**SYNOPSIS**

**Report on**

**Chats layer**

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**ABSTRACT**

Chat application is an easy platform to connect people by enabling them to stay linked to each other. In today’s time messaging apps have more worldwide users than conventional social networks—which mean they will play a progressively more significant role in the distribution of digital information.Flutter – a high performance framework is based on Dart language is used for this purpose. It provides high UI directly in the operating system’s workspace rather than through

native framework. Firebase, a next-generation appdevelopment platform on Google Cloud, provides Backendas-Service.

It is a real-time database that permits storing a list of objects in the form of a tree form data structure. A Flutter-based chat application offers a versatile and user-friendly platform for seamless communication. Leveraging Flutter's cross-platform capabilities, this application ensures a consistent experience across Android and iOS devices. The app's architecture encompasses key features such as real-time messaging, multimedia sharing, and user authentication.

Integration with Firebase or other backend services enables real-time communication, allowing users to exchange messages instantly. Firebase's Firestore database serves as a robust backend solution for storing and retrieving chat data securely

The chat application supports multimedia sharing, enabling users to exchange images, videos, and other files seamlessly. Utilizing Flutter's plugins for image and file handling, the app ensures efficient transmission and display of multimedia content within conversations.

Furthermore, the application prioritizes user experience by implementing features such as push notifications to alert users of new messages, ensuring timely responses even when the app is not actively in use. Additionally, the incorporation of advanced features like end-to-end encryption enhances security and privacy, fostering trust among users.

In conclusion, a Flutter-based chat application offers a comprehensive solution for modern communication needs, combining intuitive design, real-time messaging, multimedia sharing, and robust security features to deliver a seamless and enjoyable user experience.

**Keywords**

Messenger, Chat, Firebase, Flutter, Cloud

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1. **Introduction**

Introducing our Flutter-based chat application, a modern and intuitive platform designed to revolutionize how you connect and communicate with your friends, family, and colleagues. With its sleek design and seamless functionality, our app offers a dynamic messaging experience that transcends the boundaries of devices and operating systems.

Built on the versatile Flutter framework, our application ensures a consistent and visually appealing interface across both Android and iOS devices. Whether you're using a smartphone or a tablet, you'll enjoy a fluid and responsive chat experience that adapts to your screen size and device specifications.

At the heart of our application is real-time messaging, enabling you to exchange text, images, videos, and other multimedia content with lightning-fast speed. Say goodbye to delays and hello to instant communication, whether you're chatting one-on-one or in group conversations.

Security and privacy are paramount, which is why our app integrates robust authentication mechanisms to ensure that only authorized users have access to their accounts and conversations. Your data is encrypted and securely stored, giving you peace of mind knowing that your private conversations remain just that—private.

But our app isn't just about messaging—it's about enhancing your overall communication experience. With features like push notifications, you'll never miss an important message again, even when the app is running in the background.

Join us as we redefine the way you connect with the world. Welcome to the future of communication. Welcome to our Flutter chat application.

1. **Literature Review**

Chat Service have a long history with lot of research been done in late nineties. In 1996 at North Carolina State University, Zanin-Yost cited an exploratory service using synchronous video chat through CU-SeeMe software. On the other side, the University of Michigan Shapiro Undergraduate Library conducted similar experiment with CUSeeMe. Many other renowned researchers in several Universities have worked on the Library system & services related to Chat software Libraries exploring more scaled down software options for real time chat through instant messaging (IM) software such as America Online’s AIM, Microsoft’s MSN Messenger, and Yahoo Chat.

This technology was less expensive, easy to use and many people in the target audience were using it. Flutter framework introduced by Google, an open source UI software development kit is an easy to use and also provide more security to the user. Number of issues can be of concerned for preparing the chat app, like what if the documents/stuff could be hacked or leaked by hackers to the

competitors or it becomes difficult to provide enough space to the users for saving their data. Google Cloud[10] service called Firebase provides database and authentications services to all,

it is considered as one of the most trustable company in terms of security. For IDE, there is visual studio code and android studio for android SDK and emulator for testing code and

deploying it. App will consist of 4 screens, 1st screen is home page, 2nd is registration page, the 3rd is the login page and lastly the final 4th one is chat room page. And finally all the pages are combined to main page where it is needed to import all the pages and create routes there (order of pages toappear).

1. **Project / Research Objective**

The primary objective of this research project is to investigate and implement strategies for enhancing the user experience (UX) in chat applications. The research aims to address the following specific objectives:

1. **User Needs Analysis :** Conduct a comprehensive analysis of user needs and preferences regarding chat applications. This will involve surveys, interviews, and usability testing to identify key pain points, usability challenges, and feature preferences.

2. **Evaluation of Existing Chat Applications:** Evaluate popular chat applications in terms of their user interface design, functionality, performance, and user satisfaction. This analysis will provide insights into current industry standards and areas for improvement.

3. **Identification of UX Design Principles**: Identify and define UX design principles and best practices relevant to chat applications. This may include principles related to navigation, information architecture, visual design, responsiveness, accessibility, and engagement.

4. **Implementation of UX Enhancements:** Develop prototypes or implement UX enhancements based on the findings from user needs analysis and UX design principles. This may involve redesigning user interfaces, optimizing performance, introducing new features, or refining existing features to improve overall user satisfaction and usability.

1. **Evaluation of UX Enhancements:** Conduct usability testing and user feedback sessions to evaluate the effectiveness of the implemented UX enhancements. Measure key metrics such as user satisfaction, task completion rates, error rates, and time-on-task to assess the impact of the enhancements on user experience.
2. **Guidelines and Recommendations**: Develop practical guidelines and recommendations for designing and improving user experience in chat applications. These guidelines will serve as a valuable resource for developers, designers, and product managers to create chat applications that meet user needs and expectations effectively.

By accomplishing these objectives, this research project aims to contribute to the advancement of UX design practices in the development of chat applications, ultimately leading to more intuitive, engaging, and user-friendly communication platforms.

1. **Project Flow/ Research Methodology**

1. **User Needs Analysis:**

- Conduct surveys and interviews to gather insights into user preferences, pain points, and expectations regarding chat applications.

- Analyze user feedback from existing chat applications to identify common issues and areas for improvement.

- Utilize usability testing to observe user interactions with chat applications and identify usability challenges.

2. **Evaluation of Existing Chat Applications:**

- Select a sample of popular chat applications for evaluation based on factors such as user base, platform diversity, and feature richness.

- Assess the selected applications based on criteria including user interface design, functionality, performance, and user satisfaction.

- Use heuristic evaluation and user testing to identify strengths, weaknesses, and opportunities for improvement in each application.

3. **Identification of UX Design Principles:**

- Review existing literature and research on UX design principles relevant to chat applications.

- Compile a list of key principles and best practices in areas such as navigation, information architecture, visual design, responsiveness, accessibility, and engagement.

- Adapt and refine these principles based on insights gathered from user needs analysis and evaluation of existing applications.

4. **Implementation of UX Enhancements:**

- Based on the identified UX design principles and user feedback, develop prototypes or implement UX enhancements in a selected chat application.

- Prioritize enhancements based on their potential impact on user experience and feasibility of implementation.

- Collaborate with developers, designers, and product managers to integrate the enhancements into the application.

1. **Project / Research Outcome**

A user acquires the access to messages by logging into the application by providing email address and password which was given while registering to the application. This information is stored inside the Database. Each time user login, the information is crossed checked with the database.

Once the users has logged in successfully, messages can be sent to each other The situation is: the first user sees the second user online, the first user sends a message to the second

user, and the second user receives it. Just text data, no binary data.Firebase authentication services in the accounts are created as users register with their emails. The chats are saved in forms of documents, individual document contains individual chat. Users can use the app without the fear of data breaching or other security problems.

1. **Requirement Specification**

Functional Requirements:

The key requirement of an application is to provide a system for Online Chatting at a small scale.

Non-Functional Requirements:

- Ease of operation: The User Interface must be

user friendly The chat room is simple as it has a wall chat like structure.

- Accessibility: The application must be available for use as and when required.

Hardware Specifications (minimum):

* Operating System: Windows, Mac
* Processor : Intel Core 2 Duo 3.0 GHz
* RAM: 4 GB

Software Specifications:

* Language: Dart
* Tools: Flutter , Android Studio
* Database: Firestore (GCP)
* IDE : Visual Studio Code

The first page is basically home page which will ask the user either to register or to login. The second page is for new users that is registration and after filling details on it, new account of user will be created and after that the login page where the details of pre-registered users will be matched from database and if the details are right the user will be landed to chat-room or page where user can chat plus it also has a logout button at the top corner of app bar by pressing it user will get the login page.

1. **Proposed Time Duration**

The proposed time duration for the project would depend on various factors such as the scope of research, complexity of the chat application, availability of resources, and the depth of analysis required. However, a general timeline breakdown could be as follows:

1. User Needs Analysis: 0-1 weeks

- Conducting surveys, interviews, and usability testing to gather user insights.

- Analyzing user feedback from existing chat applications.

2. Evaluation of Existing Chat Applications:1-2 weeks

- Selecting and evaluating a sample of popular chat applications.

- Assessing user interface design, functionality, performance, and user satisfaction.

3. Identification of UX Design Principles: 2-3 weeks

- Reviewing literature and research on UX design principles.

- Compiling and refining key principles relevant to chat applications.

4. Implementation of UX Enhancements: 4-5 weeks

- Developing prototypes or implementing UX enhancements in a selected chat application.

- Collaborating with developers, designers, and product managers to integrate enhancements.

5. Evaluation of UX Enhancements: 4-6 weeks

- Conducting usability testing and user feedback sessions to evaluate effectiveness.

- Analyzing quantitative and qualitative data to measure improvements in user experience.

6. Guidelines and Recommendations: 2-3 weeks

- Formulating practical guidelines and recommendations based on research findings.

- Creating a comprehensive document outlining best practices and design principles.

7. Documentation and Presentation: 1-2 weeks

- Documenting research methodology, findings, and recommendations.

- Preparing presentations or workshops to disseminate findings to stakeholders.

Overall, the proposed time duration for the project could range from approximately 7-8 weeks, depending on the depth of research and complexity of implementation. Adjustments to the timeline may be necessary based on unforeseen challenges or additional requirements that arise during the project.

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