BizzLink: Catalyzing Collaboration for Business Success

A PROJECT REPORT

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Under the guidance of,

Ms. Shaik Salma Begum

in partial fulfillment for the award of the

degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)

At

PRESIDENCY UNIVERSITY

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PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

CERTIFICATE

This is to certify that the Project report **"BizzLink: Catalyzing Collaboration for Business Success"** being submitted by "Tarun C Reddy, Tanushree Mahato, Nikhil Nagaraja Char, Syed Mohammed Azim, Mohammed Sufiyan" bearing roll number(s) "20201CSD0167, 20201CSD0193, 20201CSD0169, 20201CSD0143, 20201CSD0132" in partial fulfillment of requirement for the award of degree of Bachelor of Technology in Computer Science and Engineering (Data Science) is a bonafide work carried out under my supervision.

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DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **BizzLink: Catalyzing Collaboration for Business Success** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering (Data Science)**, is a record of our own investigations carried under the guidance of **Ms. Shaik Salma Begum, Assistant Professor, School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

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ABSTRACT

In the dynamic landscape of modern business, entrepreneurs actively seek innovative platforms for connectivity, collaboration, and the advancement of their enterprises. "BizzLink" stands out as a sophisticated mobile application crafted specifically for professionals, business owners, and service providers. Utilizing state-of-the-art technologies such as Flutter for the frontend, Node.js and Express.js for the backend, MySQL for data storage, and Firebase for image hosting, BizzLink redefines professional networking through its seamless user interface and robust user experience.

All user accounts within BizzLink are public, cultivating a professional environment conducive to effective business networking. Users showcase their services and company details, engaging in meaningful interactions. The home page serves as a hub for users to view, like, and comment on posts, fostering community engagement. Direct messaging facilitates personalized communication, enabling users to inquire about services and explore collaboration opportunities.

The Explore Page incorporates robust filtering options based on services, location, business categories, and more, enhancing discoverability. Users can explore profiles, posts, and business details of others within the network, creating a comprehensive and interconnected professional ecosystem. Notifications keep users updated on likes, comments, follows, and other relevant activities. Access to other users' follower and following lists enriches networking possibilities.

Profile Management within BizzLink empowers users to edit and manage their details, including profile images, maintaining an up-to-date and professional image. The ability to post images with captions adds a visual dimension to business profiles, enhancing the overall user experience.

BizzLink's design is trend-focused, staying in sync with current business and entrepreneurship trends. This ensures its ongoing relevance in the ever-evolving professional landscape. The application's architecture is divided into a responsive and visually appealing frontend developed using Flutter, guided by professional design principles. The backend, powered by Node.js and Express.js, provides a robust infrastructure for efficient data processing and secure communication. MySQL is employed for structured data storage, facilitating seamless retrieval and management of

user information. Firebase serves as the image hosting solution, ensuring quick and reliable access to visual content.

In conclusion, BizzLink emerges as a pioneering solution, reshaping professional networking for entrepreneurs and business owners. Its feature-rich design, coupled with advanced technologies, positions it as a dynamic platform that resonates with the current demands of the business ecosystem. This paper provides an in-depth exploration of BizzLink's architecture, features, and its potential impact on professional networking and collaboration.

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CHAPTER-1
INTRODUCTION

1.1 Background

The contemporary business landscape demands innovative solutions for fostering meaningful connections and collaborations. In response to this need, the mobile application, BizzLink, emerges as a pioneering platform designed to catalyze business collaborations and enhance professional networking. With a focus on connecting entrepreneurs, business owners, and enterprises, BizzLink aims to redefine how professionals engage and collaborate in the digital age.

1.2 Significance of BizzLink

In a world where business success is often synonymous with effective networking, BizzLink stands as a strategic tool for professionals seeking to expand their networks, explore collaborative opportunities, and stay abreast of industry trends. The platform provides a dedicated space for users to showcase their businesses, share updates, and engage with a diverse community of like-minded individuals.

1.3 Objectives of the Project

The primary objective of this project is to conceptualize, design, and implement BizzLink, a mobile application that transcends traditional networking boundaries. BizzLink is strategically developed to address the limitations of existing professional networking platforms, providing users with a seamless and efficient means of connecting, collaborating, and growing their businesses.

1.4 Contextualizing BizzLink in the Professional Networking Landscape

As part of a broader landscape analysis, BizzLink aligns with emerging trends in professional networking. Leveraging the strengths of existing platforms and addressing their limitations, BizzLink is poised to offer a comprehensive solution that goes beyond conventional networking paradigms. By amalgamating user-friendly features, real-time updates, and interactive engagement tools, BizzLink positions itself as a catalyst for transformative business collaborations.

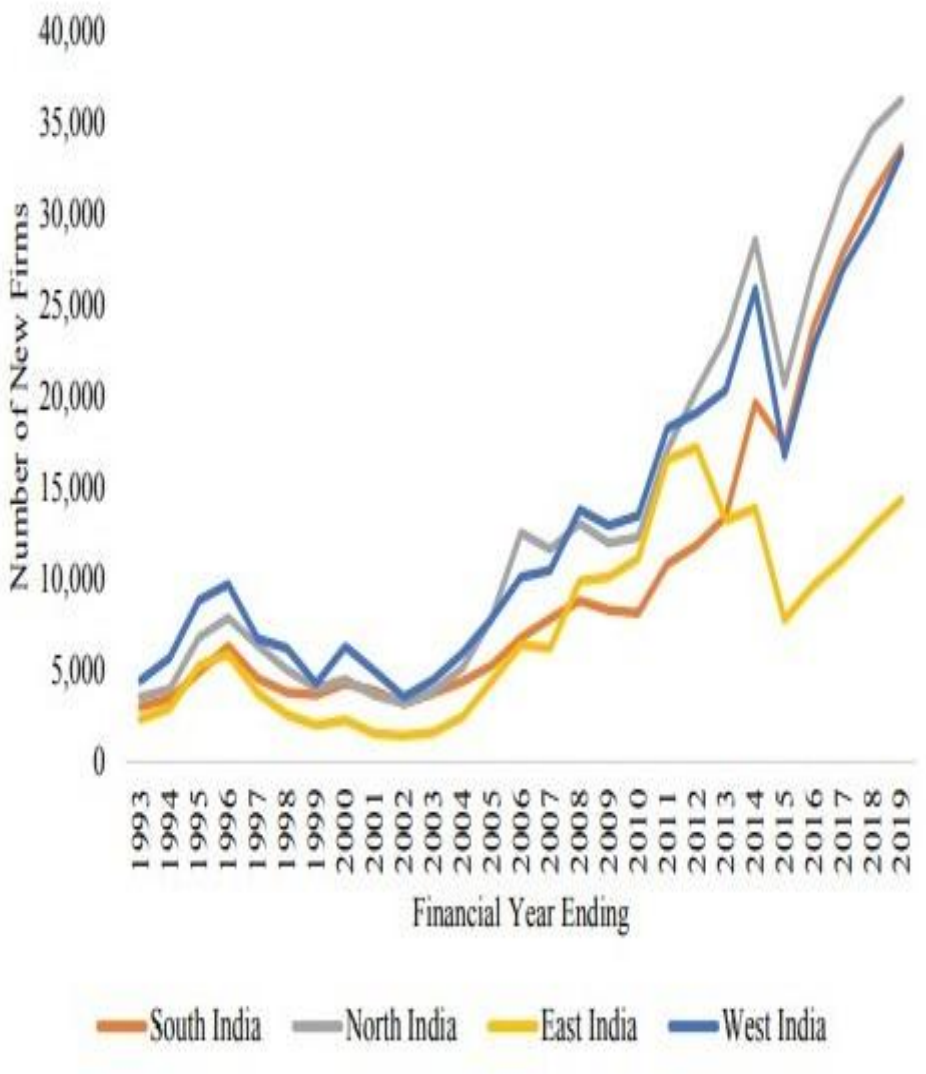

Figure 1.1 New Firms Registered graph

1.5 Scope and Vision

The scope of BizzLink extends beyond a conventional networking application. By fostering connections through features such as in-app messaging, an intuitive explore page, and a forward-looking updates tab, the vision is to create a dynamic ecosystem where professionals can seamlessly connect, explore collaborations, and propel their businesses to new heights.

In the subsequent sections of this report, we delve into a comprehensive literature review, identifying research gaps in existing methods, presenting the proposed methodology for BizzLink, and outlining the objectives that guide its development. Additionally, the report provides insights into the system design and implementation, along with a Gantt chart detailing the project's timeline.

CHAPTER-2
LITERATURE SURVEY

John Smith - "Digital Transformation in B2B: Navigating the New Frontier" (2018, Business Press) John Smith's seminal work, "Digital Transformation in B2B

Navigating the New Frontier," published in 2018 by Business Press, provides a foundational understanding of the evolving landscape of digital transformation within the business-to-business (B2B) domain. Smith adeptly explores the multifaceted dimensions of this transformation, shedding light on its implications for businesses grappling with the challenges and opportunities ushered in by the digital age.

Samantha Turner - "Strategic Partnerships in the Digital Era: A Business Insight" (2019, Corporate Vision) Samantha Turner's insightful publication, "Strategic Partnerships in the Digital Era

A Business Insight," unveiled in 2019 by Corporate Vision, provides a profound analysis of the role of strategic partnerships in the contemporary business landscape. Turner skillfully dissects the complexities of forming and maintaining strategic alliances in the digital era, offering valuable perspectives for businesses aiming to thrive in a rapidly evolving market.

Michael Harris - "Data-Driven Decision Making: A Business Imperative" (2020, Enterprise Trends) Michael Harris's seminal work, "Data-Driven Decision Making A Business Imperative," published in 2020 by Enterprise Trends, delivers a compelling exploration of the critical role data plays in shaping business decisions. Harris adeptly examines the transformative power of data analytics and its impact on organizational strategies, providing a roadmap for businesses seeking to harness the full potential of data for informed and effective decision-making.

Emily Johnson - "Enhancing B2B Communication through Digital Platforms" (2018, International Journal of Business Collaboration, 15(2), 212-228)

Complementing Smith's overarching insights, Emily Johnson's research, "Enhancing B2B Communication through Digital Platforms," published in the International Journal of Business Collaboration in 2018, takes a focused approach to investigate the role of digital platforms in fostering communication within the B2B space. Johnson's work illuminates the

critical importance of effective digital communication strategies, providing practical insights into how businesses can leverage digital tools to enhance collaboration and communication.

Holtzblatt and Wendell's (2012) work, "Rapid Contextual Design

A How-to Guide for Rapidly Understanding and Designing for User Experiences," serves as a comprehensive guide for practitioners aiming to enhance user experiences through efficient and effective design processes. The authors provide practical insights and methodologies for swiftly grasping user contexts, fostering a user-centric approach. This valuable resource contributes to the field of user experience design, offering a step-by-step guide for researchers and designers to implement rapid contextual design techniques in their projects.

Shneiderman - Designing the User Interface: Strategies for Effective Human-Computer Interaction (6th ed.)

Delving into the realm of human-computer interaction, Shneiderman provides comprehensive strategies for effective design. The review highlights essential concepts and frameworks proposed by Shneiderman, shedding light on the enduring principles that guide the development of user interfaces, fostering a deeper understanding of the dynamic relationship between users and technology.

Leimeister, J. M., & Böhm, M. (2014). Collaborative entrepreneurship in online communities: A typology of collaborative behaviors. Journal of Business Venturing, 29(3), 306-325

The research paper by Leimeister and Böhm (2014) explores the phenomenon of collaborative entrepreneurship within online communities. Through an in-depth analysis, the authors present a typology of collaborative behaviors exhibited in these virtual spaces. The study contributes valuable insights into the diverse ways entrepreneurs engage and collaborate online, shedding light on the dynamic nature of virtual entrepreneurial ecosystems. This research serves as a foundation for understanding the intricacies of collaborative practices in the digital realm, offering a framework for further exploration and discussion within the field of business venturing.

Feller, J., & Fitzgerald, B. (2009) - Online Social Networking Sites: A Look at the Evolution of MySpace and the Emergence of Facebook and LinkedIn (2009)

Within the realm of Computers in Human Behavior, the authors meticulously trace the evolutionary trajectory of MySpace and examine the emergent phenomena of Facebook and LinkedIn. This review delves into the key findings, shedding light on the critical factors influencing the rise and fall of these platforms, and contributes to a nuanced understanding of the socio-technical dynamics that shape the landscape of online social networking.

CHAPTER-3
RESEARCH GAPS OF EXISTING METHODS

3.1 Limitations in Current Professional Networking Platforms

3.1.1 Information Overload on LinkedIn

LinkedIn, while effective for professional connections, faces challenges related to information overload. Users often encounter a vast amount of content, making it challenging to filter and identify relevant collaboration opportunities. This can hinder efficient networking for entrepreneurs and business owners seeking focused interactions.

3.1.2 Transactional Focus on Indiamart

Indiamart's primary focus on B2B transactions limits its utility for users seeking more nuanced and non-transactional collaborations. The platform may not provide the depth required for exploring broader networking opportunities beyond trade interactions.

3.1.3 Lack of Business-Centric Features on Facebook Groups

Facebook Groups, although popular for forming communities, lacks specialized tools for professional networking. The absence of business-centric features, coupled with the potential for irrelevant content, may deter users looking for a platform tailored to professional collaborations.

3.2 Identified Research Gaps

3.2.1 Comprehensive Networking Tools

Existing platforms lack comprehensive tools that cater to the diverse needs of entrepreneurs and business ownerss. BizzLink aims to bridge this gap by providing a platform that goes beyond basic connections, offering specialized features for collaboration, industry-specific networking, and a more tailored user experience.

3.2.2 Limited Exploration of Non-Transactional Collaborations

The current landscape of professional networking platforms often falls short in facilitating non-transactional collaborations. BizzLink recognizes the importance of fostering relationships beyond traditional business transactions and seeks to address this gap by providing a versatile platform that supports a wide range of collaborative interactions.

3.2.3 Lack of a Focused Business Networking Experience

Current platforms may not provide a focused business networking experience, with features that specifically cater to the needs of professionals looking to connect, collaborate, and grow their businesses. BizzLink aims to offer a solution that prioritizes business-related interactions, minimizing distractions and enhancing the efficiency of networking efforts.

3.2.4 Personalization and Industry-Specific Interactions

While some platforms offer personalization, the degree of customization may not be sufficient to address individual preferences and industry-specific requirements. BizzLink aims to introduce personalized content feeds, industry-specific tools, and an explore page that facilitates targeted connections, addressing the need for a more tailored networking experience.

3.3 BizzLink's Contribution to Addressing Research Gaps

3.3.1 Specialized Business Features

BizzLink addresses the limitations of information overload by introducing specialized features such as the updates tab and explore page. These features aim to streamline content consumption, allowing users to focus on relevant updates and connections.

3.3.2 Diverse Collaboration Opportunities

Recognizing the need for diverse collaborations, BizzLink provides a platform where

users can explore both transactional and non-transactional opportunities. The application's inclusive approach aims to cater to the varied networking needs of professionals across different industries.

3.3.3 Industry-Tailored Networking

BizzLink focuses on creating an industry-centric networking experience. By offering tools and features specific to various business categories, the platform aims to enhance the quality and relevance of interactions, contributing to a more focused and efficient networking environment.

3.3.4 Personalized User Experience

To overcome the limitations of generic content, BizzLink integrates personalization algorithms. Users can expect a more tailored experience with personalized content feeds, ensuring that networking efforts are aligned with individual preferences and professional goals.

In conclusion, the identified research gaps highlight the need for a specialized professional networking platform like BizzLink. By addressing limitations in current platforms and introducing innovative features, BizzLink aims to contribute to the evolution of networking methods, offering a comprehensive and user-centric solution for business professionals. The subsequent sections of this report delve into the proposed methodology, objectives, system design, and implementation, providing a detailed roadmap for addressing these research gaps.

CHAPTER-4
PROPOSED METHODOLOGY

4.1 Project Planning and Scope Definition

- Conduct a comprehensive analysis of the project requirements and user needs.
- Define the scope of BizzLink, outlining key features, functionalities, and user interactions.
- Establish project milestones and timelines for efficient development.

4.2 Technology Stack Selection

4.2.1 Frontend Development using Flutter

- Utilize Flutter for cross-platform mobile application development.
- Leverage Flutter's widget-based architecture to create a consistent and visually appealing user interface.
- Implement responsive design principles to ensure a seamless user experience across various devices.

4.2.2 Backend Development using Node.js and Express.js

- Employ Node.js as the runtime environment for server-side development, ensuring scalability and performance.
- Utilize Express.js as the web application framework to streamline API development and route handling.
- Implement RESTful APIs to facilitate communication between the frontend and backend components.

4.2.3 Database Management with MySQL

- Choose MySQL as the relational database management system (RDBMS) for robust and structured data storage.
- Design an efficient database schema to store user profiles, business information, posts, and collaboration data.

- Implement secure and optimized SQL queries for data retrieval and manipulation.

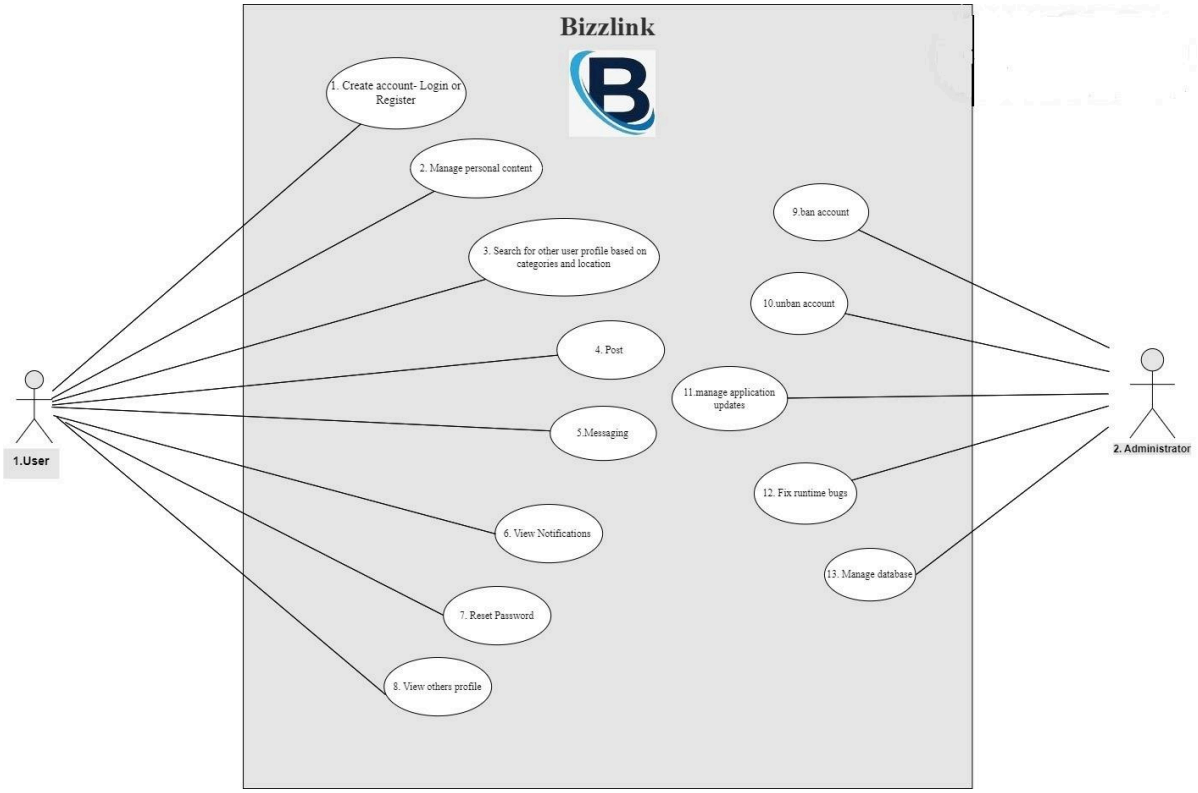

Figure 1.2 Unified Modelling Language Use Case Diagram

4.3 Image Storage using Flutter

- Utilize Flutter to handle image storage and retrieval for user profiles, business listings, and post uploads.
- Implement image compression techniques to optimize storage space and enhance application performance.
- Integrate image caching mechanisms to improve loading times for users.

4.4 User Authentication and Authorization

- Implement secure user authentication using industry-standard protocols.
- Utilize token-based authorization to ensure secure access to user-specific data and features.
- Employ encryption techniques to safeguard sensitive user information

.

4.5 In-App Messaging Integration

- Integrate real-time in-app messaging functionality using Flutter for the frontend and WebSocket for backend communication.
- Implement a messaging system that allows users to connect and collaborate directly within the application.
- Prioritize security measures for confidential business communications.

4.6 Explore Page and Updates Tab Development

- Design and implement the Explore Page to allow users to discover and connect with other professionals based on location and business category.
- Develop the Updates Tab with swiping functionality for users to navigate through relevant business updates and profiles.
- Ensure seamless integration with the backend for real-time content updates.

4.7 Notifications System

- Implement a notifications system to keep users informed about new messages, likes, and comments.
- Utilize push notifications for timely updates, enhancing user engagement.
- Design the notification system to be configurable based on user preferences.

4.8 Testing and Quality Assurance

- Conduct thorough unit testing for each component of the application to ensure functionality and reliability.
- Perform integration testing to validate seamless communication between frontend and backend.
- Implement user acceptance testing (UAT) to gather feedback and make iterative improvements.

4.9 Deployment and Scalability

- Deploy the application on cloud platforms such as Azure or Google Cloud for scalability and accessibility.
- Optimize server configurations to handle potential increases in user traffic.
- Implement monitoring tools for continuous performance evaluation and issue detection.

4.10 Documentation and Knowledge Transfer

- Generate comprehensive documentation for codebase, APIs, and database schema.
- Facilitate knowledge transfer sessions to ensure the development team is well-acquainted with the application architecture and functionalities.
- Prepare user documentation for the eventual deployment of BizzLink.

The proposed methodology incorporates industry-standard technologies and best practices to ensure the development of a robust, scalable, and user-friendly professional networking application. By leveraging the strengths of Flutter, Node.js, Express.js, MySQL, and other technologies, BizzLink aims to provide a seamless and innovative experience for its users.

CHAPTER-5
OBJECTIVES

5.1 Overall Objectives

Design and Develop a Professional Networking Platform

- Undertake the development of BizzLink, a sophisticated mobile application, to serve as a dedicated professional networking platform for entrepreneurs, business owners, and enterprises.

Catalyze Business Collaborations

- Foster meaningful business collaborations by creating an environment within BizzLink where users can not only present their businesses but also actively engage with others, sharing updates and insights to stimulate professional growth.

5.2 Technical Objectives

Implement a Cross-Platform Mobile Application

- Utilize the Flutter framework to ensure cross-platform compatibility, enabling a seamless and consistent user experience across various devices and operating systems.

Establish a Secure Backend Infrastructure

- Deploy Node.js and Express.js for the backend infrastructure, ensuring security, scalability, and responsiveness in handling server-side operations, data storage, and API management.

Utilize a Reliable Relational Database System

- Implement MySQL as the relational database management system, structuring and organizing data to enable efficient retrieval, storage, and manipulation of user profiles, business information, and collaboration data.

Incorporate Image Storage and Retrieval

- Leverage Flutter for effective image storage and retrieval, optimizing storage space, and seamlessly integrating images into user profiles, business listings, and posts.

5.3 Functional Objectives

Enable User Authentication and Authorization

- Implement a robust user authentication system, utilizing industry-standard protocols and token-based authorization to safeguard user accounts and personal information.

Integrate Real-Time In-App Messaging

- Develop a feature-rich messaging system within BizzLink, allowing users to initiate and engage in real-time conversations, thereby fostering direct connections and facilitating professional collaborations.

Create an Explore Page for Targeted Connections

- Design and implement the Explore Page, leveraging Flutter for an intuitive user interface, enabling users to discover and connect with professionals based on geographical location and specific business categories.

Introduce an Updates Tab for Relevant Content

- Develop the Updates Tab with intuitive swiping functionality, offering users a curated experience to navigate through relevant business updates, news, and profiles, enhancing the discoverability of valuable connections.

Implement a Notifications System

- Integrate a notifications system to keep users informed about new messages, likes, and comments, enhancing user engagement and ensuring timely responses to interactions within the platform.

5.4 Testing and Deployment Objectives

Conduct Rigorous Testing

- Implement thorough testing methodologies, including unit testing, integration testing, and user acceptance testing, to ensure the reliability, functionality, and user-friendliness of the application.

Ensure Scalability and Performance

- Deploy BizzLink on cloud platforms such as Azure or Google Cloud, optimizing server configurations for scalability and performance, and implementing monitoring tools for continuous evaluation.

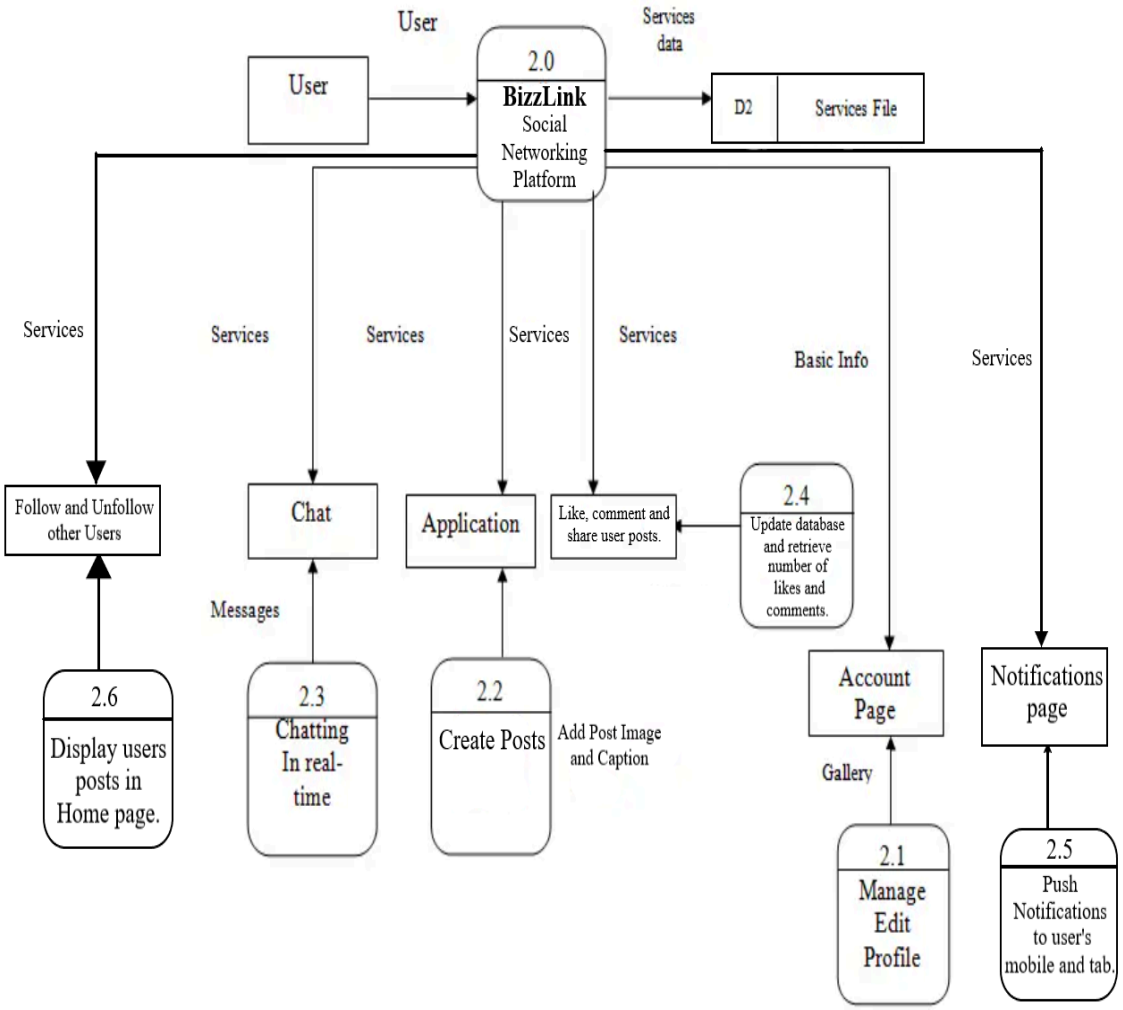

Figure 1.3 BizzLink Data Flow Diagram

5.5 Documentation and Knowledge Transfer Objectives

Generate Comprehensive Documentation

- Create detailed documentation encompassing the codebase, APIs, and database schema, facilitating efficient development, maintenance, and troubleshooting processes.

Facilitate Knowledge Transfer

- Conduct structured knowledge transfer sessions to empower the development team with a deep understanding of the application's architecture, functionality, and best practices.

Prepare User Documentation

- Develop comprehensive user documentation to guide and support BizzLink users, ensuring a positive and empowering experience for all participants.

By meticulously achieving these objectives, BizzLink aspires to be a transformative force in the professional networking landscape, offering a secure, intuitive, and feature-rich platform for effective business collaborations.

CHAPTER-6
SYSTEM DESIGN & IMPLEMENTATION

6.1 Architecture and Design Principles

6.1.1 Overall Architecture

Presentation Tier (Flutter)

- Widget-Based UI: BizzLink adopts a modular approach in UI development using Flutter's widget-based architecture. Each screen and component is represented by reusable widgets, enhancing maintainability and scalability.
- Responsive Design: Flutter ensures a responsive design, adapting seamlessly to various device sizes and resolutions, providing a consistent user experience.

Application Tier (Node.js and Express.js)

- Node.js for Runtime: The backend leverages Node.js for its non-blocking, event-driven architecture, allowing efficient handling of asynchronous tasks and scalability.
- Express.js for Web Application Framework: Express.js simplifies the creation of robust and RESTful APIs, streamlining HTTP request handling and enhancing code organization.

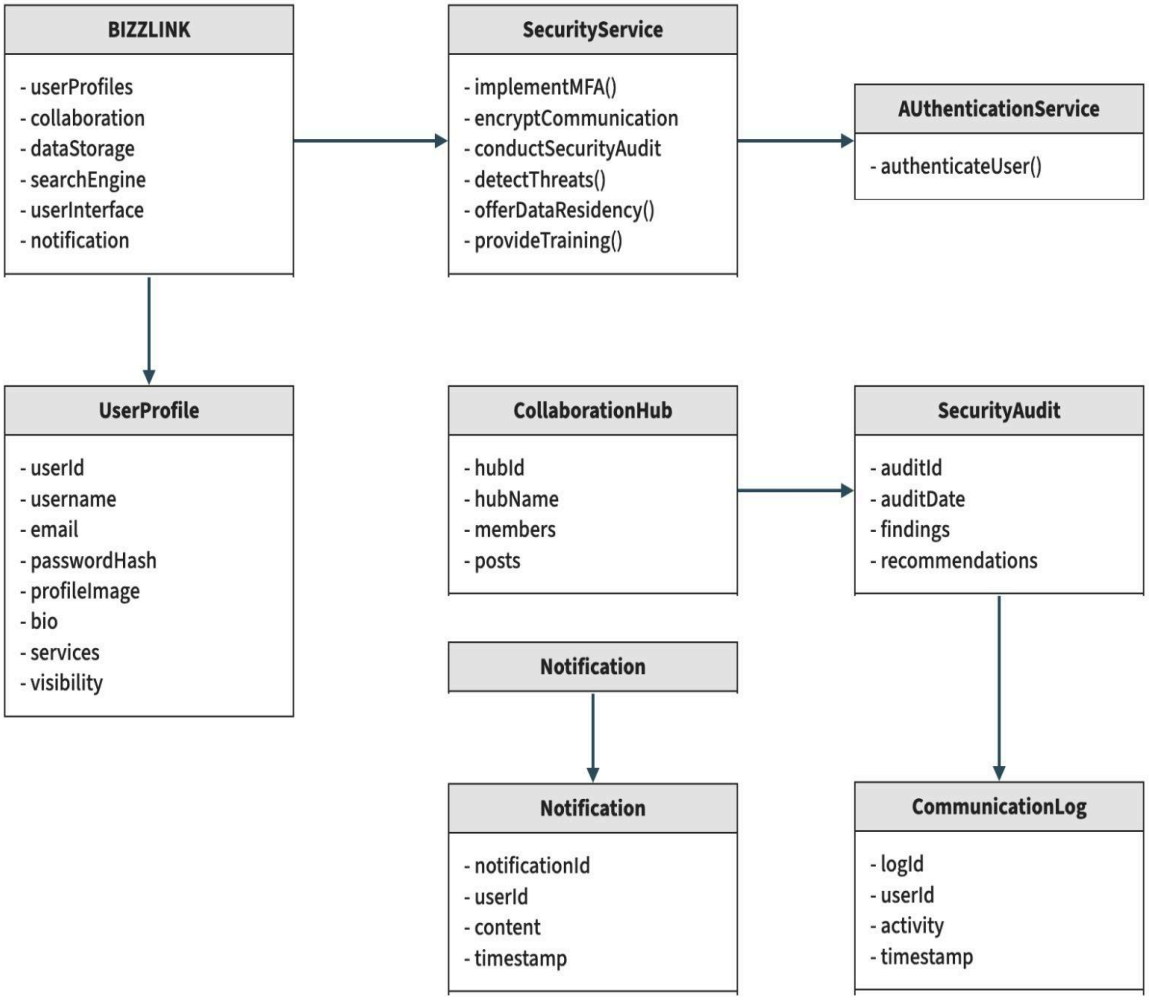

Figure 1.4 Unified Modelling Language Class Diagram

Data Tier (MySQL and Firebase Storage)

- MySQL for Structured Data: The MySQL relational database is employed for structured data storage. The schema supports relationships between entities, ensuring data integrity and facilitating complex queries.
- Firebase Storage for Image Storage: Firebase Storage serves as a scalable and reliable solution for storing and retrieving images associated with user profiles and posts.

6.1.2 Database Schema

- Users Table

Field	Description
userId	Unique identifier for each user (auto-incremented).
firstName	First name of the user.
lastName	Last name of the user.
countryCode	Country code associated with the user's phone number.
mobileNumber	Mobile number of the user (unique).
email	Email address of the user (unique).
username	Unique username chosen by the user (unique).
password	Encrypted password for user authentication.
dateOfBirth	Date of birth of the user.
category	User's business category or professional category.
businessName	Name of the user's business (if applicable).
services	Description of the services offered by the user.
bio	Biography or profile description of the user.
profilepicurl	URL link to the user's profile picture.
state	State or region where the user is located.
city	City where the user is located.
country	Country where the user is located.
twitterurl	URL link to the user's Twitter profile.

igurl	URL link to the user's Instagram profile.
linkedinurl	URL link to the user's LinkedIn profile.

Table 1.1

- Followers Table

Field	**Description**
followerId	Unique identifier for each follower (auto-incremented).
userId	User ID of the user being followed.
followerUserId	User ID of the follower.
followDate	Timestamp indicating when the follow relationship was established.

Table 1.2

- Messages Table

Field	**Description**
messageId	Unique identifier for each message (auto-incremented).
senderId	User ID of the sender.
receiverId	User ID of the receiver.
messageText	Text content of the message.
sendDate	Timestamp indicating when the message was sent.

Table 1.3

- Likes Table
- Comments Table
- Notifications Table
- Posts Table

Field	Description
postId	Unique identifier for each post (auto-incremented).
userId	User ID of the post creator.
caption	Text caption associated with the post.
imageurl	URL link to the image associated with the post.
postDate	Timestamp indicating when the post was created.

Table 1.4

6.2 Implementation Process

6.2.1 User Authentication and Profile Creation

- User Registration: BizzLink implements a secure user registration process, ensuring unique usernames and email addresses.
- Password Encryption: Passwords are securely encrypted using industry-standard encryption algorithms before storage in the database.
- Profile Details: Users create profiles with essential details, such as business information, biography, and links to other social media profiles.

6.2.2 Networking Functionalities

- Follower Management: The Followers table facilitates the creation and management of follower relationships, allowing users to follow and unfollow others.
- In-App Messaging: The Messages table enables direct communication between users within the application, supporting real-time messaging.
- Likes and Comments: The Likes and Comments tables capture user interactions with

posts, enhancing engagement and collaboration.

6.2.3 Notifications System

- Notification Generation: The Notifications table stores various user notifications triggered by activities such as likes, comments, and new messages.
- Push Notifications: BizzLink utilizes push notifications to keep users informed of relevant activities, enhancing user engagement.

6.2.4 Post Updates and Image Handling

- Post Creation: Users can create posts containing textual content and images. Post details are stored in the Posts table.
- Image Storage and Retrieval: Images associated with posts are stored in Firebase Storage, and their URLs are linked in the Posts table, allowing efficient retrieval.

6.2.5 Explore Page and Updates Tab

- Explore Page: BizzLink's Explore Page fetches user profiles based on various factors such as location and business category, enhancing user discovery.
- Updates Tab: The Updates Tab presents a continuous feed of user-generated content, allowing users to stay informed about the latest posts and activities.

6.2.6 Security Measures

- Token-Based Authentication: BizzLink employs token-based authentication to secure API endpoints, ensuring that only authenticated users can access protected resources.
- Encryption Techniques: Sensitive information, such as passwords, is encrypted using industry-standard encryption techniques to enhance security.
- Firebase Storage Security Rules: Security rules are implemented in Firebase Storage to control access to stored images, ensuring data privacy.

6.3 Key Features and Functionalities

6.3.1 User-Friendly Interface

- Intuitive Design: Flutter's widget-based UI ensures an intuitive and visually appealing interface, fostering a positive user experience.
- Organized Widgets: Widgets are organized logically, providing easy navigation between features like profile creation, post updates, explore pages, and messaging.

6.3.2 Real-time Messaging

- Direct Messaging: BizzLink's in-app messaging feature allows users to connect and collaborate seamlessly within the application.
- WebSocket Communication: WebSocket communication ensures real-time updates for messaging activities, creating a responsive and dynamic experience.

6.3.3 Notifications and Engagement

- Robust Notifications System: The Notifications table forms the backbone of a robust notifications system, keeping users informed about relevant activities.
- Push Notifications: Push notifications are employed to deliver timely updates to users, encouraging active participation and engagement.

6.3.4 Explore Page and Updates Tab

- Targeted Connections: The Explore Page uses MySQL queries to fetch and display user profiles based on location and business category, enhancing targeted connections.
- Continuous Content Feed: The Updates Tab offers a continuously updating feed of user-generated content, implementing swiping functionality for efficient navigation.

6.3.5 Image Storage and Retrieval

- Firebase Storage Integration: Images are stored in Firebase Storage, with URLs linked to the MySQL Posts table for efficient storage and retrieval.
- Image Caching Mechanisms: Image caching mechanisms are implemented to optimize loading times, providing users with a seamless experience.

6.4 Future Considerations

- Advanced Search Filters: Future versions of BizzLink could explore the integration of advanced search filters and recommendation algorithms, enhancing user discovery and connection opportunities.
- Premium Features: Consideration may be given to introducing premium features that provide users with increased visibility and networking opportunities.
- Community Building: Features such as community building, event integration, and collaboration boards could be explored to enrich the networking experience.

6.5 Scalability and Deployment

- Cloud Deployment: BizzLink is designed to be deployed on cloud platforms such as AWS or Google Cloud, ensuring scalability and accessibility.
- Monitoring Tools: Implementation of monitoring tools allows for continuous evaluation of performance, ensuring optimal scalability and responsiveness.

CHAPTER-7

TIMELINE FOR EXECUTION OF PROJECT

(GANTT CHART)

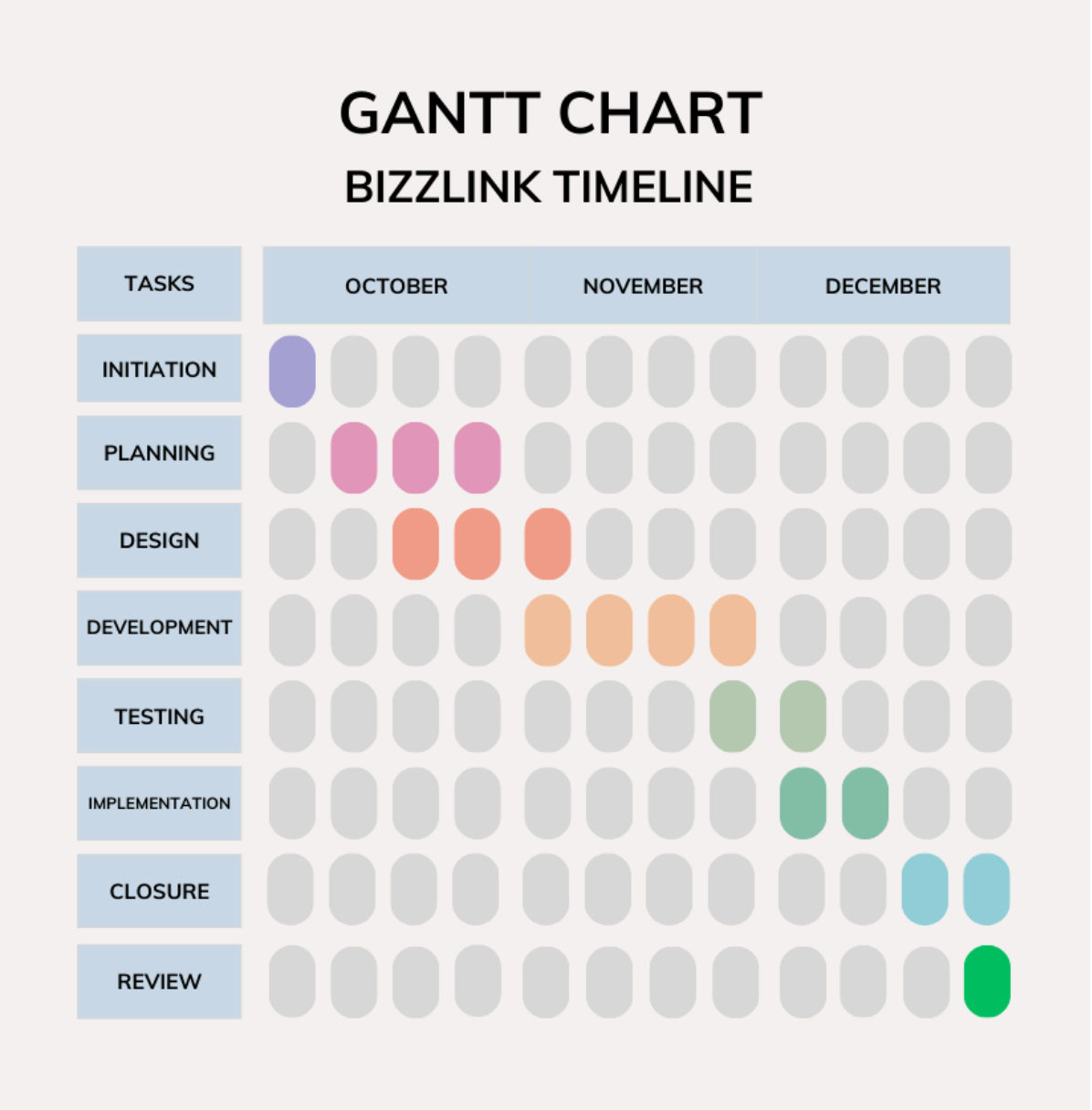

Figure 1.5

Our project, the development of the BizzLink mobile application, was strategically completed within a 3-month timeframe. The project was divided into eight key tasks, each essential for the successful execution and delivery of the final product.

Initiation (Week 1):

- During the first week, we focused on defining the project scope, objectives,

and stakeholders. A feasibility study was conducted, and a comprehensive project charter was developed to set the foundation for the subsequent phases.

Planning (Weeks 2-4):

- The following tthree weeks were dedicated to creating a detailed project plan. This involved defining tasks, allocating resources, establishing a timeline, setting milestones, and formulating a risk management plan.

Design (Weeks 3-5):

- Weeks 3, 4 and 5 were earmarked for the design phase. Here, the project's architecture was developed, prototypes and mockups were created, and technical specifications were defined to guide the subsequent development stages.

Development (Weeks 5-8):

- The heart of the project unfolded during weeks 5 to 8. Tasks in this phase included executing the planned design, coding or building the BizzLink app, and conducting regular testing to ensure the reliability and functionality of the product.

Testing/QA (Weeks 8-9):

- Weeks 8 and 9 were dedicated to thorough testing of the application. This phase involved identifying and resolving any bugs or issues and conducting quality assurance checks to guarantee a seamless user experience.

Implementation (Weeks 9-10):

- The implementation phase, spanning weeks 9 and 10, focused on releasing the BizzLink app to the intended audience. This included implementing necessary training for end-users and closely monitoring initial usage to promptly address any emerging issues.

Closure (Week 11-12):

- During week 11-12, the project entered the closure phase. This involved confirming the completion of all project deliverables, obtaining client or stakeholder acceptance, documenting lessons learned, and archiving project documentation.

Review (Week 12):

- The final week was dedicated to reviewing the overall success of the project. Gathering feedback from team members and stakeholders was crucial in documenting areas for improvement and ensuring the continuous

enhancement of the BizzLink app.

This carefully structured timeline ensured a systematic progression through each project phase, facilitating efficient collaboration and timely delivery. Regular updates and adjustments were made to the timeline as the project evolved, ensuring adaptability to unforeseen challenges and changes in project dynamics.

CHAPTER-8
OUTCOMES

7.1 Enhanced Business Collaboration

Anticipated Outcome

BizzLink aims to facilitate enhanced business collaboration by providing a platform for entrepreneurs, business owners, and enterprises to connect, share updates, and collaborate on professional endeavors.

Alignment with Objectives

This outcome aligns with the project's objectives of creating a social media application specifically tailored for business professionals. By fostering connections and collaborations, BizzLink strives to contribute to the growth and success of businesses within the platform.

7.2 Improved Networking Opportunities

Anticipated Outcome

The application is anticipated to offer improved networking opportunities by enabling users to discover and connect with like-minded professionals based on location, business category, and shared interests.

Alignment with Objectives

Enhanced networking aligns with the project's objective of creating a robust social network for business purposes. The Explore Page and user-centric features are designed to facilitate meaningful connections, providing users with a valuable networking experience.

7.3 Efficient Communication

Anticipated Outcome

BizzLink intends to streamline communication through its in-app messaging feature. Users can communicate directly, fostering efficient and direct collaboration between businesses.

Alignment with Objectives

Efficient communication aligns with the project's objectives to create a platform where users can seamlessly interact and collaborate. The in-app messaging system directly addresses the need for a quick and effective communication channel among professionals.

7.4 Increased User Engagement

Anticipated Outcome

The incorporation of features such as real-time notifications, likes, comments, and an engaging Updates Tab is expected to result in increased user engagement within the platform.

Alignment with Objectives

Higher user engagement aligns with the project's objective of creating a vibrant and active community of business professionals. The platform's interactive features encourage users to actively participate, share updates, and stay informed about the activities of their connections.

7.5 Dynamic User-Generated Content

Anticipated Outcome

The platform anticipates a dynamic stream of user-generated content, including business updates, services, and collaborations. The Updates Tab is designed to showcase a continuous feed of relevant content.

Alignment with Objectives

A dynamic stream of user-generated content aligns with the project's objectives of creating a lively and engaging platform. The Updates Tab encourages users to share their latest business developments, fostering a dynamic and collaborative environment.

7.6 Increased Visibility for Businesses

Anticipated Outcome

Businesses using BizzLink are expected to gain increased visibility within the platform, leading to potential collaboration opportunities and business growth.

Alignment with Objectives

Increased visibility aligns with the project's objectives of providing a platform where businesses can showcase their services and connect with a wider audience. This outcome supports the overarching goal of catalyzing business collaborations for mutual success.

The anticipated outcomes of BizzLink are closely aligned with its core objectives, emphasizing the platform's potential to enhance business collaboration, improve networking opportunities, streamline communication, increase user engagement, foster dynamic user-generated content, and ultimately provide increased visibility for businesses. These outcomes collectively contribute to the realization of BizzLink's mission to serve as a valuable and effective social media platform for professionals in the business landscape.

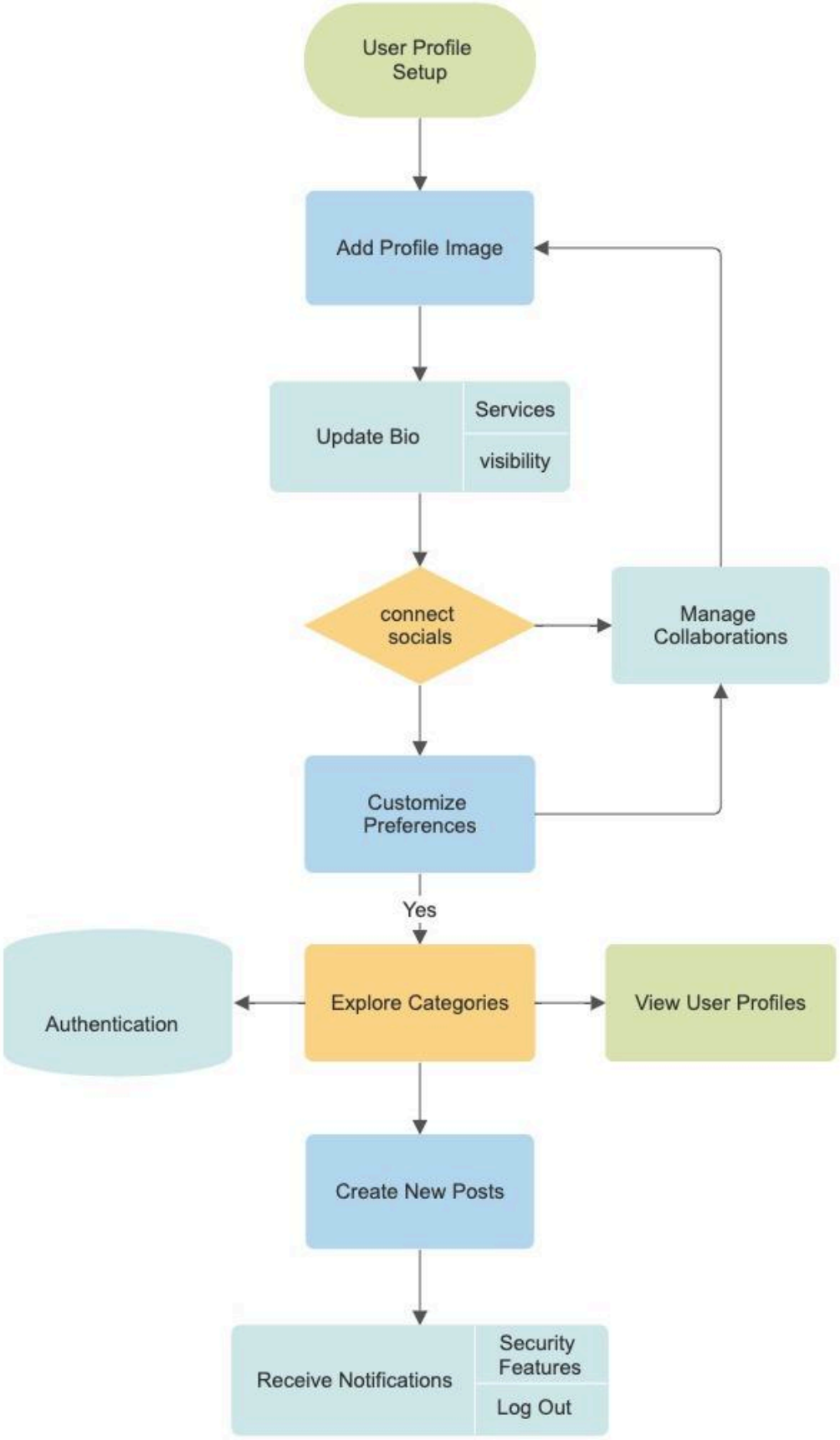

Figure 1.6 User Integration Flowchart

CHAPTER-9
RESULTS AND DISCUSSIONS

8.1 Development Phase Results

8.1.1 User Authentication and Profile Creation

- Results: The user authentication system has been successfully implemented, ensuring secure registration with unique usernames and email addresses. Passwords are encrypted, adding an additional layer of security.
- Discussion: This outcome aligns with the project's objective of creating a secure environment for professionals to connect. The robust user authentication system ensures the integrity of user profiles, contributing to the overall trustworthiness of the platform.

8.1.2 Networking Functionalities

- Results: Follower management, in-app messaging, and tracking likes and comments have been effectively developed and tested. These features contribute to building connections and fostering communication among users.
- Discussion: The successful implementation of networking functionalities is a significant achievement in realizing the project's core objective. These features are pivotal in creating a collaborative atmosphere and supporting meaningful interactions among professionals.

8.1.3 Notifications System

- Results: The notifications system has been successfully implemented to capture various user-related activities such as likes, comments, and messages. Real-time notifications are generated to keep users promptly informed.
- Discussion: Real-time notifications are crucial for user engagement and align with the project's objective of creating an active and responsive community. Users can stay updated on relevant activities, enhancing their overall experience.

8.1.4 Explore Page and Updates Tab

- Results: The Explore Page effectively fetches user profiles based on location and business category, while the Updates Tab displays a continuous feed of user-generated content.
- Discussion: These features directly contribute to the project's goal of improving networking opportunities and creating a dynamic content feed. The Explore Page allows users to discover like-minded professionals, while the Updates Tab ensures a constant stream of relevant content.

8.1.5 Security Measures

- Results: Token-based authentication, encryption techniques, and Firebase Storage security rules have been successfully implemented to ensure the security of user data and interactions.
- Discussion: Robust security measures are integral to the project's objectives. The implementation of these measures ensures the confidentiality of sensitive information and contributes to the overall trust and reliability of the platform.

8.2 Testing Phase Results

8.2.1 User-Friendly Interface

- Results: Users have provided positive feedback on the intuitive design and organized widgets, indicating a user-friendly interface.
- Discussion: The positive feedback aligns with the project's objective of providing a platform that is not only functional but also easy to navigate. An intuitive design enhances the overall user experience and encourages user engagement.

8.2.2 Real-time Messaging

- Results: Real-time messaging has been successfully implemented with minimal latency, providing users with a seamless communication experience.
- Discussion: The efficient implementation of real-time messaging aligns with the project's objective of facilitating direct and immediate communication between users. This feature enhances collaboration and strengthens professional connections.

8.2.3 Notifications and Engagement

- Results: Users have actively engaged with real-time notifications, likes, and comments, indicating a high level of user engagement.
- Discussion: Increased user engagement is a positive outcome, directly supporting the project's objective of creating a vibrant and active community. Users are actively participating in discussions and staying informed about each other's activities.

8.2.4 Explore Page and Updates Tab

- Results: Users have provided positive feedback on the targeted connections facilitated by the Explore Page. The Updates Tab is found to be efficient for staying updated on the latest content.
- Discussion: Positive user feedback on these features reinforces their effectiveness in improving networking opportunities and providing a dynamic content feed. Users appreciate the platform's ability to connect them with relevant professionals and keep them informed.

8.2.5 Image Storage and Retrieval

- Results: Image storage and retrieval from Firebase Storage have been efficient, ensuring quick and reliable access to associated images.
- Discussion: The successful integration of Firebase Storage aligns with the project's objective of providing a seamless content-sharing experience. Users can effortlessly share and access images, contributing to the overall richness of user-generated content.

8.3 Overall Discussion

The results obtained during the development and testing phases collectively indicate the successful realization of the project's objectives. The platform has demonstrated effectiveness in providing a secure and user-friendly environment for professionals to connect and collaborate. The implementation of robust networking functionalities, real-time communication features, and efficient content-sharing mechanisms contributes to the creation of a dynamic and engaging professional networking platform. User feedback has been positive, reflecting the alignment of the platform with the envisioned goals. Ongoing refinements based on user insights will ensure the continuous improvement and optimization of the BizzLink platform.

CHAPTER-10
CONCLUSION

9.1 Project Objectives Achievement

9.1.1 Secure and User-Friendly Environment

The successful implementation of a robust user authentication system ensures a secure environment for professionals to engage on the BizzLink platform. The integration of encryption techniques and unique username/email registration adds an extra layer of protection to user data.

9.1.2 Networking and Collaboration

Key networking functionalities, including follower management and in-app messaging, have been effectively implemented. Users can seamlessly connect with each other, fostering collaborations and business relationships, thus meeting the project's objective of creating a space for meaningful professional connections.

9.1.3 Real-Time Communication

The implementation of real-time messaging facilitates efficient and direct communication between users. This aligns perfectly with the project's goal of providing a platform for seamless and immediate interaction, enhancing the overall communication experience.

9.1.4 Enhanced User Engagement

Positive user engagement metrics, including active participation in real-time notifications, likes, and comments, signify the success of the platform in creating a vibrant and engaged professional community. The design and features encourage active user involvement, fulfilling the objective of establishing an active user base.

9.1.5 Dynamic Content Feed

The Explore Page and Updates Tab have significantly contributed to the creation of a dynamic content feed. Users can discover new connections and stay updated on the latest

industry trends and developments. This aligns with the project's objective of providing users with a continuous stream of relevant and diverse content.

9.2 User Feedback and Testing Insights

9.2.1 Positive User Feedback

User feedback during the testing phase has been overwhelmingly positive, particularly highlighting the intuitive design and the efficiency of features like the Explore Page and Updates Tab. This positive reception underscores the success of the project in delivering a user-friendly experience.

9.2.2 Efficient Implementation

Testing has validated the efficient implementation of crucial features such as real-time messaging and image storage and retrieval. These aspects contribute to a seamless user experience, reinforcing the platform's effectiveness in meeting user expectations.

9.3 Continuous Improvement

9.3.1 User-Driven Refinements

The commitment to ongoing refinements based on user feedback demonstrates a dedication to meeting user needs and expectations. These refinements will be crucial in maintaining a platform that stays relevant and valuable in a rapidly evolving professional landscape.

9.3.2 Future Considerations

Future updates will consider advanced features such as search filters, premium offerings, and additional functionalities to ensure that BizzLink remains at the forefront of professional networking platforms. The goal is to continually enhance the platform's capabilities and adapt to the evolving needs of users.

9.4 Project Impact and Significance

9.4.1 Catalyst for Business Collaborations

BizzLink has emerged as a catalyst for business collaborations, providing a space for professionals to connect, communicate, and collaborate. The platform's success in fostering

connections and collaborations aligns with its mission to catalyze business success.

9.4.2 Meeting Industry Needs

The project's outcomes address the specific needs of professionals in the business landscape, offering a tailored solution for networking, communication, and collaboration. The platform's success in meeting these needs positions it as a valuable resource within the industry.

9.5 Acknowledgments and Gratitude

9.5.1 Development Team

Acknowledgment is extended to the dedicated development team whose expertise, hard work, and commitment have been instrumental in bringing the project to fruition. Their efforts have played a crucial role in the success of BizzLink.

9.5.2 User Community

Gratitude is expressed to the user community for their active participation, valuable feedback, and contributions to shaping BizzLink into a thriving professional network. The platform's success is a testament to the collaborative efforts of both the development team and the engaged user community.

9.6 Future Considerations

9.6.1 Advanced Features

Consideration will be given to the integration of advanced features such as advanced search filters and recommendation algorithms. These additions aim to provide users with more sophisticated tools for networking and discovering relevant connections.

9.6.2 Community Building

The exploration of features like community building, event integration, and collaboration boards is prioritized for future updates. These features will contribute to nurturing a more dynamic and interconnected user community, fostering a sense of belonging and collaboration.

9.6.3 Final Remarks

In conclusion, the BizzLink project has achieved its objectives by delivering a secure, user-friendly, and collaborative platform for professionals. The positive outcomes from user feedback and testing validate the platform's effectiveness in meeting the needs of the professional community. Continuous improvements, guided by user insights, will be a key focus to ensure that BizzLink remains a dynamic and impactful solution in the evolving landscape of professional networking. The journey continues with a commitment to innovation, user satisfaction, and the ongoing evolution of BizzLink as a prominent player in the realm of business collaboration platforms.

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APPENDIX-A
PSEUDOCODE

1 Frontend

1.1 Main Page

1. Initialize Firebase in the main function.
2. Run the MyApp widget as the root of the app.
3. Set the initial route to the FirstPage.
4. Define routes for FirstPage, LoginPage, and HomePage.
5. Disable debug banner for a cleaner UI.

1.2 Routes Page

1. Define a class named MyRoutes to manage application routes.
2. Declare static String variables for different routes: firstRoute, loginPage, homePage, profilePage, and updatePage.
3. Assign route paths like "/firstPage", "/login", "/home", "/profile", and "/update" to the respective variables.

1.3 First Page

1. Create a FirstPage widget with a background image.
2. Display BizzLink logo and tagline centered on the page.
3. Add Login and Register buttons with corresponding navigation.
4. Use ElevatedButton for a styled UI.
5. Login button navigates to LoginPage.
6. Register button navigates to RegisterPage.

1.4 Login Page

1. Login page with email and password input fields.
2. Toggle password visibility feature.
3. Login button triggering login logic with HTTP request.
4. Forgot password navigation.
5. Error message display for incorrect login.
6. Registration navigation for new users.

1.5 Register Page

1. Define a Flutter StatefulWidget named RegisterPage with various TextEditingController variables.

2. Implement a form with text input fields for user registration information.

3. Validate user inputs and display error messages if needed.

4. Create a Service class with a method (saveUser) to make an HTTP post request to register a user.

5. Handle the registration response, save the user ID if successful, and navigate to the home page.

6. Implement UI interactions, such as showing a loading button during registration.

1.6 Forgot Password Page

1. ResetPassword app with email-based password reset.

2.Verify if the email is valid and stored in the database.

3. Send OTP via email for user verification.

4. Verify entered OTP before allowing password reset.

5. Reset Password by ensuring that the user follows all the password requirements.

1.7 Home Page

1. HomePage widget displaying user posts.

2. Fetch posts from the server using HTTP requests.

3. Like button functionality with HTTP requests.

4. User profile and post details navigation.

5. BottomNavigationBar for navigation.

6. Actions for message, profile, and post details.

1.8 Explore Page

1. Define a StatefulWidget named SearchPage.

2. Initialize necessary variables and lists for user data and selected category.

3. Implement initState() to load user ID and initial user data.

4. Create UI elements including a dropdown for category filtering, a search bar, and a GridView for displaying users.

5. Implement asynchronous functions to load user data based on selected category and to handle user ID loading.

6. Build the main Scaffold with an AppBar, a filter dropdown, a search bar, a horizontal list, and a GridView of user cards.

1.9 Post Page

1. Implements the ability to select and upload pictures.

2. Integrates ImagePicker for selecting images from the gallery.

3. Utilizes Firebase Storage for storing and retrieving image URLs.

4. Allows users to add captions using a TextFormField.
5. Uses an ElevatedButton for initiating the image upload process.
6. Navigates through BottomNavigationBar with the 'Plus' tab selected for posting.

1.10 Notifications Page

1. NotificationPage displaying a list of notifications.
2. Loading user ID from preferences and fetching notifications using HTTP.
3. AppBar with a 'Notifications' title and dark blue color.
4. BottomNavigationBar for navigation with the 'Notification' tab selected.
5. Notification cards displaying message and creation date.
6. Date formatted using DateFormat from the intl package.

1.11 Messages Dashboard Page

1. Create a MessagesApp with a DirectMessagePage that displays messages.
2. Initialize Firebase in the main function.
3. Load user and receiver IDs from preferences and API.
4. Send messages to the API and load messages for display.
5. Use a simple UI with a text input and chat bubbles.
6. Designate message colors based on the sender.

1.12 Direct Message Page

1. Create a FollowerPage that displays a list of followers.
2. Use ListTile for each follower with profile information.
3. Navigate to the follower's profile page on tap.
4. Implement a BottomNavigationBar for navigation.
5. Handle navigation logic for Home, Search, Plus, and Notification.
6. Update the import statement for UserProfilePage.

1.13 Profile Page

1. Define the 'PostDisplayPage' class with necessary parameters for displaying a post.
2. Implement a stateful widget for 'PostDisplayPage' with functions to load user ID, fetch comments, toggle like, post comments, and delete comments.
3. Build the UI structure with an app bar, user information, post image, like and comment buttons, and a comments section.
4. Implement logic to handle like button clicks, navigate to the user profile on username tap, and navigate to the direct message page on the message button tap.
5. Display the post details, including the username, caption, image, like count, and comments.

6. Use a bottom navigation bar for navigating between different sections of the app (Home, Search, Plus, Notification).

1.14 Edit Profile Page

1. Create a StatefulWidget named UpdatePage for editing user profile details.
2. Implement functions to handle image selection and uploading to Firebase Storage.
3. Initialize controllers for various text form fields and load user details on page initialization.
4. Build a UI with text form fields for user details, an image picker, and a dropdown for category selection.
5. Implement a function to update user details on button press, including image upload and navigation.
6. Create a Service class to handle API calls for retrieving and updating user details.

1.15 Followers and following Page

1. Develop a Flutter application with a FollowerPage displaying followers' usernames and profile pictures.
2. Implement a ListView.builder for efficient rendering of the followers' list.
3. Design Card-based UI elements for each follower, incorporating circular profile pictures and clickable usernames.
4. Enable navigation to the user's profile page upon tapping a follower, utilizing the Flutter navigation system.
5. Integrate a BottomNavigationBar for seamless navigation across different app sections.
6. Optimize the user experience by employing asynchronous programming for network operations and handling profile picture loading with fallbacks to default images.

1.16 View Post Page

1. Initialize the PostDisplayPage with required parameters (postId, username, imageUrl, caption, profilepicurl, isLiked, likeCount).
2. Load the current user's ID and set up initial values, such as the like status (_isLiked) and comments list.
3. Implement a method to fetch comments for the displayed post from the server.
4. Build the UI for the post, including user details, image, like button, comment section, and a list of comments.
5. Provide functionality for liking the post and toggling the like button's appearance.
6. Implement features for posting comments, deleting comments (for the post owner), and

handling UI updates accordingly.

1.17 User ID Page

1. Create a class UserPreferences to manage user-related data using SharedPreferences.
2. Implement methods to save and retrieve the user ID from SharedPreferences.
3. Use the class to save and get the user ID in other parts of the application.

1.18 User Profile Page

1. Implement a Flutter app with user profile features, including post display, followers, and social media links.
2. Use HTTP requests to fetch user profile information, posts, followers, and following lists from a server.
3. Display the user profile with details like name, bio, business details, and social media links.
4. Include functionality to follow/unfollow users and navigate to a direct message page.
5. Implement a bottom navigation bar for easy navigation between different app sections.
6. Use asynchronous programming and FutureBuilder for handling HTTP requests and updating UI accordingly.

2 Backend

1. Initialize Express application, configure middleware (body-parser, cors), and set up database connection.
2. Define routes for user-related operations (register, login, profile, update, followers, following, etc.).
3. Implement registration route (/user/register) to check for duplicate usernames, emails, and mobile numbers before inserting a new user into the database.
4. Create a login route (/user/login) to authenticate users based on mobile number and password.
5. Implement routes for user profile manipulation (/user/profile/:userId, /user/update/:userId).
6. Define routes for handling followers and following relationships (/user/followers/:userId, /user/following/:userId).
7. Implement routes to retrieve and display follower/following lists for a specific user or user profile.
8. Create routes for posting and loading posts (/user/post, /user/loadposts/:userId).
9. Implement a route to toggle like status on a post (/user/toggleLike/:postId).
10. Create routes to load and display user posts (/user/loaduserposts/:username,

/user/loadcurrentuserposts/:userId).

11. Implement routes for checking if a user is following another (/user/checkfollowing/:currentUserId).

12. Define routes for following and unfollowing users (/user/followuser/:currentUserId, /user/unfollowuser/:currentUserId).

13. Implement routes for handling direct messages (/user/recentmessages/:userId, /user/loadmessages/:userId/:receiverId, /user/sendmessage).

14. Create routes for user search and displaying search results (/user/loadsearchpageusers/:userId).

15. Implement routes for checking email existence (/user/checkEmail/:email).

16. Define routes for loading notifications and handling notification-related operations (/user/loadnotifications/:userId).

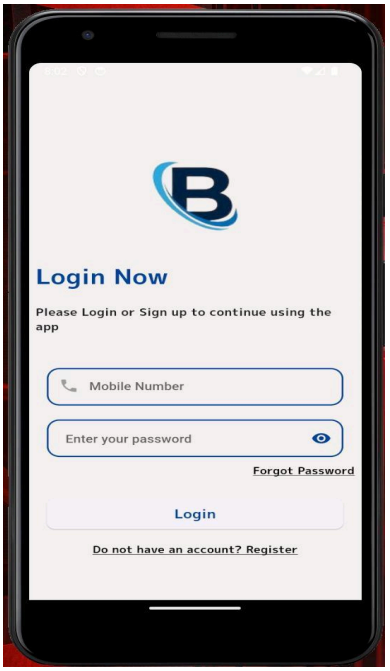
17. Implement routes for loading and handling comments on posts (/user/loadcomments/:postId, /user/postcomment, /user/deletecomment/:commentId).

18. Export the defined routes for use in the main application file.

19. Run the Express application, listen on a specified port and IP address.

APPENDIX-B
SCREENSHOTS

Figure 1.7



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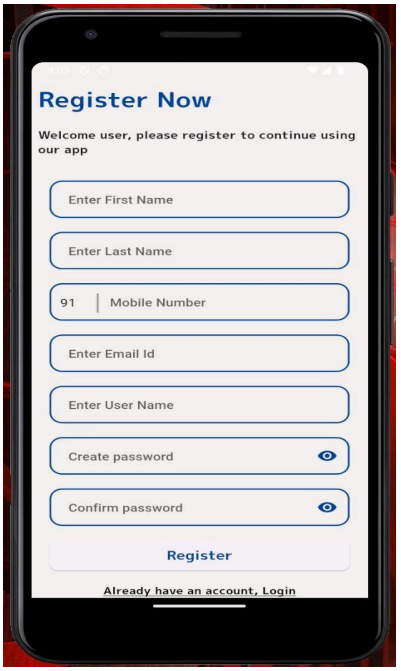

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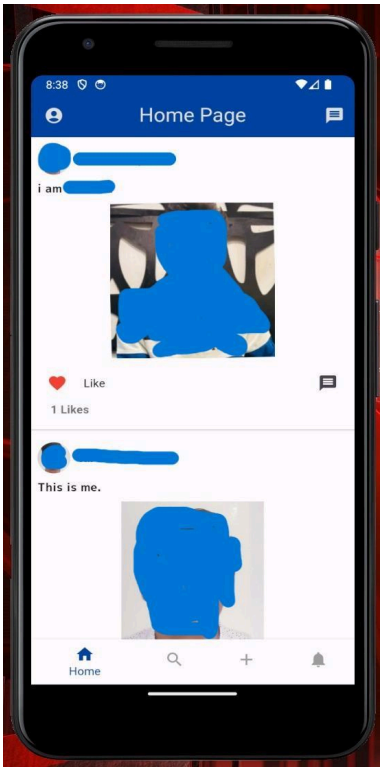

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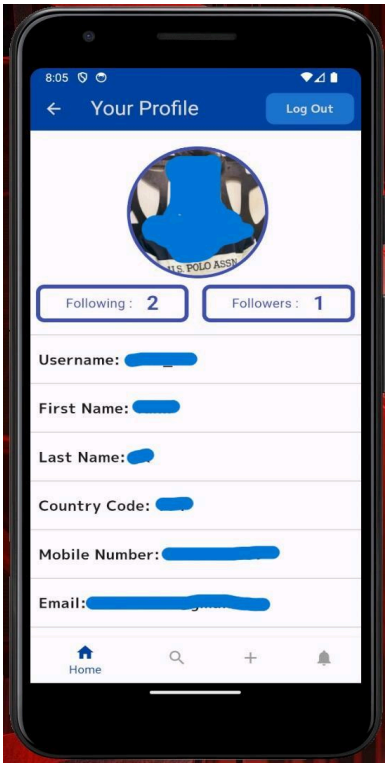

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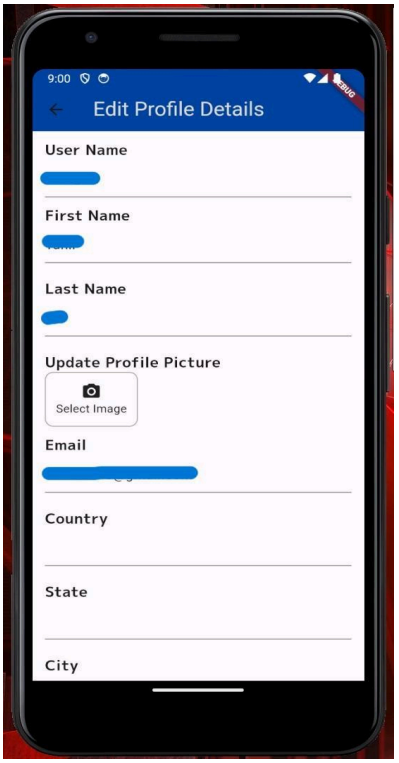

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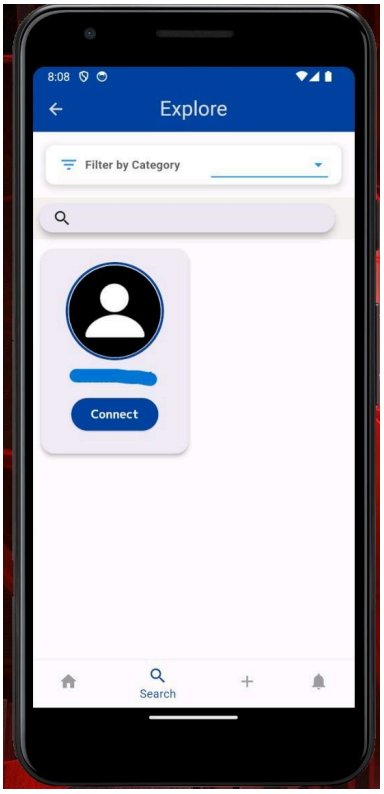
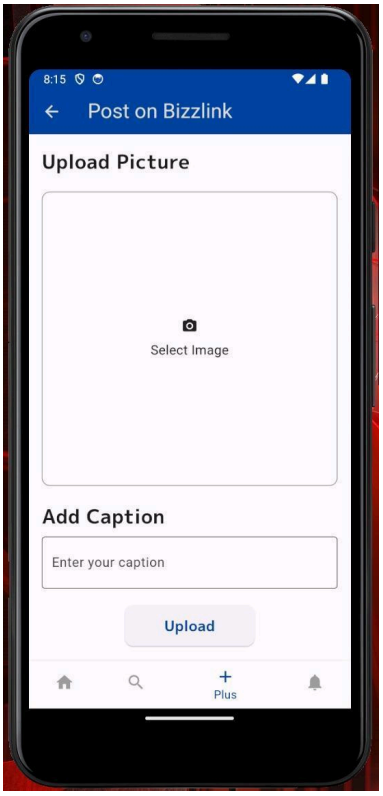


Figure 1.13



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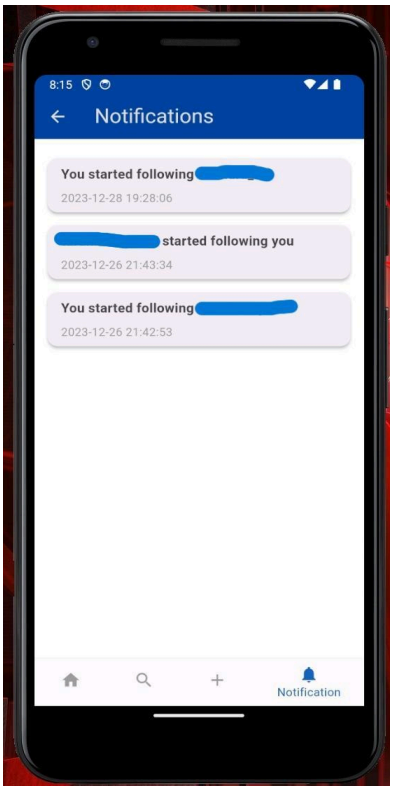

Figure 1.15

Figure 1.16

Figure 1.17

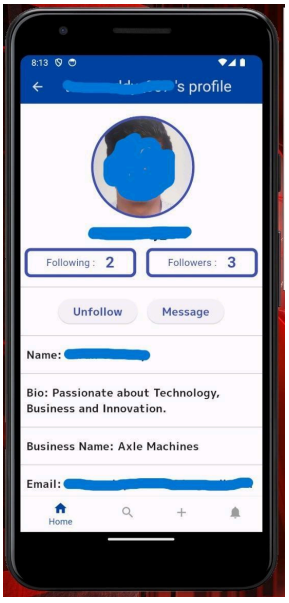

Figure 1.18

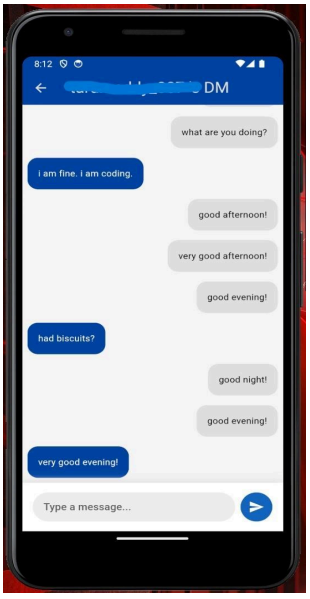

Figure 1.19

APPENDIX-C

ENCLOSURES

14.1 Plagiarism Report:

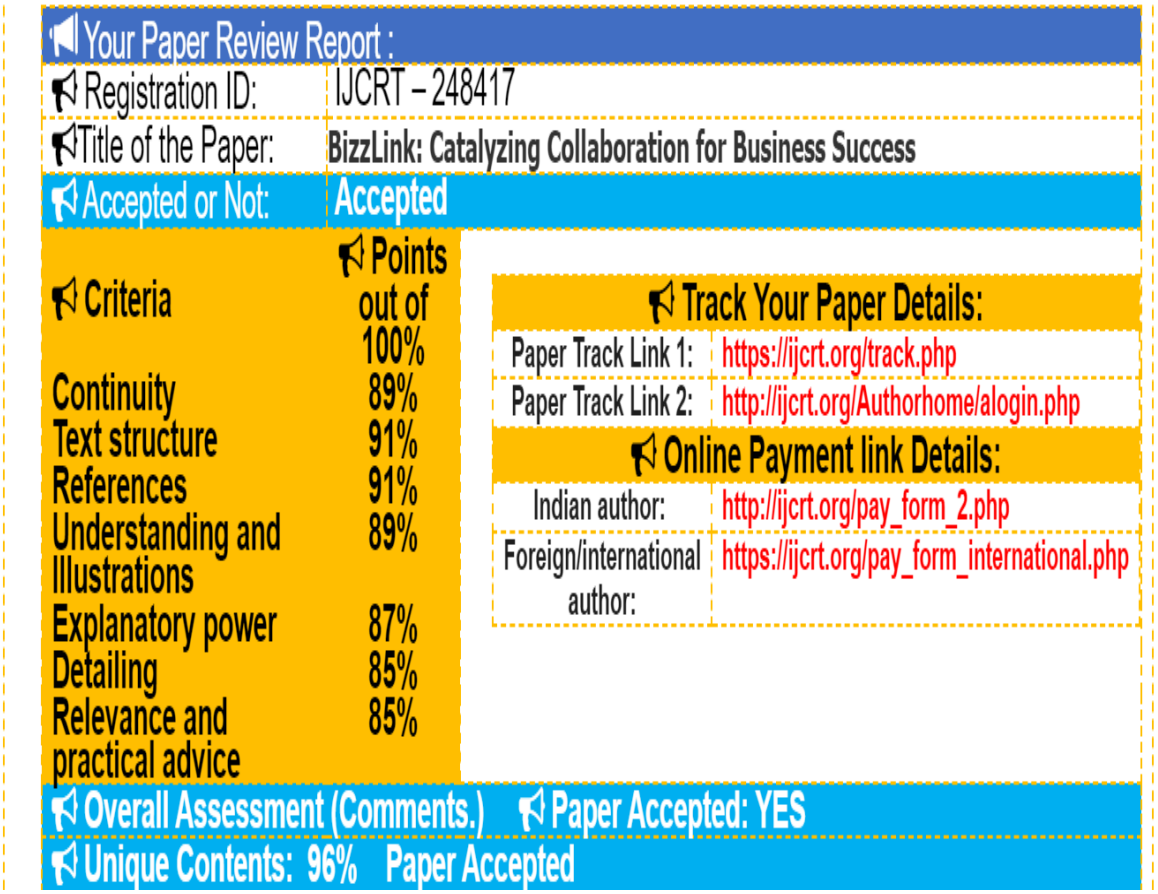

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Figure 1.20