

EyeRis Shield: Eye Care Website

Vedhanahyakee A/P Annadurai¹, Hanayanti Hafit^{1*}

¹ *Fakulti Sains Komputer dan Teknologi Maklumat,*

Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, MALAYSIA

*Corresponding Author: hana@uthm.edu.my

DOI: <https://doi.org/10.30880/aitcs.2025.06.02.024>

Article Info

Received: 13 June 2025

Accepted: 3 November 2025

Available online: 30 November 2025

Keywords

Eye Care, Website, vision, detection,
refractive error, visual acuity

Abstract

Eye care is essential in overall health care, as our vision allows us to perform daily activities independently. It is important to get regular eye check-ups to maintain healthy eyesight. However, rising of digital devices causes people exposed to extensive screen time which can lead to progressive vision deterioration. Despite this problem, accessible tools for reducing screen-induced eye strain remain limited. This issue often results in neglecting eye strain indications due to insufficient awareness of eye care. Therefore, the EyeRis Shield Website is proposed to self-detect vision disorders and provide eye care tools. Prototyping methodology is implemented to develop this website. The prototype is built using the Windows platform via Visual Studio Code. The tested prototype results in each actor successfully linked with their respective module. This application is expected to serve as an eye health resource for early detection of eye conditions and foster healthy eye care habits.

1. Introduction

Eye care is an essential component of overall health care, as our vision plays a crucial role in our ability to carry out daily activities independently. It is vital to understand the importance of routine eye care and adopt proactive measures to maintain healthy eyesight. Globally, at least 2.2 billion people have near or distant vision impairment. In at least 1 billion of these, vision impairment could have been prevented or is yet to be addressed. The leading causes of vision impairment and blindness at a global level are refractive errors and cataracts. It is estimated that globally, only 36% of people with a distance vision impairment due to refractive error and only 17% of people with vision impairment due to cataracts have received access to an appropriate intervention [1]. Many individuals unknowingly develop conditions such as eye strain and refractive errors, which could be mitigated with early detection and regular eye health practices.

While most people think of eye exams as just checking how well they see (visual acuity), that's not always the case. Eye exams can be routine and happen every one to two years, like a regular wellness check [2]. With the rise of digital devices in daily life, individuals of all ages spend significantly more time in front of screens. Extended exposure to digital screens can lead to progressive vision deterioration, which, if left unaddressed, may result in more severe eye conditions. Despite this widespread problem, accessible, user-friendly tools for managing and reducing screen-induced eye strain remain limited, leaving many individuals without the resources they need to protect their eye health. This lack of accessible tools often results in the neglect of early signs of eye strain, increasing the risk of long-term vision issues. Comprehensive eye health detection tools are not widely accessible to the general public, particularly in areas with limited access to optometrists or specialised eye care services. As a result, many eye conditions go undiagnosed, leaving individuals vulnerable to progressive vision disorders that might otherwise be treatable. Many individuals are unaware of their deteriorating vision until the symptoms become disruptive, delaying diagnosis and treatment due to insufficient

public awareness of eye conditions, including their causes, symptoms, and preventive measures. Without adequate knowledge and understanding of eye health, individuals are less likely to seek routine eye assessments, increasing the risk of undetected and untreated conditions.

With that, this project proposes a website, EyeRis Shield, which will serve as an all-in-one platform for eye care, offering a range of vision assessment tools, eye health advice and assistance, eye exercises and tips. The platform aims to encourage proactive eye care through features like a vision simulator, which allows users to compare their current vision to a healthy baseline, helping them identify potential issues early on. It also includes tools for detecting refractive errors, fostering the adoption of healthy habits that can prevent long-term vision issues. Additionally, EyeRis Shield will provide eye care exercises and tips as well as reminders for screen breaks. This platform will not only enhance eye health awareness but also create a reliable record-keeping system where users can store and track their eye test history. By encouraging regular self-checks and providing valuable insights, EyeRis Shield will bridge the gap in eye care literacy and empower users to prioritize and manage their eye health effectively in their everyday lives.

To achieve the project's aim, three main objectives have been set. The first objective is to design EyeRis Shield Website based on a structured approach. The next objective is to develop EyeRis Shield Website by providing eye care tools for the early detection of eye conditions and fostering healthy eye care habits. The last objective is to test the developed website's functionality and usability on individuals with vision disorders, frequent screen users and office workers.

2. Related Work

2.1 Overview of Eye Care

According to the Cambridge Dictionary, the eye is one of two organs in your face that are used for seeing while care means the process of protecting someone or something and providing what that person or thing needs [3]. Eye care is defined as protecting the eyes and providing them with needs. When we are children, none of us need glasses since we have perfect vision and can see things independently of all this. However, as we near our 40s, most of us require glasses or contact lenses to improve our eyesight. From a vision standpoint, our eyes are in a constant state of flux our entire lives. Even after we are fully grown, our eyes keep right on changing [4]. These fluctuations can lead to changes in our prescriptions. Some fluctuations bring about a change of view due to eye problems associated with ageing.

Like many other branches of medicine, ophthalmology has become increasingly subspecialized over the past 50 years [3]. According to Sandeep Grover, he could not help but go down memory lane to about 1990, when he started practising ophthalmology in a developing country. His findings show that in this short period of two decades, ophthalmology has undergone a total revolution. The investigative tests and management of diseases have changed to a large extent, thanks to the advent of technology. Moreover, he believes no field of clinical medicine has undergone so much change in such a short duration of time and, the field continues to change [5]. His statements prove that technology is a major factor that ophthalmology has become one of the fields that revolved and will keep revolutionizing.

There are three levels of eye care which include the primary, secondary and tertiary. For this application, it will mainly focus on the primary level of eye care. Primary eye care represents the first level of contact between individuals and the healthcare system where it composes a broad range of services aimed at maintaining optimal vision health and early detection of eye problems [6]. There are five key components of primary eye care. The first component is vision screening and examinations where routine eye exams to assess visual acuity, identify refractive errors such as myopia, hyperopia, and astigmatism, and detect early signs of eye diseases. The next component is health education and promotion. Educating patients on the importance of regular eye exams, proper eye care practices, and preventive measures. Thirdly, management of refractive errors by prescribing corrective lenses to correct refractive errors and enhance vision. Then, there is the diagnosis and basic treatment component where the process of identifying common eye conditions and providing initial management or treatment. The final component is referrals which is recognizing cases that require specialized care and referring patients to secondary or tertiary care providers for further evaluation and treatment. Therefore, every individual has to take responsibility for taking care of their eye health from an early stage or primary level because the eyes are one of the most important organs to ensure we can carry out daily activities independently and lead a quality life.

2.2 Eye Care Website

The field of website development, or simply web development, is dynamic and multifaceted, needing a combination of technical know-how, strategic planning, and artistic vision [7]. Websites are important to allow businesses and individuals to establish an online presence and reach a global audience, as well as provide a platform for sharing information, knowledge, and resources. Websites are launched when they are hosted on a server and made accessible online. The server that acts as the house for the website's data is typically located in a data centre, which is securely facilitated to keep the servers always available.

Eye Care Websites are typically websites that are mostly launched by eye specialists in hospitals, optometrists, or any organisations related to eyes, vision or general health. Due to the rise of digital devices along with the prevalence of vision-related issues such as refractive errors and age-related macular degeneration, the demand for accessible and user-friendly eye care information and tools has increased. Eye care websites are increasingly integrated with teleophthalmology, the use of digital communication tools to deliver eye care remotely. Tools and features for testing vision, simulating eye impairments, screening for eye conditions, exercise trackers for eye relaxation, such as the 20-20-20 rule, and lifestyle tips assist in providing a platform for eye wellness. Nevertheless, eye care websites that incorporate gamification, reminders, and personalised dashboards have contributed to promoting eye health by showing better user engagement.

These websites are particularly useful in rural or underserved areas, as they face difficulty getting direct access to eye care. While eye care websites provide valuable services, several gaps remain. Future investment and research should be taken into consideration to provide advanced resources. Focus can be put on the personalisation, mobile-first design, data security, and integration with wearables for continuous monitoring. With that, eye care websites represent a crucial digital health tool for improving awareness, access, and management of visual health.

2.3 Refractive Errors

Refractive errors are a kind of visual issue that impairs vision [8]. It occurs when the eye's natural ability to bend light is impaired, causing light to focus improperly on the retina. They are not diseases, but optical imperfections. There are four types of refractive errors, which are myopia, hyperopia, astigmatism, and presbyopia. The World Health Organisation (WHO) built an application, WHOeyes, as an initiative to detect refractive errors through interactive testing. The application integrates the use of artificial intelligence (AI) algorithms and smartphone-based apps, enhancing the screening of refractive errors.

2.3 Visual Acuity

Visual acuity, also known as sharpness of vision or resolving power, is the capacity of the eyes to distinguish between letters and numbers at a specific distance [9]. It depends on how accurately the light focuses on the retina. There are a few methods that can be applied to measure visual acuity to determine the condition of one's eye, whether the vision is normal, nearsighted or farsighted. The gold standard for measuring someone's visual acuity is the Snellen eye chart, a chart made up of lines of letters of increasingly larger size [10]. The testing is done separately in each eye. A normal visual acuity is 20/20 (in feet) or 6/6 (in metres). The numerator is the distance from which the child can reliably distinguish the letters, while the denominator is the distance from which an adult with normal vision can reliably distinguish the letters. The chart is placed at a distance of 20 feet or 6 metres and illuminated to 480 lux. One eye is tested with the occluder placed before the other eye. There is also the "illiterate E" chart or also known as the "tumbling E" chart [10]. This chart is made up of many versions of the letter "E," which are all pointing in different directions [10]. The "Es" gets smaller as we move down the eye chart, just like other systems [10]. This test is conducted by pointing in the direction to match the way the "Es" are pointing. From there, the visual acuity is observed.

2.4 Astigmatism Dial

On the other hand, there is the Astigmatism Dial, a test or instrument used to detect and quantify ocular astigmatism. Astigmatism is caused by the tilt or decentration of the crystalline lens, or by the uneven curvatures of the two major meridians of the lenticular or anterior corneal surfaces [11]. In most cases, the condition occurs mainly due to the cornea. The Astigmatism Dial test is done by focusing on the centre of the astigmatism dial chart with one eye and the other covered, while observing whether any of the lines appear clearer or bolder than the others. Repeat the procedure for the other eye. If there are lines that appear clearer or bolder than the others, then it is a sign that there is astigmatism in a certain eye.

Next, this paragraph compares the existing applications similar to the proposed application, EyeRis Shield. Analysis of existing applications includes investigating and evaluating the project's related applications, including hardware, software, workflows, procedures, data structures, interfaces, and functionality [12]. The existing system is studied, and a high-level logical model of the proposed application is developed using one or more analysis tools [13]. This comparison aims to analyse the features, benefits, and shortcomings of existing applications, which are WHOeyes, Eye Health Manager and Eye Exercises: Improve Vision, alongside the advantages of the proposed application, which is the EyeRis Shield website. Through this comparison, the effectiveness of the EyeRis Shield website in achieving the given objectives will be proven. The features that are being compared between the existing applications and the proposed application are shown in Table 1.

Table 1: Comparison between the existing application and the proposed application

Features/Applications	WHOeyes	Eye Health Manager	Eye Exercises: Improve Vision	Proposed application (EyeRis Shield)
Sign Up and Login	Not Available	Not Available	Not Available	Available
Menu	Available	Available	Available	Available
Vision Simulator	Not available	Not available	Not available	Available
Nearsight Testing	Available	Available	Not Available	Available
Farsight Testing	Available	Available	Not Available	Available
Astigmatism Testing	Not available	Available	Available	Available
Recommendations after testing	Available	Available, AI-driven	Not Available	Available
Eye Exercises	Not available	Not Available	Available	Available
Eye Tips	Available	Not Available	Not Available	Available
Notifications and Reminders	Not available	Not Available	Not Available	20-20-20 rule reminder
Vision Advice and Assistance	Not available	Not Available	Not Available	Available
Records and History	It does not save records	Save records	It does not save records	Save records
Admin Panel	Available	Not Available	Available	Available
Required OS	Android 5.1 and above	Android 7.0 and above	Android 4.4 and above	Both Android and iOS
App Purchase	Free	Free	RM2.99 – RM27.99	Free
User-friendly	Yes, it is easy to understand and navigate	Yes, it is easy to understand and navigate	Yes, it is easy to understand and navigate	Yes, it is easy to understand and navigate
Offered by	World Health Organization	Nikita Tiart	KingBrain®	Pantai Hospital

3. Methodology

The EyeRis Shield: Eye Care Website development utilises the prototype module methodology. Prototyping, also known as Rapid Application Design (RAD), is an iterative process where all the phases are incorporated to build a working model of the initial software into the final software system [14]. The prototype module is a software development methodology in which a prototype is built, tested, and reworked until an acceptable prototype is

achieved. This module is believed to be very useful as the fundamental guide for this website development, as it serves as a roadmap during the whole development process.

Choosing a suitable software development methodology is crucial in any project development. The Prototype Model is best suited for projects where the requirements could be clearer or more likely to change. It is also effective to work on projects that call for the user or the input of the user. The reason this model was chosen is because of the several advantages it offers. According to Lewis, S., the first advantage is that it gives the customer more say in the function early, where nobody gets an opportunity to complain, resulting in high customer satisfaction. Next, this model can help identify errors and missing functionality easily. Then, the prototype product can be reused in the future for more complex projects. Furthermore, it enables users to have a clearer and better understanding of the operation. Finally, this model eases developers in developing the product since the availability of customer feedback is faster than any other method of getting an understanding of customers' needs [15].

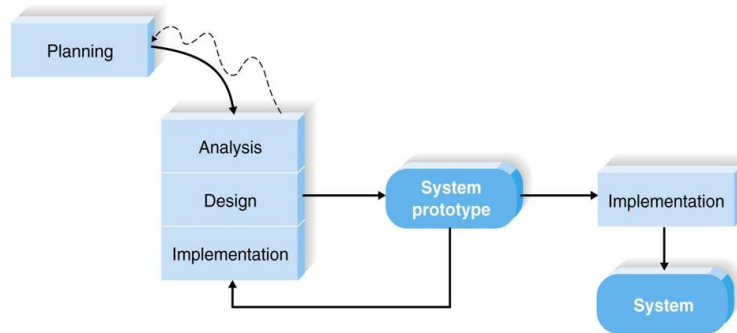


Figure 2: Prototype Model Process

Figure 2 displays the prototype model process in a simple flow chart diagram. The figure shows that the analysis, design, and implementation of the system prototype phase will be repeated. After the implementation of the system prototype, there will be a prototype refinement phase where the built prototype is evaluated by the customer. If the customer is satisfied, the implementation of the application is initiated, or else the prototype will be reviewed and updated as customer feedback. The process is repeated until a satisfactory prototype is achieved to proceed with the application implementation. Before all of these processes can be executed, planning is done beforehand.

3.1 Application Development Workflow

Table 2: Application Development Workflow for EyeRis Shield Website

Phase	Task	Output
Planning	1. Conducting extensive market research and analysis.	1. Literature Review.
	2. Identifying problem statements.	2. Project Proposal.
	3. Preparing and distributing questionnaires to target users.	3. Comparison of existing applications and proposed application.
	4. Interviewing with an eye specialist doctor.	4. Data for user requirements.
	5. Producing Gantt Chart.	5. Gantt Chart.
Analysis	1. Analyze the questionnaire findings and interview outcome.	1. List of functional Requirements.
	2. Identify functional and non-functional requirements.	2. List of non-functional requirements.
	3. Analyze project specifications.	3. Potential risk for the project.
	4. Build Unified Modelling Language (UML) diagrams.	4. Defined security procedures.
		5. Ideas in initiating the project development.
		6. Understanding of contractual issues of the project.

Table 2: Application Development Workflow for EyeRis Shield Website (cont.)

Phase	Task	Output
		7. Use-case diagram, sequence diagram, activity diagram and class diagram.
Design	<ol style="list-style-type: none"> Design the user interfaces with wireframes. Design the database. 	<ol style="list-style-type: none"> Wireframes of user interface design. Database design and specifications.
Implementation of System Prototype	<ol style="list-style-type: none"> Install application environment. Build a high-fidelity prototype. 	<ol style="list-style-type: none"> Prototype of two modules of the proposed application.
Prototype Refinement	<ol style="list-style-type: none"> Let the customer evaluate the built prototype. Review and update the prototype if needed. 	<ol style="list-style-type: none"> Customer feedback on the evaluated prototype. Improvements in-built prototype.
Implementation of Application	<ol style="list-style-type: none"> Develop the application modules. Database connection. 	<ol style="list-style-type: none"> Built user interface. Built database. User interface connected with the database.
Testing	<ol style="list-style-type: none"> Conduct application testing. Debug code. Identify areas for improvement. 	<ol style="list-style-type: none"> Complete application with the functional and non-functional requirements. Fixed and improved the application.

3.2 Questionnaires

This study used a Google Form to survey the public’s awareness of eye care. The survey was distributed via social media platforms such as WhatsApp groups. It was aimed to analyse the public’s eye health condition and awareness regarding eye care. 10 responses were collected, analysed and represented in pie charts. Figure 3 shows that the public mostly has a diagnosis of eye conditions, while Figures 4 and 5 show that the public’s awareness of eye care is very low.

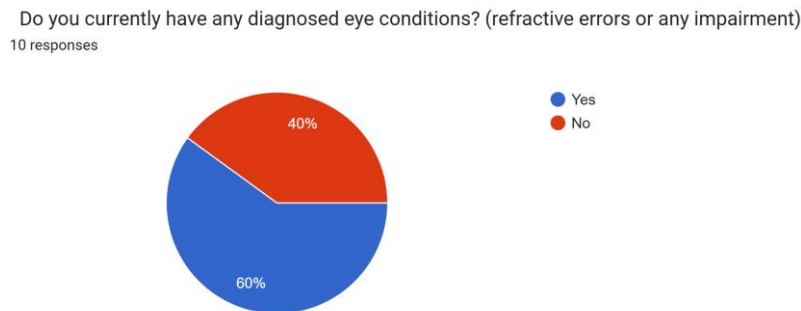


Figure 3: Sample Question

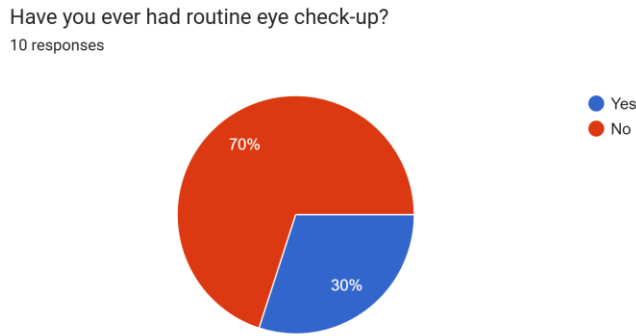


Figure 4: Sample Question

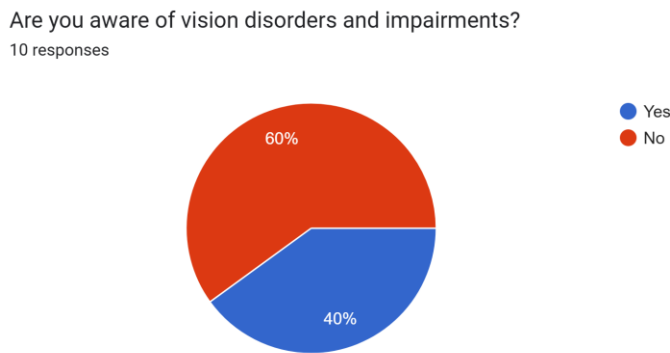


Figure 5: Sample Question

4. Analysis and Results

4.1 Requirement Analysis

Requirements analysis is a phase of the software development process which focuses on studying the requirements of a particular project before the project goes to the software development process phase [16]. At this point, the specification and description of the functional and non-functional requirements for the entire proposed application are outlined in detail.

Functional requirements describe what the system should do by focusing on the behaviour and features of the application. It defines the actions and operations of the website. Table 3 shows the functional requirements for the proposed application.

Table 3: Functional Requirements of EyeRis Shield Website

No	Module	Functionality
1.	Sign Up and Login	<ul style="list-style-type: none"> - The website should allow the users, eye specialist doctors and administrators to register as users. - The website should allow the users, eye specialist doctors and administrators to log into the system after signing up.
2.	Vision Simulator	<ul style="list-style-type: none"> - The website will provide users with an actual view and a declined eye health view to distinguish their eye condition.
3.	Vision Testing	<ul style="list-style-type: none"> - The website will detect refractive errors such as near-sighted, far-sightedness, and astigmatism. - The website will provide brief recommendations based on the results obtained.

Table 3: Functional Requirements of EyeRis Shield Website (cont.)

No	Module	Functionality
4.	Vision Advice and Assistance	- The website should allow users to have real-time chat and messaging with the eye specialist doctor.
5.	Regular Notifications and Reminders	- The website will send scheduled notifications to encourage users to follow eye exercises and take screen breaks using the 20-20-20 rule (looking at something 20 feet away for 20 seconds every 20 minutes). This module is displayed on the dashboard.
6.	Eye exercises and tips	- The website will display a variety of eye exercises that can reduce strain, improve focus, and promote overall eye health, with guidance. - The website will provide a curated collection of tips on maintaining eye health, such as the dos and don'ts, including advice on screen time management, nutrition, and eye care routines.
7.	Testing Records and History	- The website should store user activity and testing history. -The application allows user to track their eye health over time and review past testing results.
8.	Dashboard	- The website will enable users, eye specialist doctors and administrators to view the modules in the application and the timer for the 20-20-20 rule.
9.	Add New Doctor	- The website should allow the administrator to register eye specialist doctors after verifying their certification manually.
10.	Update Eye Exercises	-The website should allow the administrator to add new eye exercises and update or edit them if needed.
11.	Update Eye Tips	-The website should allow the administrator to add new eye tips and updates or edit them if needed.
12.	Log out	- The website should allow users to log out of the application when done using it.

On the other hand, non-functional requirements describe how the system should perform by defining the constraints or conditions under which the website must operate. It focuses on the operational, performance, security, and cultural and political requirements. Table 4 presents the non-functional requirements for the proposed application.

Table 4: Non-Functional Requirements of EyeRis Shield Website

No	Requirement	Description
1.	Operational	-The website is available for any modern web browser. -The website should be user-friendly. -The website should be easily maintained and updated.
2	Performance	-The interaction between the users and the website should not exceed five seconds. -The website can function in an offline scenario.
3	Security	-User can only access their accounts with their registered email and password. -All the credentials should be stored in a database.
4	Cultural and Political	-Personal information regarding users cannot be sent outside of Malaysia.

4.2 Analysis and Design

The context diagram shows the context into which the business process fits, the overall business process as just one process and all the external entities that receive information from or contribute information to the system. It focuses on the identification of the functional requirements of the application under consideration. Figure 6 displays the context diagram for the EyeRis Shield website. For this website development, three main entities will use the system: the users/patients, the eye specialist doctors and the back-end administrator.

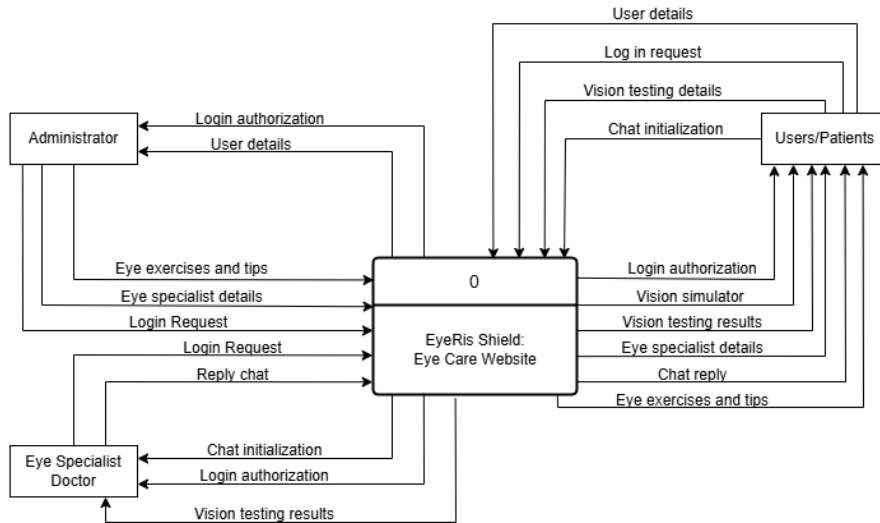


Figure 6: Context Diagram of EyeRis Shield Website

The Data Flow Diagrams (DFDs) are built to understand the designs, code architecture, as well as the proposed implementation of complex software applications. The DFDs are also used to model the workflows and processes of the project.

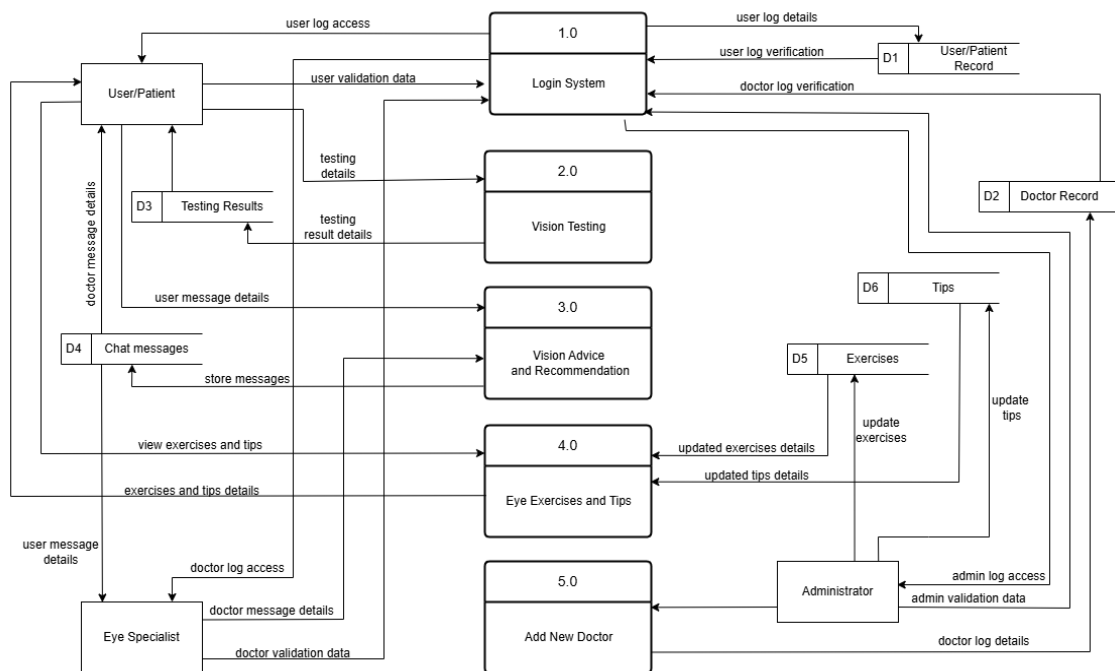


Figure 7: Data Flow Diagram Level 0 of EyeRis Shield Website

Entity Relationship Diagram (ERD) is a picture which shows the information that is created, stored, and used by a business system. It is a popular way to depict the data model. Figure 8 presents the ERD of EyeRis Shield Website.

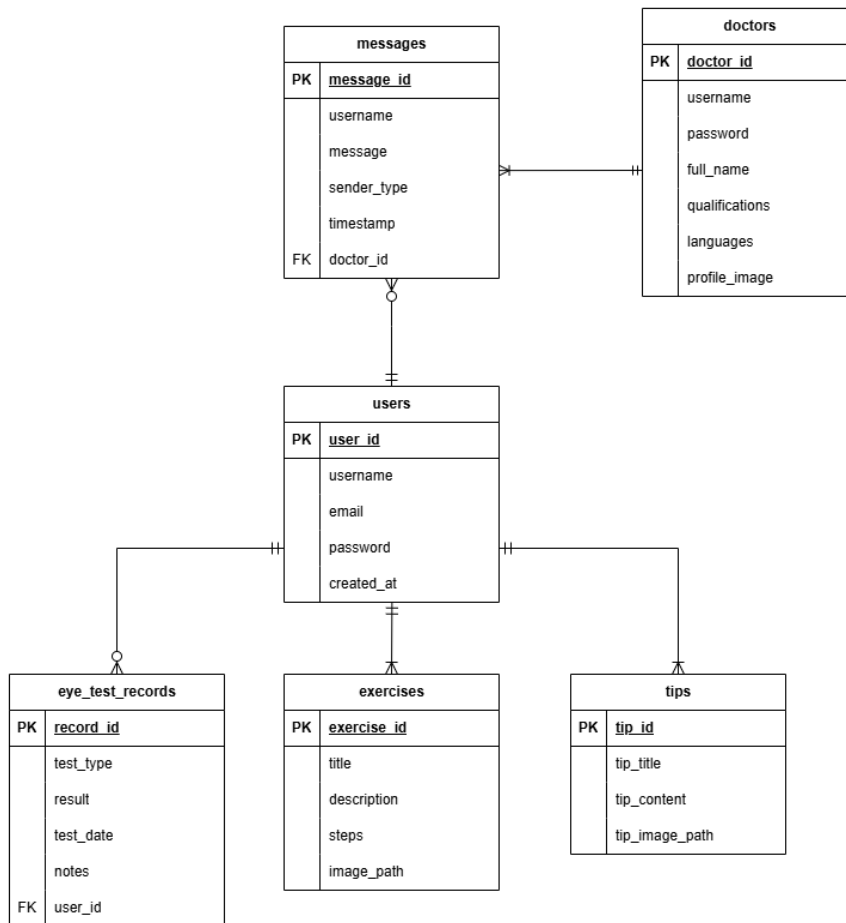


Figure 8: Entity Relationship Diagram of EyeRis Shield Website

5. Results and Discussion

This chapter describes the system implementation process and the system testing for the EyeRis Shield Website.

5.1 System Implementation

System implementation involves all the processes, such as developing the source code for the website.

5.1.1 Sign Up and Login Module

The Sign Up and Login Module of the EyeRis Shield Website features two key screens. The login screen lets users access their accounts by entering their username and password. The Create Account screen allows new users/patients to sign up by providing their username, email and password. In addition, there is a reset password function that helps users recover their accounts by resetting their passwords. These screens provide functionalities for user account management, involving login and sign-up as well as password recovery.

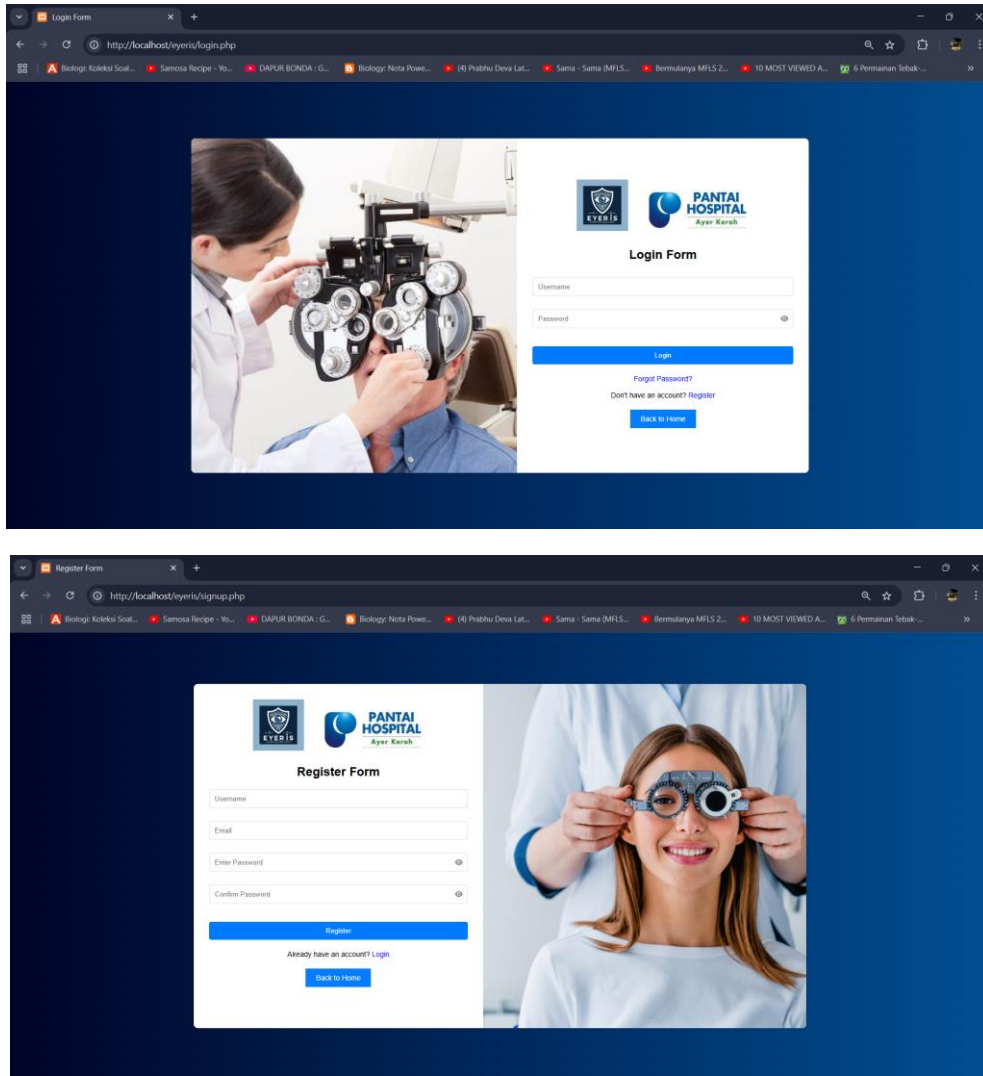
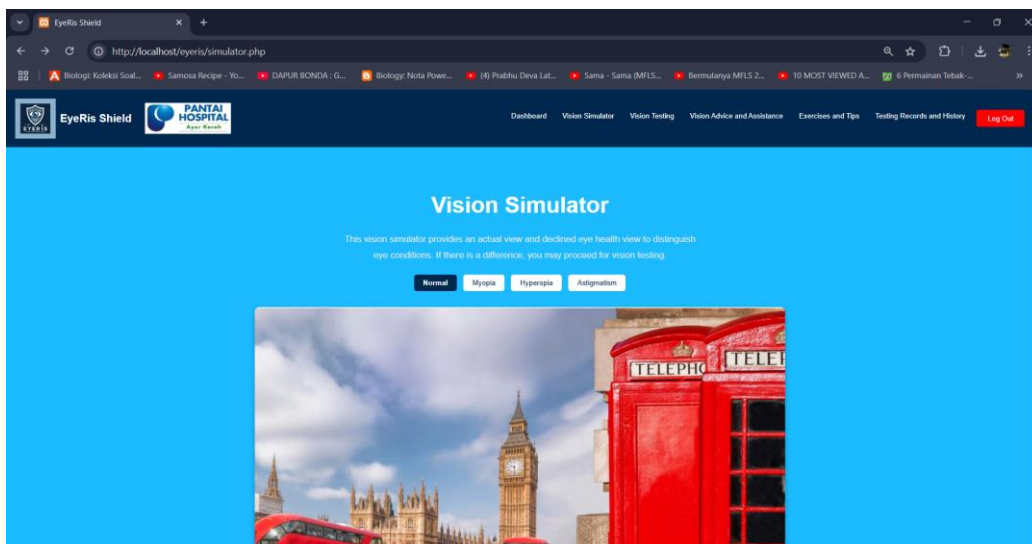


Figure 9: Sign Up and Login Module

5.1.2 Vision Simulator Module

The Vision Simulator Module interface is shown in Figure 10. This module provides users with an actual view and a declined eye health view, such as myopia, hyperopia, and astigmatism, to distinguish their eye condition. Users can slide the slider to view each eye condition.



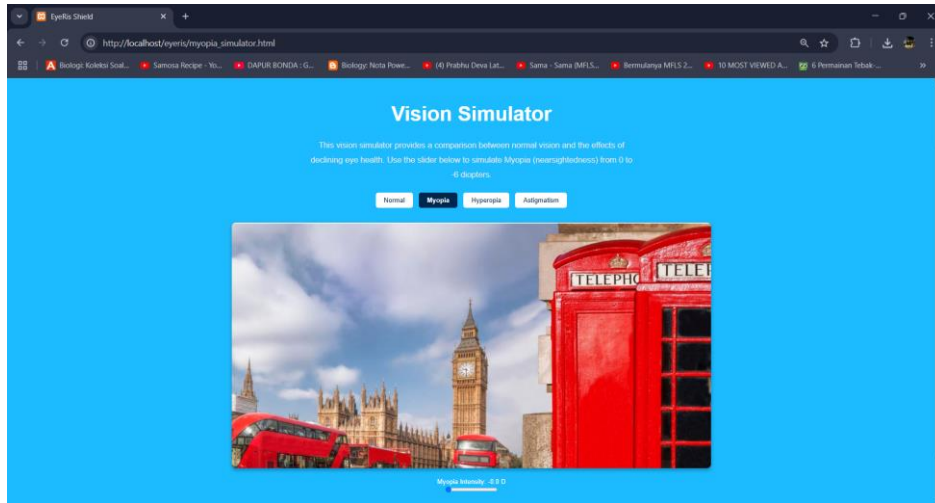


Figure 10: Vision Simulator Module

5.1.3 Vision Testing Module

The Vision Testing Module interface is shown in Figure 11. The Vision Testing Module will detect refractive errors such as myopia(near-sighted), hyperopia(far-sighted), and astigmatism and provide brief recommendations based on the results obtained. Each test module uses a certain technique. For the near-sighted test, the Jaeger Chart is used, while for the far-sighted test uses the Snellen Chart. Finally, the astigmatism test uses the Astigmatism Dial, which is an astigmatism chart.

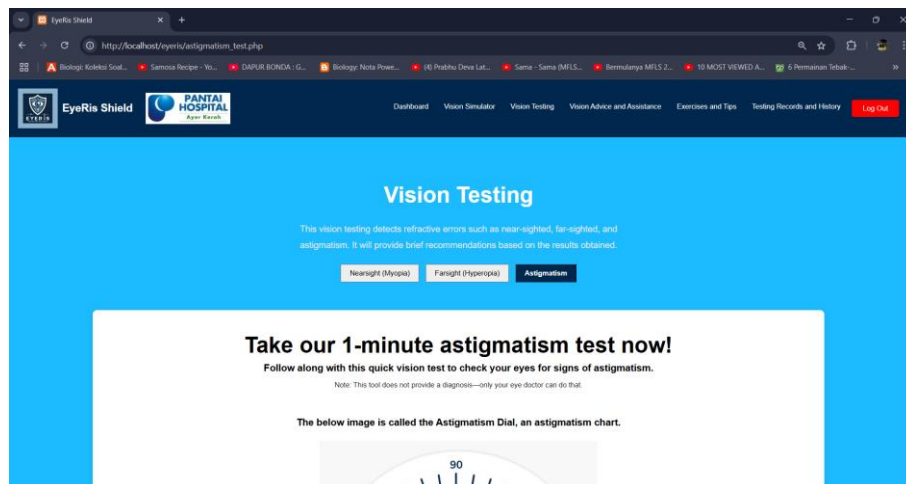
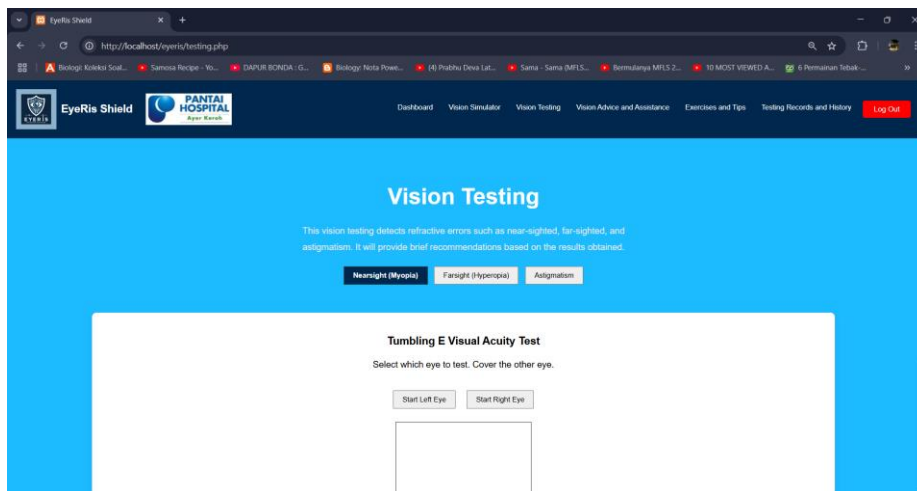


Figure 11: Vision Testing Module

5.1.4 Vision Advice and Assistance Module

The Vision Advice and Assistance Module interface is shown in Figure 12. The module allows users to have real-time chat and messaging with the eye specialist doctor of their choice. Firstly, the users will select the eye specialist doctor of their choice, then they can directly chat with the doctor in the chat room page.

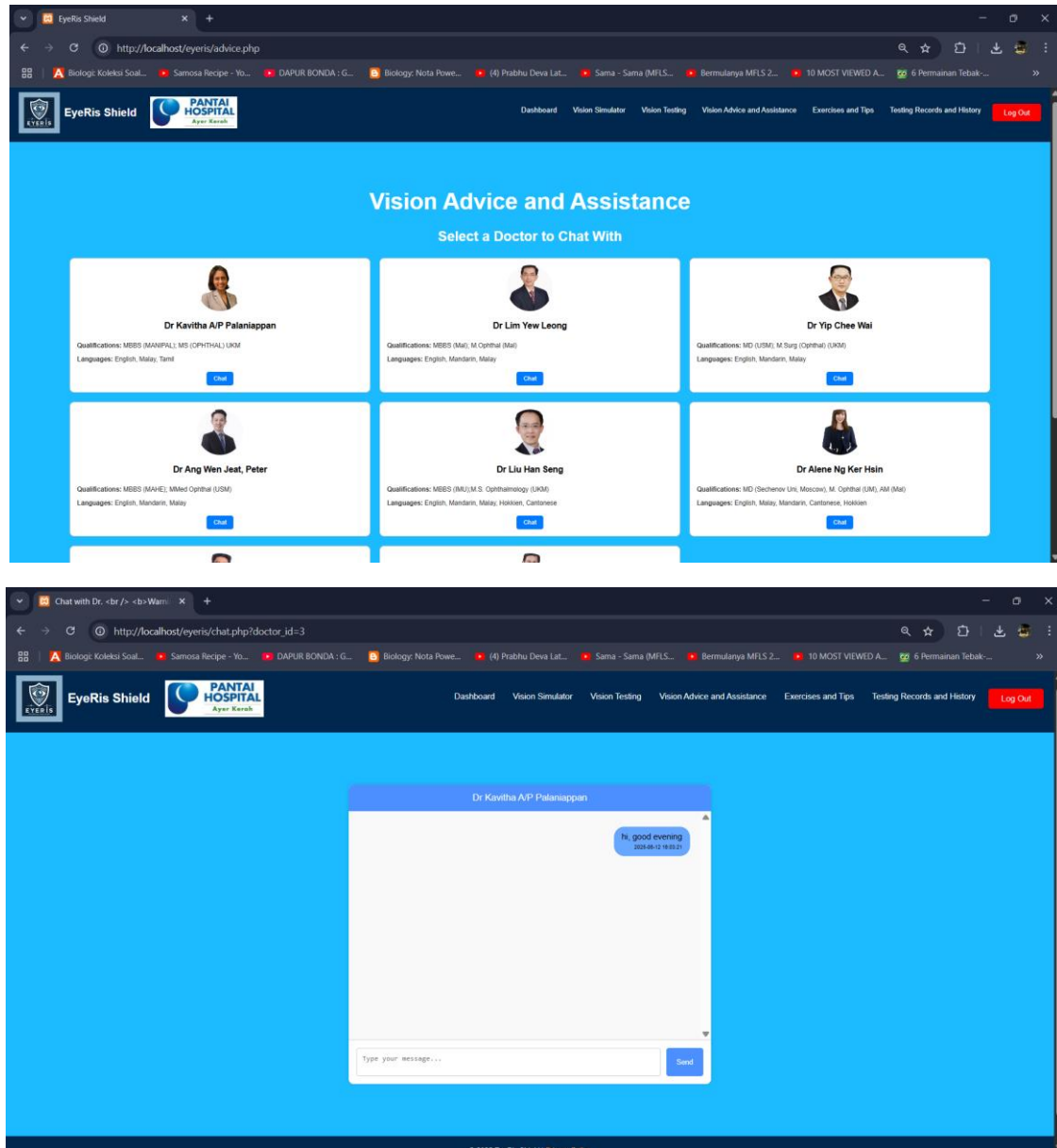


Figure 12: Vision Advice and Assistance Module

5.1.5 Eye Exercises and Tips Module

The Eye Exercises and Tips Module interface is shown in Figure 13. This module will display a variety of eye exercises that can reduce strain, improve focus, and promote overall eye health, with guidance. It will also provide a curated collection of tips on maintaining eye health, such as the dos and don'ts, including advice on screen time management, nutrition, and eye care routines.

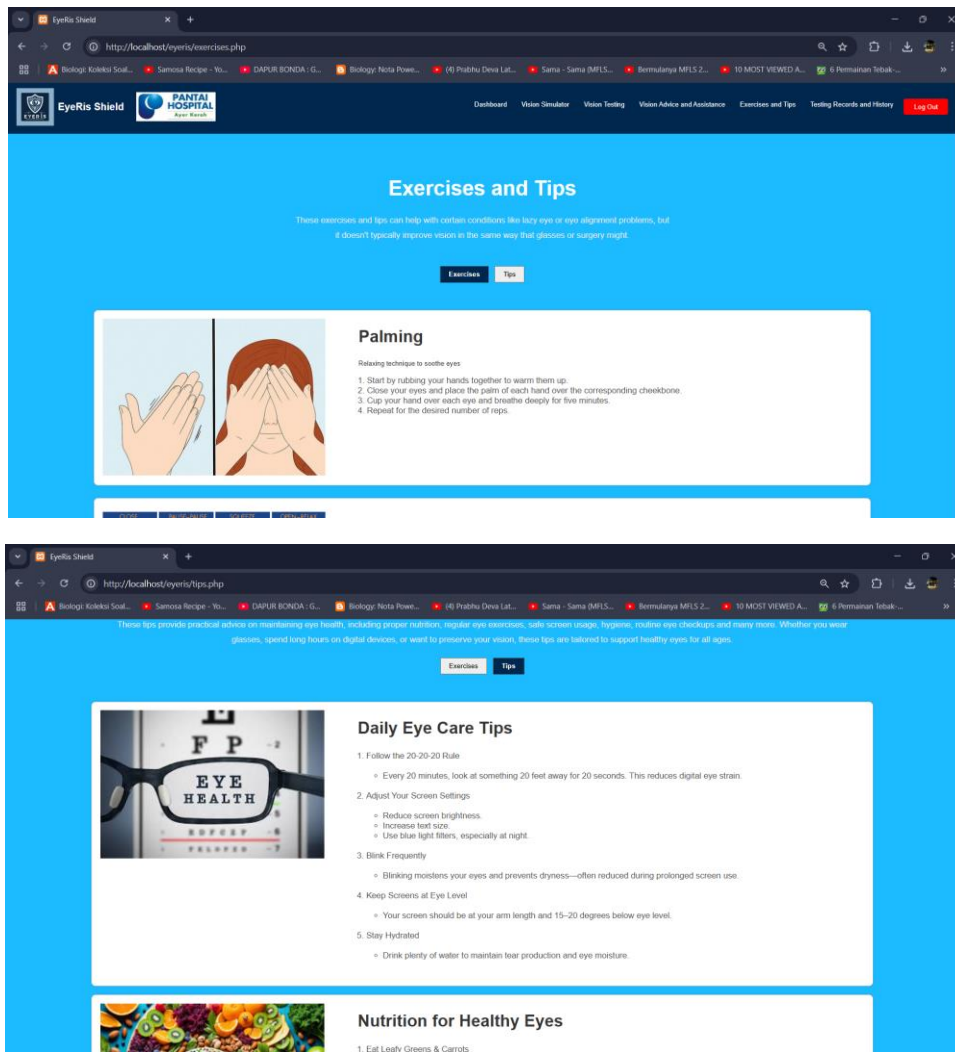


Figure 13: Eye Exercises and Tips Module

5.1.6 Testing Records and History Module

Figure 14 shows the Testing Records and History Module interface. This module should store the user testing records history in the database and allow users to track their eye health over time and review past testing results.

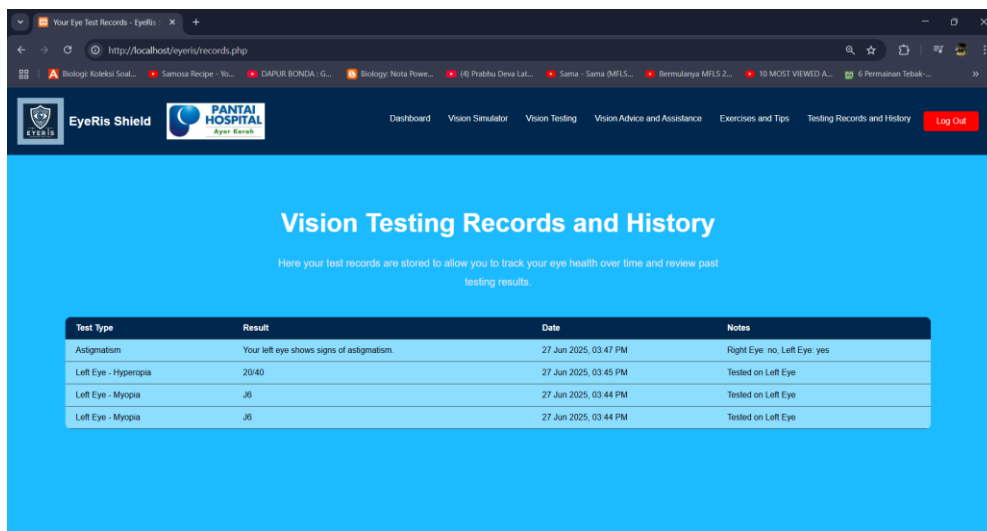


Figure 14: Testing Records and History Module

5.1.7 Add New Doctor Module

Figure 15 shows the Add New Doctor Module interface. This module should allow the administrator (admin) to register eye specialist doctors after verifying their certification manually. The admin can also edit the details or delete the eye specialist doctor profile if needed.

Full Name	Qualifications	Languages	Username	Password (Hashed)	Profile Image	Action
Dr Kavitha AP Palaniappan	MBBS (MANIPAL), MS (OPHTHAL) UKM	English, Malay, Tamil	kavitha	\$2y\$10\$raBQLhgB6q aXvQ3RUuCOG7VEFtge53TtLJaiOrRvOaYLOT3u		Edit Delete

Figure 15: Add New Doctor Module

5.1.8 Update Eye Exercise Module

Figure 16 shows the Update Eye Exercises Module interface. This module should allow the administrator (admin) to add new eye exercises and update or edit them if needed.

Title	Description	Steps	Image	Action
Palming	Relaxing technique to soothe eyes	<ul style="list-style-type: none"> -1- Start by rubbing your hands together to warm them up. -2- Close your eyes and place the palm of each hand over the corresponding cheekbone. -3- Cup your hand over each eye and breathe deeply for five minutes. -4- Repeat for the desired number of reps. 		Edit Delete

Figure 16: Update Eye Exercises Module

5.1.9 Update Eye Tips Module

Figure 17 shows the Update Eye Tips Module interface. This module should allow the administrator (admin) to add new eye tips and update or edit them if needed.

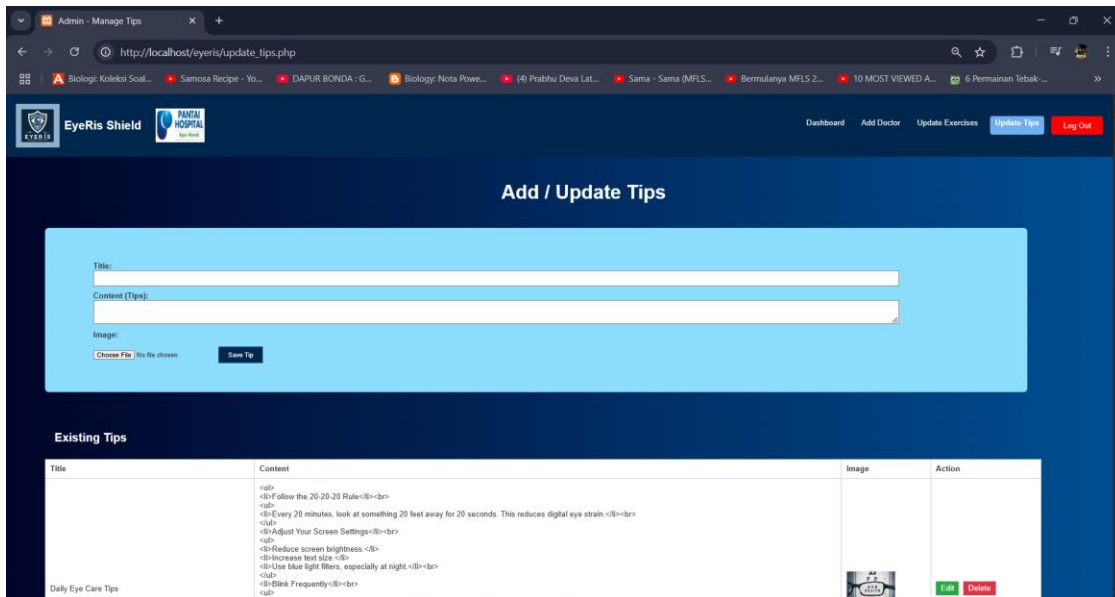


Figure 17: Update Eye Tips Module

5.1.10 Dashboard & Regular Notifications and Reminders Module

Figure 18 shows the Dashboard and the Regular Notifications and Reminders Module interface. The Notifications module will send scheduled notifications to encourage users to take screen breaks using the 20-20-20 rule. This module is displayed on the dashboard. The dashboard enables each type of user to view the modules in the application, respectively, and the timer for the 20-20-20 rule.

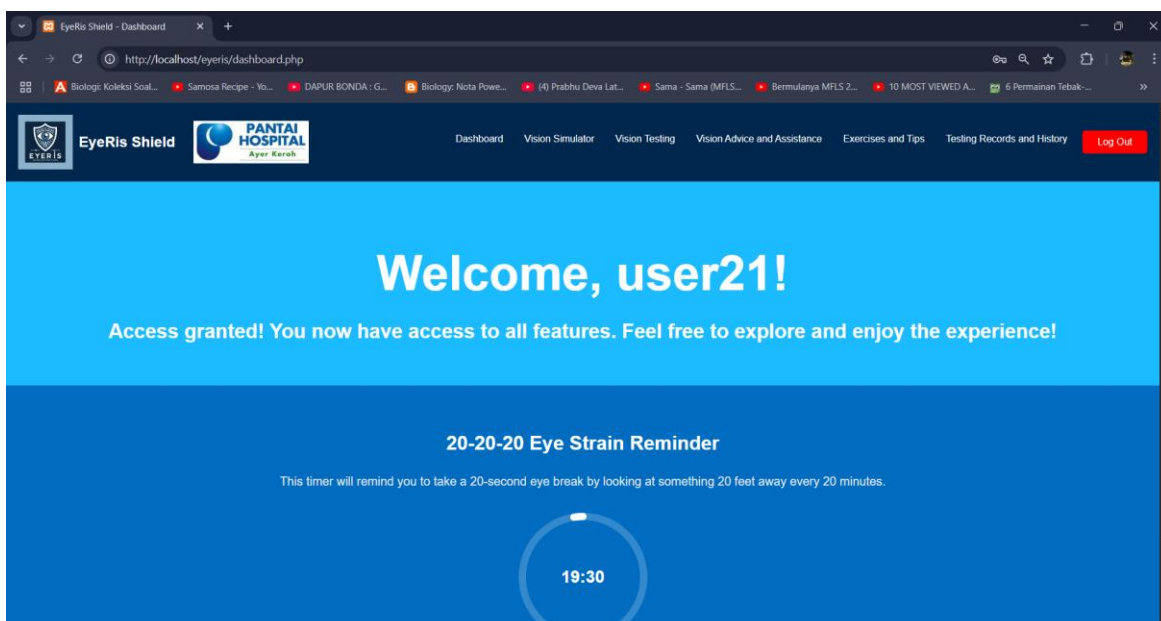


Figure 18: Dashboard and the Regular Notifications and Reminders Module

5.2 Testing

5.2.1 User Acceptance Testing (UAT)

A crucial stage in the software development life cycle that helps guarantee the program is prepared for production is user acceptance testing. It verifies the application's functionality, reliability, and usability from the viewpoint of the user. Figure 19 until Figure 22 show the results of user acceptance testing. User satisfaction is rated on a scale from 1 (very dissatisfied) to 5 (very satisfied).

The total number of respondents tested is 20. The number of respondents for the user/patient is 15, while for the eye specialist doctor is 3, and the administrator (admin) is 2.

Please select one option per row that best represents your level of satisfaction for each item.

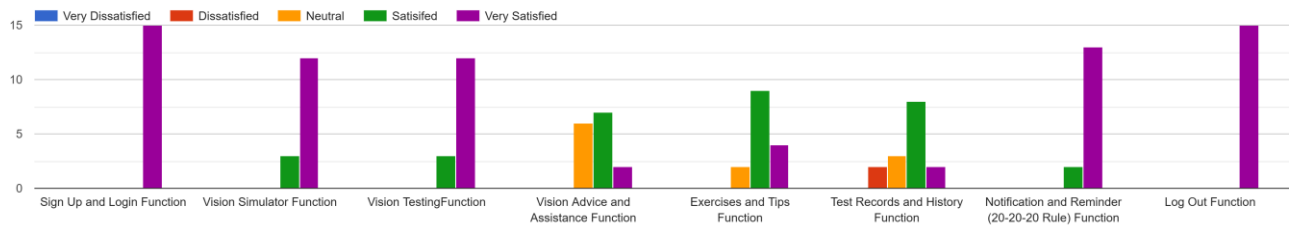


Figure 19: System Function (User/Patient)

Please select one option per row that best represents your level of satisfaction for each item.

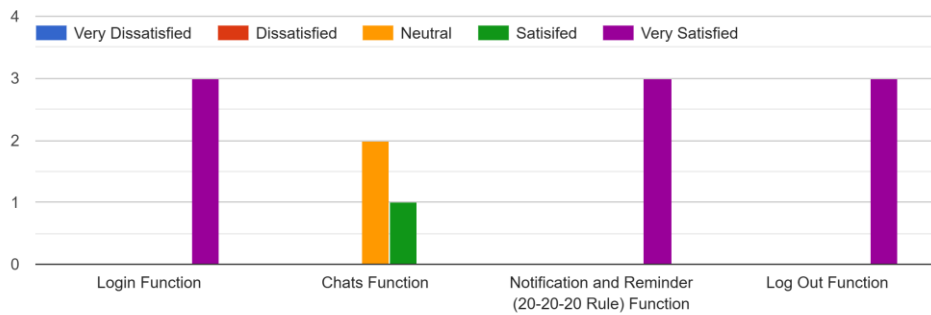


Figure 20: System Function (Eye Specialist Doctor)

Please select one option per row that best represents your level of satisfaction for each item.



Figure 21: System Function (Admin)

Please select one option per row that best represents your level of satisfaction for each item.

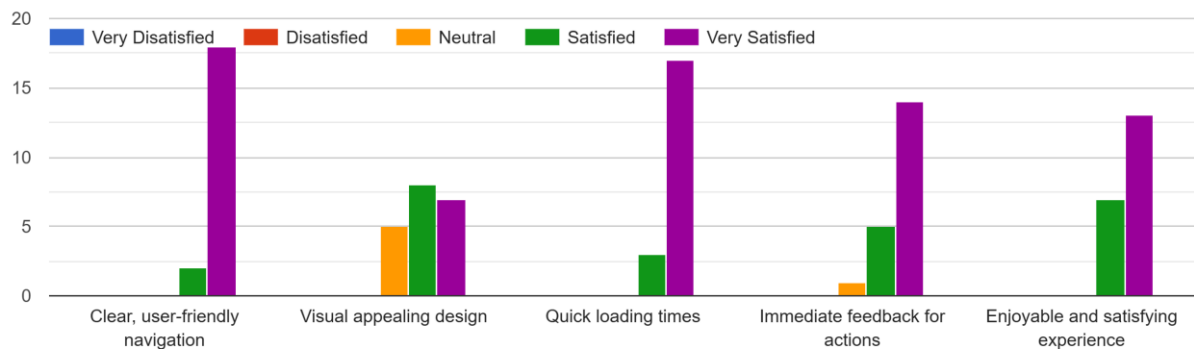


Figure 22: User Interface and User Acceptance

6. Conclusion

In conclusion, the EyeRis Shield Website has shown a lot of potential in the achievement of tackling the ever-emerging demand for applications that can be used in the management of the eyes easily and conveniently. The rise of digital eye strain and the general lack of knowledge about the prevention of the same make this initiative very relevant. Based on the structured approach and prototype construction methodology by using Visual Code Studio and phpMyAdmin, it was possible to create a functional, robust and scalable application containing basic concepts and features such as vision simulators, vision testing, vision advice and assistance, eye exercises and tips, testing records and history, add new doctor, update eye exercises and tips as well as regular notifications and reminders.

The EyeRis Shield Website has displayed a lot of progress in handling issues relating to eye health in the current generation. User Acceptance Testing (UAT) verified the website's functionality, reliability, and usability, highlighting its clear navigation, visually appealing design, quick loading times, immediate feedback for actions, satisfying experience, and practical system functions. Testing ensured the website met the needs of diverse user groups, including individuals with vision disorders, frequent screen users, and office workers, confirming its real-world applicability and functionality.

For future work, improvements can be implemented by focusing on further refining and expanding EyeRis Shield features to maximise its impact. The idea of adding some technologies can be considered to make the application user-friendly and more reliable. In addition, this application can be further enhanced by integrating a mobile platform. In short, this website is expected to serve as an eye health resource for early detection of eye conditions and foster healthy eye care habits.

Acknowledgement

The authors would like to thank the Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia for its support.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Vedhanahyakee A/P Annadurai, Hanayanti binti Hafit; **data collection:** Vedhanahyakee A/P Annadurai, Hanayanti binti Hafit; **analysis and interpretation of results:** Vedhanahyakee A/P Annadurai, Hanayanti binti Hafit; **draft manuscript preparation:** Vedhanahyakee A/P Annadurai, Hanayanti binti Hafit. All authors reviewed the results and approved the final version of the manuscript.

References

- [1] World Health Organization, "Blindness and vision impairment," *World Health Organization*, Aug. 10, 2023. <https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment>
- [2] Cleveland Clinic, "Eye Diseases: What Should I Know About Them?," *Cleveland Clinic*, May 02, 2024. <https://my.clevelandclinic.org/health/diseases/eye-diseases>
- [3] Cambridge University Press, "Cambridge Free English Dictionary and Thesaurus," *Cambridge.org*, 2024. <https://dictionary.cambridge.org/dictionary/>
- [4] G. H. Cassel, *The eye book : a complete guide to eye disorders and health*. Baltimore: Johns Hopkins University Press, 2021.
- [5] S. Grover, "Ophthalmology: Now and then," *Middle East African Journal of Ophthalmology*, vol. 19, no. 3, p. 271, 2012, doi: <https://doi.org/10.4103/0974-9233.97919>.
- [6] V. Biswas, *Community Eye Health: A Primer for Eye Care Professionals*. Shashwat Publication, 2024.
- [7] P. TI, *WEBSITE DEVELOPMENT: From Basics to Mastery – Build, Innovate, and Thrive in the Digital World*. NestFame Creations Pvt Ltd., 2025.
- [8] National Eye Institute, "Refractive Errors | National Eye Institute," Aug. 06, 2024. <https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/refractive-errors>
- [9] Lakshmanaswamy, *Clinical Pediatrics: History Taking and Case Discussions*. Wolters Kluwer India Pvt Ltd, 2022.
- [10] G. S. Schwartz, *The eye exam: A Complete Guide*. CRC Press, 2024.
- [11] T. Das and P. D. Nayar, *South-East Asia Eye Health: Systems, Practices, and Challenges*. Springer Nature, 2021.
- [12] "How do you use document analysis and existing systems analysis for requirements elicitation?," *www.linkedin.com*. <https://www.linkedin.com/advice/3/how-do-you-use-document-analysis-existing>
- [13] W. S. Davis and D. C. Yen, *The Information System Consultant's Handbook*. CRC Press, 2019.
- [14] R. Silhavy, *Software Engineering Methods in Systems and Network Systems*. Springer Nature.
- [15] S. Lewis, "What is the Prototyping Model?," *SearchCIO*, Jun. 2023. <https://www.techtarget.com/searchcio/definition/Prototyping-Model>
- [16] A. Christian, "Requirements Analysis Process and Techniques," *Requiment*, Apr. 10, 2024. <https://www.requiment.com/requirements-analysis-process-and-techniques/>

Appendix A: Gantt Chart

		Name	Duration	Start	Finish	Predecessors R...
1		Planning Phase	42 days	10/7/24 8:00 AM	12/3/24 5:00 PM	
2		Extensive Market Research and Analysis	3 days	10/7/24 8:00 AM	10/9/24 5:00 PM	
3		Identify Problem Statements	1 day	10/10/24 8:00 AM	10/10/24 5:00 PM	2
4		Prepare and Distribute Questionnaire	22 days	10/11/24 8:00 AM	11/11/24 5:00 PM	3
5		Interview with Stakeholder	1 day	10/11/24 8:00 AM	10/11/24 5:00 PM	3
6		Analysis Phase	16 days	11/12/24 8:00 AM	12/3/24 5:00 PM	
7		Analyze Questionnaire findings and interview outcome	2 days	11/12/24 8:00 AM	11/13/24 5:00 PM	4;5
8		Identify functional and non-functional requirements	1 day	11/14/24 8:00 AM	11/14/24 5:00 PM	7
9		Build Project Specifications	5 days	11/15/24 8:00 AM	11/21/24 5:00 PM	8
10		Build UML Diagrams	8 days	11/22/24 8:00 AM	12/3/24 5:00 PM	9
11		Design Phase	12 days	12/4/24 8:00 AM	12/19/24 5:00 PM	
12		Design UI with Wireframes	6 days	12/4/24 8:00 AM	12/11/24 5:00 PM	10
13		Design Database	6 days	12/12/24 8:00 AM	12/19/24 5:00 PM	12
14		Implementation of System Prototype Phase	17 days	12/20/24 8:00 AM	1/13/25 5:00 PM	
15		Install application environment	1 day	12/20/24 8:00 AM	12/20/24 5:00 PM	13
16		Build a high-fidelity prototype	16 days	12/23/24 8:00 AM	1/13/25 5:00 PM	15
17		Prototype Refinement Phase	34 days	1/14/25 8:00 AM	2/28/25 5:00 PM	
18		Customer Evaluation	12 days	1/14/25 8:00 AM	1/29/25 5:00 PM	16
19		Review and Update prototype if needed	22 days	1/30/25 8:00 AM	2/28/25 5:00 PM	18
20		Implementation of Application Phase	67 days	3/3/25 8:00 AM	6/3/25 5:00 PM	
21		Develop application modules	60 days	3/3/25 8:00 AM	5/23/25 5:00 PM	19
22		Database Connection	7 days	5/26/25 8:00 AM	6/3/25 5:00 PM	21
23		Testing Phase	10 days	6/4/25 8:00 AM	6/17/25 5:00 PM	
24		Application Testing	2 days	6/4/25 8:00 AM	6/5/25 5:00 PM	22
25		Identify Areas for Improvement	3 days	6/4/25 8:00 AM	6/6/25 5:00 PM	22
26		Debug Code	7 days	6/9/25 8:00 AM	6/17/25 5:00 PM	24;25

