**KAIMOSI FRIENDS UNIVERSITY**

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**KAFU E-VOTING SYSTEM.**

**School of Computing and Information Technology**

**Department of Information Technology and Informatics**

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**PROJECT PROPOSAL**

**PROJECT TITLE: PATA**

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**REG NO: SIT/0929/2020**

A project proposal documentation submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of Science in Information Technology of Kaimosi Friends University**.**

**October, 2023**

# DECLARATION

This project proposal documentation is my original work prepared with no other than the

indicated sources and support and has not been presented elsewhere for any other award.

Signature……………………… ……………………..Date……………………...

Denzel Gitonga

SIT/0929/2020

# CERTIFICATION

The undersigned certify that they have supervised and coordinated and hereby recommend for

acceptance of Kaimosi Friends University a proposal documentation entitled “PATA”

Signed………………………………………………….. Date……………………..

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# ACKNOWLEDGEMENT

First and foremost, I would like to give thanks to the almighty God who has counted me worthy to develop this project till its completion.

I would like to express our sincere gratitude to all the individuals, and experts who have contributed their time, knowledge, and support to the development of the PATA project. Their invaluable insights and unwavering commitment have been instrumental in shaping the vision and objectives of this project.

I extend my heartfelt appreciation to the communities and individuals who have shared their experiences and perspectives on missing persons cases, which have provided the essential foundation for PATA's development.

Furthermore, we acknowledge the guidance and support of our academic and research institution, Kaimosi Friends University, which has played a significant role in nurturing our project and providing the necessary resources to turn our vision into reality.

Finally, I would like to thank our families and loved ones for their understanding and encouragement during the course of this project. Their unwavering support has been a constant source of motivation.

# DEDICATION

This project, PATA - the Missing Persons Reporting and Response System, is dedicated to all the individuals who have faced the distress of a missing loved one. Your strength, resilience, and hope have been the driving force behind this endeavor. May PATA stand as a beacon of support and compassion, embodying the belief that technology can be harnessed for the betterment of humanity in its most vulnerable moments.

I dedicate this project to the communities and individuals who come together to support one another during times of crisis, demonstrating the incredible power of unity and shared responsibility. Your unwavering commitment to helping one another serves as an inspiration to us all.

PATA is also dedicated to the idea that technology, when used with kindness and empathy, can create a positive impact on society. May it serve as a reminder that innovative solutions can bring hope, even in the face of daunting challenges.

This project is dedicated to the countless missing persons and their families, whose stories have touched our hearts and ignited our passion to make a difference. We are committed to working tirelessly to bring hope and reunite those who are lost with their loved ones.

Lastly, I dedicate this project to the belief that compassion and technology can intersect to address vital societal issues. It is a testament to the extraordinary possibilities that emerge when we come together to support one another, particularly during times of distress.

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# CHAPTER ONE: INTRODUCTION

## 1.1 Introduction—Background of the Study

In our fast-paced, technology-driven world, we have the remarkable ability to address profound challenges with care and compassion. Our project, PATA - the Missing Persons Reporting and Response System, has its roots in the agony of a loved one going missing, a situation that fills our hearts with pain and bewilderment.

Traditional methods of reporting missing persons often feel frustratingly slow and unhelpful (Centre, 2003), leaving families in a state of anguish and uncertainty. They desperately long for a way to reconnect with their missing loved ones.

PATA emerges from the urgent need for a straightforward and compassionate solution. Its purpose is clear: to make reporting missing persons as easy as possible, to speed up the response, and to provide hope to those who are on the quest to find their missing loved ones. By harnessing the capabilities of modern technology and infusing it with a profound sense of understanding and empathy, PATA demonstrates the incredible potential of technology to aid individuals in their most vulnerable moments. It serves as more than just a technological solution; it's a helping hand, extended precisely when it's needed most.

As we progress further into the following sections, we will delve deeper into the nature of the problem at hand, elucidate the goals we aim to achieve, and underline the significant difference we aspire to make.

PATA is a manifestation of the belief that technology, when employed with compassion, can address critical societal issues and provide support when it's needed most.

## 1.2 Problem Statement

The problem addressed by PATA is the distressing experience when a loved one goes missing, causing confusion and sadness. Traditional methods of reporting missing persons (Quora, 2017) often involve lengthy procedures, leaving families feeling helpless. This issue extends beyond individuals to affect entire communities. PATA offers a simple and compassionate solution, aiming to expedite the reporting process and provide swift assistance, with the ultimate goal of reuniting missing persons with their families and instilling hope during challenging times.

## 1.3 Objectives

## 1.1.1 General Objective

To swiftly reunite missing persons with their families and loved ones by establishing a simple and rapid reporting system, ensuring that help arrives promptly, and, in doing so, minimizing the anguish of prolonged separations.

## 1.1.2 Specific Objectives

1. To create a user-friendly platform where reporting a missing person is as simple as possible, reducing the time it takes to send crucial information about a missing individual.
2. To ensure that the community is instantly alerted upon the submission of a missing persons report, with the goal of sensitizing them to respond upon the event that they see or identify the person in subject.
3. To increase the rate of successful reunions betIen missing persons and their families by providing a robust and efficient reporting and response system, with the aim of reuniting families as quickly as possible.

## 1.5 Research questions

1. How can technology be harnessed to simplify the process of reporting a missing person?
2. What features and functionalities are necessary for a Missing Persons Reporting and Response System to ensure rapid response and community engagement?
3. What impact does the timely reporting of missing persons have on the chances of successful reunions with their families?

## 1.6 Scope of the project

The PATA system is intended to be accessible and beneficial to a wide audience, with its primary focus on helping individuals and families who are in distress due to a missing loved one.

It is designed to be implemented in communities, regions, and countries facing challenges related to missing persons cases, irrespective of geographic boundaries.

The beneficiaries of this system are not limited to any specific demographic, as it is aimed at providing a universal solution to the issue of missing persons, with a focus on inclusivity and user-friendliness to assist anyone who might need its services.

## 1.7 Limitations of the study

While the PATA project aspires to address the critical issue of missing persons and provide a comprehensive reporting and response system, it is essential to acknowledge its inherent limitations (met.police.uk):

1. Technological Access: PATA relies on internet connectivity and digital devices for reporting and response. It may not be readily accessible to individuals in remote or underserved areas with limited technological infrastructure, potentially leaving them without the benefits of the system.
2. Language and Literacy: The platform is designed primarily for users who are literate and can navigate digital interfaces. Language barriers may hinder those who are not proficient in the language in which the platform is available.

## 1.8 Benefits and beneficiaries of the study

The PATA study envisions a range of benefits for various stakeholders and beneficiaries (FindLaw, 2022):

1. Families and Individuals: Families and individuals facing the anguish of a missing loved one are the primary beneficiaries. PATA provides them with a ray of hope and support, enabling rapid reporting and community engagement. The system's prompt response mechanisms aim to increase the chances of reuniting missing persons with their families, thus alleviating emotional distress and uncertainty.
2. Communities: Entire communities benefit from PATA through increased safety and collective action. The platform fosters community engagement, encouraging individuals to participate actively in efforts to locate missing persons. This not only enhances community cohesion but also promotes a sense of shared responsibility for the Ill-being of community members.
3. Authorities and First Responders: Law enforcement agencies, search and rescue teams, and relevant authorities gain access to timely and accurate information, streamlining their efforts to locate missing persons. This system aids in efficient coordination and communication among these entities, ultimately improving their ability to respond to missing persons cases.

## 1.9 Project justification

The implementation of the PATA project makes sense for several important reasons.

First and foremost, it's about helping people when they need it the most. When a loved one goes missing, it's incredibly distressing. PATA aims to ease this distress and bring hope to families and communities.

Second, PATA uses the power of technology to do something good. In today's world, technology can be used to solve problems, and PATA uses this to make the process of reporting missing persons quicker and easier.

Another important reason for this project is that it brings communities together. When someone goes missing, it affects not just one family but the whole community. PATA encourages people to work together, share the responsibility, and help each other.

By making reporting missing persons more efficient and effective, PATA increases the chances of finding them and reuniting them with their families. It's all about bringing hope and empowerment to those facing tough times. In the end, this project is all about kindness, compassion, and using technology for the greater good.

# CHAPTER TWO: LITERATURE REVIEW

# 2.1 Introduction

This erves as the foundation for the PATA project, delving into the existing body of knowledge that informs our efforts to address missing persons cases.

By examining and analyzing previous research, studies, and technology-related solutions, we gain valuable insights into the multifaceted challenges of missing persons incidents. This chapter is crucial in understanding the context in which PATA operates and highlights the gaps and opportunities that our project seeks to address.

The literature review begins by exploring the prevalence and consequences of missing persons cases, shedding light on the distressing experiences faced by individuals, families, and communities. We also delve into the traditional reporting methods and the role of technology in these cases, considering the impact of timely reporting and community engagement.

As we journey through this chapter, we aim to pinpoint the critical factors and issues associated with missing persons cases and the various technological and community-driven responses that have emerged.

By doing so, we lay the groundwork for the subsequent chapters, where we will present the design, development, and implementation of the PATA project, informed by the insights gained from the existing literature.

# 2.2 Technology-based Solutions

## 2.2.2 Google person finder

Google Person Finder is a notable example of a technology-based solution designed to address the challenge of locating missing individuals following natural disasters. (Google, 2005)

This open-source web application was developed in response to the devastating earthquake in Haiti in January 2010. It serves as a registry and message board that allows survivors, family members, and friends to post and search for information about the whereabouts of their loved ones in the aftermath of such events.

The application has been deployed in several natural disasters, and it has successfully collected information on more than 200,000 individuals (Wikipedia, Google Person Finder, 2022). This showcases the platform's potential in helping to reunite missing persons with their families and loved ones during times of crisis.

Google Person Finder highlights the role that technology can play in facilitating the exchange of critical information in disaster-stricken areas, emphasizing the significance of rapid reporting and response in increasing the chances of successful reunions.

By examining the success and challenges of such technology-based solutions, we can draw valuable insights for the development of the PATA project and its objectives.

## 2.2.3 National Missing and Unidentified Persons System (NamUs)

NamUs is a comprehensive online database and resource center that aims to address the issue of missing persons and unidentified decedents. (NamUs, 1984)

It provides a platform for law enforcement agencies, medical examiners, and the public to collaborate in the search for missing persons and the identification of unidentified bodies.

The system includes two databases: one for missing persons and one for unidentified decedents. NamUs facilitates data sharing and coordination among various stakeholders and is used to assist in resolving missing persons cases.

## 2.2.4 The UK Charity Missing People

The UK Charity Missing People has embraced technology to create a real-time information resource that offers insights into individuals reported as missing. (Charity, 1986)

This information is accessible through a clickable map of the UK regions. Through this map, the public can gain visibility into who is missing from various areas, view statistics on the annual helpline calls received from each region, and actively participate in the search for missing individuals.

While this technology-based solution provides a valuable means of engaging the public and facilitating the search for missing persons, it's important to note that it presents a partial view.

The database primarily comprises individuals known to the charity and reported through family and kinship networks. This example underscores the role of technology in enhancing public participation and engagement in the effort to locate missing individuals.

However, it also highlights the need for a more comprehensive and inclusive approach, as it focuses on individuals within the charity's network.

## 2.2.5 The Boston Mayor’s 24 Hour Constituent Service

The 2013 Boston Marathon bombings (Wikipedia, Boston Marathon bombings, 2013) presented a compelling case for the importance of effectively managing missing persons reports within the framework of emergency management.

The incident (Wikipedia, Boston Marathon bombings, 2013) prompted a surge in calls to the Mayor's 24 Hour Constituent Service, an entity initially expecting around 80 calls on that fateful day. To their surprise, they received a staggering 8,600 calls within 24 hours, representing a thousand percent increase.

To manage this influx, they created a makeshift Google Doc that recorded approximately 2,400 records.

The outcome of this sudden surge in calls underscored the challenges associated with such situations. Despite the high volume of calls, only 28 matches of missing persons were identified. Callers experienced delays and busy signals for extended periods, some waiting 10 to 20 minutes before connecting with an operator.

This hasty response highlighted the inadequacies of hastily constituted systems. Such systems often lack robust measures to protect sensitive information.

In addition, poorly coordinated systems result in inefficiencies, as friends and family members are compelled to report missing persons to multiple organizations. The concern extends to the duplication of entries for the same missing individuals, necessitating a system's ability to identify and manage duplicate records.

Moreover, there's the issue of public perception regarding government systems that collect identifying information. The example of undocumented residents in California (Wikipedia, Boston Marathon bombings, 2013) serves as a pertinent illustration.

In disaster aftermaths, individuals may be hesitant to share their information with government entities, even if the purpose of data collection seems clear. It is imperative that the public believes that their information will be used in alignment with its intended purpose and that their privacy will be safeguarded.

This case from the 2013 Boston Marathon bombings (Wikipedia, Boston Marathon bombings, 2013) highlights the challenges of efficiently managing missing persons reports during crises, particularly when facing an overwhelming volume of calls and rapidly established systems. It serves as a real-world illustration of the complexities and considerations involved in information management and public perception in the context of disaster response and missing persons cases.

## 2.2.6 The Unified Victim Identification System (UVIS)

The Unified Victim Identification System (UVIS) (NYC, 2020) stands as a noteworthy exemplar of a comprehensive disaster management system, dedicated to efficiently managing missing persons reports and victim identification following large-scale incidents.

In the wake of the September 11 attacks, New York City officials recognized the pressing need for a system that could adeptly collect missing persons reports and facilitate the exchange of critical information between emergency responders and investigators in the wake of mass casualty incidents.

The immediate aftermath of September 11 saw New York City grappling with approximately 40,000 missing persons reports recorded on paper. The challenge of tracking down leads on missing individuals and identifying the remains of decedents took months and, in some cases, years. In response to these challenges, the New York City Office of the Chief Medical Examiner (OCME) secured grant funding from the Department of Homeland Security. They partnered with Connecticut-based consulting firm ICRA Sapphire Inc. to develop UVIS.

Notably, the development of UVIS was federally funded, and as a result, the New York City OCME licenses UVIS to government agencies across the nation free of charge. In New York City (NYC, 2020), UVIS operates as a centralized communications and data collection system, connecting multiple agencies, including the city's 311 Call Centre, OCME, and the New York Police Department. This interconnected system aims to create an accurate manifest of potential victims following a disaster.

One of the critical features of UVIS (Wikipedia, UVIS, 2020) is its ability to consolidate information about missing persons. By generating a single report for each missing individual, UVIS establishes a centralized manifest of potential victims.

This manifest is accessible to all agencies involved in the victim identification process.

It streamlines and refines data, allowing for the consolidation of multiple reports about the same missing person as law enforcement, medical examiner personnel, and other stakeholders gather and analyze data.

The significance of UVIS lies in its ability to address one of the crucial challenges in disaster response — the lack of a centralized system for collecting, disseminating, and analyzing information. In the absence of such a system, issues related to integrating various lists arise. Databases are often distinct, both technologically and in terms of the information they contain.

This fragmentation makes it difficult to swiftly and definitively determine who is missing, who has been found, or who is deceased in the aftermath of a disaster.

The UVIS example showcases the transformative impact of technology in addressing the complex issue of missing persons during large-scale disasters and underscores the necessity of effective data management and coordination in emergency response.

This case serves as a powerful reference for the development of the PATA project, emphasizing the need for a centralized and efficient reporting and response system.

# 2.3 Theoretical Review

## 2.3.1 The International Committee of the Red Cross (ICRC) Central Tracing Agency

The International Committee of the Red Cross (ICRC) Central Tracing Agency, a longstanding player in this domain, has leveraged technology to enhance its tracing operations. (ICRC, 1863)

Founded in the late 1800s, the ICRC's Central Tracing Agency initially aimed to notify families about the whereabouts and well-being of detained relatives.

Today, (ICRC, 1863) it serves as a powerful platform for relaying hundreds of thousands of messages, connecting families during moments of separation and providing the peace of mind that is often elusive in times of crises.

In 2009 alone, the agency collected and delivered more than 253,000 messages. These messages played a pivotal role in scenarios such as the repatriation of Congolese prisoners of war and facilitating nearly 200 video calls between detainees and their families in Afghanistan. (Agency, 2006)

Additionally, the ICRC's Family Links website has played a critical role in tracing and reuniting missing individuals. Within just two weeks of the devastating earthquake that struck Haiti in January 2010 (Agency, 2006), the website assisted in locating more than 26,000 missing people. It also serves as a platform for people to search for missing loved ones and submit information on the whereabouts of survivors.

The ICRC's data system has collected over 83,000 names of people seeking to contact relatives or individuals with clues about missing loved ones since 2009. This data system enables communication among separated family members, helps locate missing relatives, and aids in the recovery and identification of human remains. The success of the ICRC's tracing operations highlights the transformative impact of technology in addressing missing persons cases during crises and conflicts.

## 2.3.2 The Dutch Cell Broadcast

The Dutch government has adopted a mobile phone danger alert system known as Cell Broadcast (Wikipedia, NL-Alert, 2001).

This system utilizes GSM technology to pinpoint cell phone users within a specific geographical area. In the event of a natural disaster or a terrorist attack, the Cell Broadcast system sends text messages to all mobile phones within the affected area, effectively warning individuals of the impending danger.

This technology not only enhances the timeliness of emergency alerts but also supplements other existing warning systems, including sirens and emergency broadcasts on radio and television.

Cell Broadcast (WordPress, 2007) acts as an additional and more instantaneous medium for communicating directly with people during disasters, ensuring that critical information reaches them in real-time.

The Dutch Cell Broadcast system serves as an example of how technology, particularly mobile communication, plays a pivotal role in emergency response and disaster management.

It showcases the capacity of modern technology to provide rapid and targeted alerts to individuals in danger, underlining the significance of swift reporting and response in addressing critical issues like missing persons during crises.

This example further illustrates the broader context of technology's role in enhancing emergency communication, which can provide valuable insights for the development of the PATA project.

## 2.3.2 Los Angeles Emergency Preparedness Foundation

Hurricane Katrina's impact in 2005 (WorldVision, 2019) emphasized the critical role of a coordinated and government-led missing persons protocol. Brent Woodworth, then the President of the Los Angeles Emergency Preparedness Foundation, highlighted the shortcomings of ad-hoc missing persons systems during the crisis.

While these systems were well-intentioned, they suffered from significant challenges. They operated independently, lacking communication with one another, leading to confusion and compromising public safety.

Moreover, the systems were characterized by a high degree of inaccuracy and the inability to collect essential data for effective missing persons management. A lack of privacy measures further exacerbated these issues (WorldVision, 2019).

This example from the Los Angeles Emergency Preparedness Foundation underscores the necessity of organized and coordinated efforts in addressing missing persons during crisis situations. It illustrates the significance of accurate data, inter-system communication, and privacy safeguards in ensuring the effectiveness of such systems.

## 2.3.3 The Commons Lab and the Fordham Centre on Law and Information Policy (CLIP)

The Commons Lab and the Fordham Centre on Law and Information Policy (CLIP) at Fordham Law School (Fordham, 2012) have jointly produced a report that addresses the intricate legal and policy considerations surrounding privacy in the realm of missing persons after natural disasters. Titled "Privacy and Missing Persons after Natural Disasters," this report serves as a roadmap for understanding the legal and policy complexities related to the privacy of missing individuals in diverse jurisdictions.

The report offers strategies that can be pursued by a range of stakeholders, including humanitarian organizations, private sector entities, volunteers, and policymakers.

One notable recommendation within the report urges governments to leverage their existing legal authority to support the appropriate sharing of personal information concerning missing persons in the aftermath of natural disasters (Fordham, 2012).

Moreover, the report encourages those involved in developing technologies for sharing information about missing persons to adhere to design principles that carefully balance privacy considerations with existing legal obligations. It underscores the importance of achieving this balance to ensure that privacy rights are respected while enabling effective information sharing for the purpose of locating missing individuals.

The report also calls upon privacy policy makers, legislators, and regulators to take proactive steps in clarifying how privacy rules and regulations apply to missing persons activities, particularly in key areas. This clarity is essential to ensure that activities related to missing persons can proceed without the looming threat of legal liability.

This example underscores the intersection of technology, privacy, and legal considerations in the domain of missing persons cases.

It highlights the need for thoughtful and well-informed policy development to create a framework that respects privacy rights while facilitating effective missing persons response and recovery efforts.

In the context of the PATA project, this example can serve as a valuable reference for addressing privacy concerns and legal considerations in the design and implementation of the system.

# 2.4 Conceptual Framework

The existing landscape of applications addressing missing persons cases reveals several important lessons.

While these applications have demonstrated some success, the overall impact remains limited. A critical aspect to consider in this context is the accessibility of such systems, particularly in times of emergency.

The fundamental requirement for an emergency communication system is that it should be easily and readily accessible, ensuring the highest level of effectiveness.

Statistics have shown that a significant portion of the population accesses the internet through a diverse range of devices. With a variety of devices readily available, more individuals can access internet-based applications even in critical situations.

Recognizing the importance of accessibility, the development of the PATA system has emerged as a responsive solution to bridge the gaps observed in existing applications.

PATA takes inspiration from the insights gleaned from prior systems, but it adapts and refines these concepts to offer a more inclusive approach. The need for a comprehensive, easy-to-access system has led to the development of PATA.

This system empowers both missing persons and their family members to communicate and reunite with the aim of significantly enhancing the usage and, consequently, the success of the system.

PATA is built on a foundation of inclusivity, emphasizing the importance of enabling more individuals to access a supportive system with ease and convenience. In a rapidly evolving digital world, PATA responds to the contemporary need for accessible, comprehensive reporting and response in missing persons cases.

By addressing the limitations inherent in existing systems and providing a practical, user-friendly approach to support missing persons and their families, PATA seeks to contribute to a more effective, compassionate, and inclusive solution to the challenge of locating missing individuals.

In summary, PATA's emergence as an accessible and user-friendly system takes inspiration from past applications but is designed to address their limitations. It aligns with the modern need for inclusive and comprehensive reporting and response in cases of missing persons, contributing to the overall goal of reuniting individuals with their loved ones efficiently and with a sense of compassion.

# APPENDICES

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