



INTUITIVE LOCATION SHARING VIA EMAIL THE INTOXICATED

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SECTION 1

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A Project Submitted in Partial Fulfillment of the Requirements for

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ABSTRACT

SafeDrunk is an intuitive and user-friendly feature that aims to promote safety and reduce the risk of accidents or incidents related to impaired driving. This feature is designed for individuals who may be impaired by alcohol or drugs and need a reliable and intuitive way to share their location with a trusted loved one.

The SafeDrunk feature offers a simple and easy-to-use interface that is designed to be accessible and easy to navigate, even for users who may be under the influence. Users can configure their preferred email address to send a message containing their location with a single tap of a button. This means that even in the midst of a stressful or confusing situation, users can quickly and easily share their location with a trusted loved one who can help them get home safely.

SafeDrunk is especially useful for individuals who may not feel comfortable using other transportation options while impaired. With SafeDrunk, users can easily share their location with a trusted loved one, who can then provide assistance as needed. Whether users need help getting home or simply want to ensure they arrive safely at their destination, SafeDrunk offers a reliable and intuitive solution.

CHAPTER 1

Introduction

SafeDrunk is an intuitive and user-friendly feature developed to promote safety and reduce the risk of accidents or incidents related to impaired driving. It offers a simple and effective solution for individuals who may be impaired by alcohol or drugs, providing a reliable way to share their location with a trusted loved one. SafeDrunk is designed to be accessible and easy to use, even for users who are under the influence. By promoting responsible decision-making and ensuring users have the tools they need to make informed choices about their transportation needs, SafeDrunk aims to make the roads safer for everyone.

1.1 Motivation

Impaired driving remains a serious problem in the Thailand, with alcohol-related car accidents claiming thousands of lives each year. To address the challenges faced by individuals who are intoxicated and in need of a safe way to get home, we have developed an intuitive and user-friendly solution. Our application, SafeDrunk, allows users to easily send their location to a trusted loved one, enabling them to be picked up and brought home safely. This eliminates the need for individuals to rely on uncertain transportation options or ride-sharing services when they are drunk. By providing a convenient means of communicating their location, SafeDrunk aims to ensure the well-being of intoxicated individuals and reduce the risk of accidents or harm. By leveraging the support of loved ones, we are empowering users to make responsible decisions and promoting a safer environment for everyone on the road.

1.2 Problem statement

- Lack of a reliable and intuitive means for intoxicated individuals to share their location with a trusted loved one, increasing the risk of accidents or harm during transportation.
- Limited and uncomfortable transportation options for impaired individuals, leading to a higher likelihood of impaired driving incidents.

- Uncertainty regarding one's own level of intoxication, hindering the ability to make informed decisions about driving safely.
- Insufficient availability of transportation services tailored to the specific needs of intoxicated individuals, resulting in unreliable options for safe transportation.
- Absence of an efficient and user-friendly method for intoxicated individuals to quickly communicate their location, causing delays in receiving timely assistance and increasing vulnerability in unfamiliar or unsafe situations.

1.3 Objectives of the Project

- To reduce the number of accidents and incidents related to impaired driving by providing a reliable and accessible ride-sharing option for individuals who may be under the influence.
- To develop a user-friendly and intuitive interface for the "Ride Sharing Application for the User Under Influence" that is designed to be accessible and easy to navigate, even for users who are under the influence.
- To improve the overall safety and accessibility of our roads by encouraging more individuals who may be under the influence to use safe and reliable transportation options.

1.4 Scope of the Project

The scope of the project includes the development of a user-friendly and intuitive application that allows intoxicated individuals to share their location with a trusted loved one. The key features and functionalities within the scope of the project are as follows:

- Location Sharing: The application will provide a seamless and efficient way for users to share their current location with a trusted loved one via email.
- User Interface: The user interface will be designed to be accessible and easy to use, even for individuals who are impaired by alcohol or drugs. It will prioritize simplicity and clarity to ensure a smooth user experience.

- **Compatibility:** The application will be compatible with popular smartphone platforms such as iOS and Android, ensuring a wide range of users can benefit from its functionality.
- **Notifications:** The app will send notifications to users to remind them to share their location at regular intervals or when requested by the user.

1.5 Expected Benefits

SafeDrunk should bring enhanced safety by providing intoxicated individuals with a reliable means to share their location with a trusted loved one, reducing the risk of accidents or harm during transportation. It aims to reduce impaired driving incidents, offering peace of mind to both users and their loved ones. With simplified communication, SafeDrunk ensures efficient and effective sharing of location information, promoting responsible choices and offering a safer alternative for impaired individuals.

1.6 Organization of the Document

This document consists of 6 chapters, including:

1. **Introduction** – The first chapter of this project is the introduction, which covers the motivation, problem statement, project objectives, project scope, and anticipated benefits.
2. **Background** – Chapter two of the project comprises the background information, which includes a detailed description. Additionally, this chapter contains a literature review that provides a summary of our research.
3. **Analysis and Design** – Chapter three of the report analyzes and designs the project's process and system. The focus of this chapter is on various aspects of system design, including but not limited to system architecture overview, system structure chart, process analysis and design, data flow diagram, process description, data stores, data elements, database analysis and design, ER-diagram, and other relevant elements.

4. Implementation – Chapter four of the project covers the hardware and system environment, showing an implementation guide and techniques.
5. Testing and Evaluation – Chapter five of the project focuses on the system's testing and evaluation, including unit tests, system integration tests, and test scenarios.
6. Conclusion – The final chapter of the project is the conclusion, which includes its benefits and the problems and limitations encountered during its implementation. Additionally, this chapter provides insights into future work that could be undertaken in this area.

CHAPTER 2

Background

This chapter solely focuses on the literature review topic. Through reading this chapter, the readers will gain a better understanding of the relevant information regarding the project that we have researched and studied.

2.1 Literature Review

Upon the completion of our research, we were able to gather valuable insights that helped us in the development of our project. During our research, we came across a few existing applications for call taxis, one of which was "Grab." Upon further investigation, we found this useful application for its users. However, we also discovered that it lacked sufficient motivation for people under alcohol to use it instead of self-driving.

To address this gap, we decided to use the "Grab" application as a reference point for our project while incorporating features that would motivate intoxicated individuals to use our service over self-driving. In order to achieve this, we researched and explored the possibility of implementing alcohol measurement features into our application. By offering discounts on our services, we could encourage individuals to use our service instead of driving themselves home while under the influence of alcohol.

Furthermore, we carefully considered the implementation of our project and ultimately decided to use the Flutter architecture and Dart programming language as they aligned with our project's objectives and requirements. Through our diligent research and thoughtful considerations, our project will provide a handy and beneficial service for individuals who are in need of safe and reliable transportation.

CHAPTER 3

ANALYSIS AND DESIGN

3.1 System Architecture overview

The SafeDrunk application utilizes a streamlined system architecture to facilitate the secure sharing of location information with a trusted loved one. The architecture consists of key components that work together to ensure smooth functionality and user satisfaction.

The user interface serves as the primary interaction point for users. It provides an intuitive and user-friendly platform for individuals to input their location details and initiate the location-sharing process. The interface is designed to be accessible and easy to use, even for users who may be impaired.

The application also incorporate email integration to transmit location information. When a user initiates the sharing process, the system generates an email containing the user's location details and sends it to the designated contact's email address. This seamless integration ensures the reliable delivery of location-sharing notifications.

3.2 System structure chart

SafeDrunk application is a system that emphasizes safe transportation by being alcohol free and promote comfortability. This application has three main function including:

- 1.Account register
- 2.Get the location
3. Send location

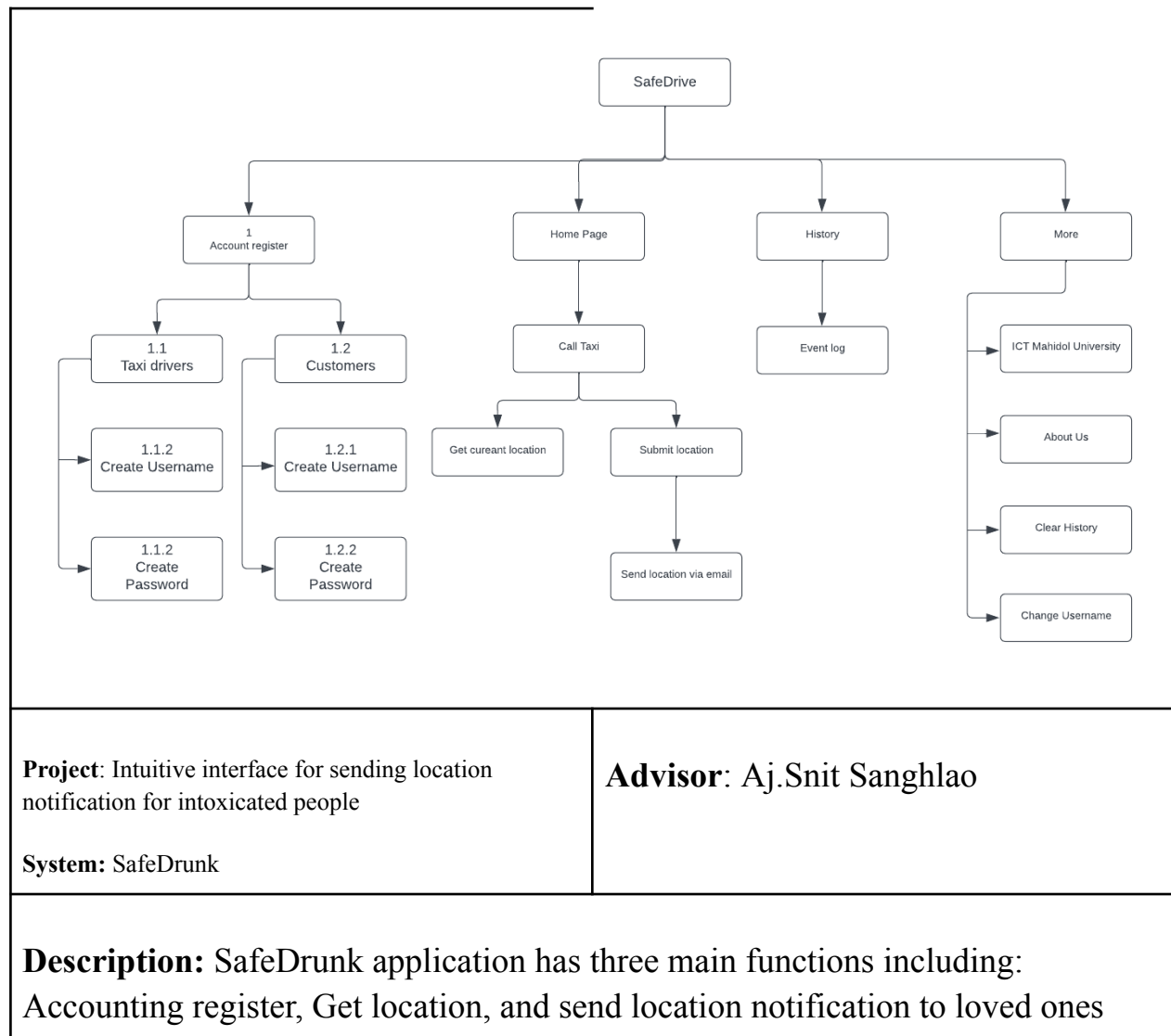


Figure 2: System Structure Chart of SafeDrive Application.

The detailed description of each subsystem is show below:

1. Account register – First step before entering the main application.

1.1 Taxi Account – This is for a taxi driver account.

1.1.1 Create Username – Users must input their username.

1.1.2 Create Password – Users must input their password.

1.2 Customers Account – This is for customers' accounts.

1.2.1 Create Username – Users must input their username.

1.2.2 Create Password – Users must input their password.

2. Getting location – Display the detail of the geolocation received

2.1 Login – Before being able to call the taxi.

2.2 Get geolocation from the built-in GPS sensor module on the device

2.3 Display the location

3. Send location – send the current location to the trusted ones

3.1 Prompt user to enter the email of their trusted ones

3.2 Send the location to the email address

3.5 I/O Design

This section explains the design of the Input and Output User Interface. The section consists of two parts, the interface design and the transition diagram showing transition through the system.

3.5.1 Interface Design

Overall:

It is to be imagined that the overall interface design for SafeDrive will consist of a simple and intuitive layout to minimize distraction for users. The leftmost side will be the first page of the application, which will prompt users to enter their login details or create a new account if they are new to the system.

Sensor Reading:

This screen will display the real-time sensor readings from built-in GPS module on the mobile phone. The sensor readings will include geolocation of the user.

Transition Diagram

Users will start by logging in or registering for an account. Once they have successfully logged in, the system will prompt the user for the location. Users can send the notification to their loved ones.

CHAPTER 4

IMPLEMENTATION

The implementation chapter of this report outlines the practical steps taken to achieve the project's objectives. This chapter will discuss the various tools, technologies, and methodologies used to design and develop the solution.

1.1 Hardware and System Environment

- Operating System and Utility Applications
 - Laptop hardware 1: Intel(R) Core (TM) i5-9300H CPU 2.40GHz, RAM 16 GB, Storage 512 GB
- Editor
 - Visual Studio
- Programming and Scripting Tools

Android Studio



- **Android studio**

The main programming language used in this project is Dart, which is the programming language used for developing Flutter applications. Dart is an object-oriented language that is optimized for building user interfaces (UIs) for

mobile, web, and desktop applications. It also provides a rich set of libraries and tools for developing high-performance and scalable applications.

Flutter, the UI toolkit used for building mobile applications, is built on top of Dart and provides a set of pre-designed widgets and tools for creating beautiful and responsive apps. It also allows for easy integration with other technologies, such as Firebase for backend services and APIs.

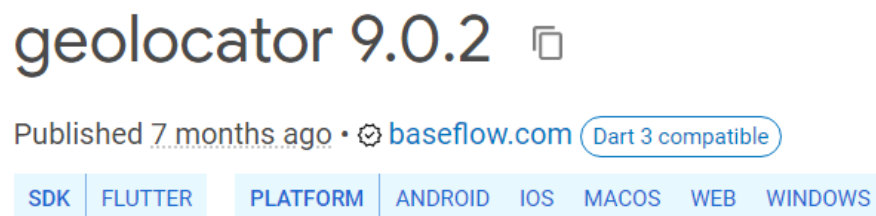
The development environment used for Flutter and Dart is called the Flutter SDK, which includes a set of command-line tools, an IDE (such as Android Studio or Visual Studio Code), and a package manager for managing dependencies.



Dart

Dart is a modern and versatile programming language optimized for client-side development. It is designed to provide developers with a productive and flexible language for building fast and efficient cross-platform applications on any device. With its strong focus on development and high-quality production experiences, Dart is an ideal language for building applications across a wide range of compilation targets such as web, mobile, and desktop.

Dart is also the foundation of Flutter, a popular open-source framework for building high-performance mobile applications. In addition to powering Flutter apps with its language and runtimes, Dart also provides developers with powerful tools for formatting, analyzing, and testing code. Its features such as hot reload, JIT (Just-In-Time) compilation, and AOT (Ahead-Of-Time) compilation make it a preferred choice for building mobile applications. With its growing community, robust ecosystem, and support for multiple platforms, Dart is a promising language for modern application development.



Geolocator Package for Flutter

The Geolocator package for Flutter is a powerful and versatile tool for location-based development. It is specifically designed to provide developers with an efficient and convenient solution for retrieving accurate and real-time device location data within Flutter applications. With its robust functionality, the Geolocator package empowers developers to build location-aware apps that offer enhanced user experiences.



EmailJS

EmailJS is a versatile and efficient JavaScript library that simplifies the process of sending emails from client-side applications. With its seamless integration and straightforward API, EmailJS allows developers to effortlessly incorporate email functionality into their web applications. By eliminating the need for server-side configurations or complex setups, EmailJS streamlines the email sending process and provides developers with a reliable solution for handling email communication. Whether it's sending contact forms, notifications, or personalized messages, EmailJS offers a convenient and flexible way to interact with email services directly from the client-side, ensuring a smooth and efficient email communication experience for both developers and end-users.

Components

This section describes the components of the application “SafeDrunk” as shown in the figure 1.

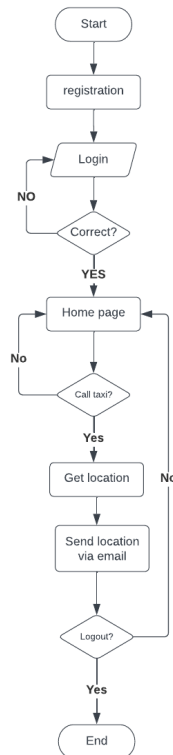


Figure 1 : Flowchart of the System – Overview

The system components flowchart, depicted in Figure 1, consists of multiple steps. The first step is user registration, which involves submitting personal details such as email, phone number, first name, last name, and username. The second step is the login process, where the user inputs their username and password. The user is redirected to the main page if the login credentials are correct. However, the user must re-enter their login information if the input is incorrect.

The third step of the main page presents the user with options to call a taxi or log out. If the user chooses to log out, they are redirected to the login page. However, if the user selects the “I am drunk” button, they are prompted to provide their geolocation with GPS readings, the user has a choice to submit the location and will be redirected to send email page. Once the user is redirected to send email page, the system waits for a email address input for the receiver. After

the user add the email, they are prompted to push send email which after pushed will be sent to the email address referred.

4.2 Implementation guide and technique

4.2.3 User interface and User experience development

The user interface is necessary to be designed to be intuitive and user-friendly, displaying the data in a clear and visually manner. The development of UI involves the use of Flutter technologies for mobile app development frameworks for mobile-based UIs. The UI also integrated with the backend system to read the data from the GPS sensor module.

CHAPTER 5

CHALLENGE ISSUE AND POTENTIAL WORKAROUND RESULT

Issue: During the development of our SafeWay location sharing application, we encountered several challenges. One of the main issues was related to the internet connection, without proper configuration, the application would not be able to access the internet and certain features would not work as intended.

Potential Workaround: To resolve this issue, we had to ensure that the *AndroidManifest.xml* file included the necessary configuration settings, such as *<uses-permission android:name="android.permission.INTERNET"/>*. By addressing these issues, we were able to successfully launch the application and make it accessible to users.

Moreover, the storage of the trusted ones' email function which would help the user to configure the email when they are sober has not been added due to several factors, although, it would be very helpful to the users.

In addition to this, we also prioritized the simplicity and intuitiveness of the application's design, especially for users who may be under the influence of alcohol. We aimed to create an easy-to-use interface that would be accessible and navigable even when the user is not in the best state of mind. We accomplished this by implementing clear and concise visual cues and minimizing distractions within the application.

Lastly, we conducted extensive testing to ensure that the application functioned smoothly and was able to meet our objectives. We also used feedback from users to continuously improve the application's performance and usability.

CHAPTER 6

TESTING AND EVALUATION

This chapter covers how the researchers test some features of this application. This party includes Unit tests and Systems integration tests. So the user can get more information about the testing process.

6.1 Unit tests

The unit test we choose some important part of feature including:

- Get the location
- Submit location

6.1.1 Test Performed: Get the location

| Operation Performed | Condition Tested | Actual Result |
|---|--|---------------|
| Page routing : Users click on “Call Taxi” button | The system bring users to get location page | PASS |
| Page routing : Users click on “Get Current Location” button | The system provides the current location of users. | PASS |

6.1.2 Test Performed: Submit location

| Operation Performed | Condition Tested | Actual Result |
|--|---|---------------|
| Page routing : Users click on “Submit Location” button | The system sends the location of users to the drivers. | PASS |
| Email notification | The system sends the location of users to the driver via email. | PASS |

6.2 System Integration Test

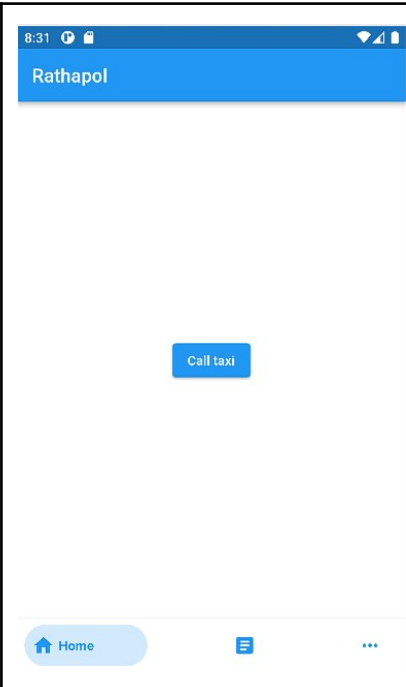
This topic aims to check whether the system can operate correctly according to the required functions or not.

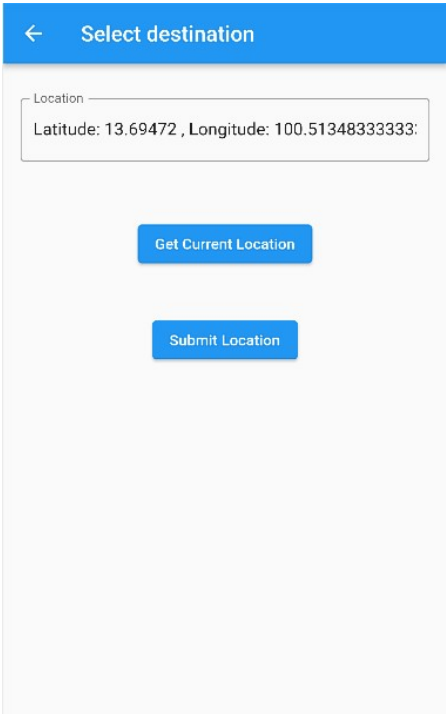
6.2.1 Test Scenario

In order to test all functional aspects of the system thoroughly, the researcher had set up a test scenario that consisted of 3 phases as shown below.


- Get the location: Users get the current location.
- Submit location: Users send the current location to the driver.

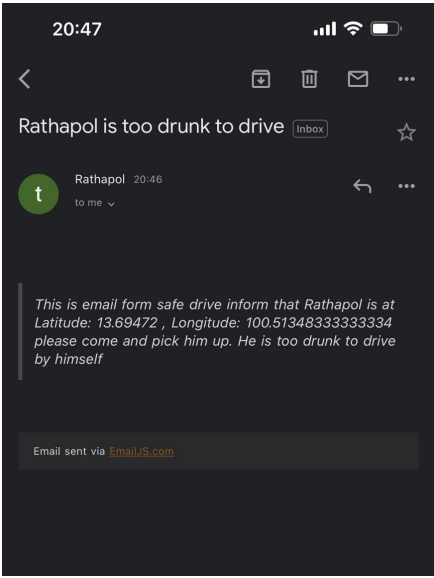
6.2.1.1 Get the location: Users get the current location

| | |
|--|--|
|  | <ul style="list-style-type: none">● In home page users can call for taxi service by enter Call taxi menu● There are 3 menus in the navigation bar: home, event log, and more. |
|--|--|

| | |
|--|--|
|  | <ul style="list-style-type: none">• After users click Get Current Location, systems will provide location by latitude and longitude format.• Then click Submit Location to send location to driver. |
|--|--|

6.2.1.2 Submit location: Users send the current location to the driver

| | |
|---|---|
|  | <ul style="list-style-type: none">• This page shows that the location is sent to the driver completely. |
|---|---|

| | |
|---|--|
|  | <ul style="list-style-type: none">● The location is sent by email to the driver. |
|---|--|

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LINK OF THE GITHUB PROJECT

<https://github.com/jaochoo/SafeDrunk>