

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

VIRTUAL PERSONAL COMPANION: Automated Event and Deadline Management System

¹Assistant Prof. N. M. Shahane, ²Vaishnavi Jallewar, ³Isha Nikam, ⁴Unnati Patodi, ⁵Harshal Kulkarni,

¹Designation of 1st Author: Assistant Professor, ²Designation of 2nd Author Student, ³Designation of 3rd Author: Student ¹Designation of 4th Author Student, ²Designation of 5th Author Student

1, Assistant Professor, Department Of Artificial Intelligence And Data Science, K. K. Wagh Institute of Engineering Education And Research, City Nashik, Country: India.

2,3,4,5, Students, Department Of Artificial Intelligence And Data Science, K. K. Wagh Institute of Engineering Education And Research, City: Nashik, Country: India.

Abstract : In the world with opportunities, we should not let any go to waste. The research present an approach to creating a smart system that help you on the top of everthing, so we won't miss out on great oppourtunities and will always remember what you need to do . It is like your personal assistant for managing schedule. The system will combine everything in one place parse the mails, identify the relevant information and make a personalised calender and it gives the reminder for the same. The system that utilizes advanced NLP algorithms and key components include email and text parser, information extraction module, Calender integration and notification system. The reserach offers parctical applications in day Education, Business, Technology and Career opportunities.

Key Words: NLP algorithm, email parser, calendar integration and extraction module

I. INTRODUCTION

In the first moving world we live in staying organised and on top of our commitments can feel like an uphill battle. With the constant barrage of emails, text messages and deadlines it's no wonder that many of a struggle to keep everything in order. Existing tools and systems will helpful to some extend of one fall short providing personalized support needed to truly stay on track. Recognising the need for more efficient and user friendly solution we propose the development of a virtual personal companion it will serve as a digital companion designed to task management provide timely reminders and make customise calendars which ultimately reduce stress and make life a bit easier.

By leveraging the latest advancement in technology and user interface design we aim to create a tool that not only meets the need of today's multitasking individuals but also empowers them to take control of their schedules and prioritise what matters the most

1.1 PROJECT IDEA

“Virtual Personal Companion” aims to address the challenges of managing multiple events and tasks across various communication platforms. Existing systems lack integration and proactive management, leading to missed opportunities and financial obligations. This report outlines the project’s scope, objectives, and methodology, with a focus on algorithms for key functions. The project redefines time and task organization through dynamic rescheduling, voice interaction, event classification, and venue location assistance. It provides users with a more efficient, accessible, and stress-free way to manage their schedules in today’s demanding world.

1.2 MOTIVATION OF THE PROJECT

The motivation for the “Virtual Personal Companion” project is rooted in the recognition of the ever-increasing complexity and fast-paced nature of contemporary life. In our digital age, individuals grapple with the overwhelming volume of information stemming from diverse sources such as emails, messages, social media, and more. This information overload often results in missed opportunities and critical commitments. The primary motivation is to enhance the efficiency of event management and provide

users with a more intuitive and user-friendly experience. Leveraging recent technological advancements, such as AI, Natural Language Processing (NLP), and voice recognition, the project aims to address these challenges and reduce the stress associated with organizing events. Furthermore, the project seeks to empower individuals to optimize their productivity by automating event management tasks, allowing them to allocate their time and energy to the most crucial activities. In doing so, it aims to simplify the often complex task of event organization, enabling users to confidently navigate their busy schedules and make the most of their time in our modern, fast-paced world.

2. LITERATURE REVIEW

The next section describes the current research in depth and discusses the many fields of AI. The biggest test for any analyst to pass is to meet these prerequisites. There aren't many creators in our community that use this strategy. Let's look into them in the following ways:

Virtual assistants are improving and providing consumers with greater advantages. The comprehension and fulfilment of requests by virtual assistants will increase as voice recognition and natural language processing continue to grow. Virtual assistants are projected to be employed in more commercial activities as speech recognition technology advances.

A computer cloud-based method to issue a command using a person. Voice user interface. The subset is chosen from a set of objects, each of which has an associated object type and at least one taggable field with a matching value. The objects are stored in the laptop's memory. A command, an object is all obtained from the individual. The charge obtained from the user is retrieved from the set of gadgets in response to the utterance. Textual content is converted to audio output in this object.[1]

The construction of a study report required participation from all users based on their personal experiences. Speech recognition technology for dictation, search, and voice commands has become a standard feature with the growing use of smartphones and wearable gadgets. Therefore, the development of a compact, high-performance speech recognition system with high accuracy and low latency that can operate effectively on mobile devices is necessary. Many services were covered by these assistants, according to the results, but advances in voice recognition, contextual comprehension, and hand-free interaction are still needed. The main purpose of this research work is to address these advancements in IVAs, which will undoubtedly boost their utilization.

Voice-based virtual assistants[2][3] aren't just for private individuals; they may also be an effective economic tool for businesses looking to boost productivity. Voice technology can provide several benefits to your organization, including lower expenses, increased efficiency, and a competitive advantage on the market. The Virtual Assistant ought to be able to produce a reliance model for unconventional tasks and use it, models, to suggest advanced user programs. It has to be tested to persuade the simplest ways during which a task has several little tasks, and every little task will have a number of its own little tasks.

An intelligent virtual assistant's primary responsibility is to react to user questions, whether in a professional setting like a website chat interface or through a voice-activated cellphone call button service. Users may significantly reduce the amount of time they would otherwise spend on chores like online research by using this technology. For instance, we often spend hours gathering research while producing a report, but virtual assistants may speed up this process.

Investigating the precision and efficiency with which intelligent virtual assistants (IVAs) recognize and react to voice input is one possible study area. Research might focus on how effectively IVAs can comprehend spoken language and perform tasks like setting reminders or doing web searches. The study could also look at aspects of the technology like usability and general satisfaction that influence customer adoption of IVAs. The results could ultimately guide the creation of more complex and useful IVAs that can better meet user needs.

Virtual assistants are also susceptible to a variety of other threats. Researchers recently demonstrated that voice-based virtual assistants will respond to ultrasonic commands that are not audible. An attacker may approach a victim, play the ultrasonic command, and have the victim's gadget reply.

Spoken dialogue systems are intelligent agents that are able to help users finish tasks more efficiently via spoken interactions. Also, spoken dialogue systems are being incorporated into various devices such as smart-phones, smart TVs, in car navigating system [5]. Also, Dialogue systems or conversational systems can support a wide range of applications in business enterprises, education, government, healthcare, and entertainment. Personal assistants, known by various names such as virtual personal assistants, intelligent personal assistants, digital personal assistants, mobile assistants, or voice assistants [4].

Many companies have used the spoken dialogue systems to design their dialogue system device, such as Microsoft's Cortana, Apple's Siri, Amazon Alexa, Google Assistant, Samsung S Voice, Nuance Dragon, and Facebook's M. These companies used different approaches to design and improve their dialogue systems. There are many techniques used to design the VPAs, based on the application and its complexity. For example, Google has improved the Google Assistant by using the Deep Neural Networks (DNN) method which highlights the main components of dialogue systems and new deep learning architectures used for these components. Also, Microsoft used the Microsoft Azure Machine Learning Studio with other Azure components to improve the Cortana dialogue system [6].

Moreover. The Amazon provides the advanced deep learning functionalities of automatic speech recognition (ASR) for converting speech to text, and natural language understanding (NLU) to recognize the intent of the text, to enable developer to build applications with highly engaging user experiences and lifelike conversational interactions [7]. Also, Facebook has launched its own personal assistant, Messenger M, which is working to combine machine-learning algorithms with contextual memory. Facebook is training Facebook's new virtual assistant for Messenger with supervised learning, a process where the computer learns by example from what human trainers teach it [8]. All these companies are trying to develop the competences in several of the core technologies for their dialogue systems, such as automatic speech recognition, text-to-speech, synthetic talking face and dialog management

2.1 TYPE OF PROJECT

This project is application-oriented, focusing on the development and implementation of an AI-powered Event Management System to address real-world challenges in efficiently organizing events and tasks. The project falls within the domain of Information Technology (IT) and Artificial Intelligence (AI), specifically in the area of event management and personal scheduling

3. PROPOSED SYSTEM

The proposed system aims to create an automated event and deadline management system that seamlessly integrates into a user's calendar application. It does this by using email and text parsing techniques to extract pertinent data, such as event dates, payment deadlines (like EMIs), and reminders for form submissions. The problems with manual calendar management, such laborious data input and the possibility of forgetting crucial engagements, are what this solution aims to solve. Users may save time, lessen cognitive burden, and make sure important events and deadlines are never missed by automating the process.

The proposed solution involves developing a system that utilizes advanced NLP algorithms to parse incoming emails and text messages, identify relevant information such as event dates, times, locations, and associated deadlines, and integrate this data in to the user's preferred calendar application. The system will consist of the following key components Email and Text Parser: This component will be responsible for parsing incoming emails and text messages to extract relevant information using NLP techniques. It will identify key entities such as event names, dates, times, locations, and deadlines.

Information Extraction Module: Once the emails and text messages are parsed, this module will extract specific entities and attributes from the text using NLP algorithms such as Named Entity Recognition (NER) and dependency parsing. It will identify events, deadlines, and reminders and extract their associated metadata.

Calendar Integration: The extracted information will then be seamlessly integrated into the user's calendar application, such as Google Calendar or Microsoft Outlook. This integration will ensure that events, deadlines, and reminders are automatically added to the user's schedule without manual intervention.

Notification System: To ensure that users are reminded of upcoming events and deadlines, a notification system will be implemented. Users can customize their notification preferences and receive reminders via email, SMS, or mobile push notifications.

4. METHODOLOGY

1. Email Integration

Determine the specific requirements for email integration with the event calendar. Obtain the necessary permissions and credentials to access the email account(s) from which event details will be extracted. Develop or configure the email parsing functionality to extract event details such as event title, date, time, location, description, and any other relevant information.

2. Event Extraction

Gather relevant information about events, including date, time, location, description from the event registration. Enter the event details into the calendar system and Sort and categorize the collected data according to the date and priority. Continuously update the calendar with new events or changes to existing ones to maintain its relevance and usefulness. If two events collab with each other then categorize it according to user's priority.

3. API interface

Utilize the API provided by the event calendar system to programmatically add events. Authenticate with the calendar service, and use the API endpoints to create, update, or delete events based on the parsed email data. Deploy the API to a production environment, ensuring scalability, reliability, and performance. Monitor API usage and performance metrics, and optimize as needed to meet user demands.

4. Alerts and Reminders

Understand the preferences and requirements of users regarding alerts and reminders. Determine the types of notifications in the form of emails and texts. Remind the user after registration of the event and before the occurring of the event. Integrate with notification services or APIs to deliver alerts through various channels such as email

4.1 TOOLS AND TECHNOLOGY USED

For implementation, the used technologies are Artificial Intelligence, Natural language Processing, ML, Mobile development and API Integration

1. Programming Languages: Python: Often used for backend development, AI/NLP processing, and scripting tasks.

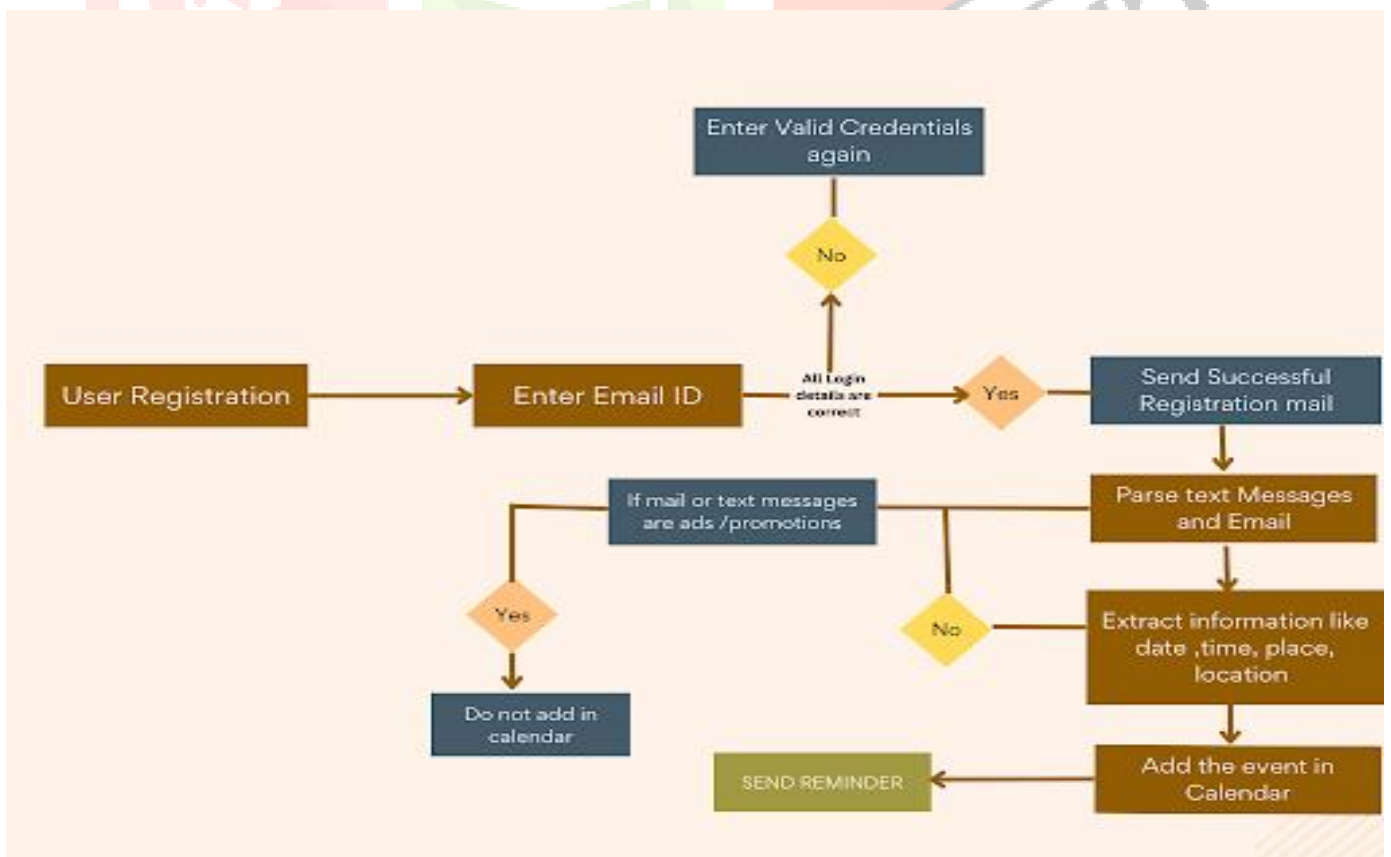
2. Frameworks and Libraries: Django or Flask: Python web frameworks for building backend APIs and web services. React, Angular, or Vue.js: JavaScript frameworks for building interactive frontend applications. Node.js: JavaScript runtime for building server-side applications. Express.js: Web application framework for Node.js, often used for building RESTful APIs. TensorFlow or PyTorch : Deep learning frameworks for implementing AI and machine learning capabilities. NLTK (Natural Language Toolkit) or spaCy : Libraries for natural language processing (NLP). Bootstrap or Materialize: Frontend frameworks for creating responsive and visually appealing user interfaces.

3. Database Management Systems: MySQL, PostgreSQL, SQLite: Relational database systems commonly used for storing calendar data, user information, and preferences.

4. APIs and Services: Google Calendar API or Microsoft Outlook Calendar API: For integrating with popular calendar services and syncing events Email APIs: Integration with email services for importing events from emails and sending notifications. By leveraging these tools and technologies, developers can build robust and featurerich Virtual Personal Assistant (VPA) calendar applications with advanced functionalities and seamless user experiences

5. ARCHITECTURAL DESIGN

The architectural diagram of the "Virtual Personal Companion" project showcases its organization and component interactions. It comprises layers for user interface, event management, database, notifications, maps, and communication platforms. The AI engine oversees features like rescheduling and priority prediction. This diagram illustrates how the project combines these components to streamline event management and enhance the user experience. An architectural diagram illustrates the structural organization of a system, showing the various components or modular parts of the system and how they interact with each other. Schemas represents a self-contained, modular unit within the system. It can be a software module, a hardware component, or any other building block. Instances: An instance is a contract or specification that defines how a component can interact with other components. Architectural diagrams are useful for visualizing the overall structure of a system and understanding how different parts interact



5.1 USER INTERFACE SCREENS

5.1.1 Data structure

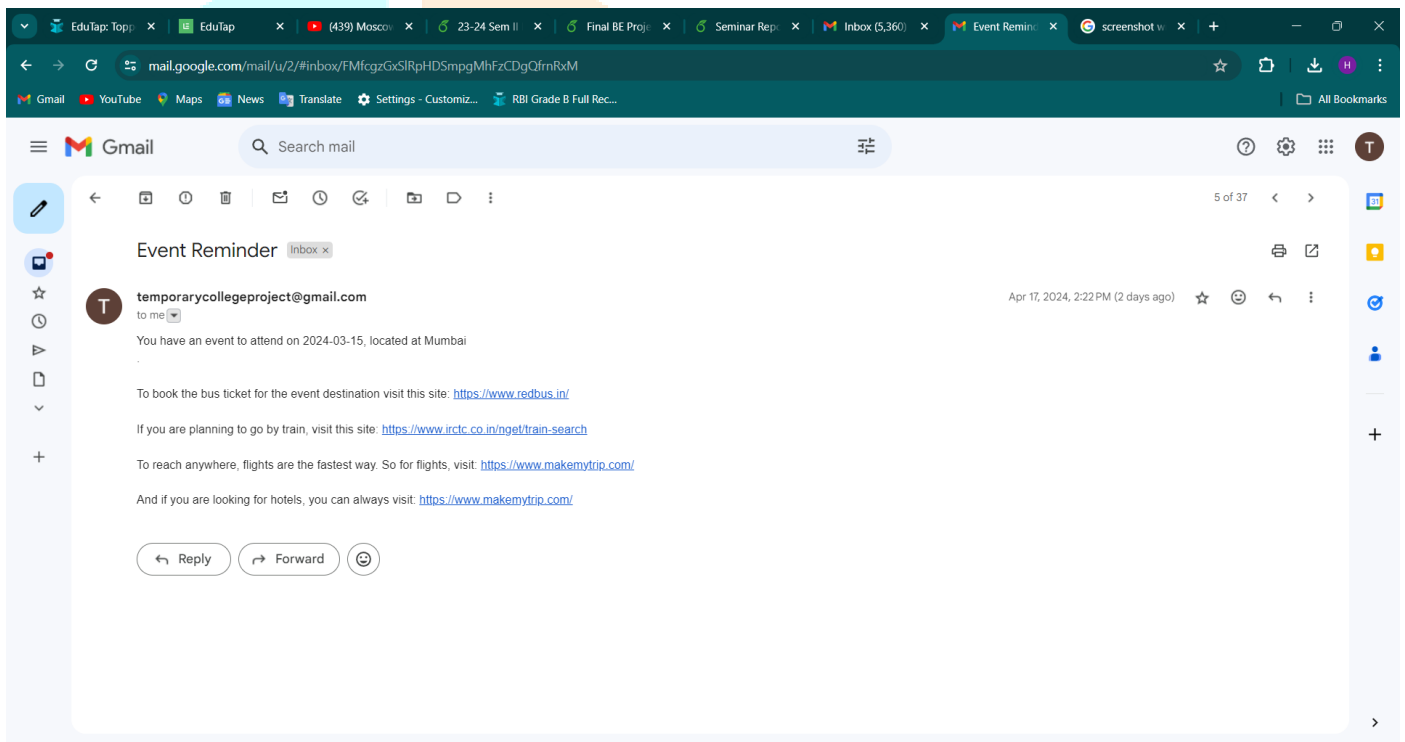
1. Numerical Data Structures: Event IDs Timestamps Priority Levels User Preferences
2. Categorical Data Structures: Event Categories Voice Command Categories Event Status
3. Other Data Structures: Textual Data: Descriptions, event names, and communication platform messages contain textual data. Boolean Data: Boolean values may be used for binary choices, such as event notifications enabled/disable.
4. Audio Data: Voice commands and system responses are recorded in audio data structures. Structured Objects: Complex structured objects are used to represent events, user profiles, and system configurations

5.1.2 Database description

1. User Table: Contains user profiles, including usernames, contact information, and preferences.
2. Event Table: Stores event information, including event names, descriptions, dates, times, locations, and assigned categories.
3. Priority Queue Table: Maintains event priorities, including user-assigned priorities and AI-predicted priorities

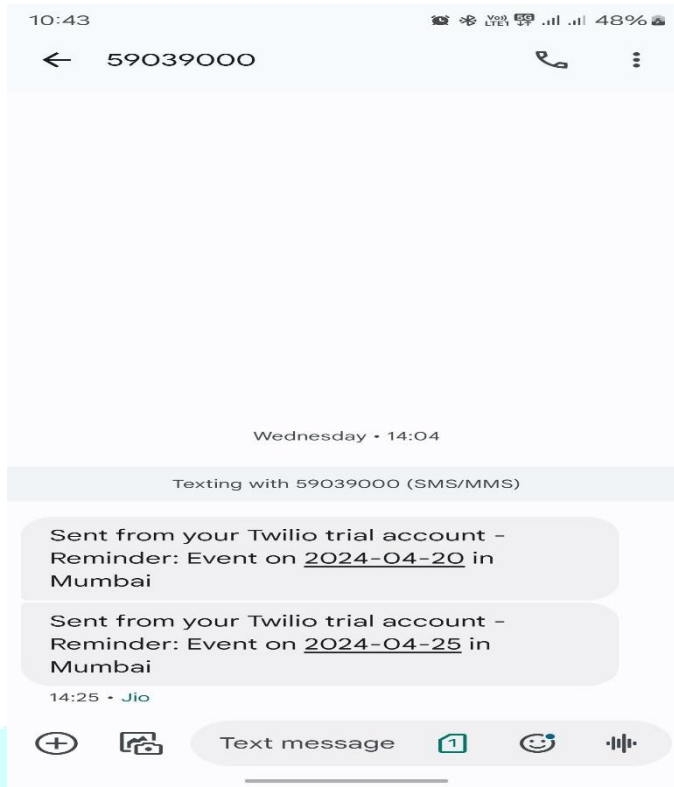
5.1.3 Mail Reminder Email Reminder Feature:

The VPA calendar project incorporates an email reminder functionality enabling users to receive email notifications for their upcoming events and appointments. This feature boosts user engagement and ensures they remain updated about their schedule, even when they're not actively using the calendar application.



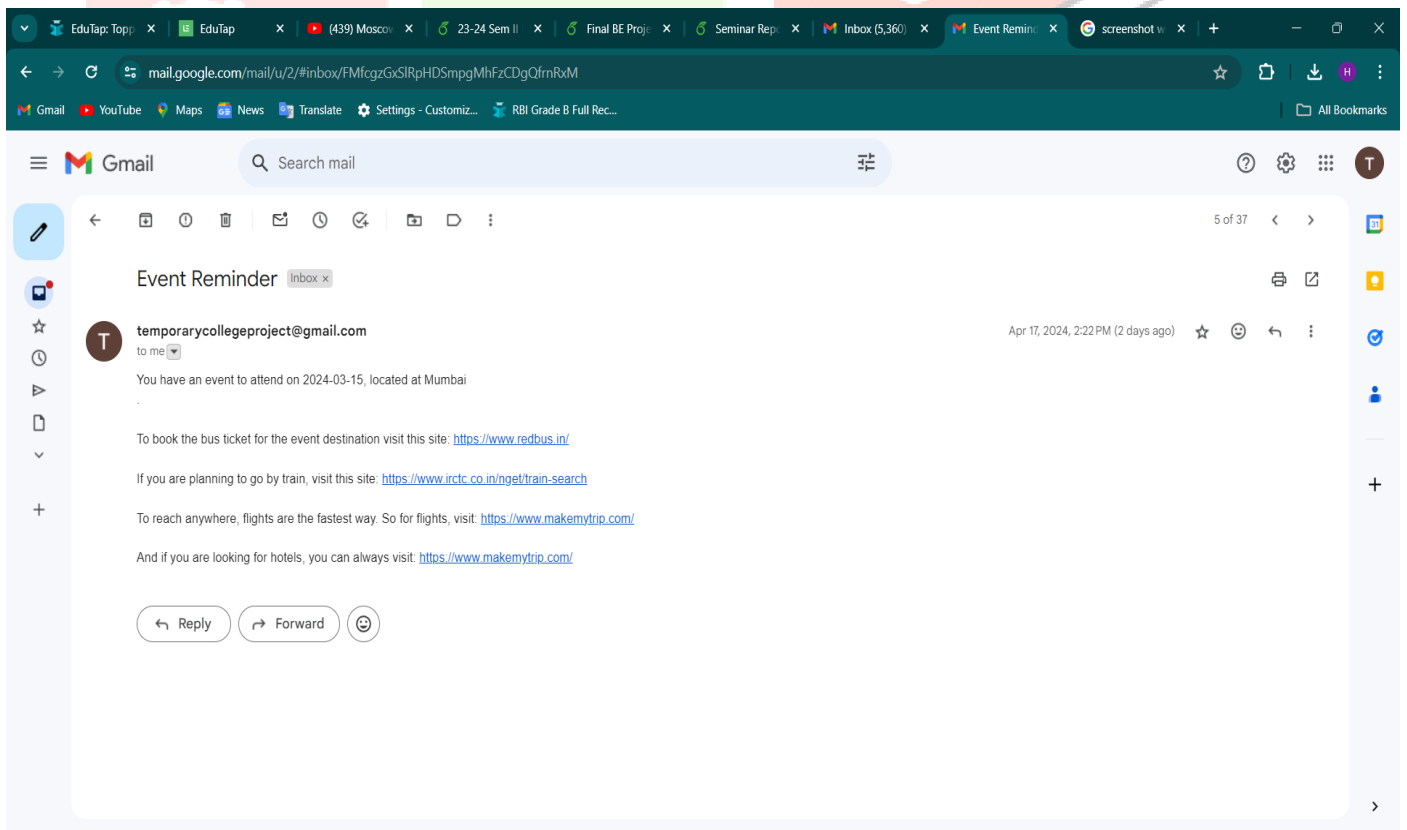
5.2 SMS reminder Phone or Text Message Reminder Feature:

The VPA calendar project incorporates a feature allowing users to receive reminder for their events and appointments via phone calls or SMS. This functionality enhances user accessibility and ensures they stay updated about their schedule, even if they're not near their devices or unable to access the calendar app.



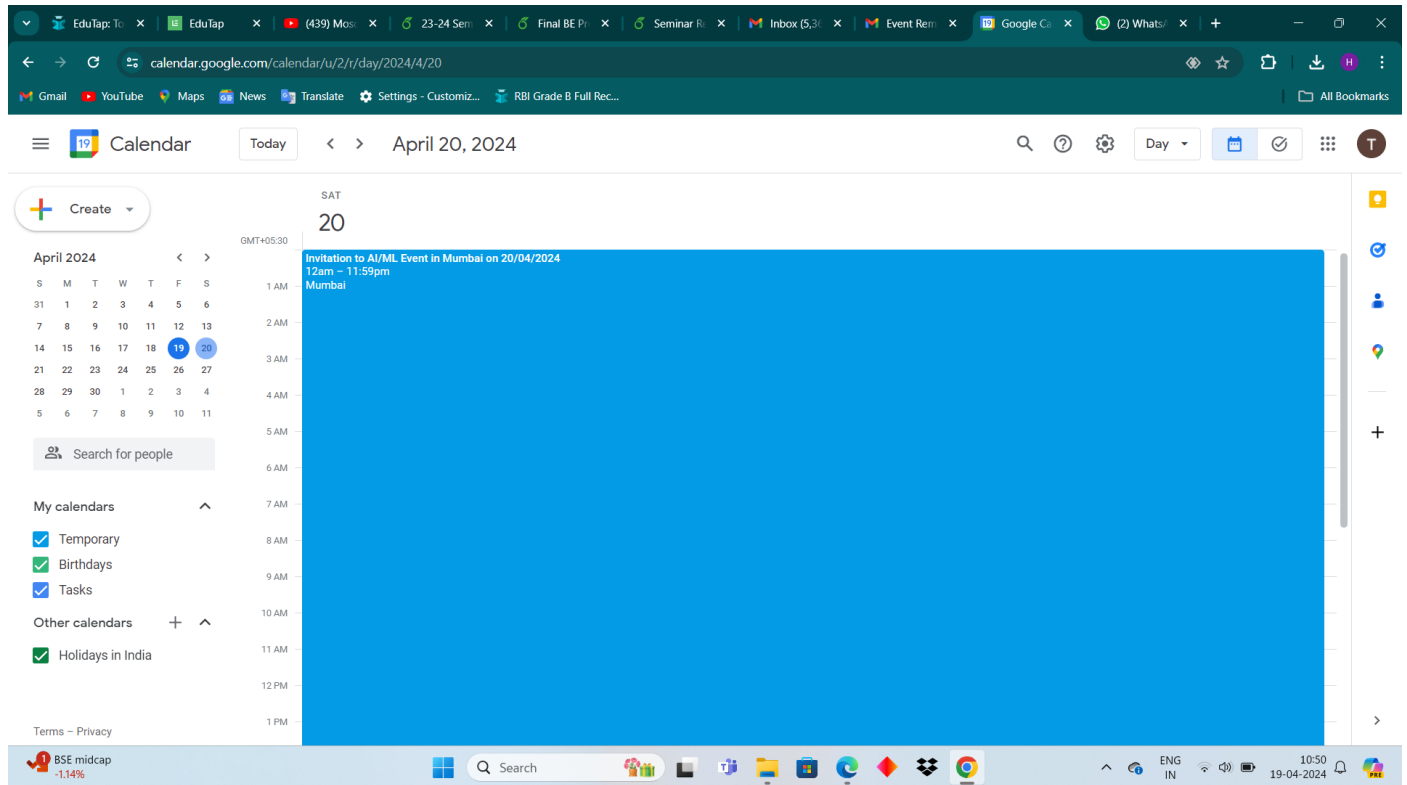
5.3 Google Calendar Integration:

The VPA calendar project incorporates Google Calendar, giving users a complete view of their schedule and events. This integration enables users to seamlessly access and manage their Google Calendar data within the VPA calendar app. Users can perform various action such as viewing, adding, editing, and deleting events directly from the VPA interface, ensuring a streamlined scheduling experience across different platforms



5.4 Event Details Feature:

In the VPA calendar project, the Event Details functionality offers users in-depth insights into their scheduled events and appointments. This feature enables users to review thorough event descriptions, encompassing event titles, dates, times, locations, and any supplementary notes or attachments. By presenting event particulars coherently, users can efficiently organize and oversee their schedules, ensuring they are well-informed and ready for upcoming engagements.



5.5 FUNCTIONAL REQUIREMENTS

Functional requirements are specifications that describe the specific functions and features a system, software, or product must perform. They serve as a blueprint for the development and testing of a system, helping ensure that it meets its intended purpose. In the VPA calendar project, functional requirements describe the precise functionalities and features that the calendar application should have to fulfill user requirements adequately. These requirements encompass tasks like scheduling events, configuring reminders, syncing calendars, verifying user identities, and incorporating external service connections. Moreover, functional requirements delineate the user interface interactions and anticipated results. By articulating detailed and thorough functional requirements, the project team guarantees that the VPA calendar app offers the intended capabilities and satisfies user demands

1. User Registration and Authentication
2. Event Management
3. Event Import and Integration
4. Dynamic Rescheduling
5. Event Classification and Priority Prediction
6. Venue Location Assistance
7. Notification and Reminders
8. User-Friendly Interface

5.6 EXPERIMENTAL SETUP

5.6.1 Data set

A real dataset of emails containing a variety of events and deadlines from the specified sources. In the VPA calendar project, the dataset comprises structured and unstructured data utilized for different functionalities within the calendar application. This dataset includes event specifics, user preferences, scheduling trends, and historical usage information. It forms the basis for features like event management, reminder customization, and tailored suggestion. The VPA calendar application offers users precise, pertinent, and individualized scheduling support to optimize their efficiency and organization.

5.6.2 Performance Parameters

Performance parameters are critical aspects of any project, as they define how well the project fulfills its objectives and requirements. A well-defined set of performance parameters is essential to gauge the success of a project. By clearly identifying, measuring, and reporting on these parameters, one can track progress, make informed decisions, and ensure that the project aligns with its intended objectives and requirements.

- **Time:** Fast managing of events, often within seconds.
- **Speed:** Real-time recognition and analysis for quick results.
- **Precision:** High precision, minimizing false event generation.
- **Recall:** High recall, ensuring that the system rarely misses events of individual.

5.6.3 Efficiency Issues

1. Misunderstanding User Commands: VPCs rely on natural language processing (NLP) to understand and respond to user commands. They can misinterpret user input specially dealing with complex requests.

2. Limited context understanding: VPCs often struggle to maintain context and remember previous interaction. User may have to repeat information to perform tasks accurately.

3. Notification Overload: An efficient VPA should be able to prioritize and filter notifications to ensure that users are alerted to the most critical events.

4. False Positives and Negatives: The VPA should not generate false alarms for unimportant events, but it should also not overlook important ones.

6. RESULT AND CONCLUSION

6.1 RESULT

In the VPA calendar project, the Result indicates the overall success and performance of the application in facilitating users' schedule management. This includes evaluating the precision of event scheduling, the dependability of reminders and notifications, the ease of use of the interface, and users' satisfaction with the overall functionality. The Result signifies the achievement of project goals in providing a valuable solution for efficiently organizing users' time and engagement. In the VPA calendar project, the analysis and discussion of project outcomes entail a comprehensive review of the project's results, focusing on different aspects of functionality, user experience, and performance. This process involves assessing how well the VPA calendar manages users' schedules, identifying its strengths and weaknesses, and exploring opportunities for enhancement. Additionally, gathering user feedback helps understand satisfaction levels, usability issues, and ideas for future improvements. Through in-depth analysis and discussion, the project team gains valuable insights into the project's achievements and areas needing attention, fostering continuous refinement to better meet user requirements.

6.2 CONCLUSION

"The Virtual Personal Companion" project represents a significant step forward in the field of event management. By harnessing the power of AI and advanced technologies, it addresses the challenges users face in organizing their busy lives. With features like dynamic rescheduling, event classification, and voice interaction, the system enhances productivity and reduces the risk of missing vital events. The integration of voice assistants and venue location assistance further simplifies the user experience. This project is a testament to the potential of technology to make our lives more efficient and stress-free, marking a promising direction for the future of event management.

7. REFERENCES

[1] Voice-Based Virtual -Controlled Intelligent Personal Assistants. 2023 International Conference on Computational Intelligence, Communication Technology and Networking (CICTN) | 979-8-3503-3802-7/23/\$31.00 ©2023 IEEE | DOI: 10.1109/CICTN57981.2023.10141447

[2] Hoy MB. Alexa, Siri, Cortana, and More: An Introduction to Voice Assistants. *Med Ref Serv Q* 2018;37(1):81-88. [doi: 10.1080/02763869.2018.1404391] [Medline: 29327988]

[3]Cocco AM, Zordan R, Taylor DM, Weiland TJ, Dilley SJ, Kant J, et al. Dr Google in the ED: searching for online health information by adult emergency department patients. *Med J Aust* 2018 Oct 15;209(8):342-347. [doi: 10.5694/mja17.00889] [Medline: 30107763]

[4] M. McTear 2016. *The Dawn of the Conversational Interface*. Springer International Publishing Switzerland 2016

[5]Y. Nung, A. Celikyilmaz. *Deep Learning for Dialogue Systems*. Deep Dialogue..

[6]Microsoft. Cortana Intelligence. <https://azure.microsoft.com>.

[7] Amazon. Amazon Lex is a service for building conversational interfaces.

[8]K. Wagner. Facebook's Virtual Assistant 'M' Is Super Smart. It's Also Probably a Human, <https://www.recode.com>.