



(RESEARCH ARTICLE)



Closed group private chat application with translation feature with firebase database

R. Gobikrishnan * and R. Vadivel

Department of Information Technology, Bharathiar University, Coimbatore-641 046.

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Abstract

Language is crucial in the multilingual workplace. Countless conversation apps are currently accessible on the Google Play and Apple App stores. These applications have a number of features that help the user's tasks. With this project, just experimented with new functionality that allows the user message to be translated based on their choices. This software also has a crucial feature called closed group private chatting. It may be quite useful for debating matters related to their field of study among intellectuals and academics. It is determined by their area of interest.

Keywords: MIT; Cloud DB; Firebase; Translator

1. Introduction

The system offers a private chat feature where the administrator may provide certain people's login information. The user's information is created in a live cloud database, allowing for sign-in from any device that has the application loaded. The software has a language settings option; if person 1 is conversing in English but person 2 wants to see the communication in their chosen language, they can accomplish this through the settings. So, this tool may be used as a private multilingual chat app.

2. Literature Survey

Streaming platforms like YouTube and Twitch have become immensely popular, providing viewers worldwide with access to a diverse range of streaming shows. In Indonesia, the trend of streaming has gained momentum, with more and more internet-connected individuals adopting it as a daily hobby. However, this surge in popularity has also highlighted the language barrier issue, as English is not the native language of Indonesian viewers. This can make it difficult for them to engage with English-only streamers, leading to a less interactive viewing experience. Consequently, viewers may find it challenging to identify and understand the streamers they are watching. (Jason Christopher Chandraa, Nunung Nurul Qomariyah, 2022).

Communication is crucial to convey ideas, thoughts, and emotions effectively. The emergence of online communication has made it possible for people to connect with individuals from different corners of the world effortlessly. To ensure seamless transfer of data and messages, messaging apps must have a fast and reliable real-time database server. Google Firebase offers an excellent platform that enables developers to create messaging apps with minimal lag time and offers several features. In this article, we will discuss the process of building a messaging app utilizing Firebase real-time servers. Building a messaging app using Firebase is straightforward and involves setting up real-time functionality for the database server to update in real-time. This feature ensures that messaging apps offer a robust, speedy, and engaging user experience. (Saiyyam Singh, Vedant Bhatnagar, Sarthak Gautam, Deepanshu Singh Satwaliya, 2022).

* Corresponding author: R. Gobikrishnan

In today's online world, various programs heavily rely on websites and random data, which include files, movies, images, music, text, and other content that may be offensive. Managing such vast amounts of data can be a challenge, particularly when it comes to relational databases. To address this challenge, a new technology called Firebase has emerged, which is particularly useful for managing large amounts of random data. Compared to traditional relational database management systems (RDBMS), Firebase is incredibly fast and efficient. This research paper focuses on using Firebase for Android app development, providing an overview of its features, related terminology, and advantages and disadvantages. The document also aims to demonstrate some of Firebase's basic features for Android app development. Firebase is a real-time database that allows developers to store and synchronize data in real time across multiple devices. It offers features such as authentication, cloud messaging, crash reporting, analytics, and more. Firebase also provides an easy-to-use API and SDK for different platforms, making it a popular choice for developers. However, Firebase has its disadvantages, including limited querying capabilities and potential security risks. Nevertheless, the benefits outweigh the drawbacks for many developers who appreciate Firebase's ease of use, speed, and scalability. Overall, Firebase is an excellent choice for developers looking to build fast and reliable Android apps that require real-time data synchronization. By using Firebase's features, developers can create engaging and immersive apps that are sure to delight users. (Pankaj Chougale, Vaibhav Yadav, Dr. Anil Gaikwad, 2021).

The mobile industry is experiencing a surge in the number of users globally, making it essential to have high-performance and visually appealing mobile apps. Multiple platforms are available with various software development kits (SDKs), resources, and training options for developers to build mobile apps that can run on a vast range of devices. Cross-platform development allows programming in a popular language such as JavaScript and exporting to different smart phone devices. Firebase, with its state-of-the-art infrastructure and tools, offers the ideal platform for developers to build advanced mobile and networked apps with exceptional quality. (Prachi R. Saraf, Sakshi M. Jadhao, Saurabh J. Wanjari, Shital G. Kolwate, 2022).

3. Methodology

3.1. Firebase

Firestore is a flexible Backend-as-a-Service (BaaS) platform that provides hosting solutions for various applications, such as Android, iOS, Javascript, Node.js, Java, Unity, PHP, and C++. With Firestore, developers can take advantage of real-time and NoSQL hosting capabilities for databases, content, notifications, and social authentication. It also supports social authentication through popular platforms such as Google, Facebook, Twitter, and Github. Additionally, it offers powerful real-time communication services that aid developers in creating applications that are responsive and high-performing.

Built using Google's technical framework, Firestore provides developers with a plethora of tools and services that enable them to create exceptional applications, grow their user base, and generate revenue. Firestore stores data in a NoSQL database format that resembles JSON, making it easy for developers to store and retrieve data using simple API calls. This feature enhances efficiency and flexibility while enabling developers to build scalable applications with ease.

3.2. Firestore real-time database

Firestore Real-time Database is a cloud-hosted database solution that offers an interface to facilitate the harmonization of application information across different platforms, including iOS, Android, and Web-based devices. This database solution securely stores information on Firestore's cloud infrastructure, making it possible for developers to design interactive, real-time applications. The information is stored in JSON format and is instantaneously synchronized to all connected users, which ensures that clients have access to the most up-to-date data available. This functionality enables clients to receive the latest data in real-time.

It's important to note that when you create cross-platform applications using Firestore's JavaScript, Android, and Apple platform SDKs, a single instance of the Realtime Database is shared by all your customers. This approach ensures that your clients always have access to the most up-to-date information without inconsistencies. As a result, the Firestore Real-time Database is an ideal solution for developers looking to build scalable, collaborative, and real-time applications.

3.3. Cloud DB in MIT

A cloud database is a specialized form of database that is specifically designed to function within a public or hybrid cloud environment. These databases provide organizations with an effective solution for organizing, storing, and managing their data. They are typically available as a managed service, known as database-as-a-service (DBaaS), or can be deployed on a cloud-based virtual machine, which can then be managed by an in-house IT team.

One important component of cloud databases is Cloud DB, which is an essential feature that enables users to store their data on an Internet-connected database server using Redis software. Although Cloud DB is not visible to users directly, it facilitates the sharing of data among app users, making it a highly suitable choice for collaborative projects or multi-user environments. While MIT usually maintains the server where the data is stored, users can also configure and operate their private server if required.

Overall, cloud databases offer significant advantages over traditional on-premises databases, including scalability, cost-effectiveness, and easy accessibility. With cloud databases, organizations can manage their data efficiently while reducing the complexity and overall costs of their IT infrastructure.

3.4. About the MIT platform

MIT App Inventor is an innovative, visual programming tool that enables users of all ages to develop fully functional apps for mobile devices. This platform offers a user-friendly experience that simplifies the creation of basic apps in under half an hour. With its block-based programming interface, even those with limited coding knowledge can build complex and powerful apps faster than traditional coding environments. The primary objective of the MIT App Inventor project is to democratize software development by allowing anyone to shift from merely consuming technology to creating technology.

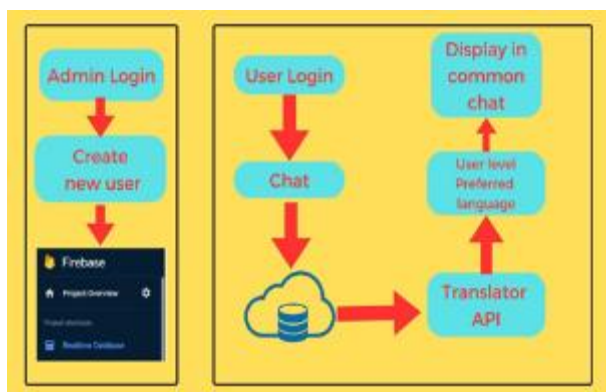
The project's core team consists of CSAIL staff and students, under the leadership of Professor Hal Abelson. This team oversees educational outreach efforts and conducts research on the impact of MIT App Inventor. Additionally, they maintain an online app development environment that is free for anyone to use and has over six million registered users worldwide. By using block-based coding programs, individuals can develop their intellect and creativity. MIT App Inventor goes one step further by providing young people with a way to make a difference and positively impact their communities.

3.5. About block-based coding

Block-based programming is a revolutionary way for developers to code using visual block elements, rather than typing complex commands. It eradicates syntax errors, making it more accessible and user-friendly. It is particularly useful for beginners or children who are interested in programming, as it eliminates the need for learning complicated code syntax. Block-based programming simplifies the process of implementing logic, making it incredibly intuitive for young users. It stands in contrast to higher-level programming languages that can require the learning of challenging concepts. With block-based programming, children can easily learn how to run programs and showcase their creativity.

4. Workflow

Fig.1. An administrator is granted access to a default login and can add new user IDs to the system. The proposed system allows for easy user addition, whether through the app or the back-end. User IDs are securely registered in the Firebase real-time database. Once granted access, users can log in to their accounts using their unique username and password. Upon logging in, users have the option to reset their password and choose their preferred language for messaging. Users can compose messages and send them to other registered users. Messages are securely stored in the cloud database and labeled with the sender's username and message content. Any updates or changes made to the message data in the database will automatically activate the translation API. The translation API is designed to identify the preferred language of the recipient, segment the username and message data, translate the message accordingly, merge the translated message with the sender's name and present the new message in the chat list.



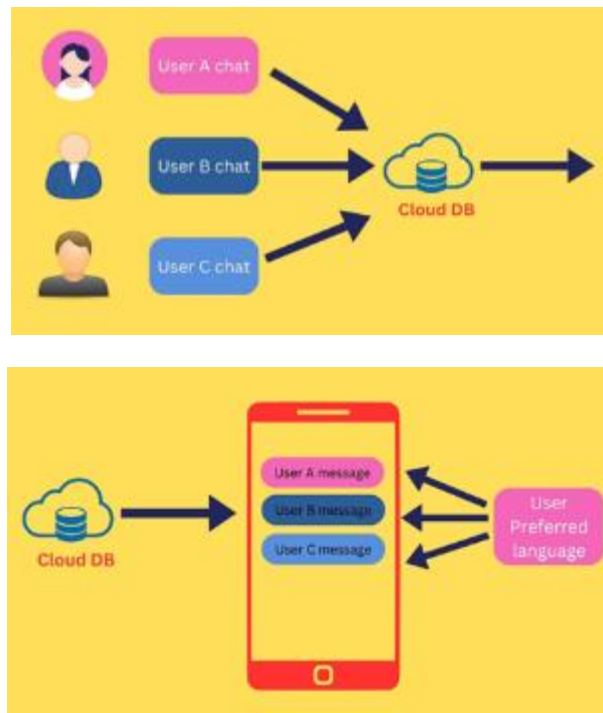


Figure 1 Flow diagram

Fig.2. This Screen only provides user interaction settings.

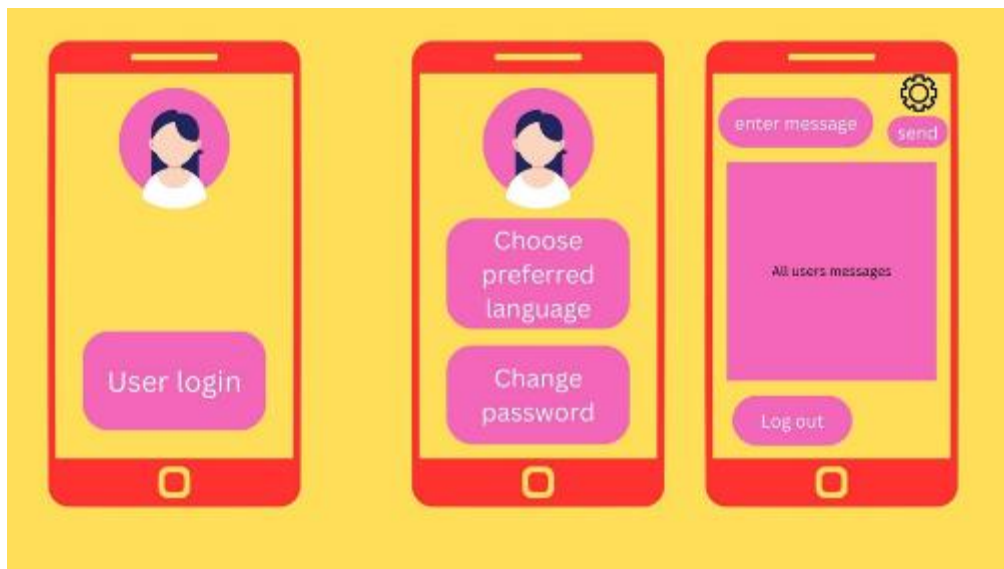


Figure 2 User-level actions

5. Implementation

5.1. Authentication and Authorization on firebase db

Authorization - Admin level access and User level access.

Admin-level access is maintained at the app level and user-level access is maintained in the firebase real-time database.

5.2. Creating a new firebase project and connecting real-time database

Fig.3.This figure represents the creating of a new firebase project and connecting a real-time database to our project.

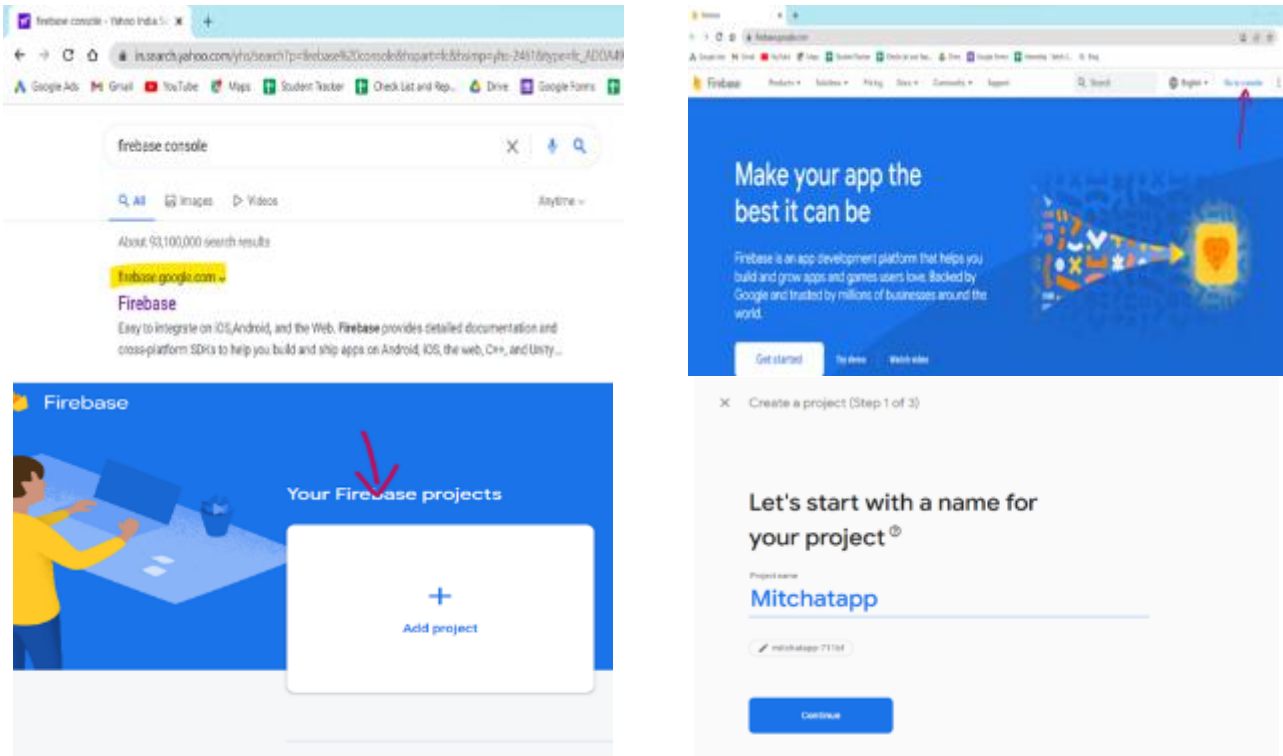


Figure 3 New project

Fig.4. these are all figures representing the access to the real-time database and choosing the location and setup database mode finally create a real-time database.

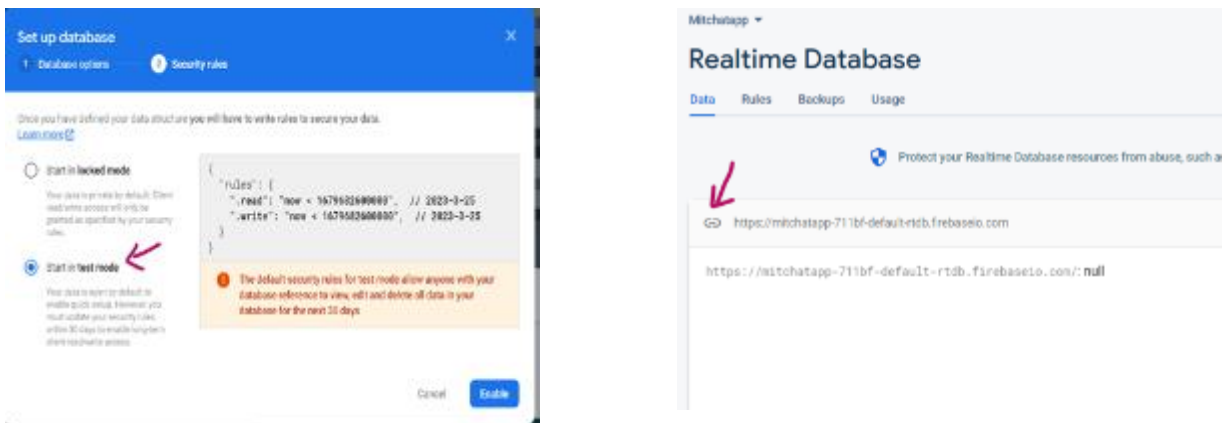


Figure 4 Real-time database

Fig.5. Firebase DB1 is stored in the data. So, this passed to the MIT tool.



Figure 5 Copy the firebase URL to be passed into MIT tool

5.3. Building a user interface

Figure 6 This figure represents the user login and admin login interface.

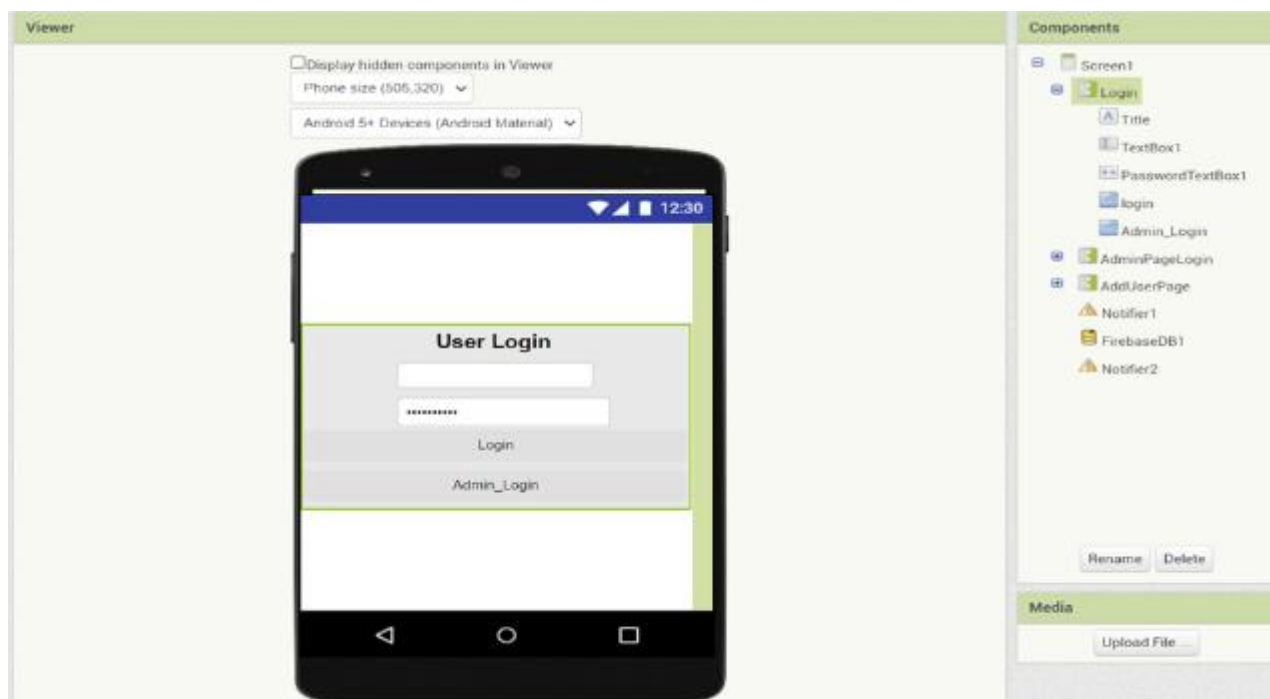


Figure 6 Login screen

Fig.7. This figure represents the admin login.

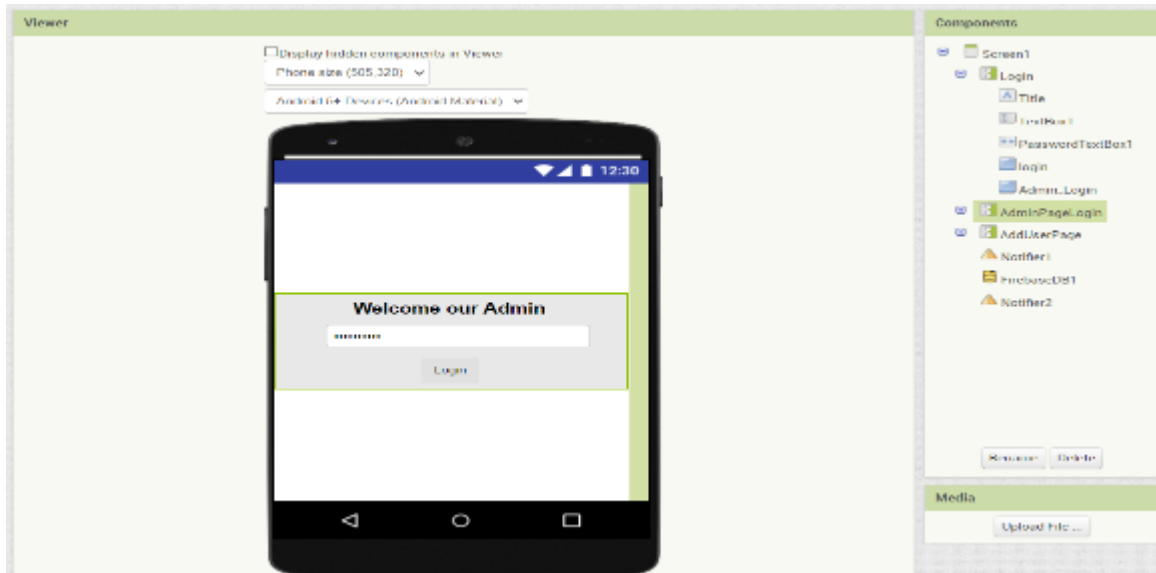


Figure 7 Admin page

Fig.8. This interface allows for the creation of new users from admin only.

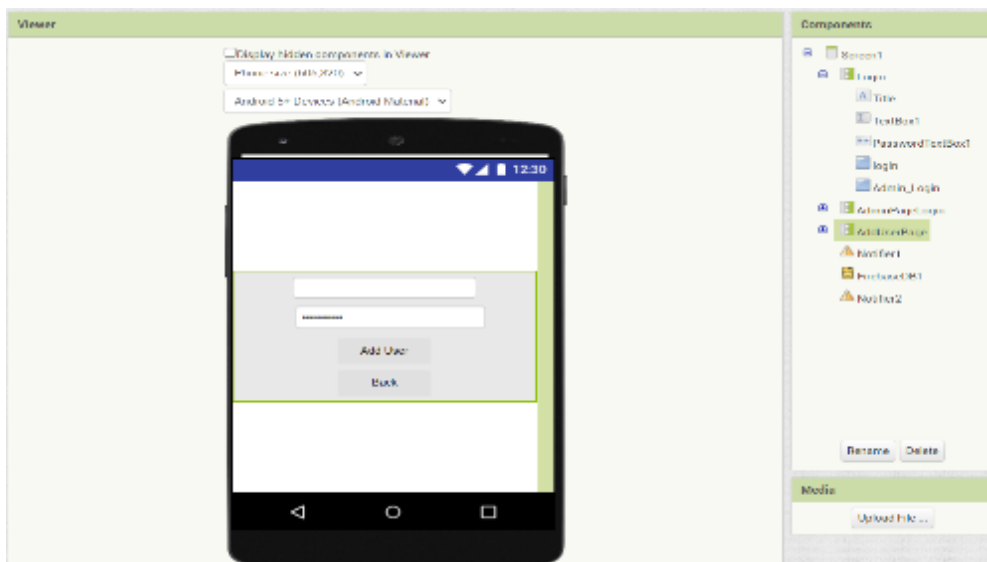


Figure 8 Add a new user page

Fig.9. This screen offers users the ability to modify their password and select their preferred language settings.

Compliance with ethical standards



Disclosure of conflict of interest

No conflict of interest.

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Author's short biography

	<p>R. Gobikrishnan received Bachelors Degree in Information technology in the year 2020 from Kammadhenu Arts and Science College, Sathyamangalam, Tamil Nadu, affiliated to Bharathiar University. He currently pursuing a Masters Degree in Information Technology from 2021 to 2023, at Bharathiar University, Coimbatore, Tamil Nadu. His area of interest is java in software development</p>
	<p>Dr. R. Vadivel is an Associate Professor, in the Department of Information Technology, Bharathiar University, Tamil Nadu, India. He received his Ph.D degree in Computer Science from Manonmaniam Sundaranar University in the year 2013. He obtained his Diploma in Electronics and Communication Engineering from State Board of Technical Education in the year 1999, B.E., Degree in Computer Science and Engineering from Periyar University in the year 2002, M.E., degree in Computer Science and Engineering from Annamalai University in the year 2007. He had published over 96 journals papers and over 40 conferences papers both at National and International level. His areas of interest include Information Security, Data mining, Digital Signal Processing</p>