Sidebar is open on the screen.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI elements.	N/A	Home, Languages, My Course, LOG OUT, and Sidebar icon (hamburger) are visible.	Pass
2	Test navigation links.	Click "Home"	The system should redirect to the correct page successfully.	Pass
3	Test navigation links.	Click "Languages"	The system changed language successfully.	Fail
4	Test navigation links.	Click "My Course"	The system should redirect to the Student Module successfully.	Pass
	Verify LOG OUT action.	Click "LOG OUT"	The session should be cleared and the user is redirected to the login page.	Pass

Table 6.5 System Testing and Performance Metrics for Dashboard Page in Parent Module

Field	Details
Test Case ID	TC_005
Module Name	Dashboard in Parent Module
Test Title	Verify Dashboard data rendering and progress tracking post-submission
Pre-requisites	1. User is logged in 2. User is redirected to the /dashboard route.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify Pre-submission UI	New User Account	"Past Applications History" and "Your Progress" should show placeholder text (e.g., "You have no applications yet").	Pass
2	Verify Last Login Info accuracy.	System Date/Time	The displayed "Last Login Info" timestamp matches the user's most recent login session.	Pass
3	Verify "Post-submission" state rendering.	Submitted Form	The "Past Applications History" list updates to include the submitted module details.	Pass
4	Verify Progress Tracker visualization.	Active Application	"Your Progress" section displays a numbered list (1, 2, 3) representing the application workflow.	Pass
5	Verify Step Completion status.	Submitted Step	Step 1 ("Application Submission") should appear highlighted in green with a completion date/time.	Pass
6	Verify Dynamic Data Updates.	Database Refresh	Any changes to the application status in the backend are reflected in the "Your Progress" section in real-time.	Pass

Table 6.6 System Testing and Performance Metrics for Application Form in Parent Module

Field	Details
Test Case ID	TC_006
Module Name	Application Form for Module 2
Test Title	Verify multi-section form input, file upload, and submission logic.
Pre-requisites	1. User is logged in 2. The user has navigated to the Application Form page.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify text field validation	All text fields	The system should highlight missing mandatory fields with red borders or error text.	Pass
2	Test File Upload functionality.	File types : png, jpeg and pdf	The file is successfully attached and displayed in the list with an option to "remove".	Pass
3	Verify Radio Button selection.	Gender: Male/Female	Only one option can be selected at a time.	Pass
4	Verify Optional vs Mandatory Guardian fields.	Guardian 1 (Req) / 2 (Opt)	Form allows submission if Guardian 2 is empty, but blocks if Guardian 1 is empty.	Pass
5	Test Dropdown menu for "State".	Select "Perak"	The dropdown displays all Malaysian states and correctly captures the selection.	Pass
7	Perform form submission.	Click "Save"	System displays a note which indicates data submitted successfully	Pass
8	Verify data persistence after submission.	Re-visit Form	Fields should display the previously saved data in a read-only or editable state as per design.	Pass

Table 6.7 System Testing and Performance Metrics for Application Status Page

CHAPTER 6

Field	Details
Test Case ID	TC_007
Module Name	Interview Details
Test Title	Verify status tracking logic and dynamic detail rendering.
Pre-requisites	1. User is logged in 2. Application has been submitted.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI for users with no submissions.	New User Account	"No Active Application" badge appears; "No application history available" message is displayed.	Pass
2	Test application dropdown selection.	Click Dropdown	Dropdown should list all submitted applications with their unique IDs.	Pass
3	Verify detail rendering post-selection.	Select Active App	"Application Details" section is populated with ID, Name, Age, Date, and Course Applied.	Pass
4	Verify Status Badge accuracy.	Status: Interview	A status badge appears in the top right of the container.	Pass
5	Verify Read-Only restriction.	Attempt Edit	The "Note" footer correctly states that editing is unavailable while the application is being processed.	Pass
6	Verify data matching.	DB vs UI	Data displayed in the "Application Details" section must exactly match the data entered.	Pass
7	Test "Show all contents" link.	Click Link	Triggers an expansion or redirection to view the all application form data.	Fail

Table 6.8 System Testing and Performance Metrics for Interview Details Page

CHAPTER 6

Field	Details
Test Case ID	TC_008
Module Name	Interview Details
Test Title	Verify rendering of interview scheduling, panel information, and meeting links.
Pre-requisites	1. User is logged in 2. Application has been verified by admin

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI for user with no scheduled interview.	New Application	"Interview details unavailable" message appears; placeholders (-) are shown for date, mode, and location.	Pass
2	Test application dropdown selection.	Select Active App	Selection successfully populates the interview data fields below.	Pass
3	Verify Date & Time accuracy.	Interview Date and time	The component displays the correct scheduled time as set by the administrator.	Pass
4	Verify Interview Panel list.	Panelist Names/Roles	Displays full names and contact numbers of interviewers	Pass
5	Test Online Meeting Link.	Click Meeting URL	The link should be clickable and successfully redirect the user to the external meeting platform	Pass
6	Verify "Important Notes" visibility.	N/A	The yellow alert box at the bottom containing instructions for medical/educational documents is clearly visible.	Pass

Table 6.9 System Testing and Performance Metrics for Offer Details Page

CHAPTER 6

Field	Details
Test Case ID	TC_009
Module Name	Offer Letter Page
Test Title	Verify rendering of offer details, acceptance/declination logic, and post-response UI states.
Pre-requisites	1. User is logged in 2. Application has been updated to "Pending Acceptance"

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI before results are configured.	Application: Pending Interview	Displays "Program Details" but shows a blank or neutral state for the offer section.	Pass
2	Verify "Congratulations" view.	Status: Passed	Displays acceptance message, "View Offer Letter" link, and "Response Required" yellow box.	Pass
3	Test "View Offer Letter" link.	Click Link	Triggers a download or opens a PDF of the formal offer letter in a new tab.	Pass
4	Test "Accept Offer" functionality.	Click "Accept Offer"	System shows a green "Offer Accepted" confirmation	Pass
5	Test "Decline Offer" functionality.	Click "Decline Offer"	System shows a red "Offer Declined" message	Pass
6	Verify state persistence.	Re-login after action	After accepting/declining, the buttons must remain hidden and only the final status message should be visible.	Pass

Table 6.10 System Testing and Performance Metrics for Payment Page

CHAPTER 6

Field	Details
Test Case ID	TC_010
Module Name	Payment Page
Test Title	Verify payment details rendering, QR code generation, and receipt upload functionality.
Pre-requisites	1. User is logged in 2. An offer has been accepted to unlock the Payment module.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI for Rejected/Declined Offer.	Status: Rejected	Displays "No pending payment registration found" error message in a red alert box.	Pass
2	Verify Payment Amount & Items.	RM 350.00	Correct amount and itemized list (Writing set, stylus, etc.) are displayed as per the accepted module.	Pass
3	Verify QR Code rendering.	Accepted Offer	A valid, scannable DuitNow QR code is visible for the "Scan to Pay" option.	Pass
4	Verify Bank Transfer Details.	Maybank Account	Displays correct Bank Name, Account Number, and Account Name for manual transfers.	Pass
5	Test Receipt Upload.	payment_receipt.jpg	File is successfully attached and the upload area shows the filename and a confirmation icon.	Pass
6	Verify "Important Information" visibility.	N/A	Yellow alert box displays payment deadlines	Pass

Table 6.11 System Testing and Performance Metrics for Sidebar Bar in Student Module

CHAPTER 6

Field	Details
Test Case ID	TC_011
Module Name	Sidebar in Student Module
Test Title	Verify Sidebar navigation and functionality.
Pre-requisites	1. User is logged in 2. The sidebar is open on the screen.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	UI elements verification.	N/A	Profile name, Menu Buttons , and 'X' close button are visible.	Pass
2	Verify UI functionality.	Click each button	Application should redirect to the corresponding page (Dashboard, Report Card & Assessment, Classes, etc.).	Pass
3	Test navigation links.	Click 'X' icon	The sidebar should collapse and active page should be visible	Pass
4	Test Button Hover function	Hover on all Button	Selected item should be highlighted in yellow	Pass
5	Test Button Click function	Click each button	Clicked button should be in green and stay green	Pass
6	Verify Role Isolation.	Student Module	Ensure Parent-specific links (like "Application Form" or "Offer Letter") are NOT visible in this menu.	Pass

Table 6.12 System Testing and Performance Metrics for Student Module Dashboard

CHAPTER 6

Field	Details
Test Case ID	TC_012
Module Name	Student Dashboard module
Test Title	Verify rendering of student profile data and course progress tracking.
Pre-requisites	1. User is logged in 2. Students are enrolled in at least in a Module

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify Profile Header rendering.	Student Account	The system displays a student's profile picture, "Student" role label, and current enrolled module.	Pass
2	Verify "Your Progress" section.	Enrollment Data	The system correctly identifies the subject group for the current enrollment.	Pass
3	Verify Progress Bar calculation.	Subject Enrolled	Progress bar should accurately reflect the percentage of completion and rendered correctly	Pass
4	Verify UI consistency.	N/A	Header navigation remains consistent with the rest of the portal.	Pass
5	Verify data isolation.	N/A	Ensure students only see their own progress and cannot view data for other students or modules.	Pass

Table 6.13 System Testing and Performance Metrics for Report Card & Assessments

CHAPTER 6

Field	Details
Test Case ID	TC_013
Module Name	Report Card & Assessments module
Test Title	Verify assessment result viewing and parent verification submission.
Pre-requisites	1. User is logged in 2. Assessments have been graded completed by the trainer.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI elements.	N/A	Past assessment Result, Present Assessment Result and verification checkbox and Submit button are visible.	Pass
2	Review assessment results.	Existing grades	Assessment name, result and timestamp are correctly displayed.	Pass
3	Perform Parent Verification.	Click checkbox and "Submit Verification"	Clicking the checkbox and submitting should successfully record the parent's verification.	Pass
4	Verify Status Update.	After submission	The "Parent Verification" status column changes to "Done".	Pass
5	Verify UI state after submission.	N/A	The "Current Assessment Results" section should update to show "No current assessment results".	Pass

Table 6.14 System Testing and Performance Metrics for Classes Page

CHAPTER 6

Field	Details
Test Case ID	TC_014
Module Name	Classes module
Test Title	Verify rendering of class progress and completion status
Pre-requisites	1. User is logged in 2. Student is enrolled in a course

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI Consistency.	N/A	UI layout, color schemes (green progress bars), and font styles match the Dashboard design.	Pass
2	Verify "Age Group 1" (Completed).	Group 1	The section displays "2/2 lessons Completed", status label "Completed", and 100% green bar.	Pass
3	Verify "Age Group 2" (In-progress).	Group 2	The section displays "1/3 lessons Completed", status label "In progress", and 33% bar fill.	Pass
4	Verify math accuracy.	Data Sync	The visual percentage bar width must match the calculated ratio of (Completed/Total) lessons.	Pass

Table 6.15 System Testing and Performance Metrics for Attendance Page

CHAPTER 6

Field	Details
Test Case ID	TC_015
Module Name	Attendance module
Test Title	Verify rendering of class progress and completion status
Pre-requisites	1. User is logged in 2. Student is enrolled in a course

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify status legend.	N/A	Legend correctly displays "Absent" (Red) and "Present" (Green) indicators.	Pass
2	Verify attendance marker accuracy.	Attendance Records	Days marked as present are highlighted in green, and days marked as absent are highlighted in red.	Pass
3	Test month navigation.	Click < or >	Calendar dynamically updates to show attendance data for the previous or next month.	Pass
4	Verify UI consistency.	N/A	Header, footer, and page title align with global portal design.	Pass

Table 6.16 Testing and Performance Metrics for Parent Guidelines Page

CHAPTER 6

Field	Details
Test Case ID	TC_016
Module Name	Parents Guidelines
Test Title	Verify video playback, progress tracking, and manual completion marking.
Pre-requisites	1. User is logged in 2. Educational videos are correctly embedded and linked from the backend.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify video embedding.	Video embedded	YouTube player loads correctly with functional play and pause	Pass
2	Verify watch status badge.	N/A	A "WATCHED" overlay or badge appears on videos that have been previously completed.	Pass
3	Verify progress counter logic.	N/A	"Videos Watched" counter accurately reflects the number of completed videos.	Pass
4	Test manual completion.	"Mark As Completed" checkbox	Checking the box updates the counter and adds the badge to the thumbnail.	Pass
5	Verify UI Consistency.	N/A	Layout, progress badge colors, and fonts match the overall system design.	Pass

Table 6.17 System Testing and Performance Metrics for Admin Login

CHAPTER 6

Field	Details
Test Case ID	TC_017
Module Name	Login Module for Admin Portal
Test Title	Verify video playback, progress tracking, and manual completion marking.
Pre-requisites	1. User is logged in 2. Educational videos are correctly embedded and linked from the backend.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI elements.	N/A	"New Password" and "Confirm Password" fields are visible with the "Update Password" button.	Pass
2	Test empty field submission.	Both fields null	System prevents submission and displays "Required" validation error messages.	Pass
3	Verify password masking.	AnyPassword	Input characters remain hidden/masked for both fields to ensure security.	Pass
4	Verify login with new password.	New credentials	User can successfully log in using the newly updated password.	Pass
5	Verify Remember Me	Click Remember Me Checkbox	User credentials remembered by system	Fail

Table 6.18 System Testing and Performance Metrics for Sidebar Bar in Admin Portal

Field	Details
Test Case ID	TC_018
Module Name	Sidebar in Admin Portal
Test Title	Verify Sidebar navigation and functionality.
Pre-requisites	1. User is logged in 2. Sidebar is active and visible on the interface.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI elements and Profile.	Admin Account	Sidebar displays profile name ("Admin"), role, and full list of administrative menu and their icons must be visible.	Pass
2	Test navigation links.	Click each button	Application should redirect to the corresponding page (All User, Applications, etc.).	Pass
3	Test collapsible buttons .	Click '<' and '>' icon	The sidebar should collapse and open correctly	Pass
5	Test active button function	Click each button	Clicked button should be in green and stay green	Pass

Table 6.19 System Testing and Performance Metrics for Dashboard in Admin Portal

Field	Details
Test Case ID	TC_019
Module Name	Dashboard in Admin Portal
Test Title	Verify operational summary metrics and registration table accuracy.
Pre-requisites	1. User is logged in 2. Active student enrollments and portal users exist in the database.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI element	N/A	Page renders and displays Operational summary for your organization and metric cards.	Pass
2	Verify metric counters.	Mock Database Counts	Student enrollments and Admin portal users accurately reflect database counts.	Pass
3	Verify "Pending registrations" table.	Users	Table displays Child name, Guardian, Parent Account, Status (e.g., "Pending Interview"), and Timestamp correctly	Pass
4	Verify "New students" table.	Users	Displays recently active students with enrollment types (e.g., "Online - Active").	Pass
5	Test record drill-down.	Click "Open" button	System redirects the admin to the detailed application or student profile page.	Pass

Table 6.20 System Testing and Performance Metrics for User Account Management in Admin Portal

Field	Details
Test Case ID	TC_020
Module Name	User Account Management
Test Title	Verify application filtering, status updates, and detail retrieval.
Pre-requisites	1. User is logged in 2. Multiple applications exist in the system across different states

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI element	N/A	The page renders and loads, showing all submitted student applications and their current stated.	Pass
2	Verify column data accuracy.	Application ID, Student Name, Status	Table correctly displays ID Student Name and current Status.	Pass
3	Test Search functionality.	Search query	The list filters to show only applications matching the student name	Pass
4	Test Status Filtering.	Filter: "Pending"	The system displays only applications with a "Pending" or "Processing" status.	Pass
5	Verify Pagination/Scroll.	Multiple records	The system allows administrative users to scroll or navigate through the full list of records.	Pass
6	Access detailed view.	Click "Open" button	System redirects to the specific application detail page for processing.	Pass
7.	New Registration	Click “Add New User” button	System displays form to input the new account details and saves properly	Pass
8.	View Existing Registration	Click “Eye” Button	System displays account details in a read-only or editable format with account creation and last edited timestamps.	Pass
9.	Delete Existing Registration	Click “Bin” Button	System deletes the account successfully and deleted account cannot log in the system	Pass

Table 6.21 System Testing and Performance Metrics for Module 2 Application Processing in Admin Portal

CHAPTER 6

Field	Details
Test Case ID	TC_021
Module Name	Module 2 Application Processing
Test Title	Verify admin's ability to review application data and update processing status.
Pre-requisites	1. User is logged in 2. An application has been selected from the Applications list

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI elements and rendering	N/A	Page renders and displays all user application and details correctly	Pass
2	Verify “Eye” Buttons	Existing submitted application	System displays the registration details submitted by the user in User Portal	Pass
3	Verify “Folder” Buttons	Existing submitted application	System Redirects to Application Admin Matter to carried necessary functions there	Pass
4	Verify “Check” Button	Existing submitted application	System Approves Application	Pass
5	Verify “X” Button	Existing submitted application	System Rejects Application	Pass
6	Verify Parent Notification trigger.	Status Change	Changing status to "Processing" or "Interview" should trigger the relevant UI update on the Parent's Dashboard.	Pass
7	Verify data matching.	DB vs UI	Ensure all data fields (ID, Name, Date) perfectly match the parent’s submission without truncation.	Pass

Table 6.22 : System Testing and Performance Metrics for Interview Scheduling & Management in Admin Portal

CHAPTER 6

Field	Details
Test Case ID	TC_022
Module Name	Interview Management
Test Title	Verify interview scheduling, panel assignment, and dynamic status updates.
Pre-requisites	1. User is logged in 2. Application exists with a status allowing interview scheduling.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify UI elements and rendering	N/A	Page renders and display necessary UI and details correctly	Pass
2	Verify progress stepper rendering.	Click “Save/Update” Button at the bottom of the page	Progress stepper updates accordingly and accurately as per the flow	Pass
3	Verify Interview Scheduling Section	Click "Set Interview"	A form appears to input interview date, time, link/location and mode of interview correctly.	Pass
4	Verify Offer Letter generation	Interview Result is Pass	System automatically and accurately generates Offer Letter as per user details	Pass
5	Verify Payment	Uploaded Receipt by User	Able to view uploaded receipt and update verification by clicking button only after checking checkbox.	Pass
6	Halted Application	Application Rejected or Decline by User	Not able to configure details if Decline. If Rejected, rejected remarks updates is visible	Pass

Table 6.23 : System Testing and Performance Metrics for Student Assessment & Academic Records in Admin Portal

CHAPTER 6

Field	Details
Test Case ID	TC_023
Module Name	Students & Assessment
Test Title	Verify administrative tracking of academic progress and manual assessment entry.
Pre-requisites	1. User is logged in 2. Student is enrolled in module 2

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Navigate to Student Profile.	Click Clipboard Button in the Masterlist	Page displays Enrollment summary including name, registration ID, and other Active enrollment status.	Pass
2	Verify Progress Tracking table.	Subject Group Progress	The table correctly lists subjects by age group and marks videos as Completed or Pending	Pass
3	Review Assessment History.	Previous evaluations	Displays historical attempts with Subject, Result Pass or Fail, Time, and Parent Notification status.	Pass
4	Initiate New Assessment.	Click "+ New Assessment"	The "New Assessment Result" form is triggered.	Pass
5	Input Assessment Data.	Age Group 1, Pass, Date	System allows selection of assessment group, subject, result, and specific trainer remarks.	Pass
6	Save Academic Record.	Click "Save"	Entry is added to the student's permanent history and progress percentage is updated.	Pass
7	Verify Parent Verification	Verification data from User Portal	Parent Verification Status updated dynamically to Acknowledge from Pending after parent clicks the checkbox.	Pass

Table 6.24 : System Testing and Performance Metrics for Class Admin Portal

CHAPTER 6

Field	Details
Test Case ID	TC_024
Module Name	Students & Assessment
Test Title	Verify class list rendering, search functionality, and deletion workflow.
Pre-requisites	1. User is logged in 2. Existing courses are populated in the database.

Step	Step Description	Test Data	Expected Result	Pass/Fail
1	Verify data accuracy.	Course Name, Created Date	The table correctly displays information such as "Module 2" and its respective creation timestamp.	Pass
2	Test Search functionality.	Search query	The list filters to show only courses matching query	Pass
3	Test deletion trigger.	Click trash icon	A confirmation dialog or action is triggered to prevent accidental deletion of a course.	Pass
4	Verify Pagination/Scroll.	Multiple course records	The system allows administrative users to navigate through the full list of course modules.	Pass
5	Create a New Course.	Click "+ New Course" button	System redirects or opens a form to input new course details.	Pass

6.2 Objectives Evaluation

This section evaluates the extent to which the three stated objectives of the project have been achieved through the development and testing of the OSSVIM Module 2 portal.

Objective 1: To develop an accessible and informative landing page that provides parents with accurate, easy-to-understand resources related to early identification and support for BVI children.

This objective has been successfully achieved. The system includes dedicated informational landing pages covering the causes of visual impairment, early recognition of BVI symptoms, developmental milestones, and available support systems for multi-disabled and deafblind children. These pages were designed with accessibility and clarity in mind, ensuring that content is structured, readable, and navigable by users with varying levels of digital literacy. The sidebar navigation, header layout, and content hierarchy were iteratively refined to support intuitive browsing, as validated through functional testings.

Objective 2: To implement a reliable and user-friendly course registration system that facilitates class enrollment, interview scheduling, offer letter access, and kit purchasing with a secure backend infrastructure.

This objective has been met successfully. The system provides a complete registration workflow for parents, encompassing the application form (TC_006), application status tracking (TC_007), interview details viewing (TC_008), offer letter access (TC_009), and payment processing for kit purchasing (TC_010). All related test cases recorded passing results, confirming that the end-to-end registration flow operates as intended. The backend infrastructure, built using Next.js, Vue.js, and PostgreSQL, ensures data integrity and secure user interactions throughout the registration process.

Objective 3: To establish a centralized learning resource management portal where parents can monitor their child's development progress, access educational guidelines, and download relevant reports.

This objective has been met through the Student Module and Admin Portal components of the system. Parents are able to view their child's report card and assessment results (TC_013), access parent guidelines (TC_016), monitor class schedules (TC_014), and track attendance (TC_015). On the administrative side, administrators are equipped with tools to manage student profiles, record assessment outcomes, update progress tracking, and generate enrollment summaries (TC_025). All relevant test cases passed successfully, confirming the portal's effectiveness as a centralized learning management resource.

Overall, all three project objectives have been achieved successfully. The 26 test cases conducted through Black Box Testing recorded consistent pass results across all modules, affirming that the system functions in accordance with its specified requirements and successfully delivers on its intended purpose.

CHAPTER 7

Conclusion and Recommendations

7.1 Conclusion

In conclusion, the system which is in development will tremendously help in addressing the lack of centralized and accessible resources for parents of BVI children in Malaysia. Module 2 of the OSSVIM portal, in specific, aims to provide structured information on BVI childcare and parental guidance. The system will also include features for course registration and progress tracking, simplifying access to early intervention programs.

The public portal system was developed using modern web development tools such as Typescript language React.js as well MUI, making it the entire system user-friendly, scalable, and sustainable. Although throughout development, several challenges such as navigation issues, type mismatches, and interface alignment were faced, they were all successfully resolved, which in turn strengthened and produced an overall UI and UX learning experience.

Besides that, through this project, a fully functional web-based portal has been built comprising three core components. A comprehensive informational portal provides parents with clear, structured content covering BVI causes, early recognition strategies, developmental milestones, and available support services. Next, a User Portal complete course registration system enables parents to apply for intervention programs, schedule interviews, receive offer letters, and purchase relevant learning kits with all through a secure and intuitive workflow. Lastly, a learning resource management system allows parents to monitor their child's development progress, access educational guidelines, and review assessment reports, while equipping administrators with the tools necessary to manage student records, classes, and academic tracking.

In conclusion, this project establishes a strong foundation for a comprehensive support platform as it aims to support the work of the Malaysian Association for the Blind (MAB) and has the potential to significantly improve early intervention outcomes and empower families in supporting the development of BVI children, with further refinement and user evaluation.

7.2 Recommendations

While the current system has met its stated objectives and demonstrated reliable functionality, several areas are identified for further improvement and expansion in future development cycles.

Given that Malaysia is a multilingual country, the addition of Bahasa Malaysia as a supported language would significantly broaden the portal's accessibility and reach, particularly for parents who are less comfortable navigating content in English.

Future work should include structured User Acceptance Testing (UAT) sessions involving actual MAB staff, parents of BVI children, and where appropriate, BVI users. Feedback from these sessions would provide invaluable real-world insight into usability gaps that functional testing alone cannot capture.

While the current system supports basic responsive layouts, dedicated mobile optimization should be prioritized in future iterations. A high proportion of parents in Malaysia access digital services primarily through mobile devices, and a smooth mobile experience is essential for broad adoption.

As Module 2 establishes a stable and scalable foundation, future development should focus on expanding the OSSVIM portal with additional modules addressing other aspects of BVI support, such as vocational guidance, peer communities for families, and direct communication channels between parents and MAB admins and trainers.

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APPENDIX

Code Samples

page.tsx

```

src > app > [lang] > module2 > page.tsx > Module2Page
6 //M2Main is the component file of Main @ homepage of module 2
7
8 import React from "react";
9 import Link from "next/link";
10 import Image from "next/image";
11 import M2Main from "./M2Main";
12 import M2HeaderSvg from "../../public/m2/m2_header.svg";
13 import M2SectionBlindAndVisuallyImpairedSupport from "../../public/m2/m2_section_blind_and_visually_impaired_support.jpg";
14 import M2SectionDeafBlindSupport from "../../public/m2/m2_section_deafblind_support.jpg";
15 import M2SectionMultiDisablesSupport from "../../public/m2/m2_section_multi_disable_support.jpg";
16 import M2LearningResources from "../../public/m2/m2_section_learning_resource.jpg";
17
18 const Module2Page = () => {
19   return (
20     <div
21       className="flex-col p-8 bg-gray-50"
22       style={{
23         backgroundImage: `url(${M2HeaderSvg.src})`,
24         backgroundRepeat: "no-repeat",
25         backgroundSize: "100%",
26         color: "black",
27         textAlign: "justify",
28       }}
29     >
30       <div className="flex">
31         <div className="w-2/6"></div>
32         <div
33           className="w-4/6"
34           style={{
35             color: "black",
36             fontWeight: "bold",
37             fontSize: "24px",
38           }}
39         >
40           Parenting and Childcare assistance of the Blind & Visually Impaired
41           (BVI), Deafblind, & Multi-Disabled in Malaysia
42         </div>

```

DM6to12.tsx

```

src > app > [lang] > module2 > DM > 6-12Months > DM6to12M.tsx > ...
7 const DM6to12M: React.FC = () => {
63   /* Content */
64   <div className="flex flex-col md:flex-row bg-white border border-t-0 rounded-b-lg">
65     /* Sighted child */
66     <div className="md:w-1/2 p-6 border-r border-gray-300">
67       <Typography fontWeight={600} variant="h5" className="font-semibold mb-2 text-black text-center">
68         Sighted child
69       </Typography>
70       <div><br/></div>
71     </div>
72     <ul className="list-disc pl-5 text-md text-black space-y-1 mt-4">
73       <li>Knows familiar people</li>
74       <li>Shows stranger anxiety</li>
75       <li>Reacts when you leave - looks, reaches for you or cries.</li>
76       <li>Shows several facial expressions, like happy, sad, angry, surprised.</li>
77       <li>Looks when you call their name</li>
78       <li>Plays games with you like pat-a-cake</li>
79     </ul>
80   </div>
81
82   /* BVI Development */
83   <div className="md:w-1/2 p-6">
84     <Typography fontWeight={600} variant="h5" className="font-semibold mb-2 text-black text-center">
85       Fostering optimal development for BVI children
86     </Typography>
87     <div><br/></div>
88   </div>
89   <ul className="list-disc pl-5 text-md text-black space-y-1 mt-4">
90     <li>Familiarize child with other people (one person at a time so the child can recognize according to voice)</li>
91     <li>To identify self</li>
92     <li>Train momentary separation</li>
93     <li>Expose baby to social activities (shaking hands, waving bye-bye)</li>
94   </ul>
95
96   /* Section Header */

```

CausesVI.tsx

APPENDIX

```
CausesVI.tsx X
src > app > [lang] > module2 > CausesVI > CausesVI.tsx > ...
1 //File : CausesVI.tsx // Under Module 2 - Part 1/3
2 import React from "react";
3 import Typography from "@mui/material/Typography";
4
5 const CausesVI: React.FC = () => {
6   const causes = [
7     {
8       explanation: "Certain genetic conditions can affect vision by altering the development or function of the eyes or the visual pathways.",
9       color: "bg-cyan-200",
10      expColor: "bg-blue-400",
11      titleBg: "bg-pink-300",
12      title: "Genetic Causes",
13      content: (
14        <>
15          <ul className="list-disc list-inside mt-2">
16            <ul>
17              <b>Albinism:</b>
18              A genetic disorder that causes decreased melanin production which may impact
19              eye pigmentation and result in problems such as light sensitivity and impaired vision.
20              <br />
21              <br />
22              <b>Retinitis Pigmentosa:</b>
23              A group of inherited disorders that cause damage to the retina,
24              leading to night blindness and gradual loss of peripheral vision.
25            </ul>
26          </ul>
27        </>
28      ),
29    },
30    {
31      explanation: "Certain pediatric eye diseases can affect vision by damaging critical structures of the eye.",
32      color: "bg-fuchsia-200",
33      expColor: "bg-purple-500",
34      titleBg: "bg-pink-300",
35      title: "Peadiatric Eye Diseases",
36      content: (
37
```

PDos.tsx

```
PDos.tsx M X
src > app > [lang] > module2 > Parenting > PDos.tsx > PDos
7 const PDos: React.FC = () => {
60
61   return (
62     <div className="relative">
63       <div className="absolute top-7 left-36">
64         <Image
65           src="/images/156.png"
66           alt="Parent and kids"
67           width={170}
68           height={170}
69         />
70       </div>
71       <div className="absolute top-7 right-48">
72         <Image
73           src="/images/158.png"
74           alt="Happy kid"
75           width={170}
76           height={170}
77         />
78       </div>
79       <div className="absolute top-[250px] right-[20px]">
80         <Image
81           src="/images/162.png"
82           alt="Kite"
83           width={120}
84           height={80}
85         />
86       </div>
87       <div className="p-6 bg-gray-50">
88         <div className="flex justify-center my-6">
89
```

User-Portal FrontEnd Project File Snippet

```

    app > userportalmain > Module > Offer > OfferPage > OfferPage.jsx
    32 export default function OfferPage() {
    33   const [registrationId, setRegistrationId] = useState<string | null>(null);
    34   const [contestOptions, setContestOptions] = useState<ModuleRegistrationContestOption>[]();
    35   const [contestFeedback, setContestFeedback] = useState<string | null>(null);
    36   const [offerData, setOfferData] = useState<Module2OfferViewData>({
    37     programName: MODULE2_OFFER_PLACEHOLDER,
    38     startDate: MODULE2_OFFER_PLACEHOLDER,
    39     duration: MODULE2_OFFER_PLACEHOLDER,
    40     issuedDate: MODULE2_OFFER_PLACEHOLDER,
    41     deadline: MODULE2_OFFER_PLACEHOLDER,
    42     offerLetterId: null,
    43     status: 'unknown',
    44   });
    45   const refreshOffer = async () => {
    46     const context = await resolveActiveRegistrationContext('offer');
    47     setContestOptions(context.options);
    48     if (!context.context.activeRegistrationId) {
    49       setRegistrationId(null);
    50       setErrorMessage(MODULE2_OFFER_MESSAGES.unavailable);
    51     }
    52   };
    53 }
  
```

```

GET /studentportal/200 30ms (compile: 6ms, render: 31ms)
GET /studentportal/ParentsGuidelines 200 in 44ms (compile: 7ms, render: 37ms)
GET /studentportal/Attendance 200 in 45ms (compile: 6ms, render: 38ms)
GET /studentportal/ParentsGuidelines 200 in 41ms (compile: 5ms, render: 36ms)
GET /studentportal/ReportCard 200 in 41ms (compile: 6ms, render: 37ms)
GET /studentportal/Attendance 200 in 41ms (compile: 6ms, render: 36ms)
GET /studentportal/Classes 200 in 40ms (compile: 6ms, render: 41ms)
GET /studentportal/ReportCard 200 in 38ms (compile: 5ms, render: 33ms)
GET /studentportal/200 in 36ms (compile: 5ms, render: 31ms)
GET /studentportal/ReportCard 200 in 42ms (compile: 6ms, render: 36ms)
GET /200 in 39ms (compile: 7ms, render: 31ms)
GET /userportalmain/200 in 53ms (compile: 10ms, render: 42ms)
GET /userportalmain/Module/Offer 200 in 43ms (compile: 6ms, render: 37ms)
GET /userportalmain/Module/Status 200 in 46ms (compile: 6ms, render: 38ms)
GET /userportalmain/Module/Offer 200 in 46ms (compile: 6ms, render: 40ms)
GET /userportalmain/Module/Payment 200 in 42ms (compile: 6ms, render: 36ms)
GET /userportalmain/Module/Offer 200 in 42ms (compile: 6ms, render: 36ms)
GET /userportalmain/Module/Details 200 in 368ms (compile: 31ms, render: 53ms)
GET /userportalmain/Module/Status 200 in 41ms (compile: 6ms, render: 34ms)
GET /userportalmain/Module/200 in 46ms (compile: 7ms, render: 38ms)
GET /userportalmain/Module/Details 200 in 51ms (compile: 5ms, render: 46ms)
GET /userportalmain/Module/Offer 200 in 55ms (compile: 6ms, render: 49ms)
GET /userportalmain/Module/Payment 200 in 37ms (compile: 5ms, render: 32ms)
  
```

OSSVIM Portal Backend Project File Snippet

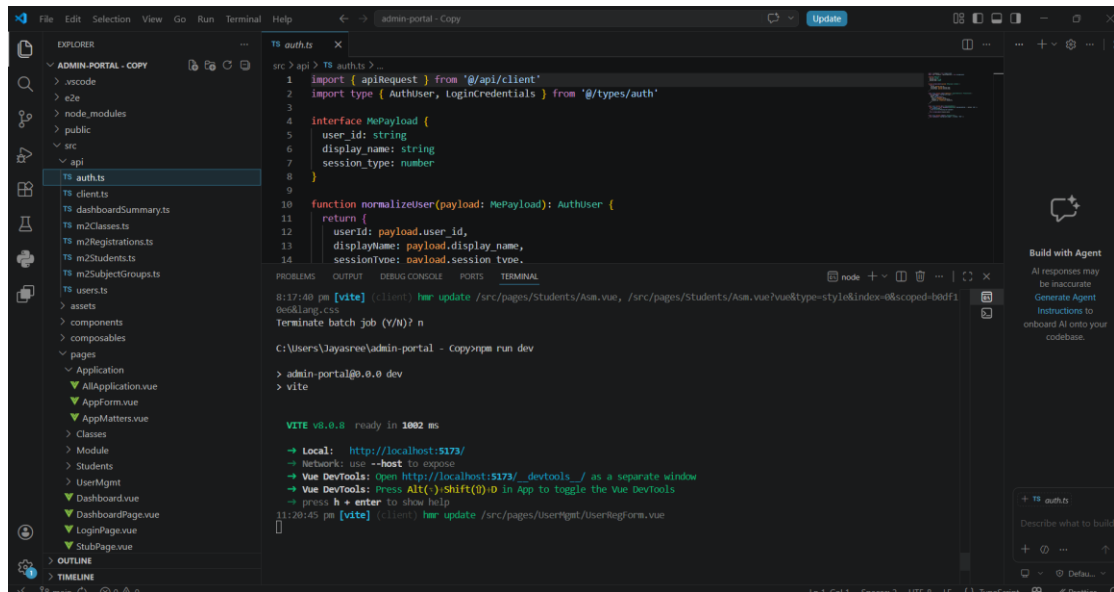
```

    package-lock.json
    config.json.sample
    config.json
    1 config.json {
    2   "name": "ossvim",
    3   "publicDomain": "http://localhost:8001",
    4   "publicUpDomain": "http://localhost:3006",
    5   "org": {
    6     "orgname": "MALAYSIAN ASSOCIATION FOR THE BLIND",
    7     "mail": {
    8       "smtpMail": {
    9         "service": "hotmail",
    10        "smtpUsername": "test@outlook.com",
    11        "smtpPassword": "test",
    12        "fromName": "OSSVIM Test Mail"
    13      },
    14      "m2": {
    15        "paymentSetting": {
    16          "recvBank": "Maybank",
    17          "recvBankAccount": "Malayasian Association for the Blind (MAB)"
    18        }
    19      }
    20    },
    21    "play_name": "root", "phone_number": "0000-0000", "ap_user_type": "1", "creation_time": "2026-05-03T01:52:43.412Z", "last_updated_time": "2026-05-03T01:52:43.412Z"}
    22   "log": null
    23 }
  
```

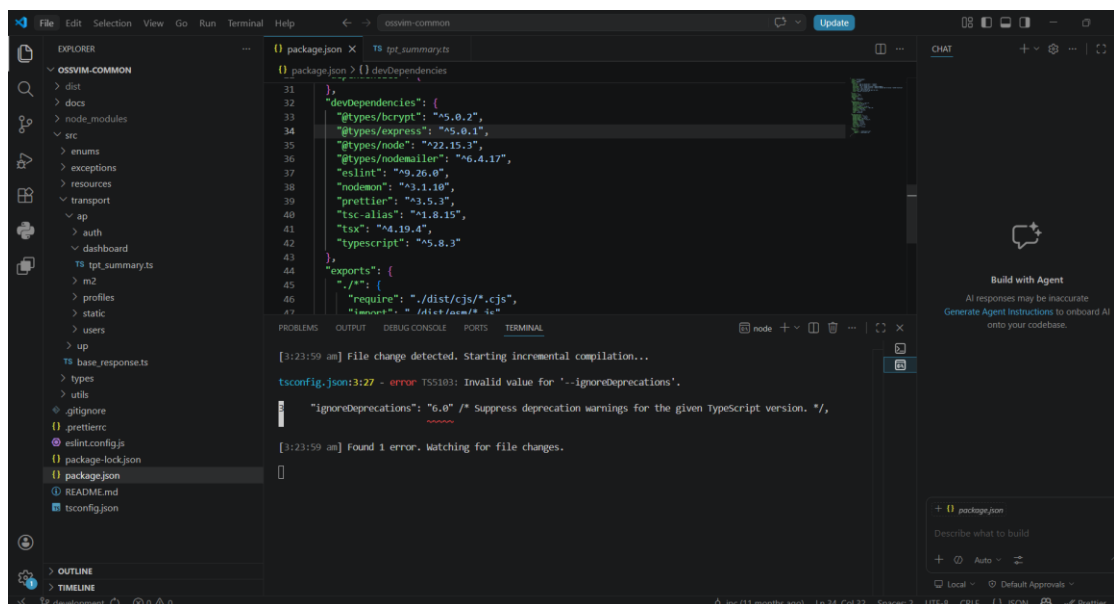
```

{"time": "2026-05-03T18:59:42.661Z", "time_taken_ms": "43", "method": "GET", "url": "/api/ap/m2/students/", "req": {}, "rsp": [{"students": [{"enrollment_id": "b663759a-4b65-495c-b188-274f4f66e906", "enrollment_type": "1", "up_user_id": "a4781b48-ebff-49bc-bbef-597563b9defc", "up_user_display_name": "Taylor", "up_user_email": "taylor@gmail.com", "registration_id": "2b0bf2e-2f0a-4752-8637-5ccfa47561da", "child_name": "Taylor", "latest_subject_group_id": "4ab0714a-3c98-42d0-8775-58822c477b0", "latest_subject_group_name": "Age group 1", "creation_time": "2026-05-03T17:47:00.030Z", "enrollment_id": "32b90d79-32f6-4a3b-8cf1-c2e9d8088080", "enrollment_type": "2", "enrollment_status": "1", "up_user_id": "f8b975df-496c-418c-a097-7a385af6b3ff", "up_user_display_name": "Rocky", "up_user_email": "rocky@gmail.com", "registration_id": "c0781b02-6ff9-4045-8111-ba278c042c96", "child_name": "Rocky", "latest_subject_group_id": "7937108e-592c-4e63-a01a-29e212b5a33", "latest_subject_group_name": "Age group 2", "creation_time": "2026-05-03T15:55:02.397Z", "enrollment_id": "1823b0dc-d875-4c50-9fdd-0715bfff5d79", "enrollment_type": "2", "enrollment_status": "1", "up_user_id": "051e033d-b2b3-488e-b434-85a17559b5a9", "up_user_display_name": "abc", "up_user_email": "abc@gmail.com", "registration_id": "8503d001-c761-49ec-b992-601a8488d8da", "child_name": "Peter Parker", "latest_subject_group_id": "57b7a2de-01f6-4ac1-a359-b2257938862c", "latest_subject_group_name": "Age group 3", "creation_time": "2026-05-03T00:26:41.272Z", "log": null}], "time": "2026-05-03T19:00:22.000Z", "time_taken_ms": "28", "method": "GET", "url": "/api/ap/m2/courses/subject_groups/57b7a2de-01f6-4ac1-a359-b2257938862c", "req": {"id": "57b7a2de-01f6-4ac1-a359-b2257938862c", "rsp": [{"subject_group_id": "57b7a2de-01f6-4ac1-a359-b2257938862c", "subject_group_name": "Age group 3", "subject_group_order": "3", "required_child_min_age": "3", "subjects": [{"subject_id": "981c8f5b-c8ef-4b05-b73d-279ba9c804f1", "subject_name": "Learning Videos", "subject_video_o_link": "https://www.youtube.com/watch?v=ms0V12dUc", "subject_order": "1"}, {"subject_id": "141e307c-934c-4a4b-a0b1-3237920431fa", "subject_name": "The Five Sen ses", "subject_video_o_link": "https://www.youtube.com/watch?v=qp04mg9AQ", "subject_order": "1"}, {"subject_id": "2767fe0b-60fe-405f-908c-e15056a39d0a", "subject_name": "Daily habits", "subject_video_o_link": "https://www.youtube.com/watch?v=59u0t01900", "subject_order": "2"}], "log": null}]}
  
```

Admin Portal Frontend Project File Snippet



OSSVIM Common File Project Snippet



Poster



ACCESSIBLE CHILD DEVELOPMENT SUPPORT PORTAL FOR BLIND AND VISUALLY IMPAIRED (BVI) CHILDREN

BY: JAYASREE A/P CHANDRAGOPAL SUPERVISED BY: DR SAW SEOW HUI

INTRODUCTION

The Malaysian Association for the Blind (MAB) provides support (rehabilitation, training, education), but:

- Information is scattered.
- Digital resources are limited.
- Registration processes are inefficient.

The project proposes a digital support platform for parents of Blind and Visually Impaired (BVI) children, building on MAB's OSSVIM portal.

DID YOU KNOW ?

- Globally: Appx, 2.2 billion people, have some form of vision impairment and half of these cases could have been prevented or can be treated.
- In Malaysia: 2% of the population are blind in both eyes. Of these cases:
 - 17 out of 20 (85%) are preventable.
 - 60% are treatable.

WHY THE PROPOSED SYSTEM IS BETTER THAN EXISTING SYSTEMS

Current problems with MAB :

- No centralized accessible platform → parents struggle to find information.
- Registration is manual and inefficient.
- Lack of structured parental support tools → parents find it hard to track child's development.

Proposed improvements:

- All resources are in one digital portal (centralized).
- Automated, integrated registration → reduces paperwork, saves time.
- Interactive parental tools (progress tracking, developmental milestones guidance).
- Scalable → can expand to cover more disabilities and services in the future.

OBJECTIVES

- To develop an accessible and informative landing page
- To implement a reliable and user-friendly course registration system
- To establish a centralized learning resource management portal

CONCLUSION

- The project provides an accessible, web-based intervention platform for families with visually impaired children.
- It fills the digital resource gap by offering structured, reliable, and parent-friendly information.
- Acts as a foundation for future modules to support broader intervention needs.



