**Project Report**

**Motivational Quotes- Android & iOS Application**

Submitted by

Hammad Ahmad

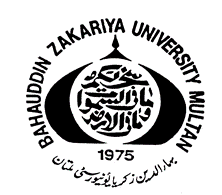
BSIT(M)-20-56

2020-2024

Supervised By

Dr. Maroof Pasha

[Document title]



## DEPARTMENT OF INFORMATION TECHNOLOGY

**BAHAUDDIN ZAKARIYA UNIVERSITY MULTAN PAKISTAN**

**FINAL APPROVAL**

This is to certify that we have read this report **Motivational Quotes- Android & iOS Application** submitted by ***Hammad Ahmad BSIT(M)-20-56*** and it is our judgment that this report is of sufficient standard to warrant its acceptance by Bahauddin Zakariya University, Multan for the degree of BS (IT) / MIT (Master of Information Technology).

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**DEDICATION**

***To my Loving Parents***

**ACKNOWLEDGMENT**

All the acclamation and appreciation are for Almighty ALLAH, the most beneficent and the most merciful. I am very grateful to ALLAH who made me able to complete the work presented here. It is due to His unending mercy that this work moved towards success.

With humble and profound sense of devotion, I express my most sincere thanks to **Dr. Maruf Pasha,** Head of Department of Information Technology, BZU Multan for his valuable guidance and support.

My sincere gratitude to project supervisor **Dr. Maruf Pasha,** Head of Department of Information Technology, Department of Information Technology, BZU Multan for having faith in me and thus allowing me to carry out a project on a technology completely new to me. He helped immensely by guiding me throughout the course of the project, inspiring me to take up new challenges along the road, and at the same time providing valuable suggestions & constructive criticisms.

I would also thank **Mr. Abbas Hassan,** Department of Information Technology, BZU Multan for giving me support on this project and giving me the confidence that I can do it.

**Hammad Ahmad**

**PROJECT BRIEF**

|  |  |
| --- | --- |
| PROJECT NAME | Motivational Quotes- Android & iOS Application |
| UNDERTAKEN BY | Hammad Ahmad |
| SUPERVISED BY | Dr. Maruf Pasha |
| STARTING DATE | April 01, 2024 |
| COMPLETION DATE | June 01, 2024 |
| COMPUTER USED | Core i5, 4.9 Ghz,8GB RAM, 1TB Hard disk+225 SSD |
| OPERATING SYSTEM | MS Windows 10 64-bit/Mac OS |
| SOURCE LANGUAGE(S) | Dart (Android) |
| DBMS USED | Firebase, Firestore |
| TOOLS/PACKAGES | Android Studio, VS code, MS Office, Xbox |

**ABSTRACT**

"Quotez" is a smartphone software that curates quotes from a variety of sources to provide users daily doses of inspiration and encouragement. People frequently find themselves in need of a positive boost in today's fast-paced environment in order to overcome obstacles and pursue their goals with newfound zeal. The purpose of "Quotez" is to meet this demand by providing users with motivational quotes that speak to them personally.

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# **Chapter 1 INTRODUCTION**

## Introduction of Android operating system

Being a mobile operating system, Android OS is a modified version of Linux, originally developed by a start-up, Android, Inc. As Google entered mobile market, it purchased Android and, in a bid, to encourage independent development works, it released the developer tools under the open-source Apache License. The permissive licensing allows the OS and related software to be modified and distributed by enthusiastic developers, network operators and device manufacturers.

### **1.1.1 Technology Features**

**Dalvik VM**

A modified version of JAVA programming language is used for app development with Dalvik VM used to run the apps on Android devices. Dalvik VM can be viewed as modified version of JVM constrained in terms of memory and processor speed and converts the java bytecode (in form of JVM compatible class files) to Dalvik compatible dex executables before installation.

**Application Interface & II/W Support**

Based on Direct Manipulation, the on screen objects have been programmed to respond to real world actions like swiping, touching etc. Boasting of a fast & responsive fluidic touch screen, the OS supports various dedicated hardware like proximity sensors, gyroscopes, magnetometer and accelerometer etc. The Home Screen is analogue to the Desktop in a Windows OS. Powered by Google Play Store, millions of apps can be readily downloaded and used. Apps are available in the apk format. Google provides the SDK free of cost and it supports a comprehensive set of developing tools which primarily includes an IDE (Android Studio), a debugger, and support for emulator and sample codes etc. It even supports C/C++ extensions or bytecodes through JNI and the support is available through Native Development Kit (NDK).

**Architecture**

Based on Linux kernel, most of the middleware, APIs & libraries are written in C. The hardware platform is generally of ARM architecture (hence parallel processing) with later support being available for x86 & MIPS also. All GNU libraries are not supported, hence restricting porting of Windows applications onto Android Device owners are not given ROOT access and hence they have access only to /data partition on flash storage and not to the /system which holds OS and boot files and other sensitive read-only partitions.

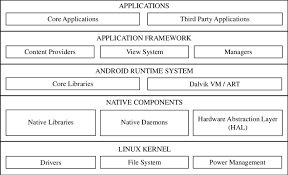


Figure 1. 1 Android Operating System Architecture

**Memory Management**

The OS supports multi-threading but depending on the instant memory availability, it can kill application to reduce overloading. The RAM management is such so that power consumption is at minimum. As far as third-party applications are considered, the SDK provides with ample library entities such as Services, Background Tasks & Foreground Tasks for working with application lifetime.

**Security & Privacy**

Though the OS is immune to normal user usage, but the security flaws can be exploited, as done by the open-source community, to get ROOT access (can be used for malicious purposes by crackers) and modify device capabilities. Except that, the device owners' applications are mostly run in an isolated area of OS called sandbox which restricts access to the system resources and hardware unless the user explicitly gives the access permissions during installation itself. Hence, the app gains access to /data partition through this method and the data partition only. The newest Android OS versions have enhanced security features such as malware scanners built into system to keep a tab on malicious software downloaded through Google Play or any other third- party application. Newer applications now rely on OAUTH 2.0 for secure access to internet.

**Network Connectivity**

The OS supports a full range of connectivity solutions ranging from Bluetooth to ZigBee (through accessory support) and from 2G to LTE support. It supports data packet transmissions through GPRS/EDGE support. Internet can also be accessed through Wi-Fi, WiMAX and shared among other devices through tethering (both over Wi-Fi & USB) support. PC communication is established through device management software using USB & Bluetooth. HTTP service is supported and through use of Google APIs, the phone is an effective GPS enabled device.

### **1.1.2. Android Versions till Date**

Android is the operating system that powers more than one billion smartphones and tablets. Since these devices make our lives so sweet, each Android version is named after a dessert. Whether it's getting directions or even slicing virtual fruit, each Android release makes something new possible.

|  |  |  |  |
| --- | --- | --- | --- |
| Android | Code Name | API Level | Version |
| Android 1.0 | N/A | 1 | 1.0 |
| Android 1.1 | Petit Four | 2 | 1.1 |
| Android 1.5 | Cupcake | 3 | 1.5 |
| Android 1.6 | Donut | 4 | 1.6 |
| Android 2.0 | Eclair | 5 | 2.0 |
| Android 2.2 | Froyo | 8 | 2.2 |
| Android 2.3 | Gingerbread | 9 | 2.3 |
| Android 3.0 | Honeycomb | 11 | 3.0 |
| Android 4.0 | Ice Cream Sandwich | 14 | 4.0 |
| Android 4.1 | Jelly Bean | 16 | 4.1 |
| Android 4.4 | KitKat | 19 | 4.4 |
| Android 5.0 | Lollipop | 21 | 5.0 |
| Android 6.0 | Marshmallow | 23 | 6.0 |
| Android 7.0 | Nougat | 24 | 7.0 |
| Android 8.0 | Oreo | 26 | 8.0 |
| Android 9.0 | Pie | 28 | 9.0 |
| Android 10.0 | Android Q | 29 | 10.0 |

Table 1. 1 Android Versions

## 1.2 Project introduction

### **1.2.1 Main Theme**

The main theme of Quotez revolves around the fundamental human need for inspiration and motivation. In today's digitally-driven society, individuals often seek moments of reflection and encouragement amidst their busy lives. Quotez aims to cater to this need by providing a digital platform where users can easily access a curated collection of inspirational quotes.

The essence of Quotez lies in its ability to empower users with words that uplift, inspire, and resonate with their personal journeys. Whether seeking motivation for professional endeavors, personal growth, or simply a daily dose of positivity, Quotez endeavors to be the go-to destination for users looking to enrich their lives through meaningful quotes.

### **1.2.2 Scope of the Project**

The scope of the Quotez project encompasses the development of a comprehensive mobile application coupled with a robust backend infrastructure to support its functionality. The app will be designed to deliver a seamless user experience across various devices and platforms, ensuring accessibility for a diverse user base.

Key features of the Quotez app include:

* User Registration and Authentication: Users will have the ability to create accounts, log in securely, and manage their profiles within the app.
* Curated Database of Inspirational Quotes: The app will boast a vast repository of inspirational quotes sourced from renowned authors, thinkers, and leaders across different cultures and time periods.
* Search and Filter Functionalities: Users can easily explore the quote database using intuitive search and filter options based on keywords, authors, themes, and more.
* Personalized Collections: Quotez enables users to save their favorite quotes and organize them into personalized collections, facilitating easy access and management.
* Social Sharing Capabilities: Users can seamlessly share their favorite quotes with friends and followers on social media platforms, fostering a community of inspiration and connection.

### **1.2.3 Objectives of the Project**

The primary objectives of the Quotez project are outlined as follows:

1. User-Centric Design: Develop an intuitive and visually appealing user interface that prioritizes ease of navigation and engagement.

2. Comprehensive Quote Database: Curate a diverse collection of high-quality quotes spanning various themes, genres, and cultural backgrounds to cater to the diverse interests of users.

3. Enhanced User Experience: Implement robust search, filter, and personalization features to empower users with personalized content tailored to their preferences.

4. Social Integration: Integrate seamless social sharing functionalities to enable users to connect with others and spread inspiration across digital platforms.

5. Scalability and Reliability: Build a scalable backend infrastructure capable of accommodating future growth in user base and quote database size, while ensuring reliability and security.

By fulfilling these objectives, Quotez aims to establish itself as a premier destination for individuals seeking daily inspiration, motivation, and empowerment.

### **1.2.4 Thesis Organization**

The following thesis has been organized to give a clear view of what and how the app behaves. Chapter 1 gives a clear introduction to why android was chosen as the target platform. It also talks about why the apps were built and to what ends the apps are required plus the scope of the applications. Chapter 2 gives a literature view of the work that has already been done in the field of Quoteza. Chapter 3 provides an analysis of various use case scenarios of the project. It shows relevant use-case diagrams, sequence diagrams and class diagrams. Chapter 4 speaks in detail about Quoteza application. It gives a clear view of the database model used for the project through various tools such as ER-Diagrams, Data Flow Diagrams, Table Design etc. Chapter 4 goes into details of the technologies used, software used & backend configurations. It also gives view on how to implement and connect to those technologies from Android Application and then back to the device end. Chapter 5 shows screenshots of various screens of the application tested on a live tablet.

### **1.2.5 Summary**

This chapter dealt with questions like why the application was created and what does it stand for. Overview or general working principles have been provided. The problem statement for has been detailed and analyzed well. The nature of the project has been explained. An introduction into why android was selected as target OS has also been provided.

# **Chapter 2 System Analysis**

## 2.1 Feasibility Study

The feasibility study for the Quotez app involves an in-depth analysis of various factors to determine the practicality and potential success of the project. This includes technical, economic, market, operational, and legal feasibility. Each of these aspects is explored to ensure a comprehensive understanding of the feasibility of developing and launching the Quotez app.

### **2.1.1 Technical Feasibility**

Objective: To evaluate the technical requirements and challenges associated with the development of the Quotez app.

* **Technology Stack:** The Quotez app will be developed using Flutter, a powerful and flexible framework for cross-platform mobile app development. Flutter allows for a single codebase to be deployed on both iOS and Android platforms, significantly reducing development time and costs. The backend will be powered by Firebase, which offers a suite of tools and services such as real-time database, Firestore, authentication, cloud storage, and cloud functions. This combination ensures a robust and scalable architecture.
* **Development Tools:** The development will utilize modern tools and environments:

1. Flutter SDK: For developing the cross-platform app.
2. Firebase Console: For managing backend services.
3. IDEs: Such as Android Studio or Visual Studio Code.
4. Version Control: Using GitHub for collaborative development and version control.

* **Personal Expertise:**

I am familiar with Dart programming language (used in Flutter) and Firebase services is advantageous. Solo development allows you to leverage your expertise and focus on building the app according to your vision.

* **Integration Capabilities:**

Integration with Firebase services and third-party APIs can be efficiently managed by a single developer. Firebase provides easy-to-use SDKs and documentation, while third-party APIs often offer straightforward integration methods.

### **2.1.2 Economic Feasibility**

**Initial Development Costs:**

Being a solo developer, initial development costs primarily include personal expenses such as time investment and software subscriptions. Open-source tools and free-tier plans for services like Firebase help minimize upfront costs.

**Ongoing Maintenance Costs:**

Solo development reduces ongoing maintenance costs as there are no salaries to be paid. Cloud service expenses for Firebase may increase as user base and usage grow, but costs can be managed effectively.

**Revenue Projections:**

As a solo developer, revenue streams such as a freemium model, in-app advertisements, and premium features can generate income. Revenue projections need to be conservative and aligned with the app's development timeline and target audience.

### **2.1.3 Operational Feasibility**

**Development Plan:**

I am creating a realistic development plan with achievable milestones is essential. Breaking down tasks into manageable chunks and prioritizing features based on user feedback can help ensure operational feasibility.

**Resource Allocation:**

I need to manage my time and resources effectively. Setting realistic expectations and balancing development tasks with other commitments is crucial for successful project execution.

**Risk Management:**

Identifying potential risks such as technical challenges or scope creep and proactively addressing them can mitigate project risks. Flexibility and adaptability are key traits for me to navigate unforeseen challenges.

**Scalability:**

I should design the app with scalability in mind, allowing for future growth and expansion. Choosing scalable technologies like Flutter and Firebase and implementing efficient coding practices can facilitate scalability.

### **2.1.4 Legal Feasibility**

**Intellectual Property:**

Ensuring proper attribution of quotes and compliance with copyright laws is essential for legal feasibility. Solo developers can use public domain quotes or obtain necessary permissions for copyrighted content.

**Data Privacy and Security:**

Implementing robust data privacy and security measures to protect user data is paramount. Solo developers should adhere to data protection regulations and prioritize user privacy.

**Terms of Service and Privacy Policy:**

Creating clear and comprehensive terms of service and privacy policy documents that outline user rights and data usage policies is important for legal compliance. Solo developers can use online templates or seek legal advice to draft these documents.

## 2.2 Existing System: Data Gathering

Data gathering for the existing system involves collecting information about similar apps, user preferences, and market trends to understand the landscape in which Quoteza will operate. As a solo developer, conducting thorough research is crucial to inform decision-making and ensure the app meets user needs effectively.

### **2.2.1 Questionnaires**

**Design of Questionnaires:**

Create structured questionnaires tailored to gather insights into user preferences, experiences, and expectations regarding existing inspirational quote apps. Questions should cover aspects such as app usage frequency, favorite features, areas for improvement, and desired functionalities in a new app like Quoteza.

**Distribution:**

Utilize online platforms, social media, and relevant communities to distribute the questionnaires to a diverse sample of potential users. Engaging with target audiences through targeted messaging and incentives can encourage participation and gather valuable feedback.

**Questions Focus:**

Focus questions on understanding user behavior, motivations, and pain points when using existing quote apps. Inquire about specific features users find valuable, challenges they encounter, and their willingness to adopt new features or platforms.

**Analysis of Responses:**

Collect and analyze responses systematically to identify common themes, patterns, and trends. Pay attention to recurring feedback, user preferences, and areas of consensus or divergence among respondents. This analysis will guide decision-making during the development of Quoteza.

### **2.2.2 Sampling & Observations**

**Sampling Method:**

Utilize stratified sampling to ensure representation from different demographics, age groups, and user segments within the target audience. This approach provides a comprehensive understanding of user needs and preferences across diverse user groups.

**Observation Techniques:**

Conduct direct observations of users interacting with existing inspirational quote apps in real-world settings. Observe user behavior, navigation patterns, and interactions with app features to identify usability issues, pain points, and areas for improvement.

**Data Collection:**

Systematically record observations, noting user actions, reactions, and feedback. Capture insights into user experience, interface design, and feature usability to inform the development of Quoteza.

**Insights Gained:**

Summarize key insights gained from questionnaires and observations, highlighting common trends, user preferences, and areas for innovation. These insights will serve as a foundation for designing and developing Quoteza to meet user needs effectively.

By conducting comprehensive data gathering through questionnaires and observations, valuable insights into user preferences, behaviors, and market trends will be obtained. This data will inform the development of Quoteza, ensuring it addresses user needs and stands out in the competitive landscape of inspirational quote apps.

## 2.3 Existing System: Data Analysis

Data analysis plays a crucial role in understanding the existing landscape of inspirational quote apps and extracting valuable insights to inform the development of Quoteza. As a solo developer, thorough analysis of collected data will guide decision-making and ensure Quoteza meets user needs effectively.

### **2.3.1 Data Flow Diagrams (DFDs)**

**Purpose of DFDs:**

Develop Data Flow Diagrams (DFDs) to visually represent the flow of data within existing inspirational quote apps. DFDs provide a structured overview of how data moves through the system, helping identify key processes, inputs, outputs, and interactions.

**DFD Levels:**

Level 0 (Context Diagram): Provide an overarching view of the system, illustrating high-level processes and interactions with external entities such as users and databases.

Level 1 (Decomposition Diagram): Break down the main processes identified in the context diagram into more detailed subprocesses, inputs, outputs, and data flows.

**Interpretation:**

Analyze the generated DFDs to identify inefficiencies, bottlenecks, and areas where existing quote apps excel or fall short. Pay attention to the flow of data between different components of the system, identifying opportunities for optimization and enhancement in Quoteza.

### **2.3.2 Requirements Engineering**

**Requirement Elicitation:**

Gather functional and non-functional requirements based on insights from data gathering activities, including questionnaires and observations. Engage with potential users to understand their needs, preferences, and pain points when using existing quote apps.

**Requirement Analysis:**

Analyze collected requirements to ensure they are clear, complete, and feasible for implementation. Prioritize requirements based on user feedback, market trends, and project constraints, focusing on features that add the most value to Quoteza.

**Requirement Specification:**

Document requirements in a structured format, detailing functional specifications (e.g., user authentication, quote browsing, social sharing) and non-functional specifications (e.g., performance, security, usability). Clearly define the scope and objectives of Quoteza to guide development efforts.

**Requirement Validation:**

Validate requirements with stakeholders, including potential users and project sponsors, to ensure alignment with user expectations and project goals. Gather feedback and iterate on requirements as needed to refine and finalize the scope of Quoteza.

### **2.3.3 Deliverables**

**Functional Specifications:**

Document detailed specifications for Quoteza's functionality, outlining user stories, use cases, and system behavior under different scenarios. Specify features such as user registration, quote browsing, saving favorites, and social sharing with clear acceptance criteria.

**Non-Functional Specifications:**

Define requirements related to performance, security, usability, and scalability to ensure Quoteza meets user expectations and industry standards. Specify metrics and benchmarks for measuring and evaluating non-functional aspects of the app.

**System Architecture:**

Design a high-level system architecture for Quoteza, outlining the integration of Flutter for the frontend, Firebase for backend services, and third-party APIs for additional functionality. Define components, interfaces, and data flows to guide implementation.

**Prototypes and Wireframes:**

Develop prototypes and wireframes to visualize the user interface and user experience design of Quoteza. Iterate on design concepts based on user feedback and usability testing to create intuitive and engaging interfaces.

**Implementation Plan:**

Outline a comprehensive plan for implementing Quoteza, including development tasks, timelines, resource allocation, and milestones. Break down the development process into manageable increments, prioritizing features based on user needs and project objectives.

By conducting thorough data analysis and documenting requirements, specifications, and deliverables, Quoteza's development will be guided by a clear understanding of user needs, market trends, and system requirements. This structured approach ensures Quoteza meets user expectations and stands out in the competitive landscape of inspirational quote apps.

# **Chapter 03 System Design**

## 3.1 Introduction to System Design

The system design phase is a critical stage in the development of the Quoteza app, where the conceptual framework and architectural blueprint of the system are established. This section provides an overview of the system design process, outlining the key objectives, methodologies, and considerations involved in designing Quoteza.