

INTERNSHIP REPORT

B.Tech in Computer Science and Engineering

DIVISION OF COMPUTER SCIENCE AND ENGINEERING

SCHOOL OF ENGINEERING

CUSAT



RUVAIS P

20223087

Internship Details:

Kraltek

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MAY 13 2024 - JUNE 13 2024

DIVISION OF COMPUTER SCIENCE AND ENGINEERING
SCHOOL OF ENGINEERING
COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY

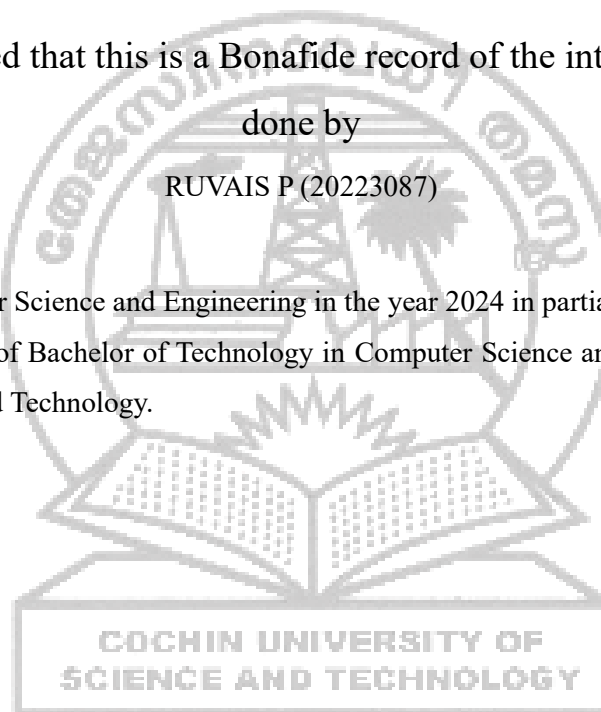
CERTIFICATE

Certified that this is a Bonafide record of the internship

done by

RUVAIS P (20223087)

of III Semester, Computer Science and Engineering in the year 2024 in partial fulfilment requirements for the award of Degree of Bachelor of Technology in Computer Science and Engineering of Cochin University of Science and Technology.



Dr. Pramod Pavithran
Head Of Division

Ms. Sheena S
Class Co-ordinator

Acknowledgment

Completing this internship at Kraltek, a start-up under Kerala Startup Mission and CITTIC, has been made possible through the contributions and support of various individuals and entities.

First and foremost, I would like to express my heartfelt gratitude to **Dr. Pramod Pavithran**, Head of the Department, for fostering an environment conducive to learning and growth. His constant encouragement and support have been instrumental in making this internship a fruitful experience. I also sincerely thank **Ms. Sheena S**, our class coordinator, for her unwavering support, guidance, and assistance throughout this journey.

I am deeply thankful to **Mr. Ziyad K**, Founder of Kraltek, for allowing me to intern as a Flutter Developer. I owe a special debt of gratitude to **Mr. Ziyad K**, my mentor during the internship, whose constant guidance, support, and patience played a pivotal role in shaping my internship experience. Their insightful feedback and encouragement significantly enhanced my understanding of Flutter and mobile application development.

My heartfelt appreciation goes to the **Kraltek team** for fostering a collaborative and motivating work environment. Their readiness to assist me in understanding various project components and their willingness to share knowledge made this internship both productive and enjoyable.

Finally, I am immensely grateful for the unwavering support of my parents and the divine guidance that kept me going throughout this journey.

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1. Introduction

During my 30-day internship at Kraltek, I focused on mobile application development, primarily leveraging the Flutter framework for front-end design. This experience provided me with hands-on exposure to building cross-platform mobile applications with a strong emphasis on designing dynamic, responsive, and user-friendly interfaces. Working alongside experienced developers and designers allowed me to understand team-oriented workflows, version control systems, and industry best practices, enhancing both my technical and interpersonal skills.

The primary objective of the internship was to gain proficiency in Flutter, Google's versatile toolkit that enables the creation of natively compiled applications for mobile, web, and desktop platforms from a single codebase. By exploring Flutter's widget-based architecture, I learned to develop custom widgets, utilize pre-built UI components, and create visually appealing interfaces. Managing state using providers and implementing seamless navigation between screens further enriched my understanding of application workflows.

Throughout the internship, I handled tasks such as designing custom widgets, optimizing user interfaces for responsiveness across diverse screen sizes, and addressing cross-platform compatibility challenges. These responsibilities helped me gain practical experience in debugging, performance optimization, and testing methodologies, ensuring the robustness and functionality of the applications. Additionally, I worked with APIs to fetch and dynamically display data, a critical aspect of modern mobile application development.

The internship also allowed me to deepen my understanding of the Dart programming language, which forms the core of Flutter development. Writing efficient and maintainable code improved my problem-solving abilities and logical thinking. I gained insights into front-end development principles, user experience design, and the importance of creating intuitive, user-centered applications.

Overall, my time at Kraltek was a transformative experience that equipped me with practical knowledge, confidence, and a strong foundation in mobile application development. It solidified my passion for creating innovative applications and prepared me to contribute effectively to real-world projects in the software development industry.

2. Organizational Overview

Kraltek, a promising startup incubated at CUSAT under the Kerala Startup Mission and CITTIC (Centre for Innovation, Technology Transfer, and Industrial Collaboration), is committed to creating innovative solutions that address real-world challenges. The organization focuses on designing practical and user-friendly products, reflecting its mission to simplify everyday life through technology. One of its standout initiatives is a medicine reminder hardware system aimed at helping users effectively manage their medication schedules and improve adherence to prescribed routines.

This groundbreaking project has already seen the development of a functional prototype, showcasing the feasibility of the hardware solution. The current phase emphasizes designing an intuitive user interface (UI) that ensures a seamless and engaging interaction between users and the device. The UI is envisioned to empower users by allowing them to set medication reminders with precision, specifying details such as time, dosage, and frequency.

Beyond basic reminder functionality, the system is equipped with advanced features to track medication history and provide insights based on user inputs. These analytical capabilities will allow users to monitor their progress, detect patterns, and make informed decisions about their health. This blend of functionality and analysis aims to offer users a comprehensive tool for effective health management.

The project prioritizes accessibility, simplicity, and ease of use to ensure that individuals across all age groups can benefit from the system. The focus on a streamlined and user-friendly interface underscores Kraltek's dedication to inclusivity, ensuring that even users with limited technical knowledge can operate the system with confidence.

This initiative embodies Kraltek's broader vision of addressing critical societal challenges through innovation and user-centered design. By integrating technology and thoughtful engineering, the medicine reminder system exemplifies how Kraltek is making a tangible impact on health management, reinforcing its role as a pioneer in delivering solutions that improve the quality of life for users.

3. Objectives of the Internship

The objectives of my internship at Kraltek were designed to provide a comprehensive learning experience in front-end mobile application development using the Flutter framework. The key objectives included:

1. **Learn Basic Principles of UI/UX:** Understand foundational UI/UX concepts, including color schemes, text size, font weight, alignment, padding, border radius, and design consistency.
2. **Object-Oriented Programming in Dart:** Develop a strong grasp of Dart programming, focusing on its syntax and structural format for creating efficient, maintainable code.
3. **Gain Practical Experience in Flutter:** Acquire hands-on experience in developing cross-platform mobile applications using Flutter and Dart.
4. **Develop Proficiency in UI/UX Design:** Enhance skills in designing user-friendly interfaces using Flutter's rich widgets and design tools, emphasizing intuitive interactions.
5. **Build Responsive Layouts:** Learn to create responsive layouts that adapt seamlessly to various screen sizes and orientations.
6. **Collaborate with a Development Team:** Work closely with experienced developers and designers, participating in team activities like daily stand-ups and code reviews.
7. **Learn Best Practices in Software Development:** Apply industry-standard practices such as coding standards, testing, and quality assurance to deliver high-quality software.
8. **Build Packages in Flutter:** Gain experience in creating platform files and deploying applications across multiple platforms.
9. **Enhance Problem-Solving Skills:** Tackle challenges encountered during development to improve critical thinking and adaptability in dynamic environments.

4. Overview of Activities

4.1 Orientation

On the first day of my internship, I participated in an orientation program that introduced me to Kraltek's culture, values, and ongoing projects. I was introduced to Mr. Ziyad K, the founder of Kraltek, who also served as my mentor throughout the internship. During the orientation, I was provided with an overview of the tools and technologies used at Kraltek, including Flutter for front-end development, Dart as the primary programming language, Git for version control, and Firebase for backend services. This orientation session helped set the foundation for the tasks and projects I would be involved in.

4.2 Basic Principles of UI/UX

A significant part of the internship focused on understanding and applying the basic principles of UI/UX design. UI/UX revolves around creating intuitive, user-friendly, and visually appealing interfaces. The key concepts include understanding user behavior and the need to ensure a seamless and easy-to-navigate interface. Consistency was emphasized to ensure a unified user experience across different screens while maintaining a clear visual hierarchy to help users navigate the app effectively. I also learned the importance of usability and accessibility in design, ensuring that the application could be used by all individuals, regardless of their abilities. Incorporating user feedback mechanisms such as animations or alerts became crucial in enhancing the interactive experience, providing users with real-time feedback on their actions.

4.3 Familiarization with Flutter

The primary focus of my internship was to familiarize myself with the Flutter framework, an open-source UI development kit created by Google. Flutter uses the Dart programming language and provides a rich library of pre-built widgets that help developers create high-performance applications with expressive user interfaces. My introduction to Flutter started with understanding its architecture, which is based on reactive programming principles. This model allows for efficient UI updates, ensuring high responsiveness and fluid user interactions.

A standout feature of Flutter that I heavily utilized was **Hot Reload**, which enables real-time updates to the app without the need to restart the entire application. This significantly

accelerated the development process, allowing for rapid experimentation and iterative design changes. I engaged in completing tutorials, reviewing official documentation, and familiarizing myself with common widgets such as Container, Column, Row, and Stack. Additionally, I focused on setting up the development environment, learning the Dart programming language, and exploring Flutter's wide range of widgets. I successfully implemented various layout designs, experimented with stateless and stateful widgets, and learned navigation techniques to create user-friendly, interactive applications.

4.4 UI Development

Once I had a foundational understanding of Flutter, I moved on to more advanced UI development. Using Flutter's widget-based architecture, I built organized and visually appealing user interfaces. The core focus was on creating **responsive layouts** that adapt seamlessly to different screen sizes using tools such as MediaQuery and LayoutBuilder. I also created reusable custom widgets to ensure consistent design elements across the application, enhancing code maintainability and reducing development time.

In addition, I managed **navigation** between screens using Flutter's Navigator class, ensuring smooth transitions and intuitive user flows. One of my primary goals was to maintain a cohesive look and feel across the entire application. This was achieved by defining a **global theme** using ThemeData, which allowed for consistent styling of text, colors, and other UI components. I also customized individual widget styles to fit within the overall theme while ensuring functionality and clarity.

4.5 Cross-Platform Development with Flutter

One of the major tasks I completed during the internship was converting one of my Flutter projects into platform-specific files compatible with Android, iOS, and web. Flutter's ability to maintain a **unified codebase** across platforms allowed for minimal code changes while ensuring consistency in both functionality and design. I utilized Flutter's tools to generate platform-specific files and verified that the app performed smoothly on all platforms. This cross-platform development experience highlighted Flutter's efficiency in deploying applications across various devices and platforms while maintaining a high-quality user experience.

4.6 Code Reviews

Throughout the internship, I actively participated in code reviews, as illustrated in Figure 4.1, Figure 4.2, Figure 4.3, Figure 4.4, Figure 4.5, Figure 4.6, Figure 4.7, Figure 4.8, Figure 4.9, Figure 4.10, Figure 4.11, Figure 4.12, Figure 4.13, and Figure 4.14. These activities played a critical role in my professional development, allowing me to receive constructive feedback from my peers and supervisors. This helped improve the quality and maintainability of my code while teaching me the importance of adhering to industry best practices. The collaborative environment at Kraltek fostered continuous learning, where each code review became an opportunity to refine my skills and adopt a more disciplined approach to software development..

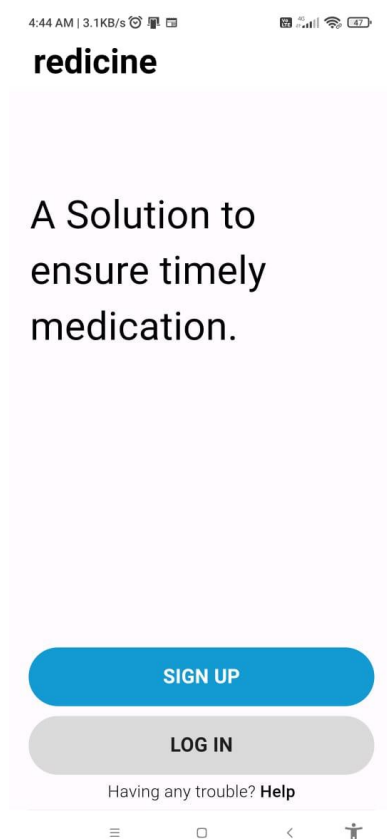


Figure 4.1. Screenshot of landing page

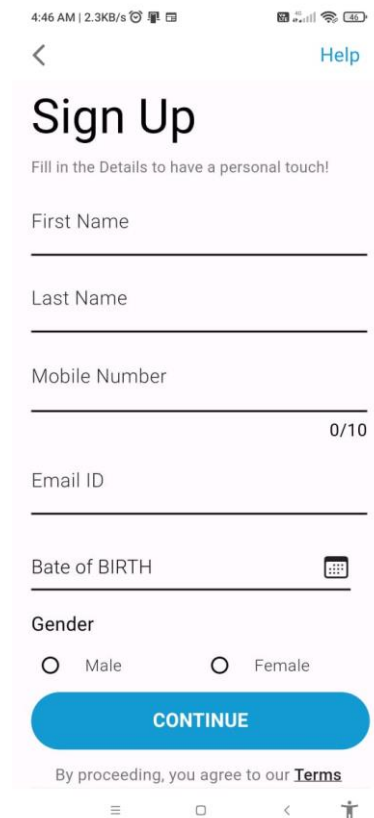


Figure 4.2. Screenshot of Signup page

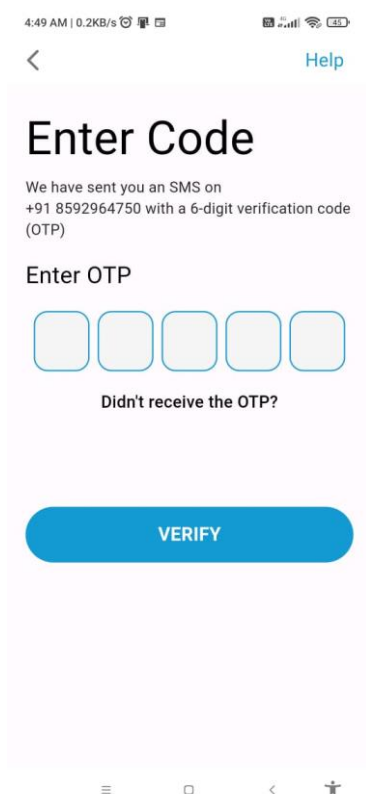


Figure 4.3. Screenshot of
OTP verification

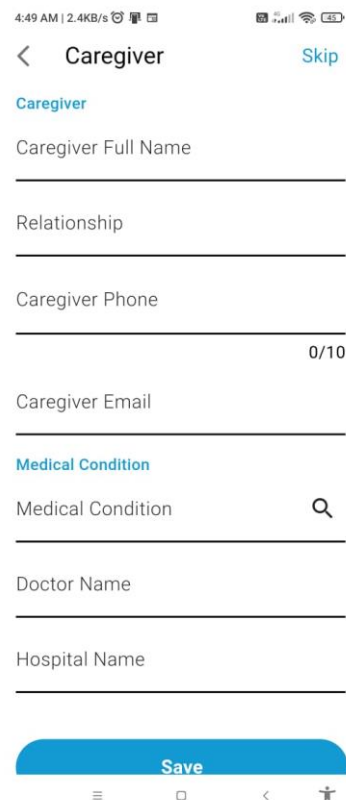


Figure 4.4. Screenshot of
Data page

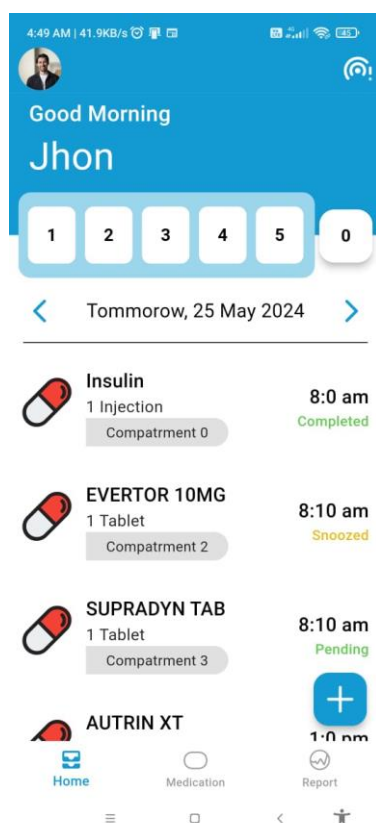


Figure.4.5 Screenshot
of the Home page

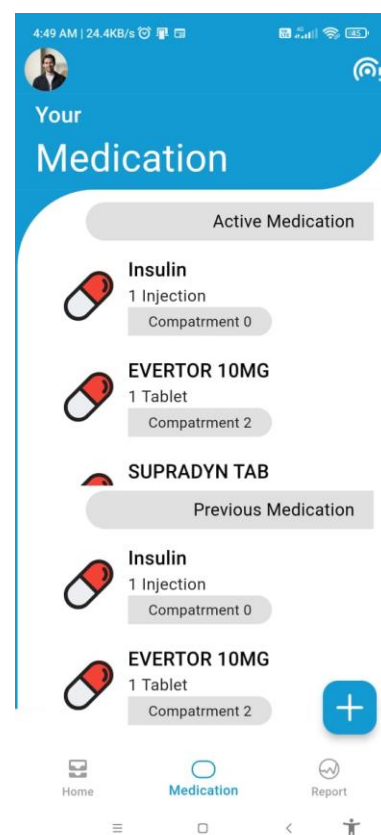


Figure.4.6 Screenshot
Medication page

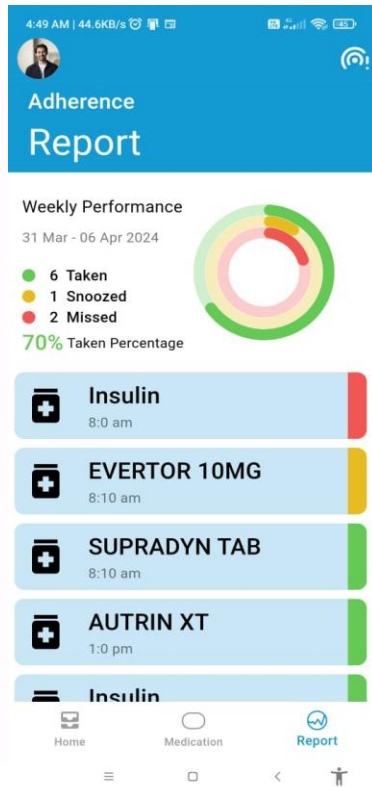


Figure 4.7. Screenshot of Report Page

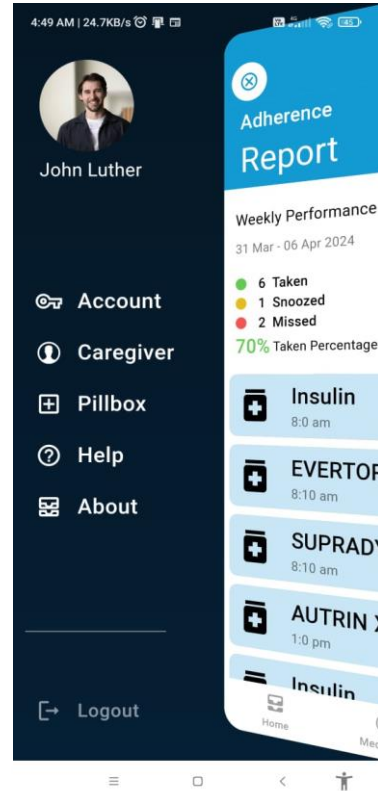


Figure 4.8. Screenshot of Navigation Page

This screenshot shows the 'Add a new Medicine' form. It has a title bar with a back arrow, the text 'Add a new Medicine', and a 'Save' button. The form contains several input fields: 'Medicine' (a text field), 'Name of Medicine' (a text field with a search icon), 'Type of Medicine' (a dropdown menu), 'Total pills You're adding' (a dropdown menu), and 'Icon' (a text field). Below these is a 'Compartment' section with five circular buttons labeled 1, 2, 3, 4, and 5, and an 'Other' button. At the bottom, there is a 'Schedule' section with a dropdown menu for 'How often do You take'.

Figure 4.9. Screenshot of adding new data section(1)

This screenshot shows the 'Add a new Medicine' form, continuing from the previous one. It features a row of six circular buttons labeled 1, 2, 3, 4, 5, and 'Other', where button 2 is currently selected. Below this is a 'Schedule' section with a dropdown menu for 'How often do You take'. Further down is a 'Reminders' section with a dropdown menu for 'Single a day'. Below that is an 'Other' section with a text field for 'Note...'. The form also includes a 'START DATE' field with a calendar icon.

Figure 4.10. Screenshot of adding the new data section(2)

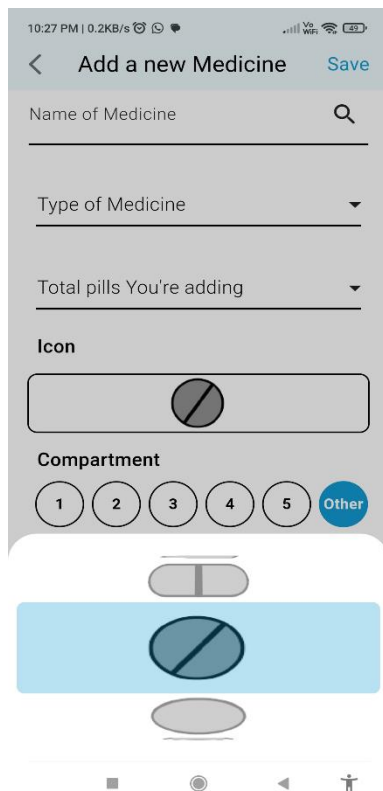


Figure 4.11. Screenshot of adding the new data section(3)

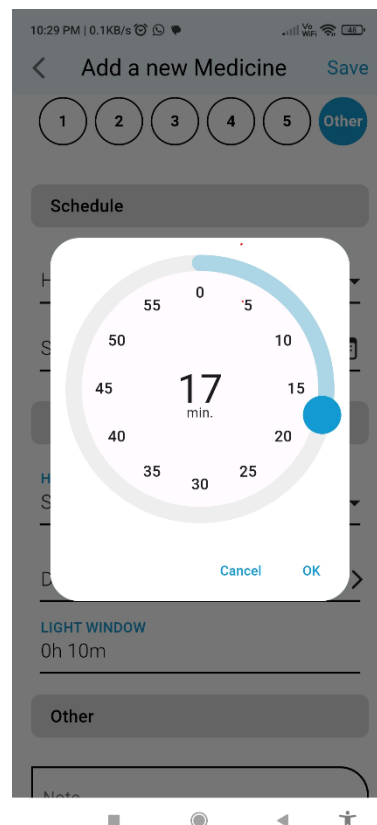


Figure 4.12. Screenshot of the selecting minutes

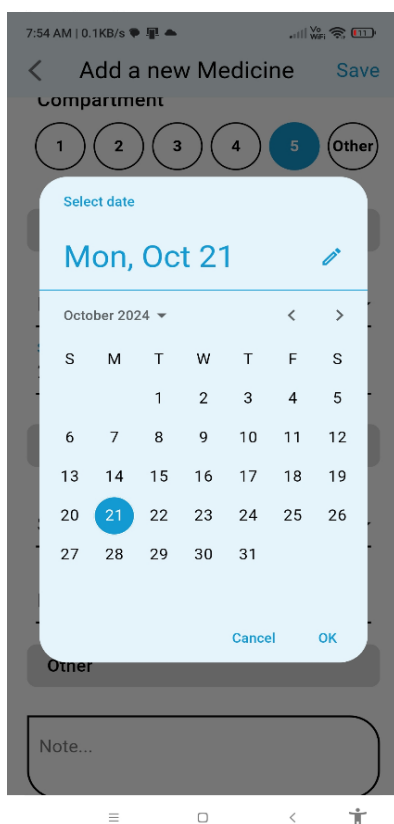


Figure 4.13. Screenshot of the selecting date

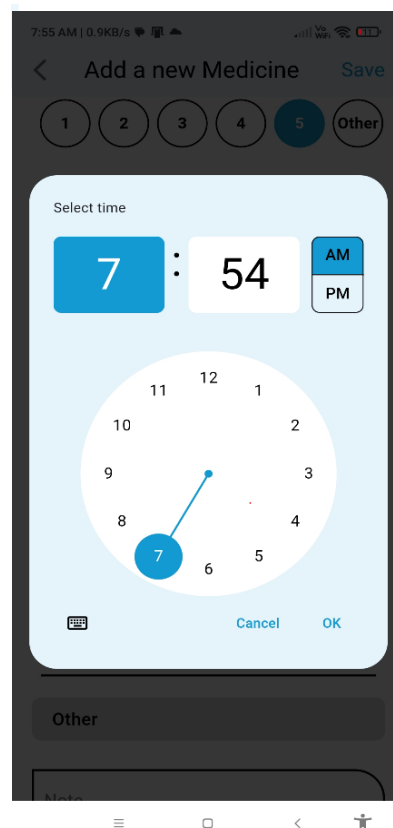


Figure 4.14. Screenshot of the selecting time

5. Skills Gained

Throughout my internship at Kraltek, I developed a range of technical and soft skills that significantly enhanced my abilities as a developer and contributed to my overall professional growth.

5.1 Technical Skills

- **Proficiency in Flutter:** I gained a strong understanding of the Flutter framework, particularly its widget-based architecture. This allowed me to efficiently create responsive and dynamic user interfaces that adapt seamlessly across different platforms.
- **Dart Programming:** My proficiency in Dart improved considerably. I became adept at writing efficient, maintainable code while utilizing key features of the language, such as asynchronous programming, collections, and object-oriented principles.
- **UI/UX Design Principles:** I deepened my knowledge of UI/UX design, learning how to craft user-centered, visually appealing applications. I focused on creating interfaces that prioritize user needs and ensure ease of navigation across various devices.

5.2 Soft Skills

- **Collaboration and Adaptability:** Working in a team environment greatly enhanced my collaboration skills. I learned the value of effective communication, actively sharing ideas, and incorporating feedback from peers to improve project outcomes.
- **Problem-solving:** My problem-solving abilities were sharpened through hands-on experience tackling real-world development challenges. This experience taught me to think critically, evaluate different solutions, and implement the most effective one.
- **Time Management:** Balancing multiple tasks with tight deadlines allowed me to strengthen my time management skills. I learned to prioritize tasks efficiently, ensuring timely project completion without compromising quality.
- **Attention to Detail:** Participating in code reviews emphasized the importance of precision and attention to detail. This experience helped me write cleaner, more efficient code and improved my overall development workflow.

6. Challenges Faced

During my internship at Kraltek, I encountered several challenges that significantly contributed to my personal and professional growth. These experiences not only enhanced my technical expertise but also honed my problem-solving and interpersonal skills:

1. **Learning Curve:** As a newcomer to the Flutter framework, understanding its widget-based architecture and nuances posed a significant initial challenge. The steep learning curve required me to dedicate substantial time to studying documentation, experimenting with sample projects, and seeking guidance from my mentor. Through perseverance and hands-on practice, I gradually built a strong foundation in Flutter and gained confidence in using it to develop functional and visually appealing user interfaces.
2. **Time Management:** Balancing multiple tasks and adhering to project timelines was another challenge. Juggling responsibilities like designing, coding, and debugging often felt overwhelming. To manage my time effectively, I adopted prioritization techniques such as creating structured to-do lists and setting clear deadlines for each task. This approach allowed me to streamline my workflow, complete assignments on time, and maintain the quality of my deliverables.
3. **Responsive Design:** Ensuring that the mobile application operated seamlessly across devices with varying screen sizes required meticulous effort. Designing adaptive layouts demanded an understanding of tools like MediaQuery and LayoutBuilder and necessitated iterative testing and refinement. Overcoming this challenge deepened my understanding of responsive design principles and taught me the importance of user-centric development.
4. **Collaboration and Communication:** Initially, working within a team environment presented difficulties in articulating ideas and incorporating feedback effectively. Miscommunication occasionally led to delays or misunderstandings. Over time, I learned to communicate more openly by actively seeking clarification, participating in discussions, and listening to the perspectives of team members. This enhanced my ability to collaborate effectively, contributing to the team's collective success.

These challenges were invaluable in shaping my internship experience, allowing me to emerge as a more competent and confident developer prepared to tackle real-world problems.

7. Conclusion

My 30-day internship at Kraltek was a truly transformative experience, offering invaluable insights into both the technical and collaborative aspects of mobile application development. Immersing myself in hands-on practice with the Flutter framework allowed me to design and build visually appealing, responsive user interfaces tailored for modern cross-platform applications. The challenges I faced—ranging from mastering new technologies and integrating backend services to managing tight project timelines—pushed me to develop robust problem-solving strategies and emphasized the importance of teamwork and effective communication in a fast-paced development environment.

This internship not only sharpened my technical expertise, such as proficiency in Dart programming, state management, and UI/UX design but also honed critical soft skills like adaptability, time management, and collaboration. Working on real-world projects bridged the gap between academic knowledge and industry practices, providing me with a deeper understanding of the software development lifecycle. From concept to implementation, each task was an opportunity to apply theoretical concepts and refine them into practical solutions.

The supportive mentorship at Kraltek played a pivotal role in my learning journey. The collaborative environment fostered a culture of continuous learning and innovation, where I was encouraged to ask questions, experiment with ideas, and learn from my mistakes. Daily stand-ups, code reviews, and brainstorming sessions allowed me to understand the nuances of team dynamics and the iterative nature of product development.

Beyond technical growth, the experience inspired a broader perspective on the impact of technology in solving real-world problems. By contributing to meaningful projects and observing the company's commitment to innovation, I gained a profound appreciation for the importance of user-centric design and sustainable development practices.

As I advance in my career, the knowledge, skills, and values gained during my internship at Kraltek will serve as a strong foundation for future endeavors. I am immensely grateful for this opportunity, which has shaped me into a more confident and capable developer. The insights and inspiration drawn from this experience have motivated me to continually seek new challenges and strive for excellence in the tech industry.

Reference

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