

UNIVERSITY OF BUEA

**Faculty of Engineering and Technology**

CEF440

**INTERNET PROGRAMMING AND MOBILE PROGRAMMING**

**Design and Implementation of a Mobile-Based Archival and Retrieval of Missing Objects Application using Image Matching**

*Submitted to:*

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**REQUIREMENT GATHERING**

# Introduction

## Overview

The project aims to develop a Mobile-Based Archival and Retrieval of Missing Objects Application using Image Matching. Traditional methods for finding lost items are often ineffective. Therefore, the project proposes leveraging mobile technology and image matching algorithms to create a robust platform for archiving and retrieving missing objects

### Objectives

The main objective of requirement gathering is to understand stakeholders' needs regarding the application. Through research, surveys, we aim to gather insights into user requirements, technical constraints, and regulatory considerations.

### Summary

Losing personal belongings is a common issue causing inconvenience. The project seeks to address this by creating a mobile app that uses image matching to find missing items. It will feature intuitive interfaces, advanced technology, and real-time notifications.

# Stakeholder Analysis

## 2.1- Primary Stakeholders

The primary stakeholders identified for the project include:

1. **End Users:** Individuals who have lost personal belongings and will use the application to input their image or missing object image as well as search and retrieve them.

2. **Developers:** The team responsible for designing, developing, and implementing the mobile application and its backend infrastructure as well coming out with the database for the application.

3. **Administrators:** Personnel responsible for managing the application's database, monitoring user activities, and ensuring system reliability, especially as the system becomes congested.

4. **Regulatory Authorities:** Entities responsible for enforcing data protection regulations and ensuring compliance with legal requirements.

## 2.2- Roles and Responsibilities of Stakeholders

**1. End Users:** Provide input on user requirements, test application prototypes, and provide feedback for improvement.

**2. Developers**: Analyze stakeholder requirements, design and implement the mobile application, and ensure technical feasibility and scalability of the application.

**3. Administrators**: Manage the application's database, monitor system performance, and address user inquiries or technical issues.

**4. Regulatory Authorities**: Review the application's compliance with data protection regulations and provide guidance on ensuring user privacy and security.

# Requirement Gathering Techniques

System standards are the operating procedures, standards, and specifications.

## User Interview:

Conducted some fact-finding research with stakeholders such the police, an NGO as well as normal citizens, to gain insights into their various perspectives, experiences, and expectations regarding the mobile application. These interviews provided valuable qualitative data on user needs, preferences, and pain points. As well as quantitative approximate to missing objects.

## Surveys:

Getting feedbacks from stakeholders, so as to see and know their perspectives of missing objects, what can be done, how should it be done and should the output be. This was shared using WhatsApp and telegram applications in our various groups.

## Market Research:

Analyzed existing solutions and market trends related to lost and found services, image recognition technologies, and mobile applications addressing similar problems. This research helped identify opportunities for innovation and understand competitive offerings in the market.

## Documentation Review:

Reviewed relevant documentation, including project proposals, research papers, and technical specifications, to gain insights into domain-specific knowledge and existing challenges in image matching algorithms, mobile application development, and database management.

## Regulatory and Compliance Analysis:

Identified legal and regulatory requirements relevant to the project, such as data protection regulations (e.g., GDPR), consumer privacy laws, etc. An analysis of regulatory requirements was conducted to ensure that the application design and data handling practices comply with applicable regulations.

## Risk Assessment:

Conducted a risk assessment to identify potential threats to the project's success, including technical challenges, resource constraints, and market competition. Risks were evaluated based on their probability and impact, and mitigation strategies were developed to address identified risks throughout the project lifecycle.

# Findings from Requirement Gathering

## Insights from Interviews:

* + - * Stakeholders expressed frustration with traditional methods of searching for lost items, with proper details and pictures of the item.
      * Users emphasized the importance of privacy and data security in the application.
* Need for language support in cases where the two users speak different languages.
* The ability to report and get lost items even with phones being offline, as there are areas with low or limited connectivity.
* Basic and simple design so that most people can use and manage their accounts efficiently.
* Preferences for location awareness/indication was noted, so as to ease point and time of collection.
* Need for notifications and status updates when lost item is found and recovered.
* Need for verification and monitoring so that frauds do not occur, or at least limit it.
* Lastly, for users with eye defects a voice command support, zoom functionality or large text and icons features should be made available on the app.

## Key Findings from Market Research:

* Market research indicated a limited presence of established object retrieval apps hence the need for one and also business opportunity.
* Existing solutions lack image matching, which reduces the efficiency of someone getting his/her lost items.

## Insights from Documentation Review:

* + - Existing research provided valuable insights into image matching algorithms, mobile application development best practices, and data management techniques.
    - Potential challenges and limitations were identified such as data collection and storage.

## Regulatory and Compliance Considerations:

* Transparency regarding data usage and robust security measures will be crucial for building trust within users.

# Summary of Requirements

## Prioritized Requirements (Functional requirements)

* Lost item reporting which should include details of the item, pictures, locations, dates and time etc.
* Image matching which will help the users easily identify their missing objects when found.
* Security of user’s credentials, monitoring and verification of all activities within the application.
* Feedback/ support groups or number so as to receive updates or worries from the users.

## Non-functional requirements

* Increase performance of the app so as to make image upload, search time and user interaction interesting and good for the users.
* Simplicity of the mobile app so that most users if not all can use it efficiently.
* Push notifications, alerts and status updates so users get know their lost objects have been found.
* Location preferences so as to ease point and time of collection of the missing object.
* Then monetization strategy such as premium and basic plans could be incorporated into the app, so as to cater for the running and maintenance of the app and database.

# References

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