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# Chapter – One

## Introduction

### 1.1 Abstract

Flutter is an open-source software development kit which enables smooth and easy cross-platform mobile app development. You can build high quality natively compiled apps for iOS and Android quickly, without having to write the code for the two apps separately. All you need is one codebase for both platforms.

Last year, Tim Sneath, product manager of Flutter announced an increasing use of Flutter with more than 2 million developers using the toolkit since its release in 2018. The spring update also reveals that it's seeing an uptick in not just consumer apps but also enterprise app development.

In this article we are going to introduce this developer-friendly app development language. We'll explain what Flutter is, and we will brief out its advantages and disadvantages.

### 1.2 Proposed Problem

Messaging has become a part of our everyday lives in part due to its convenience for real-time chat communication and simple-to-use functionality. For instance, an iOS or text message on an iPhone or Android device from a friend, an email from a co-worker on Microsoft or Gmail, a team chat in a Slack or Microsoft Teams workspace, or even instant messaging through social media. These messaging and real-time chat applications play an important role in how the world interacts today, due to their immediacy and vast capabilities.

A chat application makes it easy to communicate with people anywhere in the world by sending and receiving messages in real time. With a web or mobile chat app, users are able to receive the same engaging and lively interactions through custom messaging features, just as they would in person. This also keeps users conversing on your platform instead of looking elsewhere for a messaging solution. Whether it's private chat, group chat, or large-scale chat, adding personalized chat features to your app can help ensure that your users have a memorable experience

### **1.3 Definition and explanation**

Flutter is a free and open-source mobile UI framework created by Google and released in May 2017. In a few words, it allows you to create a native mobile application with only one codebase. This means that you can use one programming language and one codebase to create two different apps (for iOS and Android).

Flutter consists of two important parts:

1. An SDK (Software Development Kit): A collection of tools that are going to help you develop your applications. This includes tools to compile your code into native machine code (code for iOS and Android).
2. A Framework (UI Library based on widgets): A collection of reusable UI elements (buttons, text inputs, sliders, and so on) that you can personalize for your own needs.

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### **1.4 Aim and Scope**

The following project will help in understanding how Flutter works and how we can use it to build our own chatting application and connect to a database and understand how it all functions and learn to implement it properly

## Chapter -Two

### Literature Survey

#### 2.1 Study Of Existing Systems

Company Name	Type Of Service	Description
<b>Alibaba Group</b>	Standalone Application	Alibaba scales China's second-largest marketplace using Flutter
<b>BMW</b>	Standalone Application	Scaling customer centric product development at BMW Group with Flutter
<b>Google Play</b>	Standalone application	Uses Flutter to go global
<b>Dream 11</b>	Standalone application	Fantasy booking application uses Flutter

Fig 2.1.1 Existing Systems using Flutter

## Chapter – Three

### Methodology

#### 3.1 Technologies Used

##### 1) Basic Mainframe:

Flutter :

- Using Flutter, you can write code, manage, and run it across multiple platforms. For the developers, this saves time, money, and effort.
- Flutter offers a customizable layered architecture that allows for highly customizable designs, expressive UIs, and fast rendering.
- The structure of Flutter consists of three layers:- Framework Dart, Engine C/C++,Embedder Platform-specific
- The Dart-based platform that takes care of app widgets, gestures, animations, illustrations, and materials

##### 2) Database:

Firebase:

- Authentication – Firebase Authentication makes it easy for developers to build secure authentication systems and enhances the sign-in and onboarding experience for users. This feature offers a complete identity solution, supporting email and password accounts, phone auth, as well as Google, Facebook, GitHub, Twitter login and more.
- Cloud messaging – Firebase Cloud Messaging (FCM) is a cross-platform messaging tool that lets companies reliably receive and deliver messages on iOS, Android and the web at no cost.
- Realtime database – the Firebase Realtime Database is a cloud-hosted NoSQL database that enables data to be stored and synced between users in real time.

## Functionalities

- User registration and authentication: A chat app should have a user registration and authentication system to ensure that only authorized users can access the app and its features. This can include features like Google verification.
- Messaging functionality: A chat app should provide users with the ability to send and receive messages, as well as to view message history. Additional messaging features like emojis can also improve user engagement.
- Support for multiple platforms: The chat app should be available on multiple platforms, including web, mobile, and desktop, to ensure that users can access the app from their preferred device.
- Personalization options: User can modify username according to name there in Google . Even profile photo is from Google profile.
- Privacy and security features: The app should include features to protect user privacy and security, such as end-to-end encryption, two-factor authentication, and user verification.

## Methodology / Project Workflow

While the system design of a chat app is unique in how it deals with the idiosyncratic business needs, you can always break it down to two major components: the chat client and the chat server.

### • Chat Client

The chat client is what the user experiences. A desktop, web or smartphone chat application, the chat client is responsible for interacting with the operating system (i.e. your computer, browser or smartphone).

Interactions include sending push notifications, displaying data to the user and storing messages and files. When you type a message and hit send, the chat client transmits that message to the other major component: the chat server.

### • Chat Server

The chat server is just that, a server (or usually many many servers) that hosts all the software, frameworks and databases necessary for the chat app to operate. This server, or pool of servers, is responsible for securely receiving a message, identifying the correct recipient, queuing the message and then forwarding the message to the recipient's chat client.

The chat server's resources can include a REST API, a WebSocket server, an AWS instance for media storage, etc.