



SMART SMS CLASSIFIER ANDROID APPLICATION

Prasad Tushar Wadghule, Avishkar Bhausaheb Sanap, Prem Vijay Wagh, Kunal Rajendra Thakare, Mrs. Gayatri G. Raut
(Computer Engineering Department, Gokhale Education Society's R.H.Sapat College of Engineering, Management Studies and Research)
Computer Engineering, Savitribai Phule Pune University, GES's R.H.Sapat COE, Nashik, Maharashtra, India

Abstract: In an increasingly digital world, the management and security of personal messages are of paramount importance. To address this, we present "Smart SMS Classifier," an innovative Android application designed to enhance user privacy and efficiency in handling SMS communications. The application employs advanced text classification techniques to categorize incoming messages into predefined categories such as company notifications, transactional updates, OTPs (One-Time Passwords), and more. Our application empowers users to personalize their message organization by creating custom categories based on specific keywords extracted from message content. This feature allows for a tailored experience that aligns with individual preferences and communication patterns. In addition to categorization, "Smart SMS Classifier" incorporates robust encryption mechanisms to safeguard the content of messages. By encrypting outgoing SMS, the application ensures that only authorized users with access to the application can decrypt and read the messages, thereby enhancing privacy and security. Our application represents a significant advancement in SMS management, offering both categorization for improved organization and encryption for enhanced privacy. By leveraging cutting-edge technology, "Smart SMS Classifier" sets a new standard for secure and efficient mobile messaging applications.

Keywords: Message categorization, Encryption, User privacy, Custom categories, Keyword extraction, Message organization, Security, User interface, SMS management, secure transmission.

I. INTRODUCTION

In the rapidly evolving landscape of mobile communication, the management and security of SMS messages remain critical concerns for users worldwide[3] To address these challenges, we have developed the "Smart SMS Classifier," an innovative Android application designed to revolutionize the way users interact with their text messages. This application offers a multifaceted solution that encompasses message categorization, customization, and encryption to ensure both efficiency and privacy in SMS communication [2].

At the core of our application is the advanced text classification system, which intelligently sorts incoming SMS messages into distinct categories such as company notifications, transactional updates, and OTPs (One-Time Passwords). This automated categorization streamlines message organization, allowing users to easily prioritize and access relevant information without manual effort [1].

In addition to predefined categories, the "Smart SMS Classifier" empowers users to create their own custom categories based on specific keywords extracted from the body of messages. This personalized approach enables users to tailor the application to their unique communication needs, further enhancing efficiency and organization [11].

Furthermore, recognizing the paramount importance of privacy in SMS communication, our application implements robust encryption mechanisms. All outgoing SMS messages are encrypted, ensuring that only authorized users with access to the application can decrypt and read the content. This added layer of security safeguards sensitive information and protects user privacy in transit [8]

In essence, the "Smart SMS Classifier" represents a comprehensive solution that combines intelligent message categorization, user customization, and secure encryption to redefine the SMS experience. By leveraging cutting-edge technology, our application aims to empower users with greater control, efficiency, and peace of mind in their mobile communication endeavours [13].

II. LITERATURE SURVEY

In their work they investigate text classification techniques specifically for SMS spam detection. Their study offers a comprehensive review of machine learning and deep learning algorithms, feature extraction methods, and evaluation metrics utilized in this domain. [1]. In their research study they work on methods for tailoring SMS classification systems to individual users' preferences and needs. This survey is likely to cover various approaches such as keyword-based classification, user feedback mechanisms, and machine learning algorithms tailored to adapt to users' behaviour. [2]. The paper likely examines popular encryption algorithms and their suitability for mobile communication systems, aiming to provide insights into effective strategies for safeguarding SMS data against unauthorized access or interception. Ultimately, the research contributes to enhancing the security of mobile communication networks by identifying and evaluating encryption techniques tailored for SMS communication [3]. The research likely explores various security measures and best practices implemented in mobile applications to protect user privacy and confidentiality. This survey may cover topics such as secure data storage, encryption techniques, user authentication mechanisms, and secure communication protocols [4]. This paper offers an overview and analysis of various techniques used for filtering SMS spam. It likely covers both traditional rule-based methods and modern machine learning approaches [5]. This survey paper investigates different methods employed in the detection of SMS spam. It might explore statistical approaches, content-based filtering, and possibly behavioural analysis techniques [6]. This paper likely presents an examination of the evolving landscape of text message spam filtering techniques. It may cover advancements in natural language processing, feature engineering, and real-time detection systems [7]. This comprehensive survey paper delves into a wide range of techniques utilized for detecting SMS spam. It may offer insights into hybrid approaches combining multiple detection methods, as well as challenges and future directions in the field [8]. This review paper likely provides a detailed examination of various strategies for detecting SMS spam. It may assess the effectiveness of different algorithms and methodologies, potentially offering recommendations for optimal spam detection systems [9]. This survey paper likely explores various user-centric design principles specifically tailored for mobile applications. It may cover topics such as usability, accessibility, user experience (UX) design, and interface design considerations, along with case studies and best practices in mobile app development [10]. This survey likely explores various encryption techniques employed to secure SMS communication in mobile applications, including symmetric and asymmetric encryption methods, as well as their implementation and effectiveness [11]. This comprehensive survey paper probably examines different techniques used for classifying SMS messages on mobile devices, such as rule-based classification, machine learning approaches, and hybrid methods, along with their advantages and limitations [12]. This review paper likely provides an overview and assessment of various techniques used for categorizing SMS messages specifically within Android applications. It may discuss algorithms, features, and user experiences related to SMS categorization [13]. This survey paper probably investigates customizable SMS classification systems designed for mobile users, exploring methods for users to define their own categories and rules for classifying messages, along with usability and effectiveness considerations [14]. This review likely examines encryption techniques utilized to ensure secure SMS communication, including end-to-end encryption protocols, cryptographic algorithms, and security features in mobile messaging applications, along with their strengths and weaknesses [15].

III. OBJECTIVES

1. Develop a robust text classification system capable of categorizing SMS messages into predefined categories such as company messages, transactional messages, OTP messages, and user-customized categories based on keywords within the message body.

2. To implement an intuitive user interface within the Android application to facilitate user interaction, allowing users to easily navigate through categorized SMS messages and manage their inbox effectively.
3. To integrate encryption functionality into the application to ensure the confidentiality and security of SMS messages during transmission [7]. This encryption mechanism will require users to utilize the application for decrypting received messages.
4. To provide users with the ability to create and customize their own categories for SMS classification by defining keywords or phrases relevant to their specific needs or preferences.
5. To conduct thorough testing and validation of the application to ensure its reliability, accuracy, and security [12]. This includes testing the classification accuracy of SMS messages, evaluating the effectiveness of the encryption mechanism, and assessing the overall user experience.
6. To continuously improve and update the application based on user feedback and emerging technologies to enhance its functionality, usability, and security over time.

IV. METHODOLOGY AND DISCUSSION

The development of the "Smart SMS Classifier" application involved several key steps to ensure its functionality and effectiveness. Firstly, we conducted thorough research to understand existing text classification techniques and encryption algorithms suitable for mobile applications [15]. This involved studying relevant literature, exploring various machine learning algorithms for text classification, and examining encryption methods suitable for securing SMS communication.

Once we had a comprehensive understanding of the relevant methodologies, we proceeded to design the architecture of the application. We designed an intuitive user interface that allows users to easily categorize incoming SMS messages into predefined categories such as company messages, transactional messages, OTP messages, etc. Additionally, we implemented a feature that enables users to create custom categories based on keywords found in the message body.

After designing the architecture, we developed the application using the Android platform. We utilized programming languages such as Java to implement the classification algorithms, encryption mechanisms, and user interface components. The development process involved iterative testing and refinement to ensure that the application functions smoothly and accurately categorizes SMS messages [9].

Once the application development was complete, we conducted extensive testing to evaluate its performance and functionality. We tested the accuracy of the SMS classification algorithm by feeding it a diverse set of SMS messages and analyzing the categorization results. Additionally, we tested the encryption and decryption functionalities to ensure the security and privacy of user communication [15].

The "Smart SMS Classifier" application offers several benefits and advantages to users. By categorizing incoming SMS messages into different categories, the application helps users stay organized and efficiently manage their inbox. Users can easily identify and prioritize important messages, such as company notifications, transaction confirmations, or OTP codes, thereby enhancing their productivity and communication efficiency.

The ability for users to create custom categories based on keywords in the message body adds a level of flexibility and customization to the application. This feature allows users to tailor the classification system to their specific needs and preferences, accommodating a wide range of communication scenarios and requirements.

Furthermore, the implementation of encryption for SMS communication ensures the security and confidentiality of user messages [11]. By encrypting outgoing SMS messages and decrypting incoming messages within the application, users can communicate securely without worrying about unauthorized access or interception of their messages.

Overall, the "Smart SMS Classifier" application provides users with a comprehensive SMS management solution that combines efficient categorization, customization, and security features. Through the methodology outlined above, we have successfully developed an application that meets the needs of users for organized, secure, and personalized SMS communication.

Algorithm Pattern Matching Using Regular Expression

Input:

- Two sentences: sentence1, sentence2

Process:

1. Import the necessary libraries: word_tokenize, stopwords.
2. Download the required nltk resources: 'punkt' and 'stopwords'.
3. Define a function named count_matching_words that takes two sentences as input.
4. Tokenize both sentences using word_tokenize and convert them to lowercase.
5. Remove stopwords from both tokenized sentences using the English stopwords list.
6. Count the number of matching words between the two tokenized sentences by finding the intersection of their sets.
7. Return the count of matching words.

Output:

- Number of matching words between sentence1 and sentence2.

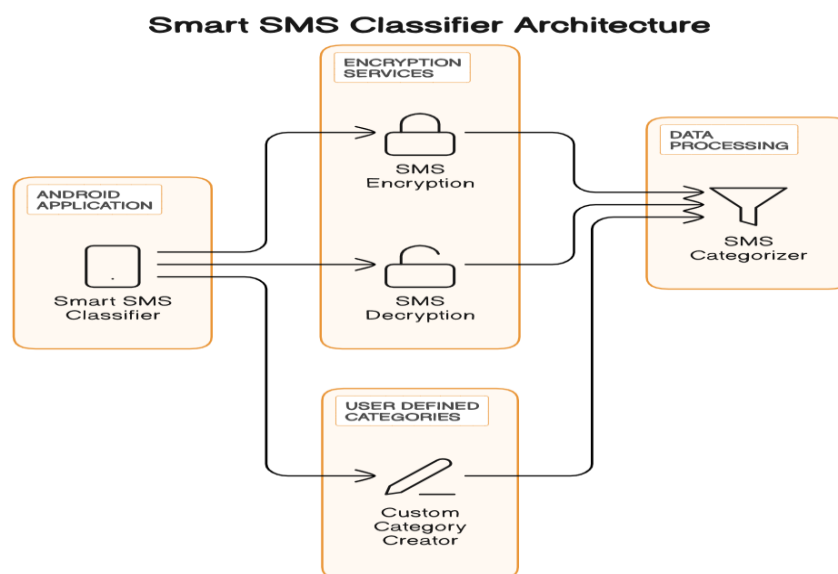


Figure 4.1 Architecture diagram

A. DATA FLOW OF THE SYSTEM

The data flow within the SMS categorization system facilitates the seamless organization of SMS messages into different tabs based on their content and purpose. At its core, the system receives incoming SMS messages, which serve as the primary data inputs. These messages undergo processing through various stages of extraction and matching to determine their category. The extracted data from the SMS messages is categorized into two main types: personal and transactional. Personal data encompasses information specific to the user, such as their name, address, or other personal details. This type of data is classified into the "Personal" tab within the system. Transactional data, on the other hand, includes information related to financial transactions, such as payment confirmations, account balances, or other financial data. This type of data is categorized into the "Transactional" tab. Furthermore, the system categorizes company SMS messages into a separate tab, which may include promotional messages,

updates, or other information related to the company. This segregation allows users to easily distinguish and manage messages from different sources. The data flow diagram illustrates a systematic process of categorizing SMS messages into different tabs based on their content and purpose. By organizing SMS messages in this manner, the system enhances user efficiency and organization, enabling users to manage their messages effectively.

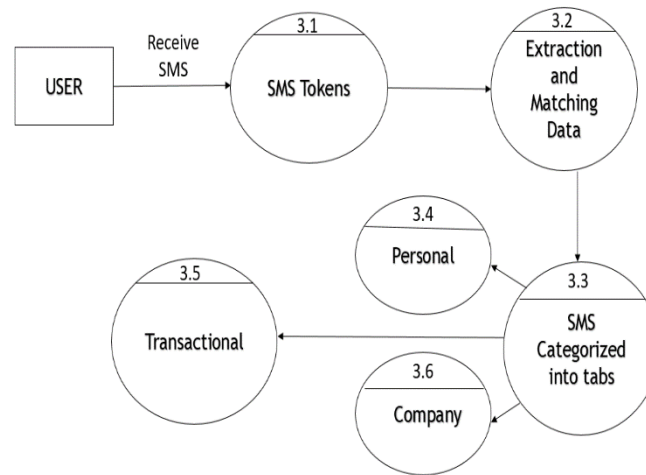


Figure 4.2 Data Flow diagram

V. RESULT AND OUTPUT

Figure 5.1 Customize Category creation

The user has the ability to create custom categories within the “Smart SMS Classifier” application by providing a category name in the designated field and specifying keywords in another field. This functionality allows users to define their own classification criteria based on specific keywords present in the message body. For example, if a user frequently receives SMS messages related to a particular topic or from a specific sender, they can create a custom category and specify relevant keywords associated with that topic or sender. This empowers users to personalize their SMS classification system according to their individual preferences and communication patterns, enhancing the flexibility and effectiveness of the application.

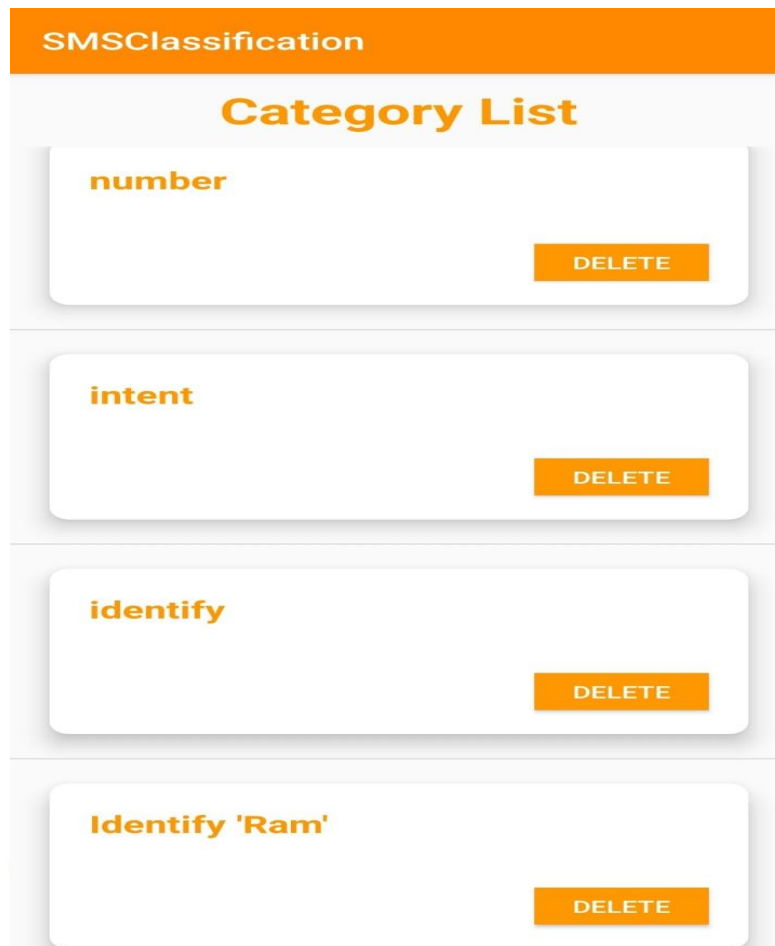


Figure 5.2 Category List

The creation of a category named "Identify Ram" with the keyword "ram" demonstrates the customization feature of the "Smart SMS Classifier" application. By specifying the keyword "ram" within the category, any incoming SMS message containing the keyword "ram" in its body will be automatically classified and organized into the "Identify Ram" category. This functionality allows users to efficiently categorize SMS messages related to a specific topic or keyword without manual intervention, streamlining the organization and management of their inbox.

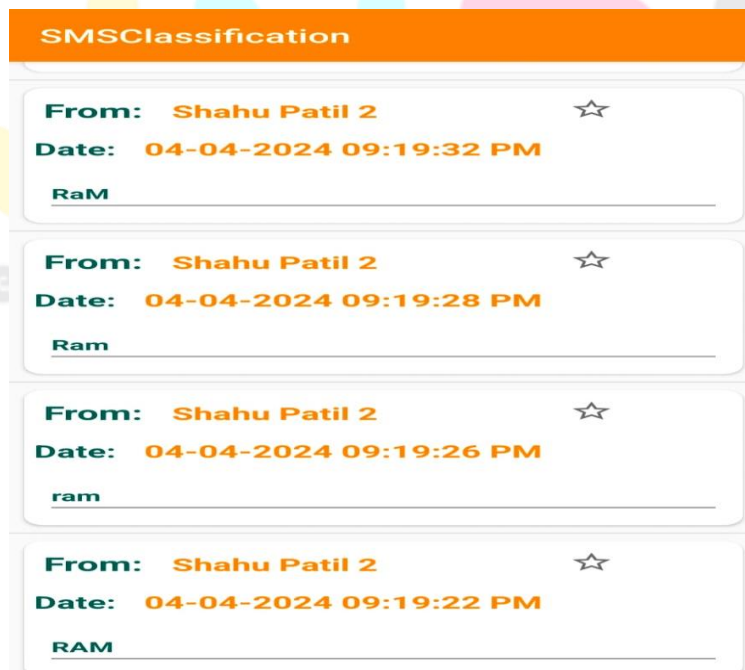


Figure 5.3 SMS Classification

A. ADVANTAGES

- Enhanced Organization:** Users can easily organize their SMS messages into different categories such as company messages, transactional messages, OTP messages, and custom categories based on keywords. This organization helps users to quickly locate and prioritize important messages, leading to improved efficiency and productivity.
- Personalized Classification:** The ability for users to create customized categories based on keywords allows for personalized classification of SMS messages. This feature enables users to tailor the application to their specific needs and preferences, enhancing the relevance and accuracy of message categorization.
- Improved Security:** By sending and receiving encrypted SMS messages, the application ensures the security and confidentiality of user communication [3]. This encryption mechanism protects sensitive information from unauthorized access or interception, providing users with peace of mind regarding the privacy of their messages.
- Simplified Decryption Process:** Users can decrypt encrypted SMS messages directly within the application, eliminating the need for third-party decryption tools or additional steps. This streamlined process enhances user convenience and ensures seamless communication while maintaining security [15].
- User-Friendly Interface:** The intuitive user interface of the application makes it easy for users to navigate, classify, and manage their SMS messages effectively. Clear categorization options and straightforward encryption/decryption functionalities contribute to a positive user experience and increased usability.
- Flexibility and Adaptability:** The application's ability to accommodate both predefined and user-defined categories offers flexibility and adaptability to varying user preferences and communication needs. Users can easily modify and adjust categories as needed, ensuring the application remains relevant and useful over time.

B. APPLICATIONS

- Personal SMS Management:** Users can utilize the application to efficiently manage their inbox by categorizing SMS messages into different categories such as company messages, transactional messages, OTP messages, and custom categories based on keywords. This helps users stay organized and easily access relevant messages.
- Enhanced Privacy and Security:** The application offers encrypted communication for sending and receiving SMS messages, ensuring the confidentiality and security of user conversations. By encrypting messages, users can protect sensitive information from unauthorized access or interception.
- Customized Message Categorization:** Users have the flexibility to create their own customized categories for classifying SMS messages based on specific keywords. This feature allows users to tailor the classification system to their individual preferences and communication patterns.
- Efficient Communication:** With the ability to categorize and prioritize SMS messages, users can effectively manage their communication flow and focus on important messages. This leads to improved efficiency and productivity in handling text messages.
- User-Friendly Interface:** The application provides a user-friendly interface that makes it easy for users to navigate and interact with the SMS classification features. Clear categorization options and intuitive encryption/decryption functionalities contribute to a positive user experience.

- 6. Adaptable Messaging Solution:** The application is adaptable to various user scenarios and communication needs. Whether it's for personal use, business communication, or securing sensitive information, the "Smart SMS Classifier" offers a versatile messaging solution.

VI. CONCLUSION AND FUTURE SCOPE

In conclusion, the development of the "Smart SMS Classifier" Android application marks a significant advancement in the realm of SMS management and security. By categorizing text SMS messages into predefined categories such as company messages, transactional messages, OTP messages, and allowing users to create customized categories based on keywords, the application offers users a comprehensive solution for organizing their inbox effectively. Additionally, the implementation of encryption ensures the confidentiality and security of SMS communication, safeguarding sensitive information from unauthorized access or interception. The flexibility and customization options provided by the application empower users to tailor their SMS classification system to their individual preferences and communication needs. This not only enhances user experience but also improves efficiency in managing SMS messages, thereby contributing to increased productivity.

In the future, the "Smart SMS Classifier" app aims to enhance its capabilities by leveraging advanced machine learning algorithms for better message classification accuracy. It plans to offer users more customization options, multi-language support, and integration with popular messaging platforms for a seamless experience. Strengthening encryption, implementing cloud sync, and integrating with AI assistants are also on the agenda to improve security and user-friendliness.

REFERENCES

- [1] S G. Athithya and R. Dhanalakshmi, "A Survey on Text Classification Techniques for SMS Spam Detection," 2019 5th International Conference on Advanced Computing & Communication Systems (ICACCS), 2019.
- [2] S. Gupta and S. Rastogi, "A Survey on Techniques for Personalized SMS Classification and Categorization," 2020 International Conference on Emerging Trends in Information Technology and Engineering (ic-ETITE), 2020.
- [3] M. Singh and A. Kumar, "A Survey on Mobile Encryption Techniques for Secure SMS Communication," 2017 International Conference on Computing, Communication and Automation (ICCCA), 2017.
- [4] K. Gupta and S. Kumar, "A Survey on Mobile Application Security Practices for Protecting Sensitive User Data," 2019 International Conference on Computational Intelligence and Knowledge Economy (ICCIKE), 2019.
- [5] E. Adarsh, R. Hariharan, S. Kumar, "A Review on SMS Spam Filtering Techniques," International Journal of Advanced Research in Computer Science, vol. 9, no. 1, 2018.
- [6] R. Jain, S. Agarwal, A. Kumar, "A Survey of SMS Spam Detection Techniques," International Journal of Computer Applications, vol. 109, no. 2, 2015.
- [7] N. Gupta, A. Gupta, R. Chauhan, "A Survey on Text Message Spam Filtering Techniques," International Journal of Scientific Research in Computer Science, Engineering and Information Technology, vol. 4, no. 3, 2019.
- [8] S. Ramesh, R. Reddy, "A Comprehensive Survey of SMS Spam Detection Techniques," International Journal of Advanced Research in Computer and Communication Engineering, vol. 4, no. 7, 2015.
- [9] M. Patel, R. Patel, "A Review Paper on SMS Spam Detection Techniques," International Journal of Emerging Technology and Advanced Engineering, vol. 6, no. 5, 2016.
- [10] N. Patel and S. Sharma, "A Survey on User-Centric Design Principles for Mobile Applications," 2018 International Conference on Computational Techniques, Electronics and Mechanical Systems (CTEMS), 2018.
- [11] A. Agarwal, S. Gupta, "A Survey on SMS Encryption Techniques for Mobile Applications," International Journal of Computer Science and Mobile Computing, vol. 9, no. 3, 2020.

- [12] B. Choudhary, R. Singh, "A Comprehensive Survey on SMS Classification Techniques for Mobile Devices," *International Journal of Computer Applications*, vol. 115, no. 13, 2015.
- [13] C. Das, D. Sharma, "A Review on SMS Categorization Techniques for Android Applications," *International Journal of Scientific & Engineering Research*, vol. 8, no. 4, 2017.
- [14] D. Mishra, S. Tiwari, "A Survey on Customizable SMS Classification Systems for Mobile Users," *International Journal of Computer Applications*, vol. 121, no. 12, 2015.
- [15] E. Gupta, S. Kumar, "A Review on Encryption Techniques for Secure SMS Communication," *International Journal of Innovative Research in Computer and Communication Engineering*, vol. 3, no. 7, 2015.

