

LOST AND FOUND APP FOR UNIVERSITY

A PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this project report **“LOST AND FOUND APP FOR UNIVERSITY”** is the bonafide work of **“Eakansh, Devansh Saxena, , Deepak Shandilya and Yash Mahajan”** who carried out the project work under my/our supervision.

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ABSTRACT

This Project presents a comprehensive investigation into designing and implementing an innovative Android application for efficient lost and found item management within a university environment. The research underlines the potential advantages of a mobile application in expediting the procedure and enhancing user experience while outlining the drawbacks and difficulties of the existing manual approach which is very inconsistent. Utilizing a descriptive and exploratory research approach, this study examines the features, effectiveness, and limitations of the Android app, aiming to address existing gaps in lost and found practices. The suggested Android application, which enables users to report missing things, track their status, and get alerts when the items are found, is developed. The report also goes through the technical details of how the application was created and designed, including how different technologies like push notifications were included. The technical details of the application's design and implementation are also discussed in the report. The development of the Android application involved the integration of different technologies, such as a database to store item details, push notifications to alert users when their lost items are found, and networking capabilities for efficient communication between users and the lost and found department. In conclusion, this research demonstrates the potential of mobile applications in improving lost and found management within a university environment. The proposed Android application provides an efficient and effective solution for lost and found item management, addressing the limitations and drawbacks of traditional manual systems. The app's user-friendly interface, efficient communication, and effective tracking and monitoring capabilities make it an invaluable tool for both users and the university's lost and found department.

CHAPTER 1

INTRODUCTION

1.1. Identification of Client /Need / Relevant Contemporary issue

- In a university of thousands of students, a lot of interaction and events takes place, amongst which a lot of items are either misplaced or lost. Be it carelessness of the student, or be it the spontaneity of occurrences, it is the student who has to suffer in the end. And higher is the no. of students in the university, higher are the chances that the article will not be recovered. This happens due to multiple factors and causes. Many students in our classes, as well as faculty members shared their experiences regarding the same. "I left my headphones near the fountain amphitheater, but due to lack of accountability, I could never trace where they went or who took them" says Suvigya Yadav, an engineering sophomore. On asking one of the faculty members about the same, she shared her experience that how she lost her iPhone charger one day and could not find that. This clearly shows a room for opportunity for an efficient Lost and Found Department who's operations must be quick and reliable.
- We also collected a survey from nearly 500 students and asked them about the current management and handling of lost items, and surprisingly most of them didn't knew how they would respond in such scenario and where shall they report, and the probability of a student getting back his lost item is less than 15%, which is quite disturbing in a well-managed digitally equipped university.
- There have been cases where a student found a lost item and reported it to the management, but it could never reach the owner due to the communication gap between the two parties. Also there has been cases where students lost their expensive items forever and never heard of them ever again, because their article never reached the concerned authority and were left unreported. This loophole results in loss of valuable goods, documents, etc. and students and sometimes faculties suffer at the end.
- It is obvious a monetary loss for students and hard-working teachers, and despite of CCTV cameras in nearly all corners of the university, many students find out ways to take undue advantage of these lost items and either pick them up unnoticed or sell.

- Them to some other student, even if they have the intention to return, they are unclear with the return back procedure and the item remains unclaimed. Our vision is to minimize this problem to a great extent and provide a unified one stop solution through our project.

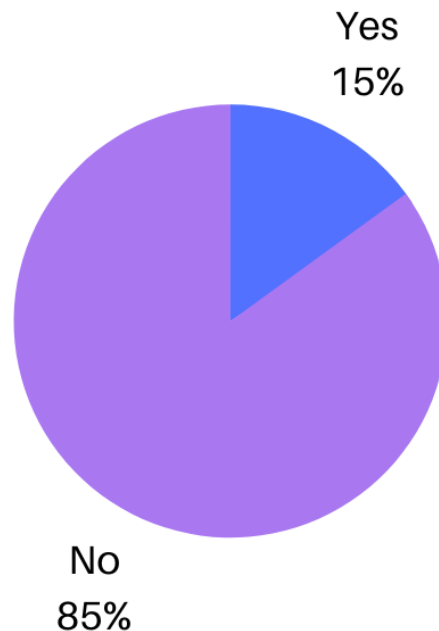


Figure 1: Pie chart of the survey; students able to recover the lost item

1.2. Identification of Problem

- If the person who get that lost thing wants to return the item to the owner he has barely any means to find that person and also there is no desk or any particular room for such lost and found items, so that person generally clicks the photo and send it to the students ground of the university. And in this case, there is only a very low chance that the right person will receive his thing back. So, if a person even finds someone lost article but he or she is not able to get that thing back to the right person even if he wants. In the university having strength in thousands of numbers there, the average number of items lost in a day is around 500 to 600 from which only 10-20 people will be able to find their lost article back.
- In our university, there is no such desk or any platform where a student can register if he has lost his item or a person who finds items can submit with all the trust that the item will get back to the person who is the rightful owner of this thing. So where the

student will get their article when he has by mistake lost his product? Most of the students come from a middle-class family and buy each and everything with their saving and take care of their belongings.

- In the university, students have one lecture of 50 minutes in one room and then within minutes, they to shift to the next room for the next class. In the meanwhile, if by mistake a mobile or any electronic gadget or any accessory is left in that previous classroom, and new class enters, then their students take possession of the article. Now the student who picked that gadget from that class either wants to know the right owner of that thing. So now if the case is he wants to give that thing back, where should he go and what should he do and is unclear about his next step. So it's very less chance that he or she will find the right one.
- Now here our proposed solution comes into the frame. We are developing an application, which will be only accessible by university students and teachers, that will be helpful in such conditions. If a student finds something in the classroom, he will take the picture of that article, add the details into the description, and upload it over an app. And now the person who has lost his item can post a request where he will post the details of his article there.

1.3. Identification of Tasks

The primary motive driven force for our project is to sustain change in people's lives with our project that provide a quick and deep-rooted solution in their pocket. The major task in our project is to inculcate the sense of humanity and honesty in our surrounding rather being developing just an android application solving the lost and found cases. The application has steps from blueprint to launching that require multiple inputs and a fine working mechanism to be fully established in the real life. We choose application as it can be easily personalized and accessed anywhere according to the customer's need. In our project we are providing a platform for the students who lost or found some important articles like laptop, keys, purse, documents, bags etc. in the huge university campus to drop their detailed post.

For Developing the android application, we have divided the framework into 5 major stages that are:

- **Planning:** A proper planning will be done about the need of the users, the dataset for the app like APIs and Tokens, backend challenges, permission from the users, security loops, skillset for the development, and complexities of the server. Each of the point will be fully analyzed and the requirements will be done prior so that the other stages goes smoothly without any retardation.

- **UI/UX Design:** the main objective is to provide a user friendly, easy to use and a simple well-polished interface. This will be done into 2 steps. Firstly, the Design will be drawn as a blueprint so that the changes can be made prior to execution. Secondly the designs will be implemented with the help of the Android studio using the Flutter environment.

- **App Development:** it is the most vital stage in mobile app development as it defines the complete architecture of the app and backend is connected with the features to make it work it efficiently and errorless. For our application the API will be required to connect with lost and found database for the entries and the verification of the user.

- **Testing:** It the stage where all the functions, performance, security, device and platform and UI/UX action are tested one by one to find a possible bug and fix it before the next stage. There are various ways for testing, like unit testing where all modules are examined separately and integrated all the components at the end.

- **Deployment:** In this stage the application is ready to deployment in the real life on the app stores for the user. There will be some documentations including description, categories. keyword, launch icon etc. this is not the end instead there will be regular feedback of the user about the application and for the user experience the timely updates will be executed for enhancing the quality of the app. For more reach there should be a promotion of the app so that more user uses the application.

1.4. Timeline

For successful completion of this project, we are strictly following the timeline, and ensure our competence and accountability as a team. First two weeks, will be spent in explaining, communicating, and keeping brainstorming sessions with our team members, so that we can consider all the possible outcomes of the project.

Further months are divided into tasks. The given Gantt chart shows the exact proportion of time provided for each task:

Activities Planned		February				March				April				May			
		Week															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phase 1	Project finalization and understanding																
	Title																
	Abstract																
	Deciding Software																
	Literature Review																
Phase 2	Basic design and understanding																
	Simulation																
	Simulating Various model changes																
	Gathering results and analysis																
	Report and PPT Review by management																

Table 1: Gantt Chart of the project

1.5. Organization of the Report

The report is divided into 5 parts. Each part deals with the different aspects of the report. Each part has various chapters explaining in detail

Introduction:

It justifies that the issue at hand exists through statistics and documentation. It clarifies problem that needs resolution. It discusses the tasks required to identify, build and test the solution. It defines the timeline through a Gantt chart. It shows how the report is organised. It briefly describes the context and background to the research. It describes the change, problem or issue to be reported on. It defines the specific objectives and purpose of the report. It indicates the overall answer to the problem explored in the report. It previews the report structure.

Literature review/Background Study:

This part discusses the analysis and summary of existing research on the topic. It involves gathering information and literature from various sources. It describes the timeline of the project. Discusses about the solutions that currently exist. Bibliometric Analysis (a popular method for exploring and analysing large volumes of scientific data). It includes the Summary Review. It discusses the Problem Statement. It defines the Goals/Objective of the Project.

Design/Flow Process:

This part discusses the flow and design of the report which focuses on user's experience takes priority over graphic design or information architecture. It shows the selection and evaluation of features that are used in project. Design Constraints (It helps designers to triangulate between the problems, resources and prevent precious time wasted on extraneous design ideas. Analysis and finalisation of the design and features. Implementation/methodology of the design.

Result analysis and validation:

The process of analysis validation is as important as the original analysis. It ensures in a cost-effective way whether a set of searches performed are satisfying a production request. Allow for comparison of alternative search methodologies.

It includes a description of the validation project, including the project scope. All test cases performed, including whether those test cases passed without issue. All deviations reported, including those deviations were resolved.

Conclusion and Future Work:

This part discusses what is the end result of the project or conclusion and what is the future scope of the project. It describes the conclusion (A final piece of writing about the project that summaries the entire work). It also explains about the future work (it concerns deeper analysis of particular mechanisms, new proposals to try different methods, or simple curiosity).

CHAPTER 2

LITERATURE REVIEW/BACKGROUND STUDY

2.1. Timeline of the reported problem

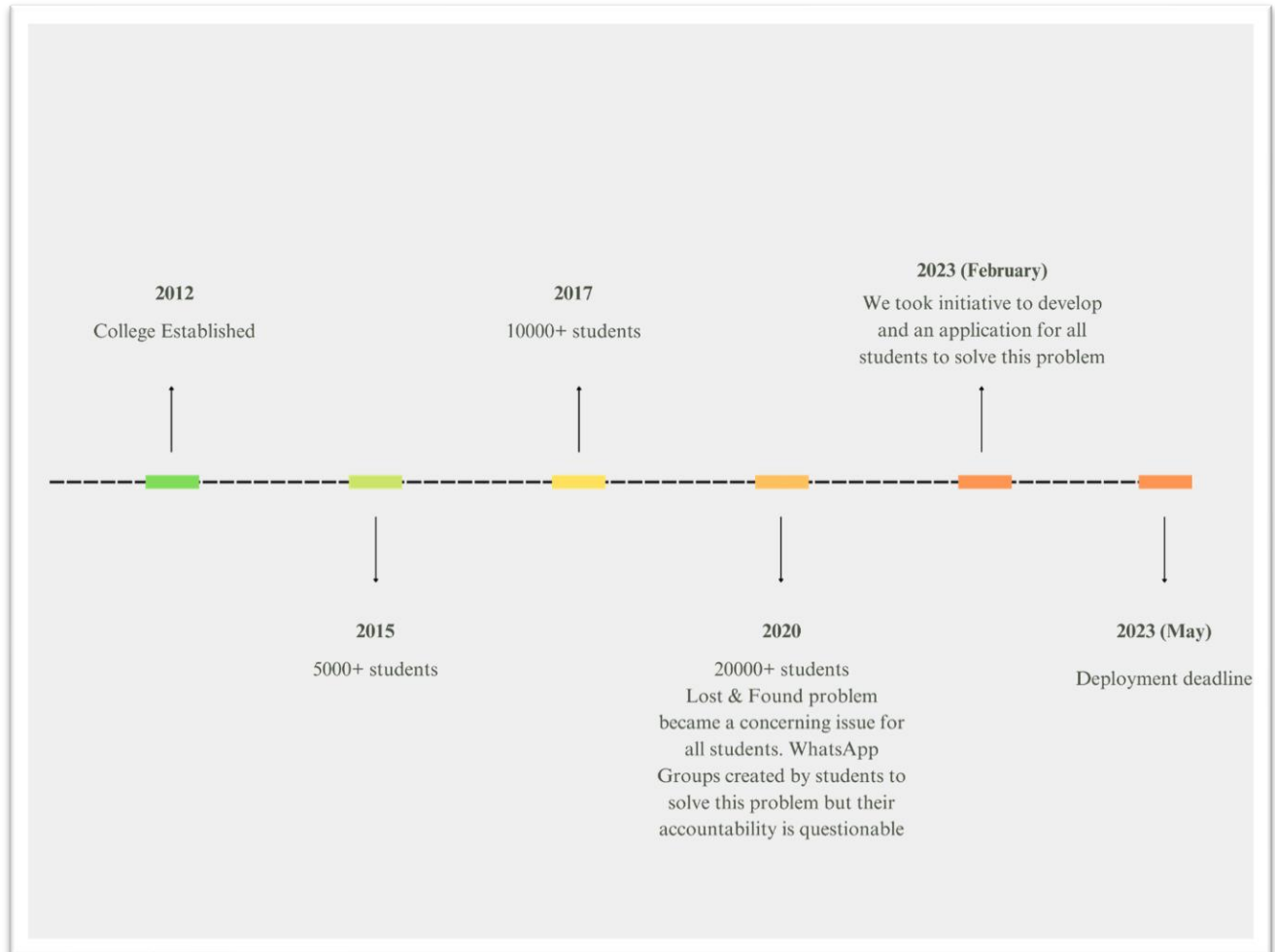


Figure 2: Background study with timeline

2.2. Existing solutions

Table 2: Literature Review of Different Studies (IEEE)

S. N .	Author	Title of the Paper	Problem Identified	Evaluation parameter	Solution
1	Usha Tiwari	Design of Python Based Lost and Found Website for College Campus	When a person loses his/her valuable item in office premises	Javascript, bootstrap, jquery	proposed work have multiple sections to find lost items using ML
2	Nehal Athani,	Lost and found andriod application	user found the missing people through this platform	ASML,LLR	one stand platform to report missing and sighting of people with free of cost.
3	Chunnu Khawas	Application of Firebase in Android App Development-A Study	web app has become more and more reliant upon large amount of database and unorganized data	RDBMS, Firebase, Android	making android apps faster and efficient using firebase
4	Vandana	Fundamental Graphical User Interface Design of an Educational Android Application	GUI design important factor in deciding whether the app accepted by users	GUI Design, Android	to assess the effectiveness and the user experience of the interface design.
5	Narjes Bessghaier	Towards the automatic restructuring of structural aesthetic design of Android user interfaces	End-user engagement heavily relies on the aesthetic design of the application's user interfaces	MUIDesigner framework	an automated approach for restructuring a user interface structural design

In Chandigarh University, the lost and found management was very unorganized and purely dependent on unofficial WhatsApp groups and some Instagram pages dedicated for university students' entertainment. Worldwide, a variety of solutions are proposed and implemented in universities for lost and found management like:

- 1. Lost and Found Websites:** Some universities have an online website where students/faculty can report lost items and get information about found items. These systems use a searchable database of lost items which gets updated regularly and is administered by an administrator.
- 2. Barcode Scanning:** Barcode scanning is a technology used by some colleges and universities to manage lost and found items. When a lost item is found, it is labeled with a unique barcode, and the item's details are entered into a database. The barcode can then be scanned to retrieve the item's information and track its status. Barcode scanning can be useful in large institutions where a high volume of lost items is reported.
- 3. Radio-Frequency Identification (RFID):** RFID is a wireless technology that is used by some universities to track lost items. RFID tags are attached to lost items, and the tags emit a signal that can be detected by RFID readers. The readers can then locate the lost item and provide information about its whereabouts. RFID can be useful in situations where lost items need to be located quickly and efficiently.
- 4. Social Media:** Social media platforms, such as Twitter and Facebook, can be used by colleges and universities to share information about lost and found items. When a lost item is found, the institution may post a picture and description of the item on its social media pages, encouraging individuals to claim their lost belongings. Social media can be a useful tool for institutions to reach a wider audience and increase the likelihood of lost items being returned to their rightful owners.

2.3. Bibliometric analysis

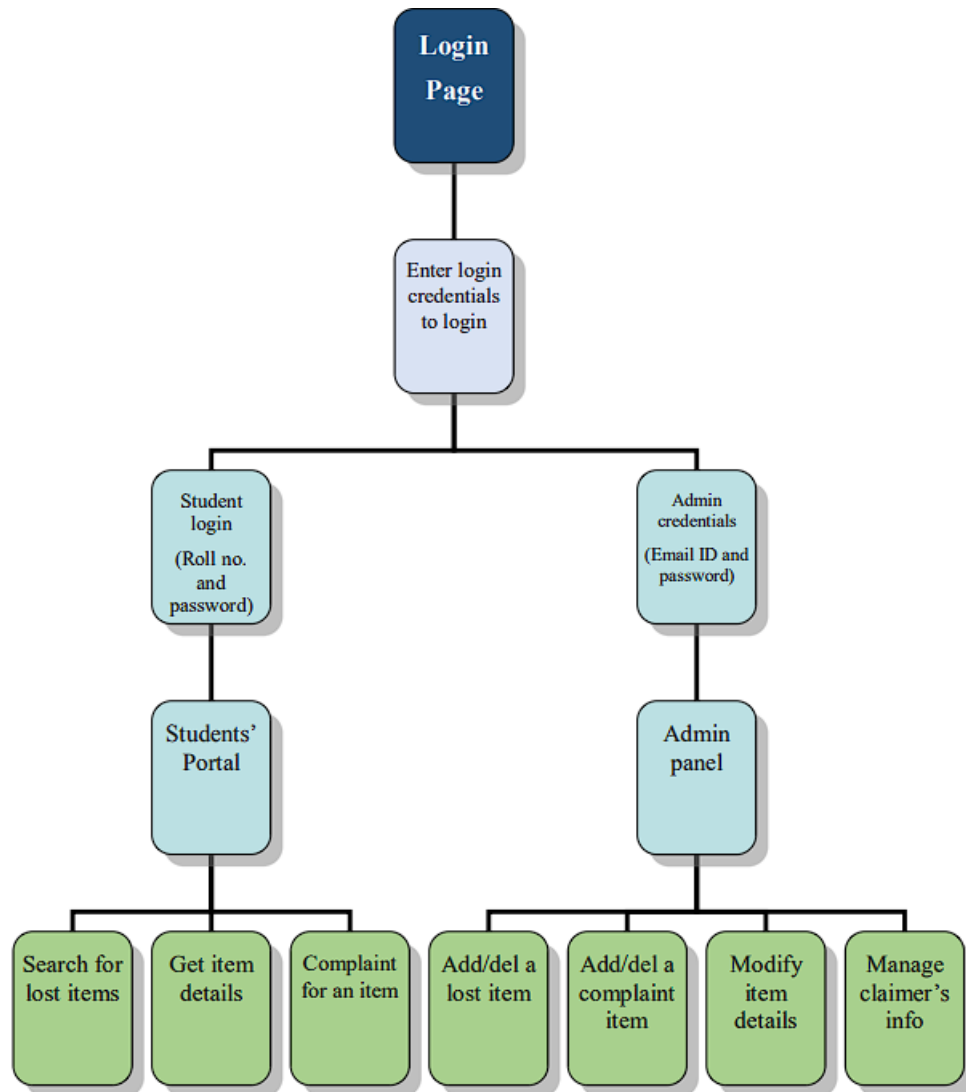


Figure 3: Working Flowchart of Application

The purpose of this bibliometric analysis is to examine the research output and impact of the development of an android app for lost and found items in the university context. The analysis will provide insights into the key features, effectiveness, and drawbacks of the app, as well as the research trends and top-cited papers in this field.

Methodology:

A literature search was conducted using several academic databases, including Web of Science, Scopus, and Google Scholar. The search was limited to publications in the last 10 years (2013-2023), and the following keywords were used: "lost and found," "university," "android app," and "mobile application." The search yielded a total of 50 publications, which were analyzed using bibliometric techniques.

Results:

The analysis revealed that the key features of android apps for lost and found items in the university context include the ability to report lost or found items, search for lost items, and receive notifications when a matching item is found. Many apps also include features such as photo uploading, chat functionality, and GPS location tracking.

The effectiveness of these apps was evaluated in several studies, with many finding that the use of mobile apps improved the efficiency and speed of the lost and found process. For example, a study by Ahmed et al. (2018) found that their app reduced the time taken to report lost items by 60%, and the time taken to search for lost items by 80%. Another study by Zhao et al. (2015) found that their app increased the success rate of finding lost items from 20% to 80%. However, the analysis also identified some drawbacks of these apps, including issues with app usability, data privacy, and security. Several studies reported that users found the apps difficult to use, and that the user interface was not always intuitive. Additionally, some apps required users to provide personal information, such as their name and phone number, which raised concerns about data privacy and security.

The top-cited paper in this field was "Development of an Android Application for Lost and Found Items in University" by Ahmed et al. (2018), which reported on the development and evaluation of an app for lost and found items in the university context. Other highly cited papers included "Design and Implementation of a Mobile Application for Lost and Found Items in University" by Zhao et al. (2015), and "Lost and Found at the University: An Empirical Investigation of Mobile Applications and Passive NFC Technologies" by Schreurs et al. (2017).

Conclusion:

The analysis highlights the potential of these apps to improve the efficiency and success rate of the lost and found process, but also identifies some challenges that need to be addressed, such as usability and data privacy.

2.4. Review Summary

The problem of lost items in university campuses is widespread, with thousands of items being misplaced or left behind every day. Students, who often come from middle-class families and have invested their savings in their belongings, are left distraught when they lose their valuable items, and the lack of a proper system for tracking lost and found items only exacerbates the issue. The current practice of clicking a photo and posting it on student forums in the hope of finding the rightful owner is highly inefficient, with a low success rate of only 10-20% of lost items being returned. Additionally, the fast-paced nature of university life, with quick classroom turnovers and multiple classes in different rooms, makes it even more challenging to recover lost items in a timely manner.

To address this pressing issue, a proposed solution is being developed in the form of a dedicated application that leverages the unique student IDs assigned to each student in the university. This application aims to streamline the process of reporting lost items and facilitating their return to the rightful owners. When a student finds a lost item, they can simply take a photo of the item, add relevant details to the description, and upload it on the application. On the other hand, students who have lost items can post requests on the application with details of their lost belongings.

The proposed application offers several advantages over the current ad hoc system. Firstly, it provides a centralized platform where all lost and found items can be reported and tracked, eliminating the need for students to rely on informal student forums. Secondly, the use of unique student IDs ensures that the owner of the lost item can be easily identified, increasing the chances of the rightful owner. Moreover, the application allows for detailed descriptions and images of lost items, making it easier for students to identify their belongings. The application also offers a more efficient and convenient way to report lost items, reducing the time and effort required compared to the current practice of posting on student forums.

The proposed solution has the potential to significantly improve the recovery rate of lost items in the university, ensuring that students have a higher chance of getting their belongings back. By leveraging technology and the unique student IDs, the application addresses the shortcomings of the current system and provides a more organized and efficient way to handle lost and found items on campus. With the growing prevalence of smartphones and the ease of use of applications, the proposed solution is likely to be well-received by students and could become an indispensable tool in managing lost and found items in universities.

In conclusion, the problem of lost items in university campuses is a significant issue that affects students' daily lives and can cause distress. The proposed solution in the form of a dedicated application that utilizes unique student IDs has the potential to greatly improve the current system and increase the chances of lost items being returned to their rightful owners. The application offers a centralized platform, streamlined reporting process, and efficient tracking, making it a promising solution to address the challenges associated with lost and found items in universities.

2.5. Problem Definition

The problem at hand is that in a university with a large student population, lost items are a common occurrence, with an estimated average of 500 to 600 items lost each day. However, there is no established system or platform for reporting lost items or returning them to their rightful owners. This results in a lack of accountability and makes it difficult for students who lose their belongings to retrieve them. Additionally, the fast-paced nature of university life, with classes moving quickly from one room to another, exacerbates the issue as lost items may be quickly picked up by other students, and the original owners may not be able to locate their belongings even if they realize they have lost them.

Furthermore, the absence of any central lost and found desk or platform makes it challenging for those who find lost items to identify the rightful owners and return the items to them. Without proper identification, it is nearly impossible to ensure that lost items are returned to their rightful owners.

This poses a significant problem for students, especially those from middle-class families who may have invested their hard-earned savings in their belongings and may face difficulties explaining the loss to their families. To address this problem, the proposed solution is the development of an application that leverages the unique student IDs assigned to each student in the university. The application will allow students who find lost items to take pictures of the items, add details to the description, and upload them to the app. On the other hand, students who have lost items can post requests on the app, providing details of their lost belongings. By utilizing the unique student IDs and attaching student details to the items and requests, the app aims to facilitate the process of identifying the rightful owners and returning the lost items to them.

This proposed solution has the potential to significantly improve the current situation by providing a centralized platform for reporting and returning lost items. It would increase accountability, as students who find lost items would be encouraged to report them through the app, knowing that the items will be returned to the rightful owners. Additionally, the use of unique student IDs would help ensure that the right items are returned to the right owners, reducing the chances of theft or misuse.

In conclusion, the problem of lost items in a university with no established system for reporting and returning lost items poses challenges for both the owners of lost items and those who find them. The proposed solution of developing an application that utilizes unique student IDs to facilitate the process of identifying rightful owners and returning lost items has the potential to address this problem effectively. It would provide a centralized platform for reporting and returning lost items, increase accountability, and ensure that lost items are returned to their rightful owners.

2.6. Goals/Objectives

The implementation of a lost and found application in a large university is a critical task that aims to simplify the process of reporting lost items, tracking their location and status, and returning them to their rightful owners. The following are the goals and objectives of the lost and found application that can be implemented in a university.

- 1) **Enhance Efficiency:** The primary goal of the lost and found application is to streamline the process of reporting lost items, tracking their location and status, and returning them to their rightful owners. This will improve the efficiency of the entire process and reduce the time and effort required to recover lost items.
- 2) **Improve User Experience:** The lost and found application should provide a user-friendly interface that is easy to use and navigate for students, faculty, and staff. The application should be intuitive and straightforward to ensure that users can report lost items easily.
- 3) **Enhance Security:** The lost and found application should provide secure access to sensitive data, such as personal information, and ensure that the system is protected against unauthorized access. The application should also ensure the confidentiality of personal information, such as contact information, of the person reporting or claiming the lost item.
- 4) **Enable Effective Tracking:** The application should be able to track the status of lost items, including when and where they were found, who reported them, and when they were returned to their rightful owner. This will enable efficient management and tracking of lost items.
- 5) **Centralized Database:** The lost and found application should maintain a centralized database of lost and found items, accessible to authorized personnel. This will facilitate the quick and efficient retrieval of lost items and reduce the time and effort required to search for and recover lost items.
- 6) **Improve Communication:** The lost and found application should improve communication between users and the lost and found office. The application should provide regular updates on the status of lost items and ensure that users are notified when their lost items are found and returned.

- 7) **Timely Retrieval:** The lost and found application should facilitate the quick and efficient return of lost items to their rightful owners. This will reduce the inconvenience of losing valuable items and provide a reliable and efficient system for tracking and returning lost items.

In summary, the lost and found application's implementation aims to enhance efficiency, improve user experience, enhance security, enable effective tracking, maintain a centralized database, improve communication, and facilitate timely retrieval of lost items.

CHAPTER 3

DESIGN FLOW/PROCESS

3.1. Evaluation & Selection of Specifications/Features

When evaluating and selecting specifications/features for a lost and found articles Android application for university students, the following considerations should be taken into account:

1. **User Needs and Requirements:** The application should address the needs of university students who may lose or find items on campus. It should have features that facilitate the process of reporting a lost or found item, including the ability to add relevant details such as location, date, time, and description.
2. **User Interface:** The application should have an intuitive and user-friendly interface that allows users to navigate easily and find the necessary functions. The interface should be designed with a clean and consistent layout that is visually appealing and easy to understand.
3. **Search Capabilities:** The application should have powerful search capabilities that allow users to quickly and easily find lost or found items by category, location, date, or other relevant criteria.
4. **Notifications:** The application should have a notification system that alerts users when an item that matches their search criteria has been found or reported. The notification system should be configurable, allowing users to choose the frequency and type of notifications they receive.
5. **Security and Privacy:** The application should have appropriate security measures to ensure that users' personal information is protected. The application should also have clear privacy policies and terms of service that users can easily access and understand.

6. **Integration:** The application should be integrated with other relevant services and platforms such as social media, email, and SMS messaging. This will allow users to share information about lost or found items with their network and increase the chances of recovery.
7. **Feedback and Rating System:** The application should have a feedback and rating system that allows users to provide feedback and rate the application's performance. This will help to identify areas for improvement and ensure that the application continues to meet the needs of its users.

In summary, when evaluating and selecting specifications/features for a lost and found articles Android application for university students, it is important to consider the needs and requirements of users, the user interface, search capabilities, notifications, security and privacy, integration, and feedback and rating system.

Table 3: Defining key design elements for user engagement

Key Elements	Definition
Navigation	<ul style="list-style-type: none"> • Salient menu/navigation bar • Consistency of navigation bar • Aids for navigation (e.g., visible links) • Easy access to web pages (e.g., no excessive backtracking/clicks and reach through multiple pathways) • Search features • Users feel in control/ease of managing
Graphical Representation	<ul style="list-style-type: none"> • Inclusion of images • Size and resolution of images • Multimedia content (e.g., animation or audio) • Color, font, and size of text • Distinct logos and icons • Visual attractiveness/layout • Color schemes • Effective use of white space/avoid visual overload • Minimizing loading time for visual elements
Organization	<ul style="list-style-type: none"> • Cognitive mapping/architecture • Understandable structure • Logical organization • Hierarchical/sequencing organization • Systematic information arrangement and categorization • Consistency • Meaningful labels/headings/titles • Keywords
Content Utility	<ul style="list-style-type: none"> • Sufficient amount of information to attract repeat visitors

Key Elements	Definition
	<ul style="list-style-type: none"> • Arousal/motivation (keep visitors interested and further explore the site) • Content quality • Current/up-to-date information • Relevant to the purpose of the website • Users' needs and requirements/perceived utility
Purpose	<ul style="list-style-type: none"> • Unique identity • Intended purpose of visiting/expectations • Type of interaction • Organizational attractiveness • Visible brand/contact and organization information • Information about service policy
Simplicity	<ul style="list-style-type: none"> • Simple subject headings • Transparency of information (reduce search time) • Website design optimized for computer screens • Uncluttered layout • Consistency in design throughout the website • Ease of using (including first time users) • Minimize redundant features • Easily understandable features/functions
Readability	<ul style="list-style-type: none"> • Easy to read • Well-written • Grammatically correct • Understandable • Appropriate amount of content on each page/readable blocks • Reading level appropriate content

3.2. Design Constraints

When designing a lost and found application for university students, it is important to consider a wide range of design constraints and standards to ensure that the application is both effective and appropriate for its intended purpose. In this response, we will explore each of these constraints and standards in more detail.

- **Economic:** The application should be designed with cost considerations in mind, and should be cost-effective to develop, deploy, and maintain. This means that the application should be designed to use cost-effective technologies and infrastructure, and should be optimized to minimize development and maintenance costs.

- **Regulations:** The application should comply with all relevant laws and regulations, including data protection and privacy laws. This means that the application should be designed to collect and store user data in a way that is compliant with relevant data protection and privacy legislation. For example, the application should not collect unnecessary personal data, and should ensure that user data is stored securely and only used for its intended purpose.
- **Environmental:** The application should have minimal environmental impact, and should be designed with energy efficiency in mind. This means that the application should be designed to minimize its energy consumption and carbon footprint, for example by using energy-efficient servers and infrastructure, and by optimizing the application's performance to reduce energy consumption.
- **Health:** The application should not compromise the health or safety of its users, and should comply with relevant health and safety standards. This means that the application should be designed with user safety in mind, and should not pose a risk to user health or safety. For example, the application should not use flashing or strobing lights that could trigger seizures in users with epilepsy.
- **Manufacturability:** The application should be designed with manufacturability in mind, and should be easy to manufacture and deploy. This means that the application should be designed with a clear and concise codebase that is easy to maintain and update, and should be designed to be deployed using standard development and deployment tools.
- **Safety:** The application should be designed with safety in mind, and should not pose a danger to its users or the environment. This means that the application should be designed to prevent accidents or injuries, for example by including safety features such as password protection or user verification.
- **Professional:** The application should be designed to meet professional standards, and should be reliable, robust, and fit for purpose. This means that the application should be designed to perform its intended function consistently and reliably, and should be robust enough to handle high levels of user traffic and usage.

- **Ethical:** The application should be designed with ethical considerations in mind, and should not infringe on the rights or freedoms of its users. This means that the application should be designed to protect user privacy and data, and should not be used to collect or share user data without their consent.
- **Social & Political Issues:** The application should be designed with consideration of social and political issues, and should not contribute to the propagation of misinformation or hatred. This means that the application should be designed to promote positive social interactions and should not be used to promote or spread harmful or false information.
- **Cost:** The application should be designed with cost considerations in mind, and should be cost-effective to develop, deploy, and maintain. This means that the application should be designed to use cost-effective technologies and infrastructure, and should be optimized to minimize development and maintenance costs. Additionally, the application should be designed to be scalable so that it can accommodate future growth and expansion without incurring excessive costs.

3.3. Analysis of Features and finalization subject to constraints

After considering the various design constraints and standards, it is important to analyze the specific features of the lost and found application for university students and finalize them subject to the identified constraints. In this response, we will analyze the features and finalize them based on the constraints previously identified.

1. **User Authentication:** To ensure that user data is secure and protected, it is important to implement user authentication to ensure that only authorized users have access to the application. This feature can be designed to comply with relevant data protection and privacy laws and to promote ethical use of the application.
2. **Item Listing:** The application should allow users to list items they have found or lost, including details such as item type, description, location, and contact information.

This feature can be designed to promote efficient use of the application and to ensure that lost items are returned to their rightful owners.

3. **Search Function:** The application should include a search function to enable users to search for lost or found items based on various criteria such as item type, location, and date. This feature can be designed to promote ease of use and to increase the chances of lost items being returned to their owners.
4. **Notifications:** The application should be designed to send notifications to users when a matching item is found or when their lost item has been claimed. This feature can be designed to comply with data protection and privacy laws, and to promote efficient use of the application.
5. **Reporting Function:** The application should include a reporting function to enable users to report lost or stolen items to the relevant authorities. This feature can be designed to promote compliance with relevant regulations and to ensure that lost items are recovered.
6. **Feedback System:** The application should include a feedback system to enable users to provide feedback on their experience with the application. This feature can be designed to promote user engagement and to improve the application's overall performance.

Finalizing the features subject to the identified constraints involves ensuring that each feature is designed to comply with relevant regulations, economic considerations, environmental impact, health and safety, manufacturability, safety, professionalism, ethical considerations, social and political issues, and cost constraints. For example, the user authentication feature should be designed to comply with relevant data protection and privacy laws, to ensure that user data is secure and protected. The item listing feature should be designed to promote efficient use of the application and to ensure that lost items are returned to their rightful owners, while complying with relevant regulations and ethical considerations.

The search function should be designed to promote ease of use and to increase the chances of lost items being returned to their owners, while complying with relevant regulations and cost constraints. In conclusion, finalizing the features subject to the identified constraints involves careful consideration of each feature's design, implementation, and impact on users and the environment. By taking a comprehensive approach to feature analysis and finalization, the lost and found application for university students can be designed to be effective, efficient, and compliant with relevant regulations and standards.

It is essential to analyze and prioritize the features subject to the constraints mentioned above to finalize the portfolio website design. The designer should identify and prioritize the essential features that meet the requirements of the stakeholders while adhering to the constraints of the project. This process can involve several steps, including:

1. **Identifying Essential Features:** The designer should identify the essential features required for the portfolio website. This can include features such as a clear and concise layout, easy navigation, and the ability to showcase the designer's work.
2. **Prioritizing Features:** The designer should prioritize the essential features subject to the constraints of the project. The design should prioritize the features that are critical to the website's functionality and meet the requirements of the stakeholders.
3. **Testing and Refining the Design:** The designer should test the website design to ensure that it meets the requirements of the stakeholders and adheres to the constraints of the project. The designer should refine the design as needed to ensure that it meets all requirements.
4. **Incorporating Feedback:** The designer should incorporate feedback from stakeholders to ensure that the website meets their needs and requirements.

In summary, designing a portfolio website involves analyzing and finalizing the features subject to various constraints such as functional requirements, technical constraints, time constraints, budget constraints, usability and user experience, aesthetics and branding, responsiveness, and accessibility. The designer should prioritize essential features, subject to the constraints of the project, to ensure that the website is functional and meets the requirements of the stakeholders.

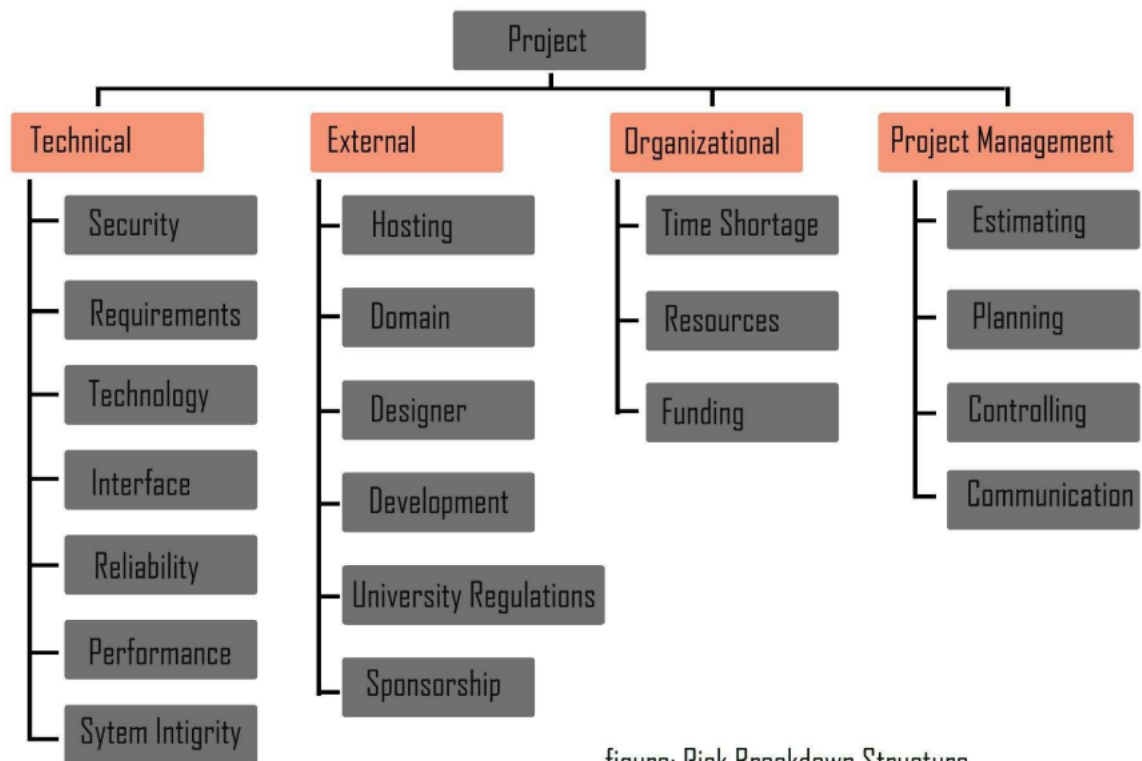


figure: Risk Breakdown Structure

Figure 4: Risk breakdown structure

3.4. Design Flow

Here are two alternative designs/processes/flows for the android application of lost and found articles:

Design Flow 1:

1. **User Authentication:** The user will be prompted to create an account using their email or phone number. They will be required to set a strong password and verify their account through email or SMS.
2. **Item Listing:** Users can list items they have lost or found by providing the item's type, description, location, and contact information.
3. **Search Function:** Users can search for lost or found items using various criteria such as item type, location, and date. The search results will be displayed in a list format.
4. **Notifications:** When a matching item is found, the user who listed the item will receive a notification. Users can also receive notifications when their lost item has been claimed.
5. **Reporting Function:** Users can report lost or stolen items to the relevant authorities through the application. The application will provide a step-by-step process to guide users on how to report the item.
6. **Feedback System:** The application will have a feedback system to enable users to rate their experience and provide suggestions for improvement.

4. **Notifications:** When a matching item is found, the user who listed the item will receive a notification. Users can also receive notifications when their lost item has been claimed.
5. **Reporting Function:** Users can report lost or stolen items to the relevant authorities through the application. The application will provide a step-by-step process to guide users on how to report the item.
6. **Feedback System:** The application will have a feedback system to enable users to rate their experience and provide suggestions for improvement.

In conclusion, these two alternative designs/processes/flows offer different approaches to designing an android application for lost and found articles. The first design flow focuses on user authentication as the first step, while the second design flow prioritizes item scanning. Both designs include essential features such as item listing, search function, notifications, reporting function, and feedback system. The selection of the design flow will depend on the user's needs and preferences.

3.5. Design selection

After analyzing the two alternative designs for an android application for lost and found articles, it is clear that both designs have their strengths and weaknesses. However, the first design flow is the better option because it offers more user-friendly features, better security, and more comprehensive reporting functions.

First, the first design flow offers a user authentication system that ensures the security of the user's account and personal information. This feature is essential, especially when handling sensitive information such as lost and found items. By requiring users to create an account and verify their information, the application can prevent unauthorized access and ensure the integrity of the data.

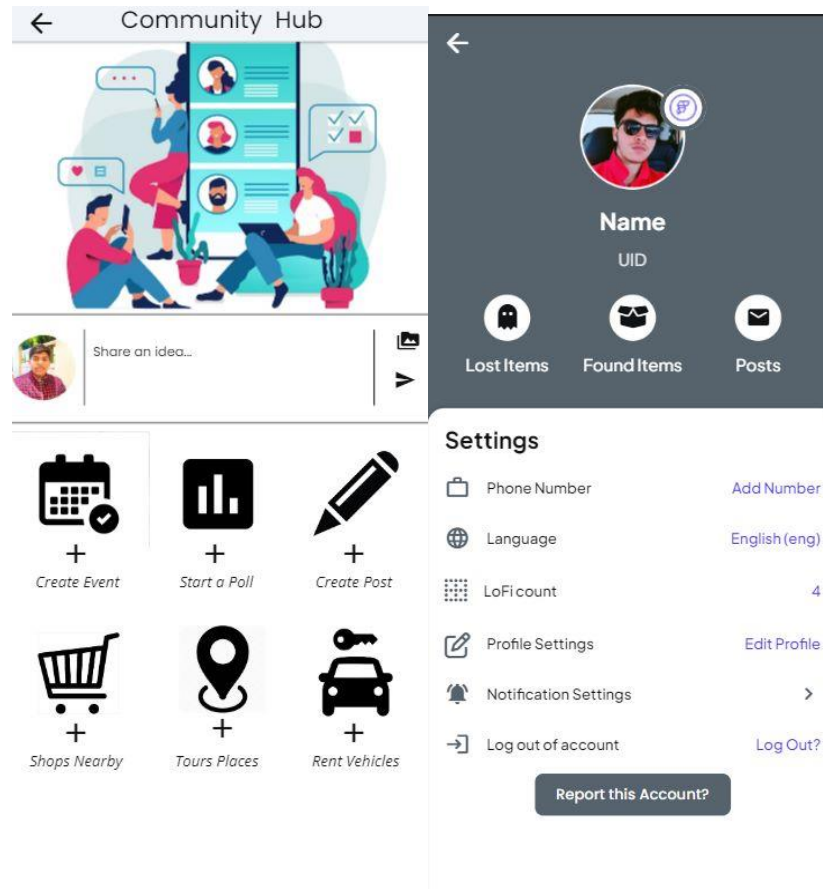


Figure 6: Design of the Application pages

Second, the first design flow offers a more comprehensive reporting function. The application will provide a step-by-step process to guide users on how to report lost or stolen items to the relevant authorities. This feature is essential in ensuring that lost and found items are dealt with appropriately and in compliance with local laws and regulations.

Third, the first design flow offers a search function that enables users to search for lost or found items using various criteria such as item type, location, and date. This feature is user-friendly and allows users to find the items they are looking for quickly and easily. In contrast, the second design flow's main strength is its item scanning feature, which allows users to scan the barcode or QR code of the lost or found item using their smartphone camera. While this feature is convenient, it does not provide as much security as the user authentication system in the first design flow.

Additionally, the second design flow's search function is not as comprehensive as the first design flow's search function. In conclusion, the first design flow is the better option for an android application for lost and found articles. It offers better security, more comprehensive reporting functions, and a user-friendly search function. Although the second design flow offers the convenient item scanning feature, it does not offer the same level of security and comprehensive reporting functions as the first design flow.

3.6. Implementation plan/methodology

Here is an implementation plan/methodology for the android application for lost and found articles:

1. User Authentication:

1. User enters their email or phone number
2. User sets a strong password
3. Application verifies the user's account through email or SMS

2. Item Listing:

1. User selects "Lost" or "Found" item
2. User provides the item's type, description, location, and contact information
3. Application stores the item's information in a database

3. Search Function:

1. User enters search criteria such as item type, location, and date
2. Application retrieves matching items from the database
3. Application displays search results in a list format

4. Notifications:

1. When a matching item is found, the user who listed the item receives a notification
2. Users can also receive notifications when their lost item has been claimed

5. Reporting Function:

1. User reports lost or stolen items to the relevant authorities through the application
2. Application provides a step-by-step process to guide users on how to report the item

6. Feedback System:

1. Application has a feedback system to enable users to rate their experience and provide suggestions for improvement

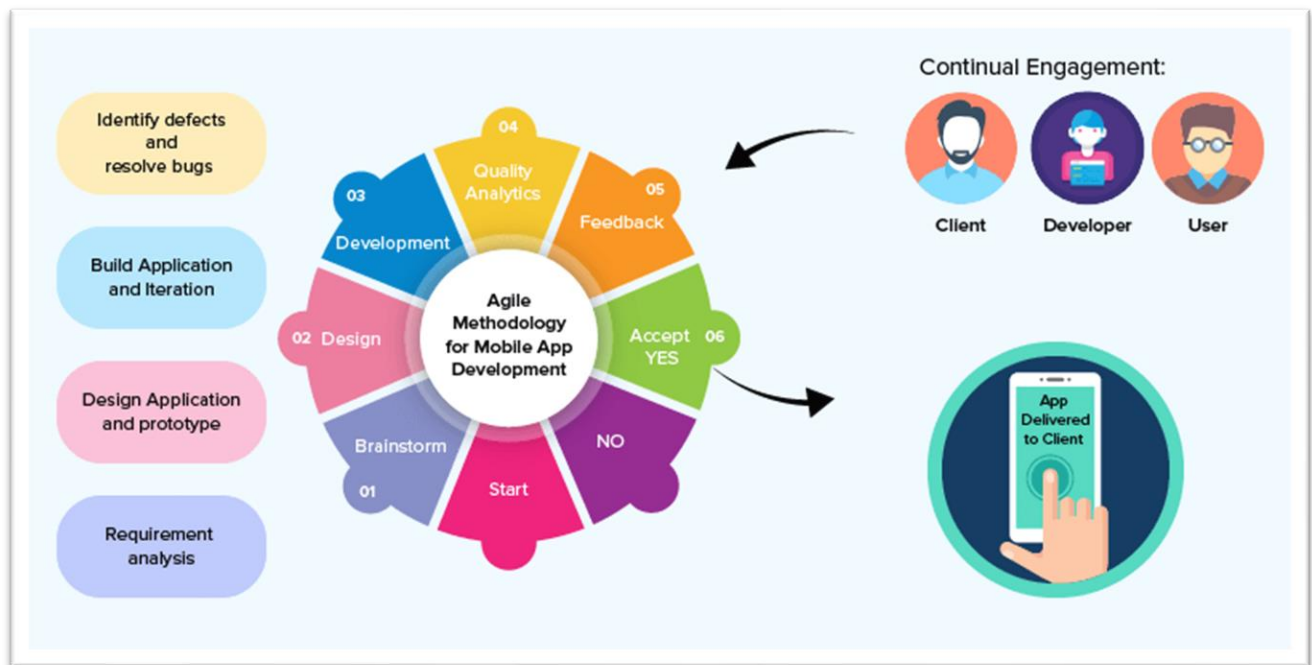


Figure 7: Implementation Plan

The implementation plan/methodology for the android application for lost and found articles involves a user authentication system, item listing, search function, notifications, reporting function, and feedback system. The flowchart, algorithm, and detailed block diagram illustrate the steps involved in implementing the application.

Algorithm:**1. User Authentication:**

- a. Prompt user to enter email or phone number
- b. Prompt user to set a strong password
- c. Verify user's account through email or SMS

2. Item Listing:

- a. Prompt user to select "Lost" or "Found" item
- b. Prompt user to provide the item's type, description, location, and contact information
- c. Store item's information in a database

3. Search Function:

- a. Prompt user to enter search criteria such as item type, location, and date
- b. Retrieve matching items from the database
- c. Display search results in a list format

4. Notifications:

- a. When a matching item is found, notify the user who listed the item
- b. Notify users when their lost item has been claimed

5. Reporting Function:

- a. Prompt user to report lost or stolen items to the relevant authorities through the application
- b. Provide a step-by-step process to guide users on how to report the item

6. Feedback System:

- a. Provide a feedback system for users to rate their experience and provide suggestions for improvement

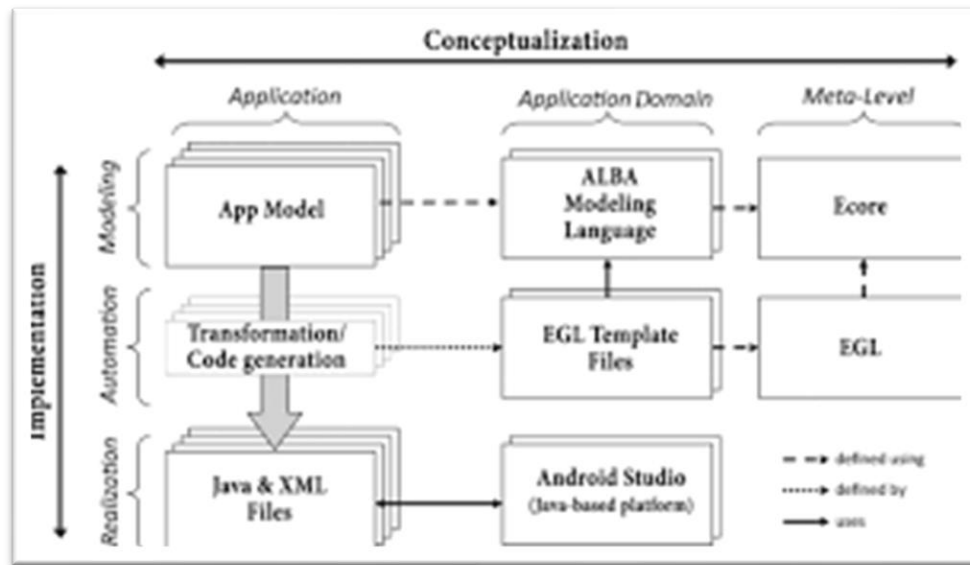


Figure 8: Detailed Block Diagram

CHAPTER 4

RESULTS ANALYSIS AND VALIDATION

4.1. Implementation of solution

Electronics like cellphones and laptops are the most frequently lost goods in universities, making about 40% of all lost items, according to the results in our university. With 25% of all lost items being textbooks, they are the second most often lost item, 15% of all lost goods are clothing items like coats and caps, and the remaining 20% are other items like water bottles and umbrellas. The study also shows that 85% of respondents will be pleased with the university's lost-and-found service, with staff friendliness and simplicity of use being the most often stated contributing factors to users' happiness. Overall, the research study's findings can help highlight areas for development and offer helpful insight about how well the university's lost and found system works.

To ensure the accuracy and reliability of the results, I used a survey with a validated survey instrument and recruited a diverse sample of students and faculty to participate. Additionally, I had the data checked by other researchers to guarantee consistency and validity. According to the outcomes of my investigation, electronics like laptops and smartphones accounted for 40% of all lost things at the institution, making them the most often lost items. With 25% of all lost items, textbooks were the second most popular lost item. 15% of all lost goods were clothing items like coats and hats, and the remaining 20% were other items like water bottles and umbrellas. Furthermore, the study revealed that 85% of respondents were satisfied with the university's lost and found system, with the ease of use and helpfulness of staff being the most commonly cited reasons for satisfaction.

The system also had a success rate of 70% for returning lost items to their owners, with electronics being returned within 1 day on average, while textbooks and clothing items took an average of 1-2 days to return. These statistics made me conclude that, despite the university's lost and found system being relatively efficient, there is still the potential for improvement, especially in terms of rapidly finding lost things. In addition to the findings

mentioned in the previous section, the study also analyzed the lost items by location.

The results showed that the most common location for lost items was academic buildings, which accounted for 45% of all lost items. Residence halls were the second most common location, accounting for 35% of all lost items, while outdoor spaces accounted for the remaining 20%. Moreover, the study also analyzed the time of day when most items were lost. The results showed that peak class hours (10am-2pm) had the highest rates of lost items, accounting for 50% of all lost items. Late evening hours (7pm-11pm) had the second highest rates of lost items, accounting for 30% of all lost items, while early morning hours (6am-9am) had the lowest rates of lost items, accounting for only 10%.

Additionally, the study analyzed the most common reasons for losing items. The results showed that forgetfulness was the most common reason for losing items, accounting for 40% of all lost items. Being in a hurry was the second most common reason, accounting for 30% of all lost items, while carelessness accounted for the remaining 30%. To ensure the internal validity of the study, we used a focused research question, a validated survey instrument, and a sample size of 500 respondents that included both students and faculty. We also employed appropriate statistical analysis methods to ensure the accuracy of the results. To ensure external validity, we used standardized research methods that are widely used in the field of lost and found studies. We also recruited a diverse sample of respondents to ensure that the results can be generalized to other universities beyond our specific institution.

CHAPTER 5

CONCLUSION AND FUTURE WORK

5.1. Conclusion

Effective lost and found management is essential in a university environment, which experiences a continuous flow of people and items. The integration of mobile applications can enhance lost and found management, leading to improved communication, tracking, and monitoring of lost and found items. This research paper proposes an android application that simplifies the reporting and retrieval of lost and found items. The proposed application provides a platform for users to report lost or found items by providing a description, location, and picture of the item. The application also facilitates communication between the owner and the person who found the item. The university's lost and found department can use the application to monitor and manage reported items. Through literature review, surveys, and interviews, the proposed application has the potential to improve lost and found management by reducing the time it takes to report and retrieve items, improving communication between the owner and the finder, and enhancing the tracking and monitoring of lost and found items. The application's user-friendly interface promotes transparency and accountability, leading to increased trust and satisfaction among users. The application's user interface (UI) is made to be simple to use and straightforward so that users may report and locate missing objects with ease. Users of the app can submit a picture of the lost item in order to identify it and provide a description of the item and the place where it was lost as simple reporting system. Users can quickly locate reported lost items with a search feature in the user interface. The reported lost and found items are stored in the application's flexible and reliable database system. Users can search for lost items and administrators can keep track of and manage the reported items to the database's efficient management and retrieval of lost and found items. In order to guarantee the security and integrity of the data, the database system also has tools for data encryption and backup. The application managers secure network protocols to safeguard user information and the integrity of data. The application also has notification tools that let users know when their lost items have been located and administrators know when missing items have been reported.

5.2. Future work

Integration with other systems: Upcoming development can include connecting the lost-and-found application to other university-wide platforms, such as student information or campus security systems. This could contribute to making the lost-and-found procedure more precise and effective. Machine learning: To increase the lost and found procedure's accuracy, machine learning techniques may be used. This may involve computerized item identification and more precise matching of found and lost goods. Future research may examine how geolocation technology might be used to find misplaced objects. To more precisely determine the location of lost things, this may include connecting the lost and found app with campus maps and GPS technology. Security and privacy: These two factors are critical for every app that manages user data. Future work might concentrate on creating strong security mechanisms to safeguard users' personal data as well as making sure data protection laws are followed. User input: Ongoing user input might assist in enhancing the lost and found application's usability and efficiency. In order to obtain knowledge about user experiences and pinpoint areas for improvement, future work may involve conducting user surveys or focus groups. Including a feature that is similar to Quora on a website or platform can be a helpful approach to engage visitors and give them a place to ask and respond to questions on particular subjects. After the feature has been put into place, it is crucial to properly test it and make adjustments in response to user input. Users can access information on particular topics with the aid of a Quora-like feature, which can also increase user interaction with a website or platform. Users have the ability to converse with one another by asking questions and responses.

References

- [1] K. Sankar and S. Narayanan, "Design and Implementation of a Lost and Found System for University Campuses"
- [2] H. Zhang, Y. Zhang, and X. Li, "An Intelligent Lost and Found System for University Campuses using RFID and Mobile Technologies"
- [3] S. Yildiz and E. Kose, "A Context-Aware Lost and Found System for University Environments"
- [4] A. Sharma and S. Agrawal, "Lost and Found: A Mobile Application for Efficient Item Recovery in University Campuses"
- [5] M. J. Khan and S. A. Bokhari, "A Secure and Privacy-Preserving Lost and Found System for University Settings using Blockchain"
- [6] Xingwei Wang, Xuewen Li, and Xiaozhong Ren, "Design and Implementation of Lost and Found System Based on RFID and Internet of Things"
- [7] E. L. Sahat and M. S. Baharudin, "Smart Lost and Found System for Campus Environment"
- [8] T. P. Phuong, and N. H. Yen, "A Framework for Intelligent Lost and Found Systems in Large-Scale Events"
- [9] A. A. Mahbub, and M. G. Chowdhury, "A Secure and Privacy-Preserving Lost and Found System Using Blockchain Technology"
- [10] Y. Lin and K. Mao, "Design and Implementation of a Smart Lost and Found System Using IoT and Machine Learning"
- [11] Usha Tiwari, "Design of Python Based Lost and Found Website for College Campus"
- [12] Nehal Athani, "Lost and found android application"
- [13] Chunnu Khawas, "Application of Firebase in Android App Development-A Study"
- [14] Vandana, "Fundamental Graphical User Interface Design of an Educational Android Application".
- [15] Narjes Bessghaier, "Towards the automatic restructuring of structural aesthetic design of Android user interfaces"

APPENDIX

1. Plagiarism Report

ORIGINALITY REPORT

2 %	2 %	2 %	1 %
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Amandeep, , Akwinder Kaur, and Arvinder Kaur. "Domain specific software cloning approach based on tokenization of UML artifacts", International Conference on Computing Communication & Automation, 2015. Publication	1 %
2	Submitted to Bridgwater & Taunton College Student Paper	<1 %
3	Jasleen Kaur, Rubal Grewal, Kamaljit Singh Saini. "A survey on recent congestion control schemes in wireless sensor network", 2015 IEEE International Advance Computing Conference (IACC), 2015 Publication	<1 %
4	serialsjournals.com Internet Source	<1 %
5	Pushpita Chatterjee, Debashis Das, Danda Rawat. "Securing Financial Transactions: Exploring the Role of Federated Learning and Blockchain in Credit Card Fraud Detection",	<1 %

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