

AI Digital Twin (SelfX.ai): Intelligent Communication Assistant

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Abstract—There is rapid increase in digital communication that created challenges in managing emails, messages and calls efficiently. This paper presents an AI Digital Twin (SelfX.ai), an intelligent system that learns the way user communication behavior and automates responses using Natural Language Processing and AI. The system generates personalized replies, prioritizes communication, and handles calls using Twilio-based voice assistance. The proposed solution improves productivity, tasks easier for the LLM to process, and provides a Enhanced communication automation framework.

Index Terms—AI Digital Twin, NLP, Communication Automation, Twilio, Smart Assistant

I. INTRODUCTION

Digital communication is a part of our lives now. We are always talking to each other through messaging platforms, emails and phone calls. This has made it easier for us to connect with each other.. It has also made things a bit crazy. We get many messages and it is hard to keep up. This can be solve these problems. really difficult. It makes user to get the things harder. We also get interrupted a lot. We have to deal with too many notifications. Sometimes we do not even get a response when we need one. This is not good for our work or our mental health. The systems we use now to communicate are not very helpful. They do not do much to make things easier for us. They are not very personalized.

They do not know how we like to communicate or what we like to say. This is a problem because we all communicate in ways. We need a system that can understand how we communicate and help us out. The AI Digital Twin, which is also called SelfX.ai is trying to solve this problem.

It makes a copy of us that learns how we communicate over time. It uses tools like Natural Language Processing and machine learning to make this happen. It leverages cloud-based services to automate things like email and messaging responses. This makes things a lot easier for us. It helps us to get things done more quickly. The AI Digital Twin is, like an assistant that really understands us and helps us to communicate in a better way.

II. PROBLEM STATEMENT

The rapid increase in digital communication has led to several challenges that affect both individuals and organizations. The way we communicate digitally is changing fast and this is causing a lot of problems, for people and organizations. Every day people get a number of messages, emails and calls and it is hard to figure out what to answer first and how to answer it. A lot of things get missed because we get too many notifications and we spend a lot of time doing the same communication tasks

repeatedly.

The systems we have now can do some things automatically but they do not really understand what is going on what is important and how each person likes to communicate. Also there is no one place that brings together messages, emails and calls into a system.

The main problems are:

- We get many notifications and it is hard to know what to look at
- We do not have a personal assistant to help us with communication
- We do not handle calls well when we are really busy
- We do not have one system to manage all our communication, like digital communication digital communication is a big part of this issue and digital communication systems should be improved to

III. OBJECTIVES

- To develop a personalized AI Digital Twin for communication
- To implement intelligent SMS and email reply generation
- To integrate AI-based call handling using Twilio
- To provide a centralized platform for communication management
- To improve user productivity and reduce cognitive load

IV. LITERATURE SURVEY

Recent advancements in Artificial Intelligence and Natural Language Processing have enabled the development of intelligent virtual assistants and automated communication systems. Several studies have explored the use of NLP techniques for intent detection, sentiment analysis, and response generation in chatbots and conversational agents.

Digital twin technology, originally used in industrial applications, has evolved to include personalized digital representations of users. These systems aim to replicate human behavior and decision-making processes. However, the application of digital twins in personal communication management is still in its early stages.

Existing systems such as virtual assistants provide limited personalization and lack integration across multiple communication platforms. Email automation tools offer basic categorization but do not generate context-aware responses.

V. SYSTEM ARCHITECTURE

The AI Digital Twin system follows a multi-layered client-server architecture designed for scalability, modularity, and efficient data processing.

The architecture consists of the following layers:

Client Layer: The Android application serves as the user interface, allowing users to interact with the system. It includes features such as message viewing, reply approval, Busy mode toggle, and call summary display. **Backend Layer:** The backend processes data, performs AI-based computations, and manages communication between components. It handles authentication, message classification, and response generation. **Database Layer:** Firebase Firestore is used to store user data, communication logs, and feedback information, enabling real-time synchronization. **External Services:** APIs such as Gmail API, Twilio, and OpenAI are integrated to provide email access, call handling, and AI capabilities.

This layered architecture ensures efficient communication, scalability, and secure data handling.

- **Client Layer:** Android application interface
- **Backend Layer:** AI processing and data management
- **External APIs:** Gmail API, Twilio, OpenAI

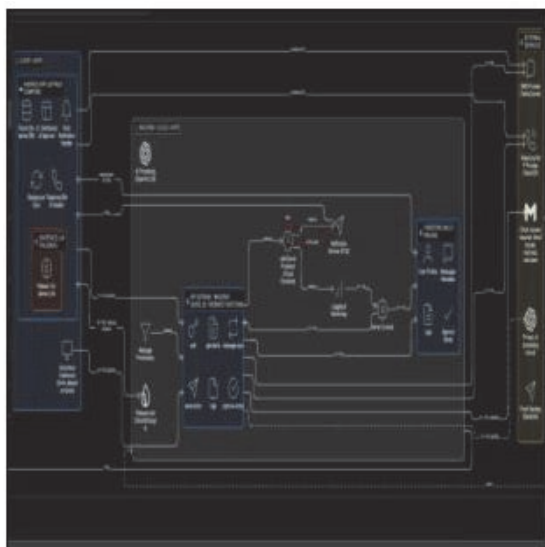


Fig. 1. System Architecture

VI. METHODOLOGY

The system operates through a structured workflow that includes data collection, processing, response generation, and continuous learning.

Data Collection: User communication data such as messages and emails are collected and stored securely. This data is used to analyze user behavior and preferences. **Natural Language Processing:** NLP techniques are applied to analyze text data for

intent, sentiment, and urgency. This helps in classifying messages and prioritizing communication. **AI Response Generation:** AI models generate context-aware replies based on user writing style. Multiple response options are provided for user approval. **Call Handling:** Twilio is used to manage incoming calls. When Busy mode is enabled, the AI agent responds to calls with predefined messages and collects caller information. **Feedback Learning:** User feedback is used to continuously improve the AI model, enabling better personalization over time.

A. Data Collection

User messages and emails are collected to understand communication patterns.

B. NLP Processing

Messages are analyzed for intent, sentiment, and urgency.

C. AI Response Generation

AI models generate personalized replies based on user style.

D. Call Handling

Twilio routes incoming calls to the AI agent, which responds using predefined messages.

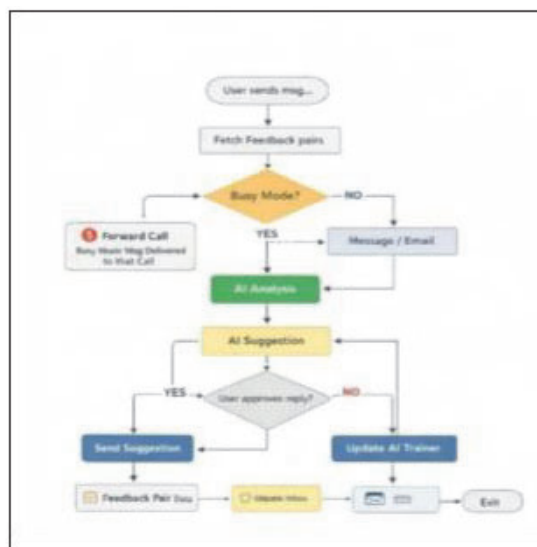


Fig. 2. Sequence Diagram

VII. MODULES

The system is divided into several functional modules:

Call Assistance Module: Handles incoming calls using Twilio and provides automated voice responses. It ensures that important calls are not missed during busy periods. **Message Processing Module:** Analyzes SMS messages using NLP techniques and classifies them based on urgency and content. **Email Automation Module:** Processes emails using Gmail API and generates AI-based reply suggestions. **AI Trainer Module:**

Learns user communication behavior and updates the model to improve response accuracy.

A. Call Assistance Module

Handles incoming calls and provides automated voice responses.

B. Message Processing Module

Classifies and prioritizes messages.

C. Email Automation Module

Processes emails and generates replies.

D. AI Trainer Module

Learns user behavior and improves response accuracy.

VIII. DESIGN

A. ER Diagram

Represents relationships between users, messages, and responses.

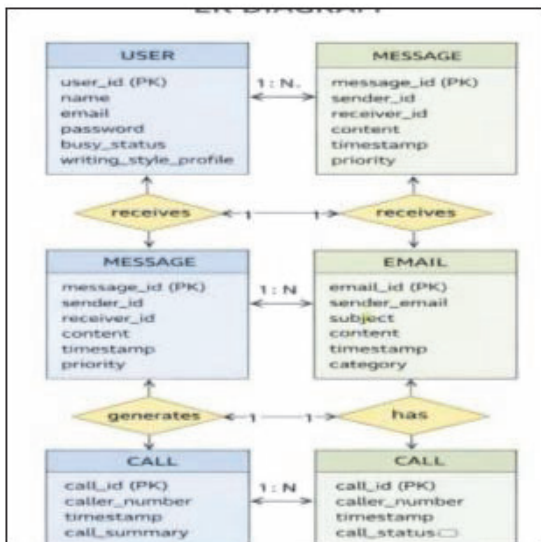


Fig. 3. ER Diagram

B. Class Diagram

Defines system structure and object relationships.

IX. IMPLEMENTATION

The system is implemented using modern technologies to ensure efficiency and scalability. The Android application is developed using Kotlin and Jetpack Compose, providing a responsive and user-friendly interface.

Firebase Authentication is used for secure user login, while

Firestore is used for data storage and real-time synchronization. Twilio API enables voice-based call handling, and OpenAI API provides AI capabilities for response generation.

The integration of these technologies ensures seamless communication between system components and efficient execution of functionalities.

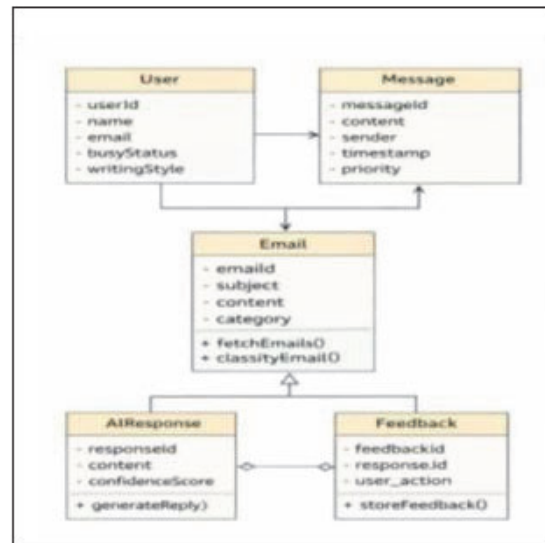


Fig. 4. Class Diagram

X. RESULTS AND DISCUSSION

The system was tested under various scenarios to evaluate its performance and effectiveness. The results indicate that the AI Digital Twin successfully automates communication tasks and provides personalized responses.

The message classification module accurately categorizes messages based on urgency, while the AI response generation module produces context-aware replies. The call assistance module effectively handles incoming calls, ensuring communication continuity.

The system demonstrates improved productivity and reduced communication overload. However, performance may vary depending on network conditions and API response times.

XI. FUTURE SCOPE

- Autonomous AI decision-making
- Integration with social media platforms
- Context-aware communication assistance

XII. CONCLUSION

The AI Digital Twin (SelfX.ai) presents an innovative solution for managing digital communication using artificial intelligence. By automating repetitive tasks and providing personalized responses, the system improves efficiency and user experience.

The integration of NLP, machine learning, and cloud services demonstrates the potential of AI-driven automation in real-world applications. The project serves as a foundation for future advancements in intelligent communication systems..

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