Gopalganj Science and Technology University, Gopalganj-8100

Course Title: Project on Mobile Application Development

Course Code: CSE278

Submitted By:

Md. Shamim Khandakar

ID: 20CSE013

Submitted To:

Dr. Saleh Ahmed

Associate Professor

Department of Computer Science and Engineering,

Gopalganj Science and Technology University, Gopalganj, Bangladesh.

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DECLARATION

This is to certify that the project entitled "**ChatBridge**" has been carried out by Md. Shamim Khandakar in the Department of Computer Science and Engineering, Gopalganj Science and Technology University, Gopalganj-8100, Bangladesh. The above project or any part of this work has not been submitted anywhere for the award of any degree or diploma.

SUBMITTED BY

Md. Shamim Khandakar

ID: 20CSE013

Project Approval

This Project is submitted to the Department of Computer Science and Engineering, GSTU, for the fulfillment of the requirements for the Degree of B.Sc. in Computer Science and Engineering.

Supervisor's Approval

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Dr. Saleh Ahmed

Associate Professor, Department of CSE, GSTU

Departmental Approval

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Dr. Mrinal Kanti Baowaly

Chairman, Department of CSE, GSTU

Gopalganj Science and Technology University, Gopalganj (GSTU)

Introduction

In today's hyper-connected digital environment, users frequently utilize multiple messaging platforms for both personal and professional communication. Telegram and Discord are two of the most widely used platforms, each offering a unique set of features and interfaces. However, switching between these platforms becomes cumbersome, especially for developers managing bots, communities, and multiple channels.

ChatBridge is an innovative Android-based application developed with the objective of unifying Telegram and Discord messages into one centralized platform. This application is designed to improve productivity, streamline communication, and reduce context-switching by providing an integrated interface for monitoring and interacting with both platforms using bot credentials.

Statement of Purpose and Goals

The core purpose of ChatBridge is to provide a unified interface that allows users to access Telegram and Discord messages seamlessly through a single mobile application. This not only saves time but also enhances usability for developers, administrators, and users who rely on bot-driven functionalities.

Specific Goals Include:

- Eliminate the need for switching between the Telegram and Discord applications.
- Enable developers to monitor bot activities in both platforms from a single screen.
- Provide foundational functionality for future features such as message sending, user authentication, and real-time syncing.
- Ensure a minimal and intuitive user interface compatible with Android devices.

Features and Deliverables

The ChatBridge application is expected to deliver the following core functionalities:

- **Telegram Integration:**
    - Accepts a Telegram bot token input.
    - Uses the Telegram Bot API to fetch and display recent messages.
- **Discord Integration:**
    - Accepts Discord bot token and channel ID.
    - Uses the Discord API to retrieve messages from a specified channel.
- **User Interface Features:**
    - Two separate tabs for Telegram and Discord.
    - Clean and organized message display for each platform.
    - Error handling and feedback for incorrect tokens or failed API calls.
- **System Requirements:**
    - Operates smoothly on Android devices.
    - Minimal use of system resources.

Success Criteria

The success of ChatBridge will be evaluated based on the following criteria:

- Telegram messages are successfully fetched and displayed using valid bot tokens.
- Discord messages are correctly retrieved using valid credentials and channel IDs.
- Both platform messages appear in their respective sections within the application.
- The application provides a stable and crash-free user experience.
- The interface remains responsive and user-friendly across multiple device types.
- Users are able to interact with the application intuitively without the need for technical expertise.

Methodology and Approach

To achieve the project goals, the following development methodology and implementation plan was followed:

1. **Research Phase:**
   o Studied the Telegram Bot API and Discord Developer API documentation.
   o Analyzed use-cases and real-world requirements of bot developers and community managers.
2. **Design Phase:**
   o Created wireframes for a clean and intuitive interface.
   o Defined separate layouts and navigational tabs for Telegram and Discord.
3. **Development Phase:**
   o Utilized Kotlin and Android Studio for native Android development.
   o Implemented token validation and message retrieval features using HTTPS and JSON parsing.
4. **Testing Phase:**
   o Conducted rigorous testing using Android Emulators and real devices.
   o Checked error handling, UI responsiveness, and API reliability.
5. **Evaluation Phase:**
   o Measured application performance against success criteria.
   o Documented bugs, limitations, and future enhancements.

Technology Stack and Resources

- **Programming Language:** Kotlin (Jetpack Compose)
- **IDE:** Android Studio
- **Telegram Integration:** Telegram Bot API
- **Discord Integration:** Discord REST API (Bot Authentication)
- **Networking:** Retrofit / OkHttp / Volley (Optional)
- **Testing Tools:** Android Emulator, physical Android devices
- **Documentation Sources:**
   o https://core.telegram.org/bots/api
   o https://discord.com/developers/docs/intro

Risk Assessment and Mitigation

Several risks and dependencies may affect the success of the ChatBridge project. These include:

- **API Limitations:** Telegram and Discord APIs impose rate limits which might throttle frequent requests. Mitigation: Implement retry and cooldown mechanisms.
- **Authentication Failures:** Use of invalid or expired tokens may result in failed API requests. Mitigation: Add real-time validation and helpful error messages.
- **Dependency on Internet:** The application requires stable internet to function properly. Mitigation: Provide offline error handling and retry options.
- **Third-party Library Issues:** Bugs in networking or UI libraries can introduce crashes. Mitigation: Use well-maintained libraries with strong community support.
- **API Changes:** Telegram or Discord may update APIs. Mitigation: Regularly monitor official documentation for changes.

App Interface Screenshots

Below is a sample screenshot demonstrating the Telegram section of the application interface:

Description:

- A tab layout with "Telegram" and "Discord"
- A text field to input the Telegram Bot Token
- A button labeled "Fetch Telegram Messages"
- Designed with a clean and minimalist look

Telegram	Discord

Enter Telegram Bot Token

Fetch Telegram Messages

Telegram	Discord

Enter Discord Bot Token

Enter Discord Channel ID

Fetch Discord Messages

11:03

Telegram	Discord

68366627560:BBAGg9kqbnVT9cJN2k7S
SK2PDehd7LVsQ5l5

Fetch Telegram Messages

[TELEGRAM] Unknown
Hello bot

[TELEGRAM] Unknown
What,s going on