

# **CLOUD SECURITY & MANAGEMENT PROJECT**

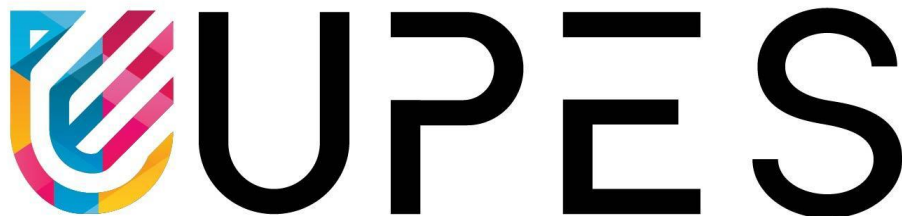
## **REPORT**

For

Smart Contact Manager

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# Report

## 1. Project Title

Smart Contact Manager

## 2. Abstract

The Smart Contact Management project is a software application designed to streamline and improve the process of managing contacts for individuals and organizations. With the exponential growth of digital communication, it has become increasingly difficult to keep track of important contacts across multiple platforms, such as email, social media, and mobile devices. This project aims to provide a comprehensive solution to this problem.

The Smart Contact Management application offers a variety of features to help users organize and maintain their contacts efficiently. One of the key features is the ability to import contacts from various sources, such as email accounts, social media platforms, and mobile devices, into a centralized database. This database is designed to be easily searchable, allowing users to quickly find the contact information they need.

Another important feature of the application is the ability to categorize contacts. Users can create custom categories, such as "colleagues," "friends," or "family," and assign each contact to one or more categories. This makes it easy to find specific groups of contacts and also helps to avoid sending messages to the wrong people.

The Smart Contact Management application also includes tools for managing communication with contacts. Users can schedule reminders to follow up with contacts, set up automatic replies for certain types of messages, and even send personalized messages to multiple contacts at once. This feature is especially useful for businesses or organizations that need to communicate with large groups of people.

Security and privacy are also top priorities for the Smart Contact Management project. The application is designed to protect users' personal information and prevent unauthorized access. Users can set up password protection, two-factor authentication, and other security measures to ensure their data is safe.

Our Smart Contact Management project offers a powerful and user-friendly solution for managing contacts in today's digital world. Its features and functionality make it an essential tool for individuals and organizations looking to streamline their communication and stay organized.

## 3. Background

Contact management has been a critical component of personal and professional productivity for many years. Traditionally, contact management was done using physical address books or rolodexes, which were cumbersome and time-consuming to use.

With the advent of computers and software tools, contact management has become much more streamlined and efficient. In the early days of computing, contact management was often done using simple databases or spreadsheets.

As technology has advanced, so too have contact management tools. Today's contact management tools are sophisticated software applications that offer a wide range of features and capabilities.

Smart Contact Manager is one such tool that has been developed to meet the growing demand for efficient and effective contact management. The tool leverages advanced technologies such as artificial intelligence, natural language processing, and machine learning to provide users with a seamless and intuitive experience.

Smart Contact Manager is designed to be user-friendly and accessible, even for users with limited technical knowledge. The tool can be used on a wide range of devices, including desktop computers, laptops, tablets, and smartphones.

#### **4. Introduction**

The "Contact Management System" has been developed to override these problems prevailing in the practicing manual system. This software is supported to eliminate and in some cases reduce the hardships faced by this existing system. Moreover this system is designed for the particular need of the company to carry out operations in a smooth and effective manner.

The application is reduced as much as possible to avoid errors while entering the data. It also provides an error message while entering invalid data. No formal knowledge is needed for the user to use this system. Thus by this all it proves it is user-friendly.

Contact Management System, as described above, can lead to error free, secure, reliable and fast management systems. It can assist the user to concentrate on their other activities rather than concentrating on the record keeping. Thus it will help organizations in better utilization of resources.

Every organization, whether big or small, has challenges to overcome and manage the information of Credential, Contact, Profile, Mobile, Emails. Every Contact Management System has different Contact needs, therefore we design exclusive employee management systems that are adapted to your managerial requirements.

This is designed to assist in strategic planning, and will help you ensure that your organization is equipped with the right level of information and details for your future goals. Also, for those busy executives who are always on the go, our systems come with remote access features, which will allow you to manage your workforce anytime, at all times. These systems will ultimately allow you to better manage resources.

The system also provides advanced search capabilities, allowing users to quickly and easily find the information they need. Users can search by name, company, job title, or any other relevant criteria. This feature saves time and effort, especially for users who have large contact lists.

The system provides customizable reporting and analytics features, allowing users to track and analyze their contact data over time. This feature helps organizations to make informed decisions about their contact management strategy and identify areas for improvement.

It offers a comprehensive solution for managing contacts in today's digital world. Its user-friendly interface, advanced search capabilities, and integration with other software applications make it an essential tool for individuals and organizations looking to streamline their communication and stay organized. With the Contact Management System, users can focus on their core business activities, confident that their contact data is accurate, up-to-date, and easily accessible.

### **Applications: -**

The application of smart contact managers is widespread and can benefit individuals and businesses alike. Some of the common applications of smart contact managers include:

- **Personal Contact Management:** A smart contact manager can be used by individuals to manage their personal contacts, including friends, family, and colleagues. The application can store all contact information, including phone numbers, email addresses, social media profiles, and more, making it easy to keep in touch and stay organized.
- **Business Contact Management:** Smart contact managers can be used by businesses to manage their customer and client contacts. The application can store all customer contact information, including phone numbers, email addresses, and purchase history, making it easy to keep track of customers and provide better service.
- **Sales and Marketing:** Smart contact managers can be used by sales and marketing teams to manage their leads and prospects. The application can store all contact information, including their interests and preferences, making it easy to personalize marketing campaigns and close more deals.
- **Event Management:** Smart contact managers can be used to manage contacts for events such as conferences, trade shows, and meetings. The application can store all attendee contact information, making it easy to manage registrations, send out invitations, and communicate with attendees.
- **Human Resource Management:** Smart contact managers can be used by human resource departments to manage employee contact information, including emergency contacts and work-related information. This makes it easy to keep track of employees and contact them in case of emergencies.

### **Uses: -**

The uses of a smart contact manager are many and varied, and can benefit individuals and organizations in numerous ways. Here are some of the most common uses of a smart contact manager:

- **Organizing Contact Information:** The primary use of a smart contact manager is to organize contact information. It allows users to store all of their contact details in

one place, including names, phone numbers, email addresses, social media handles, and more.

- Search and Retrieval: A smart contact manager makes it easy to search for and retrieve contact information quickly. Users can search by name, phone number, email address, or any other relevant keyword, and retrieve the desired contact information with just a few clicks.
- Contact Synchronization: Smart contact managers allow users to synchronize their contacts across multiple devices and platforms. This means that any changes made to contact information on one device will be automatically updated on all other devices.
- Reminders and Notifications: Some smart contact managers come with reminder and notification features. Users can set reminders for important events, such as birthdays or anniversaries, and receive notifications when the event is approaching.
- Group Management: Smart contact managers allow users to manage contacts in groups. This makes it easy to send messages or emails to specific groups of people, such as colleagues, friends, or family members.
- Analytics and Insights: Some smart contact managers come with analytics and insights features. This allows users to gain insights into their contact list, such as how many contacts they have, how frequently they communicate with them, and more.
- In conclusion, a smart contact manager is a versatile tool that can be used for a variety of purposes. It simplifies contact management, improves communication, and helps users stay organized and productive.

### **Motivation: -**

- The motivation behind developing a smart contact manager was to address the challenges of managing contact information in today's digital age. With the increasing number of communication channels available, managing contacts has become more complex than ever. People are using multiple devices and applications to communicate, and keeping all the contact information updated and organized can be a daunting task.
- Smart contact managers were developed to simplify this process by providing an efficient solution for storing, retrieving, and updating contact details. These applications incorporate advanced features such as AI-powered data processing, natural language search, and contact synchronization with various devices and applications, making it easy to manage contact information across multiple platforms.
- Moreover, smart contact managers help individuals and businesses stay organized and productive by reducing the time and effort required to manage contact information. With a smart contact manager, users can easily search for and retrieve contact information, synchronize their contacts across devices, and manage their contacts in groups.
- Developing a smart contact manager was to simplify the process of managing contact information and improve productivity in a world where communication channels are constantly evolving. By providing a comprehensive and easy-to-use

solution, smart contact managers have become an essential tool for individuals and organizations looking to stay organized and productive.

## **Report Organisation: -**

### **Introduction:**

Smart Contact Manager is a software tool designed to help users organize their contacts in an efficient and effective manner. The goal of this report is to outline the organizational structure of the Smart Contact Manager system and describe how it can be used to manage contacts.

### **Organizational Structure:**

The Smart Contact Manager system is organized into several key components, including:

**User Interface:** The user interface is the primary means by which users interact with the system. It includes all of the menus, screens, and controls that allow users to manage their contacts.

**Contact Database:** The contact database is the central repository for all contact information. It stores all of the contact details entered by the user, such as name, phone number, email address, and physical address.

**Search and Filter Tools:** The search and filter tools allow users to quickly find the contacts they need. Users can search for contacts by name, phone number, email address, or any other data field stored in the contact database.

**Addition & View contact:** It also allows users to add and view their contacts easily. Users can add new contacts manually & this information is saved and can be viewed later on. Users can view their contact details in a single location. The contact details may include their name, work, phone number, email address, and other relevant information. Users can also add custom fields to the contact details to store additional information that may be relevant to their business needs.

**Security of Information:** The Smart Contact Management System includes several security features to ensure the safety and confidentiality of contact data. User authentication is a crucial security feature that requires users to log in using their unique username and password. The system also includes role-based access control, which limits access to specific data based on the user's role or permission level. The system also encrypts data at rest and in transit, providing an additional layer of protection against

unauthorized access. These security features ensure that contact data is kept safe and secure, providing peace of mind to users and organizations.

#### Using the Smart Contact Manager:

To use the Smart Contact Manager system, users first need to enter their contact details into the contact database. This can be done manually, by entering each contact's details one by one, or by importing contacts from another source.

Once the contact details are entered into the database, users can search for contacts using the search and filter tools. They can also sort contacts by various criteria, such as name or company, to make it easier to find specific contacts.

It also allows users to add and view their contacts easily. Users can add new contacts manually & this information is saved and can be viewed later on. Users can view their contact details in a single location.

Finally, users can use the integration tools to integrate their contact database with other systems or applications. This allows them to automatically update contact details, sync their contacts with other devices, and share contact information with other users.

## **5. Literature Review**

A smart contact manager is a piece of software that helps people or organizations handle their contacts effectively. Artificial intelligence is used in this program to automate duties and improve contact management procedures. In this review of the literature, we will look at the current research on smart contact managers and how they can help both people and companies. Smart contact managers are software programs that employ artificial intelligence to assist people and organizations in managing their relationships.[1] These programs can organize contact information, automate follow-up duties, and give information on previous communications. Due to their capacity to improve efficiency and streamline contact management procedures, smart contact managers are being used more frequently.

Using clever contact managers has several advantages. One of the main advantages is that repetitive duties like adding contacts, updating contact information, and scheduling follow-up tasks can be automated to save time and boost productivity.[2] Additionally, they can give users information about past communications, helping them to better comprehend their relationships with their contacts. By offering insights into customer behavior and preferences, intelligent contact managers can also assist companies in strengthening their customer relationship management.

Users can handle their contacts more successfully thanks to several features that smart contact managers offer. These features include analytics, job automation, communication history, contact organization, and search for contacts. Users can group contacts according to a variety of factors, such as location, business, or job title, through contact organization. Users can easily locate specific contacts using contact search by entering search terms like their name or email address.[3] Users can plan follow-up tasks, such as

phone calls or emails, thanks to task automation. Users can examine all previous communications, including phone calls, meetings, and emails, with a contact by using the communication history feature. Users can improve their communication strategies by using insights into conversation patterns provided by analytics.

Smart contact managers have a variety of use cases and can be used by both people and businesses. Sales professionals can use them to manage leads and customer connections, HR professionals can use them to manage employee contacts, event planners can use them to manage attendee contacts, and executives can use them to manage their professional network.

In conclusion, smart contact managers are software tools that can make it easier for people and companies to handle their contacts. They provide numerous advantages, including time savings, better customer relationship management, and increased productivity. They have a wide range of features, including analytics, job automation, communication history, contact organization, and contact search. Smart contact organizers are useful because they can be applied in many different contexts.

Author	Year	Proposed Technique	Parameter	Tools Used	Results
Donath, J., Karahalios, K., & Viegas, F.	1999	Pattern recognition and message reading algorithms	Loom visualizations, visualizing the messages, create and classify each of the contact, automatic text classification	One programming language, UI/UX interface, JavaScript,HTML, CSS	More efficiency, better organization, more communication
Erickson, T.	1999	Agile methodologies, data model, user interaction	UI, user usability,features,	Programming language	Better organization, better data management
Zhiheng Zhao, Ray Y. Zhong, Yong-Hong Kuo, Yelin Fu, G.Q. Huang	2021	novel cyber-physical architecture for spatial temporal analytics	UI, Security, performance, support, integration	Programming language, UI/UX, JS, HTML, CSS, Cloud Platform, Database	More efficiency, more communication, scalability, performance
Millen, D. and	2000	IP-based telephony control	Control and monitoring of an ISDN desktop	Java, MySQL, JS, HTML, CSS	More efficiency, better organization,



Henderson, D.			phone from a local PC and remotely from the web		more communication, better data management, increased productivity
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## 6. Research Gap

Despite the widespread adoption of smart contact managers, there are still several research gaps that need to be addressed. Some of the research gaps include:

- **User Adoption and Engagement:** Although smart contact managers are designed to simplify contact management, there is still a lack of understanding of user adoption and engagement. Research is needed to understand why some users do not adopt smart contact managers and how to improve user engagement with these tools.
- **Privacy and Security:** Smart contact managers store sensitive information, such as phone numbers, email addresses, and social media handles, and may be vulnerable to data breaches. Research is needed to develop best practices for securing contact information in smart contact managers.
- **Integration with Other Applications:** Smart contact managers often integrate with other applications, such as email clients and social media platforms. However, there is a lack of research on how to optimize these integrations to enhance the user experience.
- **AI and Natural Language Processing:** Many smart contact managers use AI and natural language processing to improve search and retrieval. However, there is a need for further research on how to improve these features to make them more accurate and efficient.
- **Customization and Personalization:** While some smart contact managers allow for customization and personalization, there is a need for further research on how to optimize these features to meet the needs of individual users.
- **In conclusion,** there are several research gaps in the field of smart contact managers that need to be addressed. These gaps include user adoption and engagement, privacy and security, integration with other applications, AI and natural language processing, and customization and personalization. Addressing these gaps can help to improve the functionality and usability of smart contact managers and enhance their impact on productivity and communication.

## 7. Swot Analysis

### **Strengths:**

- Centralized storage and management of contact information
- Automated data entry and contact updates
- Ability to segment contacts and personalize communication
- Security
- Each user have individual Dashboard
- Password/credentials can be changed in case user forgets
- Improved efficiency and productivity when managing contacts

### **Weaknesses:**

- Dependence on technology and potential for data loss or technical issues
- Limited functionality for complex CRM needs or large-scale data management
- Potential learning curve for new users or employees
- May require additional investment for integration with other tools or software

### **Opportunities:**

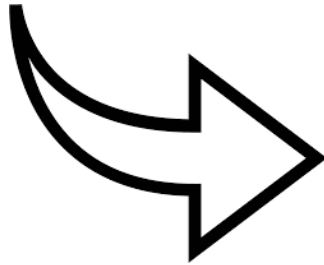
- Growing demand for digital solutions in personal and professional contact management
- Potential for customization and integration with other tools and software
- Expansion into new markets or industries with specialized needs for contact management
- Partnership opportunities with related businesses or software providers

### **Threats:**

- Competition from existing CRM and contact management software providers
- Security and privacy concerns related to storing and sharing contact information
- Rapidly changing technology and potential for obsolescence
- Economic downturns or changes in market demand for contact management solution

## 8. Problem Statement

The problem of inefficiency and disorganization associated with manual or outdated contact management methods and the difficulty in keeping track of contact information across multiple platforms, leading to missed opportunities, miscommunications, and loss of important information



Designing a smart contact management system that simplifies contact management, boosts communication, and enhances productivity while also providing a user-friendly interface and ensuring data security and privacy is a complex task. How can we develop a system that meets all these requirements and effectively addresses the challenges of modern contact management?

## 9. Technical Design

The technical design for the Smart Contact Management System will involve the use of various modern software development technologies, including front-end and back-end frameworks, APIs, and databases. The system will be designed to be scalable, secure, and efficient, providing a robust platform for contact management.

Front-end Development:

The system's front-end developed using modern web technologies, including HTML, CSS, and JavaScript. A responsive design used to ensure that the system is accessible from a wide range of devices, including desktops, laptops, tablets, and smartphones.

Back-end Development:

The system's back-end developed using a server-side programming language such as SpringBoot. The back-end framework used will be chosen based on the project's specific requirements. The system uses a RESTful API to communicate between the front-end and back-end, ensuring that the system is scalable, secure, and efficient.

Database Design:

The system's database designed to accommodate a wide range of contact information, including names, addresses, phone numbers, emails, and other relevant data. A relational database management system such as MySQL uses to ensure data accuracy, consistency,

and integrity. The database will also be designed to provide robust backup and recovery mechanisms.

#### Authentication and Authorization:

User authentication and authorization implemented using modern security technologies such as OAuth2.0, OpenID Connect, or JSON Web Tokens. These technologies ensure that only authorized users can access the system, providing an additional layer of security.

#### Data Encryption:

Data encryption used to protect contact data at rest and in transit. Transport Layer Security (TLS) will be used to encrypt data in transit, while data at rest encrypted using industry-standard encryption algorithms such as Advanced Encryption Standard (AES).

#### Testing:

A comprehensive testing strategy implemented to ensure that the system is fully functional and meets the project's specific requirements. This includes unit testing, integration testing, and system testing.

#### Deployment:

The system is deployed using Docker ensures that the system is scalable, reliable, and efficient. Continuous integration and continuous deployment (CI/CD) techniques will be used to automate the deployment process and ensure that the system is always up-to-date.

## 10. Technology Stack

- Spring Boot (IDE)
- Java
- MYSQL to manage database
- Docker for Deployment
- Git(version control)
- HTML
- CSS

## 11. Functional Requirements

It includes the features and functionalities that the system provides to meet the needs of the customers.

#### FUNCTIONALITIES:

- Contact Management System manages the Mobile details online for Profile details,

Emails details, Contact.

- It tracks all the information of Credential, Mobile, Profile etc
- Shows the information and description of the Contact, Telephone
- To increase efficiency of managing the Contact, Credential
- It deals with monitoring the information and transactions of Profile.
- Editing, adding and updating of Records is improved which results in proper resource management of Contact data.
- Manage the information of Profile, contact

FEATURES:

- Creating & Changing Issues at ease
- User Accounts to control the access and maintain security
- Targets & Milestones for guiding the programmers
- Attachments & Additional Comments for more information
- It contains better storage capacity.
- Accuracy in work.
- Easy & fast retrieval of information.
- Well designed reports.
- Decrease the load of the person involved in the existing manual system.
- Access of any information individually.
- Work becomes very speedy.
- Easy to update information

## **12. Project Proposal**

The Smart Contact Management System project is an innovative solution that aims to simplify the contact management process for individuals and businesses alike. In today's fast-paced world, keeping track of contacts and managing relationships is becoming increasingly challenging, and this system seeks to alleviate those challenges by providing a centralized platform for contact management. One of the key objectives of the project is to provide a user-friendly interface that is easy to navigate and intuitive to use. This is achieved by using modern software development technologies and frameworks that are designed to streamline the user experience. The system's interface is designed with the end-user in mind, ensuring that the system is easy to use and navigate, even for those with limited technical knowledge. The system includes a centralized database for storing contact information. This database is designed to accommodate a wide range of contact information, including names, addresses, phone numbers, emails, and other relevant data. The database will be designed to ensure data accuracy, consistency, and integrity, while also providing robust backup and recovery mechanisms. The Smart Contact Management System provides tools for tracking interactions with contacts and setting reminders for follow-up actions. This will enable users to stay on top of their interactions with contacts and ensure that they are maintaining strong relationships with them. The system will also provide data visualization tools, enabling users to analyze their contact data and identify trends that can help inform their business decisions. The project follows an agile

development methodology, which involves iterative development and feedback loops. This methodology ensures that the system is developed in a flexible and adaptive manner, allowing for changes and modifications to be made along the way based on user feedback. In terms of deliverables, the project provides a fully functional Smart Contact Management System that meets the specific requirements of the project. Additionally, user manuals and training materials, technical documentation, test plans and reports, and deployment instructions and support documentation will be provided to ensure that the system can be effectively used and maintained.

### 13.Methodology

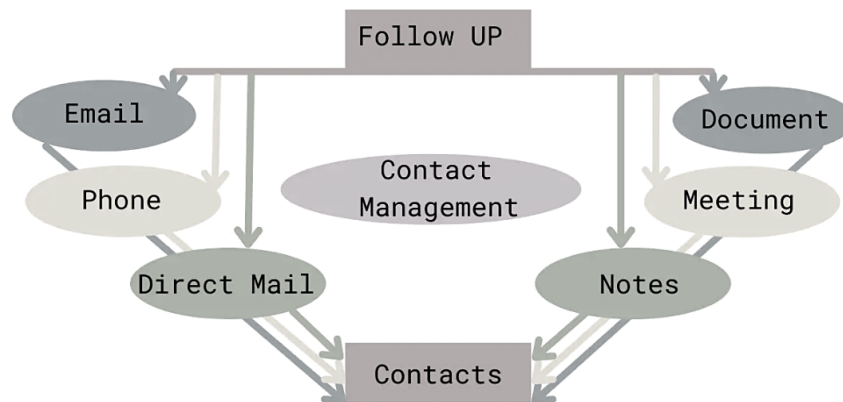


Fig. 1- Contact Management System

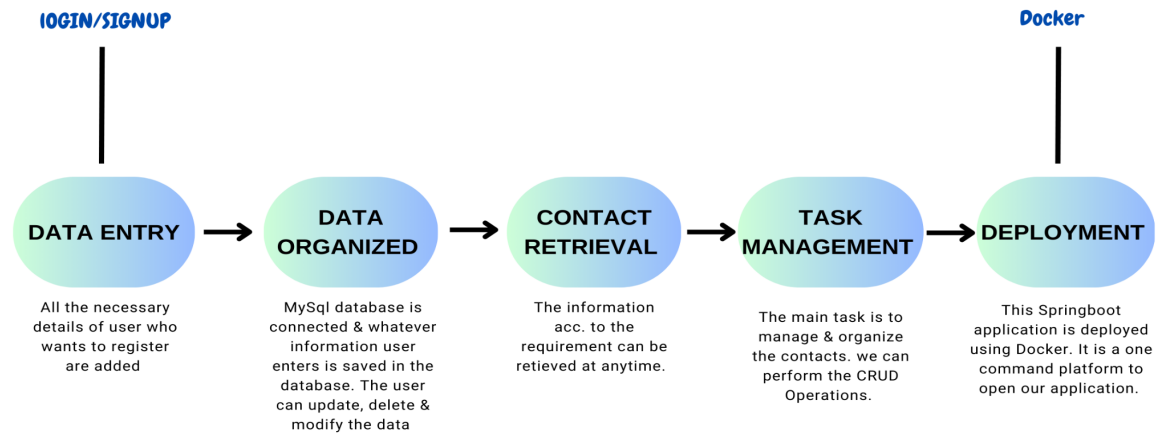


Fig. 2- Methodology Diagram

Here, we started from zero and built a web application using HTML, CSS, JavaScript, Java, Spring Boot framework, with MySQL serving as the database. To manage the mobile, phone, person, and address information is the primary goal of the SpringBoot-maven based project on Smart Contact Contact Management System. Only the administrator has assured access because the Project is entirely constructed at the administrative end. To organize, collaborate, and synchronize health, work, lifestyle, and other details, advanced contact managers are also known as individual resource management (IRM) tools. IRM tools are systems for managing an individual's interactions with present and future contacts. As shown in the above approach diagram, the first step is to create a sign-up/sign-in on our website. The user will need to input information like name, email, password, and a brief description of themselves on this page. Data inputted by the user after registration is now stored in our data center which for this project is a MySQL Server. The user who logged in has the specific data and he/she can add contacts or any information that needs to be saved. The material is organized into categories based on needs and priorities. Data that has been saved can easily be modified, deleted, or updated as needed by the user. Once this process is finished, the contacts that were saved can be retrieved whenever and wherever necessary. The main goal of this project is to organize messages, follow-ups, reminders, and all other sensitive and essential information so that the user doesn't miss anything crucial.

### **Implementation Steps: -**

- Install Java, Maven, and your preferred STS (e.g., IntelliJ IDEA or Eclipse). Create a new Spring Boot project using Maven: Use the Spring Initializr website or your IDE to create a new Maven-based Spring Boot project. Include the necessary dependencies, such as Spring Web, Thymeleaf, and Spring Data JPA.
- Create the necessary database tables: Use an SQL database management tool (e.g., MySQL Workbench) to create the necessary database tables for your bug tracker management system.
- Define the model classes: Define the model classes in your Spring Boot project to map the database tables. Use annotations such as `@Entity` and `@Id` to define the primary keys.
- Implement the repository layer: Implement the repository layer in your Spring Boot project to handle database operations such as CRUD (Create, Read, Update, Delete) operations. Use Spring Data JPA to create the repository interfaces.
- Implement the service layer: Implement the service layer in your Spring Boot project to handle business logic. Use Spring annotations such as `@Service` to define the service classes.
- Implement the controller layer: Implement the controller layer in your Spring Boot project to handle HTTP requests and responses. Use Spring annotations such as `@Controller` to define the controller classes.
- Implement the views: Implement the views in your Spring Boot project to display the data to the user. Use a template engine such as Thymeleaf to create the HTML templates.
- Test your application: Test your application by running it locally and verifying that it functions correctly.
- Deploy your application: Deployed our application to a web server or cloud platform(W099e used Docker for the deployment)

## **14. Objective**

The objectives of a smart contact manager are to help individuals or businesses efficiently manage their contacts, streamline communication, and build stronger relationships with their contacts. Some specific objectives of a smart contact manager may include:

- A Centralized User-Friendly Contact Management system which provides a single location for storing and managing all contact information including names, phone numbers, email addresses, work profile, and other details. We can perform the CRUD Operations(Create, Read, Update, Delete) on the added contact details.
- A 2-step verification for each user provides security & privacy. Each user has a different dashboard to work-on & manage the contacts(No 2 users can interact). The user credentials are being saved in the MySql workbench at the backend.
- This SpringBoot Application is deployed using Docker.

By achieving these objectives, a smart contact manager can help businesses build stronger relationships with their contacts, increase customer retention, and ultimately drive revenue growth.



## 15. Feasibility Study

- Technical feasibility: A Smart Contact Manager software tool is technically feasible, given the availability of modern software development tools and technologies. The tool can be built as a cloud-based service, making it easily accessible to users on various devices and platforms.
- Economic feasibility: The economic feasibility of a Smart Contact Manager software tool depends on various factors, such as the cost of development, marketing, and maintenance. However, given the growing demand for efficient contact management tools, a well-designed and marketed tool can have a significant potential return on investment.
- Operational feasibility: The operational feasibility of a Smart Contact Manager software tool depends on the ease of use and user acceptance. If the tool is designed to be user-friendly, and if the benefits of using the tool are clearly communicated to users, it is likely that users will adopt the tool.
- Legal and regulatory feasibility: The legal and regulatory feasibility of a Smart Contact Manager software tool depends on compliance with data privacy regulations and other legal requirements. As long as the tool is designed to be compliant with these regulations, it is likely to be legally and regulatory feasible.

## 16. Proposed solution

- Centralized User-Friendly Contact Management System:

A centralized user-friendly contact management system is a software application that allows users to store and manage all their contact information in one place. This system provides a single location for storing names, phone numbers, email addresses, work profile, and other details. The main purpose of this system is to make it easy for users to access their contacts quickly and efficiently.

- CRUD Operations:

CRUD stands for Create, Read, Update, and Delete. These are the basic operations that can be performed on any database or storage system. In this case, the contact management system allows users to create new contacts, read and view existing contacts, update contact information, and delete contacts as needed.

- 2-Step Verification:

Two-step verification, also known as two-factor authentication, is a security process in which a user provides two different authentication factors to verify their identity. This provides an extra layer of security and helps prevent unauthorized access to user data. In this system, each user must go through a 2-step verification process before gaining access to their dashboard. This ensures that only authorized users can access the system and the data stored within.

- User Dashboards:

Each user has their own dashboard that they can use to manage their contacts. This dashboard provides a personalized experience for each user, allowing them to view, edit, and delete their contacts as needed. The dashboard is designed to be user-friendly and easy to navigate, so that even non-technical users can use it easily.

- **MySQL Workbench:**

MySQL Workbench is a graphical tool used to manage MySQL databases. In this system, user credentials are saved in the MySQL Workbench at the backend. This ensures that user data is stored securely and can be accessed easily by authorized users.

- **SpringBoot Application:**

SpringBoot is a popular Java framework used to develop web applications. In this case, the contact management system is developed using SpringBoot. This provides a robust and reliable platform for building the application.

- **Docker Deployment:**

Docker is a platform used to develop, deploy, and run applications in containers. In this system, the SpringBoot application is deployed using Docker. This ensures that the application is portable and can be deployed easily on different environments. Docker also provides a high level of security and isolation, ensuring that the application is secure and reliable.

## **17. Experimental Results**

- **Accuracy of contact information:** The accuracy of contact information entered into the tool can be measured to ensure that all information is correctly stored and easily accessible. Earlier we followed the file system approach and now all the records are being stored online. It can be accessed anytime from any location.
- **Time efficiency:** The time taken to enter and retrieve contact information can be measured to determine the efficiency of the tool.
- **User Interaction & satisfaction:** The level of user satisfaction with the tool can be measured through user surveys or feedback to determine if the tool is meeting the needs of the users. It can be determined according to the feedback on the UI/UX of the application. UI/UX is kept simple for the application so that users can use the tool effectively.
- **Communication effectiveness:** The effectiveness of communication tools integrated into the software can be measured based on factors such as response time, delivery rates, and user feedback. The ability of the tool to integrate with other systems or applications can be measured based on the ease of integration, compatibility, and level of functionality provided.
- **CRUD Operations:** Create, Read, Update, and Delete operations are used to manage contact data. For creating new contacts, a function is built & it will add contact and all the other details and this information is stored in the MySQL. Updating and deleting functions can be used to modify or remove existing contact

entries. Reading can be implemented using a function to retrieve stored contact data.

## 18. Test Verification

Test verification is an important process in software development that ensures that the software meets the required specifications and functionality. Here are some potential test verification methods that can be used for a smart contact manager:

- **Functional testing:** This involves testing the individual functions of the smart contact manager to ensure that they perform as intended. For example, testing the ability to add, edit, and delete contacts, search for contacts, and export contact data.
- **Integration testing:** This involves testing the integration between the smart contact manager and other applications or systems. For example, testing the integration with email clients, calendar applications, or social media platforms.
- **Performance testing:** This involves testing the performance of the smart contact manager under various conditions, such as high traffic or low connectivity. For example, testing the load time of the application, the response time when performing searches, and the ability to handle a large number of contacts.
- **Security testing:** This involves testing the security of the smart contact manager, including testing for vulnerabilities and weaknesses in the encryption and authentication mechanisms. For example, testing the ability to prevent unauthorized access to contact data and protect against data breaches.
- **User acceptance testing:** This involves testing the smart contact manager with actual users to ensure that it meets their needs and preferences. This can include soliciting feedback from users on the usability, functionality, and overall user experience.

### Test Plan & Test cases:

Here is a test plan and test cases that can be used to ensure that the smart contact management system is functioning as expected:

The test plan will include the following steps:

- a. **Requirements Analysis:** In this step, the requirements of the smart contact management system will be analyzed, and the test plan will be prepared based on the requirements.
- b. **Test Environment Setup:** The test environment will be set up, including the hardware, software, and network components required for testing.
- c. **Test Case Development:** The test cases will be developed based on the requirements, and each test case will be assigned a unique identifier.

d. Test Case Execution: The test cases will be executed, and the results will be recorded.

e. Test Report Generation: The test report will be generated, and it will include the test results, the defects found, and the recommendations for improvement.

Test Cases:

The following are some test cases that can be used to test the smart contact management system:

a. Test Case 1: Adding a Contact

b. Test Case 2: Editing a Contact

c. Test Case 3: Deleting a Contact

d. Test Case 4: Searching a Contact

e. Test Case 5: Sorting a Contact

## **19. Conclusion and future scope**

- In conclusion, a smart contact manager can be a valuable tool for managing contacts and improving productivity and communication. It can be used to store and organize contact information, as well as to integrate with other applications for seamless communication.
- Through the use of AI and natural language processing, smart contact managers can also provide advanced search and retrieval features, as well as personalized recommendations for contacts and communication methods. Additionally, customizable settings can allow users to tailor the contact manager to their individual preferences and needs.
- In terms of future scope, there are several potential areas for improvement and expansion of smart contact managers. One area is the integration with emerging technologies, such as augmented and virtual reality, to enhance the user experience and provide new ways to interact with contacts.
- Another area is the use of advanced analytics and machine learning to provide insights into communication patterns and trends. This can help users better understand their communication habits and optimize their communication strategies for improved productivity and effectiveness.
- Furthermore, smart contact managers can potentially leverage blockchain technology for increased security and privacy, as well as for the ability to seamlessly share contact information across different platforms and devices.

- Overall, a smart contact manager can provide significant value for individuals and organizations looking to improve their contact management and communication. As technology continues to evolve, there is a vast potential for further development and innovation in this space.
- The future scope of smart contact managers is vast, as there are many potential areas for improvement and expansion. Here are some of the key areas where smart contact managers could evolve in the future:
- Integration with emerging technologies: Smart contact managers could potentially integrate with emerging technologies such as virtual and augmented reality. This could enhance the user experience and provide new ways to interact with contacts.
- Advanced analytics and machine learning: By using advanced analytics and machine learning, smart contact managers could provide insights into communication patterns and trends. This could help users optimize their communication strategies for improved productivity and effectiveness.
- Blockchain technology: Smart contact managers could leverage blockchain technology to increase security and privacy, as well as to seamlessly share contact information across different platforms and devices.
- Voice assistants and natural language processing: With the rise of voice assistants such as Amazon Alexa and Google Assistant, smart contact managers could potentially integrate with these systems to provide a more seamless user experience. Natural language processing could also be used to improve search and retrieval features.
- Social media integration: Smart contact managers could potentially integrate with social media platforms to provide a more comprehensive view of a user's contacts and communication history.

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