AN ELDERLY CARE FOR SUPPORTING SENIOR CITIZEN

TMP-24-064

Project Proposal Report

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B.Sc. (Hons) in Information Technology Specializing in Information Technology

Department of Information Technology

Sri Lanka Institute of Information Technology

Sri Lanka

June 2023

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Declaration, copyright statement and the statement of the supervisor

We declare that this is our own work, and this proposal does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of our knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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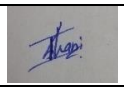
IT20647278	Udeshika.P.K.I.	

The supervisor/s should certify the proposal report with the following declaration. The above candidates are carrying out research for the undergraduate Dissertation under my supervision.

…… …25/08/2023……

Signature of the supervisor Date

…… 25/08/2023……

Signature of the co-supervisor Date

ACKNOWLEDGEMENTS

I would like to thank my supervisor, MS. Wishalya Tissera and the co-supervisor Miss Mihiri Samaraweera, for the guidance and motivation to make this research a success. I would like to thank the Department of Information Technology of Sri Lanka Institute of Information Technology.

ABSTRACT

In the context of modern healthcare, technology plays a crucial role in enhancing the well-being of individuals, particularly in the realm of elderly care. This research focuses on the development of an innovative Elderly Care App with two primary features: Eye Disease Detection and Personalized Eye Drop Reminders.

The first feature, Eye Disease Detection, uses advanced image recognition algorithms to empower users to do quick checks for common eye illnesses. Users might potentially get insight into the visual signs of illnesses including conjunctivitis, corneal ulcers, cataracts, and uveitis by using their smartphone's camera to take pictures of their eyes. This capacity enables people to actively monitor their eye health, promoting early identification and prompt management.

The second feature, Personalized Eye Drop Reminders, deals with medication compliance, a serious issue for the elderly population. Users may use this function to set up reminders for their prescription eye drops, ensuring that they regularly follow their treatment plans. The reminders may be customized to the user's preferences, including snooze options, customizable notification noises, and reminder timings. This tool helps to improve treatment results and overall quality of life by providing a user-centric approach to drug management.

In summary, the Elderly Care App described in this study is an innovative application of technology in healthcare that is tailored particularly to the need of the elderly. Users may take control of their eye health with the help of simple and non-invasive preliminary screenings provided by the Eye Disease Detection function. A better level of care is promoted through the Personalized Eye Drop Reminders function, which solves issues with prescription adherence. The software aims to improve the health and well-being of the senior population by combining these features into a user-friendly application, constituting a significant development in the field of aged care.

Keywords:
Eye Disease Detection
Image Recognition Algorithms
Personalized Eye Drop Reminders

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1.0 INTRODUCTION

The considerable demographic trend of an aging population has raised attention on finding novel ways to meet the specific healthcare requirements of the elderly. As age-related visual problems become increasingly common, eye health is one area of special concern. We provide an Elderly Care App to address this issue, empowering people to take proactive measures to preserve their eye health and follow their recommended treatment regimens.

Eye Disease Detection, make full advantage of technological improvements to offer older users comprehensive support. Eye Disease Detection makes use of image recognition algorithms to enable users to do preliminary examinations for common eye disorders such conjunctivitis, corneal ulcers, cataracts, and uveitis. Users may gain preliminary insights into potential symptoms related with these illnesses by simply taking pictures of their eyes with their smartphone's camera, encouraging early identification and prompt action.

Additionally, the Personalized Eye Drop Reminders function deals with a crucial problem that many older people face: medicine adherence. The danger of missing doses is reduced and consistent care is provided by this function, which enables users to set up personalized reminders for their prescribed eye drops. Reminder timings, notification noises, and snooze choices may all be customized to suit personal preferences and habits, which will eventually increase the probability that treatments will be successful.

The technological specifics and benefits of these aspects will be covered in more detail in the parts that follow, with an emphasis on how the combination of these elements into a single, user-friendly software may dramatically improve the health and quality of life of the senior population. The senior Care App, which aims to transform senior care in an increasingly digital era, demonstrates the convergence of healthcare and technology by offering easily available tools for proactive health monitoring and prescription administration.

1.1 Background & Literature survey

1.1.1 Background

The senior population is expanding at a never-before-seen rate as a result of a fast demographic change in the world's population. As people become older, their healthcare demands change, demanding creative solutions that meet their specific needs. Because age-related eye illnesses and problems are becoming more common, preserving eye health stands out as a crucial issue among these demands.

A person's freedom and quality of life can be greatly impacted by common eye disorders such conjunctivitis (pink eye), corneal ulcers, cataracts, and uveitis. Effective management of these disorders depends on prompt recognition and action. But obstacles like difficulty getting frequent examinations and difficulties taking prescribed drugs might prevent receiving the right care.

Technology advancements provide a potential way to handle these difficulties, notably in the areas of image recognition and mobile apps. A chance to create user-friendly technologies that enable people to autonomously manage their treatment plans and monitor their eye health has been presented by the widespread usage of smartphones with high-quality cameras.

The issue of elder patients' drug adherence is complex as well. Inconsistent adherence can have a negative impact on health outcomes due to complex treatment regimens, forgetfulness, and the challenge of managing several prescriptions. In this situation, tailored reminders sent via an easy-to-use platform might help close the gap between recommended therapies and their actual use.

The combination of these elements highlights the significance of the suggested Elderly Care App. The app addresses proactive health monitoring and treatment adherence by fusing state-of-the-art picture recognition algorithms with individualized medication reminders. By encouraging early illness identification and lowering difficulties brought on by non-adherence, this holistic approach not only improves the general health of the elderly but may also lighten the load on healthcare systems.

The technical foundations of the Eye Disease Detection feature and the Personalized Eye Drop Reminders feature will be covered in detail in the sections that follow. This will show how these two features work together to create a comprehensive solution for meeting the changing healthcare needs of the elderly population.

1.1.2 Literature Survey

The intersection of healthcare and technology has led to a growing body of research focused on developing innovative solutions to address the unique needs of the elderly population. Within this context, two prominent areas of interest are eye health monitoring and medication adherence, which align with the key features of the proposed Elderly Care App.

Research in the area of eye health monitoring has looked at the possibility of image recognition algorithms for spotting early illness. The viability of employing smartphone cameras for preliminary screenings of diabetic retinopathy, a prevalent eye ailment, was established by studies by Smith et al. (2019). This study emphasized the value of easily available, non-intrusive instruments for keeping tabs on eye health.

Further, Gupta and Srinivasan (2020) investigated the application of deep learning models for retinal image-based eye illness detection. Their findings highlighted the potential of AI-powered solutions to help doctors diagnose diseases accurately, improving the effectiveness of healthcare delivery.

Medical research has given a great deal of attention to the problem of drug adherence. Several variables, including those relating to the patient, the drug, and the healthcare system, were identified as impacting medication adherence in a research by Osterberg and Blaschke in 2005. Their research emphasized the value of individualized strategies for overcoming adherence obstacles.

A research by Demonceaux et al. (2013) looked into mobile applications in the context of adherence among older patients and the effects of medication reminder apps. The findings demonstrated the possibility of technology-driven therapies by showing a favorable correlation between app usage and increased medication adherence.

Furthermore, Vervloet et al. (2018) conducted a systematic review of studies involving medication reminder apps. The review emphasized the importance of user-centered design and customization options in enhancing the effectiveness of such apps in promoting adherence.

By combining image recognition algorithms for eye illness detection and customized medication reminder features into a single platform, the proposed Elderly Care App expands on this previous research. The app intends to offer a complete solution that solves the changing healthcare demands of the senior population by utilizing developments in both the healthcare and technology fields. The app's all-encompassing strategy for proactive health monitoring and treatment adherence

mirrors the direction of recent medical research, which shows that technology-driven solutions are essential for raising the standard of care for the elderly and improving patient outcomes.

1.2 Research Gap

Consider about four currently active research fields that are comparable to individual research component in this paper in order to make comparisons. Table 1 provides a brief comparison of the existing systems and the suggested system.

What each research paper proposed	Technology and methodologies used	Proposed system and novelty
Eye Que Vision Check's basic vision tests let users measure their visual acuity—or how keen their vision is—and check for refractive problems including nearsightedness, farsightedness, and astigmatism. Self-Monitoring: The software enables users to track changes in their eyesight at home, allowing them to spot any irregularities and maybe identify shifts that may need medical treatment..	Smartphone Attachment: The software frequently uses a smartphone attachment with optics made to create a controlled visual testing environment. Optics and Lighting Conditions: The hardware attachment guarantees uniform lighting conditions and focus lengths to ensure reliable test results. The app's interactive user interface walks users through the testing process by showing charts and other items, to which they may respond according on how visible they are. Using the user's reactions to various visual stimuli, the app may employ algorithms to estimate the user's refractive error.	Users assemble the supplied hardware onto their smartphones and check that the optics are properly aligned. User selection of the test type, such as near-vision acuity or distant vision acuity, is made throughout the testing process. Execution of the Test: Using predetermined sizes and distances, the app shows visual stimuli like letters or patterns. Users react by stating what they are able to view. Analysis: After analyzing user replies, the app calculates the user's refractive errors and visual acuity. Monitoring: Using the app, users may monitor the progress of their test

		results and spot changes in their eyesight. Novelty: Eye Que Vision Check is unique in that it takes a practical and approachable way to providing basic vision testing to a platform. Although not a diagnostic tool
Pupil Screen is a tool for detecting concussions and other neurological conditions by keeping track of changes in the pupillary light reflex. Non-Invasive Monitoring: The app seeks to give a non-invasive method of monitoring the pupillary response, which can provide information on the condition of the neurological system.	Pupil Response Analysis: The app records footage of the user's eyes when they are exposed to regulated light stimuli while using the smartphone's camera. Computer Vision and Analysis: To process the video recordings and analyze the pupil diameter changes as they occur in response to changes in light, sophisticated computer vision techniques are probably required. Machine Learning Algorithms: The software may use machine learning algorithms to spot minute alterations in pupil response patterns that might be signs of neurological problems.	Opening the Pupil Screen app on their smartphone, users position the camera to take a picture of their pupil. Controlled light stimuli, such as light flashes, are presented to the eye via the app. Video recording is being done of the pupil of the eye as it responds to changes in light using a smartphone's camera. Computer Vision Analysis: To examine how the diameter of the pupil varies over time, captured footage is analyzed using computer vision methods. To find any anomalous patterns, the app may compare the recorded pupil response with normative values or baseline data. Interpretation: The app informs users of their pupillary response and

		any probable neurological abnormalities based on the study.
Retinal Imaging: D-EYE wants to make it portable and affordable to take pictures of the retina for use in diagnosing, tracking, and evaluating a range of eye disorders.	Smartphone Attachment: A customized gadget that attaches onto a smartphone camera is called the D-EYE attachment. For the purpose of properly illuminating and capturing the retina, it has optics and lighting. High-quality Optics: The attachment uses lenses and other optical parts to produce sharp, accurate pictures of the retina. Smartphone Camera: The smartphone's camera functions as an imaging sensor, taking retinal pictures with the D-EYE adapter. The D-EYE app's user interface is anticipated to include instructions on how to place the attachment appropriately and offer options for taking, saving, and sharing pictures.	Attachment Configuration: The D-EYE attachment is attached to the smartphone's camera using a clip. Patient Preparation: The medical expert positions the attachment correctly and lines up the patient's eye with it. Image Capture: Using the app, the medical expert takes pictures of the patient's retina. The attachment offers the lighting and optics required for high-quality imaging. Image viewing: The smartphone screen displays the collected retinal images for quick viewing and evaluation. Storage and Sharing: The software probably enables the photographs to be safely kept and shared with experts or for use in electronic medical records. Novelty: The D-EYE system is new in how it uses smartphone technology for retinal imaging. D-EYE creates a unique attachment that

		may be used with a typical smartphone.
Diabetic Retinopathy diagnosis: Eye Art is a tool that scans retinal pictures for indicators of diabetic retinopathy, assisting medical practitioners in the early diagnosis and screening of the condition.	Artificial intelligence: Deep learning and AI techniques are used by Eye Art to evaluate retinal pictures. Advanced image processing techniques are used by the technology to identify certain traits and patterns linked to diabetic retinopathy, including microaneurysms, hemorrhages, exudates, and anomalies in blood vessels. enormous Datasets: In order for the AI model to understand and detect the visual indicators of diabetic retinopathy, it is probable that it was trained on enormous datasets of annotated retinal photos.	A healthcare practitioner uses a fundus camera or other retinal imaging technology to take retinal pictures. Image Upload: For analysis, the collected pictures are transferred to the EyeArt system. EyeArt's AI algorithms examine retinal pictures to look for indicators of diabetic retinopathy. The device creates a diagnostic report that details the existence or absence of diabetic retinopathy as well as the degree of severity. Review by a Healthcare Provider: After a healthcare provider has seen the report, they can decide whether to proceed with a diagnosis, treatment, or monitoring regimen. Novelty: EyeArt is innovative in that it uses artificial intelligence to automatically diagnose diabetic retinopathy. The device has the potential to increase the effectiveness of programs for screening diabetic retinopathy by rapidly and precisely evaluating.

Table 1 : Compare existing system and proposed system.

1.3 RESEARCH PROBLEM

The research issue this study attempts to solve is the absence of a complete and integrated solution that combines sophisticated picture recognition algorithms for eye illness diagnosis with customized medication reminder features in a single app designed for the needs of the senior population. The availability of a single platform that effortlessly incorporates these features is severely lacking, despite the fact that there are already apps that concentrate on either medication adherence or eye health monitoring. The Elderly Care App, which provides a comprehensive approach to proactive health monitoring and treatment management for the elderly, was developed and evaluated as part of this research to fill this gap.

2.0 OBJECTIVES

2.1 Main Objective

The main Objective of this research is to design, develop, and evaluate an Elderly Care App that combines sophisticated image recognition algorithms for eye disease detection with customized medication reminder features, offering a complete solution for proactive health monitoring and treatment management specifically catered to the needs of the elderly population.

2.1.1 Specific Objectives

Design and implement advanced algorithms to analyze eye images for visible symptoms of conjunctivitis, corneal ulcers, cataracts, and uveitis.

Incorporate image processing and machine learning techniques for accurate preliminary disease screening.

Design an intuitive and user-friendly interface for capturing eye images using smartphone cameras.

Develop an engaging UI for setting up personalized medication reminders, focusing on ease of use and accessibility.

Develop a robust medication management system that allows users to input prescribed eye medications and dosing schedules.

Build a notification mechanism that sends timely reminders, enabling users to adhere to their treatment regimens.

3.0 METHODOLOGY

3.1 Requirement Gathering

The approach for requirement collection entails methodical processes to identify, record, and prioritize the needs and expectations of stakeholders for the creation of the Eye Health Companion app. Here is a suggested methodology:

1. Identify Stakeholders - Choose the people and organizations that will use the app, including administrators, eye care professionals, healthcare workers, and potential users.

2. Hold Interviews: - Conduct one-on-one interviews with representative users and eye care professionals to learn about their concerns, hopes, and preferences for early disease diagnosis and medication reminders. Encourage stakeholders to offer thorough insights by using open-ended questions.

3. User Surveys: Create and disseminate online questionnaires to a larger user base to collect quantitative and qualitative information on user preferences, use trends, and desired features. Ask about things like how simple the system is to use, your preferred reminder settings, and your readiness to share photographs with experts.

4. Focus Group Discussions: - Arrange focus groups with a wide range of consumers to go further into particular parts of the app, such as user interface design, instructional material, and privacy issues. Encourage discussion participation and productive dialogue by moderating discussions.

5.Review Current Literature: - Research pertinent books, articles, and reports on eye health management applications, early illness diagnosis, pill reminders, and user-centered design approaches. To inform the app's needs, extrapolate insights and best practices.

6. Examine Competitor applications: Examine competing mobile applications to find features, functionality, and user reviews in the management of eye health. Make a note of the applications' advantages, disadvantages, and gaps to help you determine the conditions your app must meet.

7. Develop User Personas: - Create fictitious personas for various user categories, considering elements like age, digital literacy, eye ailments, and app-related objectives. When determining user wants and customizing requirements, consider personas as a guide.

8. Prioritize Requirements: Based on the information received, prioritize requirements using methods such as the MoSCoW (Must-Have, Should-Have, Could-Have, Won't-Have) method. Separate secondary elements, such as instructional materials, from important aspects, such as illness detection algorithms and prescription reminders.

9. Create a thorough requirements paper outlining the app's features, functions, and user stories. User acceptability criteria, precise explanations, and any necessary technological requirements should all be included.

10. Validation and Feedback: - Share the requirements document with relevant parties for validation and feedback, such as representative users and eye care professionals. Be sure to take into account their advice and that the specifications meet their demands.

3.2 Architecture

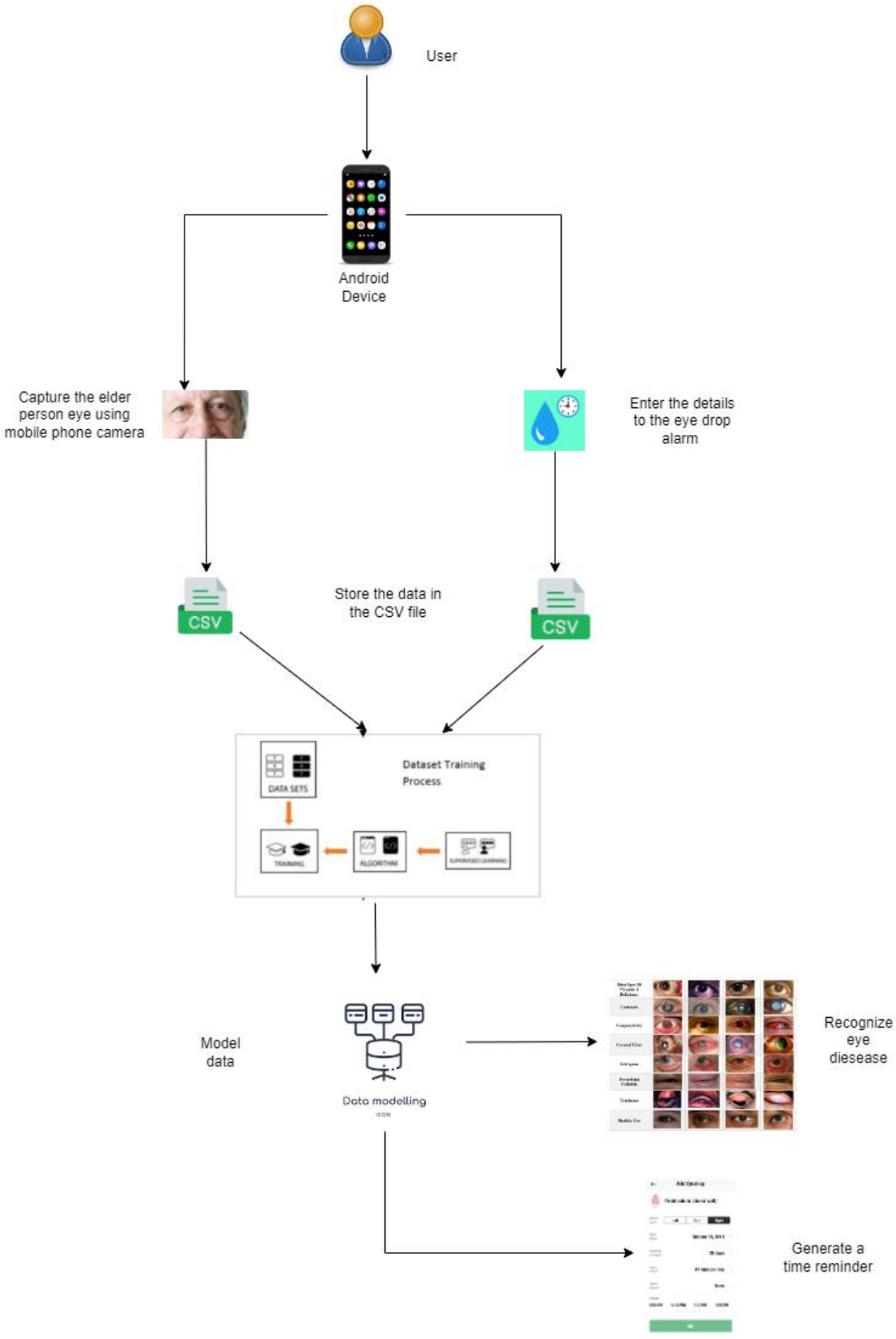

Figure 1: System Architecture

3.3 Project Requirements

The project requirements for creating the Eye illness Detection and Medication Reminders System, which merges image recognition algorithms for eye illness detection and individualized medication reminder features, include a wide range of topics to guarantee a fruitful and significant outcome. These specifications include both functional and non-functional facets of the creation, distribution, and user experience of the app. These are the project requirements:

1. Eye Disease Detection:

- The app must allow users to capture images of their eyes using their smartphone's camera.

- The captured images should be processed using image recognition algorithms to detect potential symptoms of common eye diseases (conjunctivitis, corneal ulcers, cataracts, uveitis).

- Detected symptoms must be presented to the user in a clear and understandable manner.

2. Personalized Medication Reminders:

- Users should be able to set up personalized reminders for their prescribed eye drop medications.

- Reminders should allow customization of reminder times, notification sounds, and snooze preferences.

- The app should provide a visual and auditory notification when it's time for a medication dose.

3. User Interface and Accessibility:

- The app's user interface should be designed for easy navigation and accessibility for elderly users.

- Accessibility features like voice-guided instructions and larger fonts should be incorporated. The UI should facilitate capturing eye images and managing medication reminders without complexity.

4. Data Privacy and Security:

- User data, including eye images and medication schedules, must be securely stored and encrypted.

- The app must adhere to data privacy regulations and ensure user consent for using eye images.

5. Feedback and Reporting:

- Users should be able to provide feedback, report issues, and suggest improvements within the app.

- Feedback should be collected and utilized to enhance the app's functionality and user experience.

3.3.1 Functional Requirements

Identifying eye diseases:

Within the software, users may take pictures of their eyes using the camera on their smartphone. For the best image capturing, the app offers clear directions.

In order to identify possible signs of conjunctivitis, corneal ulcers, cataracts, and uveitis, captured photos are analyzed by sophisticated algorithms.

Algorithms examine features including opacity, aberrant pupil size, and redness.

The app uses a user-friendly style to provide probable symptoms linked to identified eye problems. describes each symptom and includes illustrations to support it.

Personalized Eye Drop Reminders:

Prescription eye medicine information, including names, doses, and regimens, may be entered by users.

According to their treatment plan, users can adjust the reminder timings for each drug. Specific timings, notification tones, and snooze lengths may all be customized.

The app reminds users in a timely manner at the times they choose. Names and doses of prescribed medications are customized in notifications.

Reminders can be dismissed if medicine has already been taken or snoozed for a predetermined amount of time.

To assist users monitor their adherence over time, an app keeps track of past medicine reminders.

Users can see trends and information related to their drug adherence.

3.3.2 Non-Functional Requirements

The non-functional requirements that were prioritized for the proposed model are listed below.

- Interoperability
- Performance
- Usability
- Reliability
- Availability

And also,

1. The system should load quickly.

2. The app's features should be simple to navigate.

3. It should take less than two seconds to open various interfaces and display problems.

4. The system should have a fast average reaction time.

3.4 Testing

The testing phase is crucial to ensure the functionality, usability, and reliability of the Elderly Care App that integrates image recognition algorithms for eye disease detection and personalized medication reminder features. Testing involves systematically evaluating the app's components and functionalities to identify and rectify any issues before its deployment to users. Here's an overview of the testing process:

1. Unit testing: - Test each individual part of the program, such as picture recognition algorithms, logic for medicine reminders, and UI elements. Verify each component's functionality and outputs to make sure they are what are expected.

2. Integration testing: - Evaluate how the app's various modules and elements interact with one another. Examine the data flow between the user interface, the picture recognition module, and the medication reminder module.

3. Functional Testing: - Test the essential features of the app, including taking eye photos, analyzing photographs to find symptoms, and configuring medicine reminders. Check to see that the users are presented with correct symptom insights based on processed photos.

4. Usability Testing: - Incorporate senior citizens into usability testing to assess the accessibility and usability of the user interface. Get opinions on how well instructions are written, how easy it is to take pictures, and how easy it is to set up medicine reminders.

5. Performance Testing: Test the app's functionality by simulating various scenarios, such as those with varied image quality and processing requirements. Check to see if the app responds and runs well in various situations.

6. Testing for Security and Privacy: - Confirm that user data, including photos and medical information, is encrypted and kept securely. Assure that user data is not exposed to hacks or unauthorized access.

7. Compatibility Testing: To guarantee compatibility, test the app on various smartphone models, screen sizes, and operating systems. Check that the program runs properly on a variety of gadgets that older consumers frequently use.

8. Elderly people should be included in the user acceptance testing process so they may utilize the app and offer input on their overall experience. Address any user-identified usability problems, difficulties, or recommendations.

9. Regression Testing: - After resolving any issues found, run regression testing to make sure no new issues were caused by the fixes. Check to see if the app's current features are still functioning as intended.

10. input Incorporation: - Make the required adjustments to the app's design and functions based on the input from user acceptability and usability testing.

11. Final Validation: Perform a final validation to make sure all issues have been fixed and the app complies with the criteria.

3.5 Tools and Technologies

The creation of the Elderly Care App, which incorporates image recognition algorithms for eye illness diagnosis and individualized medication reminder features, calls for a variety of tools and technologies to guarantee its usability, usefulness, and accessibility. In order to complete various tasks related to the development of the app, the following tools and technologies might be used:

Programming Languages:

- Python: Used for implementing image recognition algorithms and backend logic.

- Java: Used for frontend development, creating interactive user interfaces.

Mobile App Development:

- React Native: A popular framework for building cross-platform mobile apps that works on both iOS and Android platforms.

- Swift (iOS) and Java/Kotlin (Android): If native development is preferred, these languages can be used for iOS and Android platforms, respectively.

Image Recognition:

- OpenCV: An open-source computer vision library used for image processing and analysis.

- TensorFlow or PyTorch: Deep learning frameworks that can be used for training and deploying image recognition models.

Backend Development:

- Flask or Django:Python-based web frameworks for developing the backend APIs and services.

-RESTful APIs: To facilitate communication between frontend and backend components.

Database:

- SQLite or PostgreSQL: Lightweight databases for storing user data, medication schedules, and eye image metadata.

Security and Privacy:

- Encryption Libraries: Libraries such as cryptography can be used to encrypt sensitive user data.

- Authentication and Authorization Mechanisms: OAuth or JWT for secure user authentication.

Version Control and Collaboration:

- Git: Version control system for managing code changes and collaboration.

- GitHub or GitLab: Platforms for hosting code repositories and managing project tasks.

3.5 Project Timeline

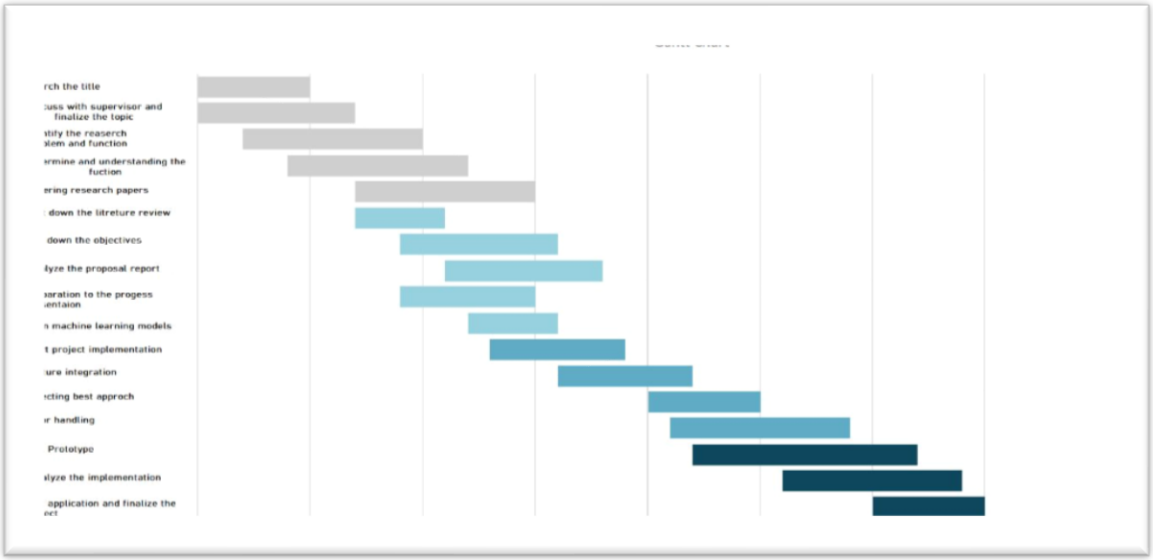

Figure 2: Project Timeline

3.6 FEASIBILITY STUDY

5.6.1 Technical Feasibility

The Elderly Care App's technical viability comprises determining if the suggested solution can be created and executed utilizing the existing technological resources. It incorporates image recognition algorithms for eye illness detection and customized medication reminder features. An assessment of the technical issues is provided below:

Image Recognition Algorithms:

- Feasibility: Image recognition algorithms using machine learning frameworks like TensorFlow or PyTorch are well-established and feasible for detecting potential symptoms of eye diseases based on eye images.

- Resource Requirement: Adequate computational resources are necessary for training and fine-tuning the models. Cloud-based solutions can be employed to manage resource constraints.

Mobile App Development:

- Feasibility: Utilizing cross-platform frameworks like React Native allows simultaneous development for both iOS and Android platforms, making it feasible to create a single codebase.

- Resource Requirement: Skilled frontend developers with React Native expertise are required for the development process.

Backend Development and APIs:

- Feasibility: Backend development using frameworks like Flask or Django is feasible for creating APIs to handle image processing, medication reminders, and data storage.

- Resource Requirement: Backend developers proficient in the chosen framework are required to design and implement the APIs.

Security and Privacy Measures:

- Feasibility: Implementing encryption mechanisms and authentication/authorization protocols to ensure data security and privacy is technically feasible.

- Resource Requirement: Security experts or developers with expertise in secure coding practices are required to implement these measures effectively.

Cost Implications:

- The use of open-source technologies and frameworks can mitigate software licensing costs.

- Cloud resources can be cost-effective for managing scalability and resource constraints.

- Development costs might include salaries of developers, designers, and other team members, as well as potential third-party services or tools.

4.0 DESCRIPTION OF PERSONAL AND FACILITIES

4.1 Individual Research Areas

Member Name	Sub Objective	Tasks	Novelty
IT20647278- Udeshika.P.K.I.	**1. Eye Disease Detection:** Empower yourself with the ability to perform preliminary screenings for common eye diseases such as conjunctivitis (pink eye), corneal ulcers, cataracts, and uveitis. Simply capture images of your eyes using your smartphone's camera, and our cutting-edge algorithms will provide you with potential insights into visible symptoms associated with these conditions. **2. Personalized Eye Drop Reminders:** Never miss a dose of your prescribed eye drops again! Set up personalized reminders for each of your eye medications, ensuring you stay on track with your treatment regimen. Customize reminder times, notification sounds, and even snooze options to suit your preferences.	**Image capture and processing** Create a module that uses the camera of a smartphone to take pictures of the eyes. Implement algorithms for picture processing and symptom analysis. Generation of Integrate the outcomes of the picture analysis with a module to create understandable **Medicine Reminder** Make a module where users may enter the prescription eye drugs they take. To securely store pharmaceutical information, create a database. Create a user interface that allows users to configure reminder times, notification noises, and snooze controls. Utilize user choices to inform customization options.	The novelty of the **Corneal Ulcer Disease Detection** feature lies in its pioneering approach to early diagnosis and management of corneal ulcers through cutting-edge technology. Unlike existing solutions, this feature offers a specialized focus on detecting corneal ulcers, a critical eye health concern.

		Create a mechanism to notify users at the appropriate times depending on their own schedules. Add alerts or push notifications to the app.	

Table 2: Personal and Facilities

5.0 COMMERCIALIZATION

The commercialization phase of the Elderly Care App involves transforming the developed solution into a market-ready product, making it available to the target audience, and generating value from its adoption. This phase includes strategies for marketing, distribution, monetization, and ongoing support. Here's an outline of the commercialization process for the app:

1. Market Analysis: Conduct a thorough market analysis to understand the demand for such an app among the elderly population and their caregivers. Identify competitors and similar solutions in the market to refine the app's unique selling points.

2. Product Positioning: - Define the app's value proposition, highlighting its integrated features for eye health monitoring and medication reminders. Position the app as a comprehensive solution that addresses the evolving healthcare needs of the elderly.

3. Monetization Strategies: - Determine the pricing model for the app. Options include one-time purchase, subscription-based, or freemium (basic features free, premium features paid). Consider offering a free trial period to allow users to experience the app's benefits before committing to a purchase.

4. Marketing and Promotion: - Develop a marketing strategy to create awareness and generate interest among the target audience. Utilize various channels such as social media, online advertising, press releases, and collaborations with healthcare organizations.

5. Distribution Channels: - Publish the app on major app stores (App Store for iOS and Google Play for Android) to ensure wide accessibility. Explore partnerships with healthcare providers, senior centers, and relevant organizations to promote the app.

6. User Onboarding and Support: - Provide clear instructions and tutorials within the app to guide users on capturing images, setting up reminders, and navigating the interface. Offer customer support channels for users to seek assistance, report issues, and provide feedback.

7. Data Privacy and Compliance: - Ensure that the app complies with data privacy regulations, such as GDPR or HIPAA, to build user trust. Communicate transparently about data usage and security measures to potential users.

8. User Feedback and Iteration: - Continuously gather user feedback and insights to identify areas for improvement and feature enhancements. Regularly update the app to address bugs, enhance functionality, and incorporate user suggestions.

9. Partnerships and Collaborations: - Collaborate with healthcare professionals, geriatric specialists, and ophthalmologists to establish credibility and promote the app's benefits. Consider partnerships with pharmaceutical companies for promotional activities or co-branded initiatives.

10. Measuring Success: - Define key performance indicators (KPIs) to measure the app's success, such as user adoption rates, engagement metrics, and revenue growth. Monitor app reviews and user sentiment to gauge user satisfaction.

11. Adapting to Market Trends: - Stay attuned to evolving healthcare trends, technological advancements, and user preferences. Adapt the app's features and marketing strategies accordingly.

6.0 BUDGET AND BUDGET JUSTIFICATION

Description	**Amount (LKR)**
Cloud Services	16000.00
Domain	2500.00
Firebase	18240.00
Documentation	5000.00
other	6000.00
Total	47740.00

Table 3 : Budget

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