وزارة التعليم العالي والبحث العلمي

العراق

جامعة بابل

كلية تكنولوجيا المعلومات

قسم امنية المعلومات

الدراسة: (الصباحية)

برنامج تنبيه الطوارئ

Emergency alert application

مشروع التخرج هو احد متطلبات الحصول على درجة البكالوريوس في تخصص امنية المعلومات في تكنولوجيا المعلومات .

A Graduate Project Submitted to the department of Information Security of the College of Information Technology, University of Babylon, in Partial Fulfillment of the Requirements for the Bachelor's degree in the Information Security of Information Technology.

الطالب

احمد علي هادي مكي الزبيدي

بأشراف

م.د خلدون حسن عبد الامير

2023

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

فَتَعَالَى اللَّهُ الْمَلِكُ الْحَقُّ ۗ وَلَا تَعْجَلْ بِالْقُرْآنِ مِن قَبْلِ أَن يُقْضَىٰ إِلَيْكَ وَحْيُهُ ۖ وَقُل رَّبِّ زِدْنِي عِلْمًا

سورة طه – الآية ١١٤.

الشكر والتقدير

الحمد لله رب العالمين والصلاة والسلام على أشرف الأنبياء والمرسلين سيدنا محمَّد وعلى آله الطيبين الطاهرين، وبعد..

فإني أشكر الله تعالى على فضله حيث أتاح لي إنجاز هذا العمل بفضله، فله الحمد أولاً وآخرًا.

ثم اقدم شكرا الى

(والدي العزيز)

نسير في دروب الحياة، ويبقى من يُسيطر على أذهاننا في كل مسلك نسلكه

صاحب الوجه الطيب، والأفعال الحسنة.

فلم يبخل عليَّ طيلة حياته

(امي الحبيبة)

إلى من أُفضِّلها على نفسي، ولِمَ لا فلقد ضحَّت من أجلي

ولم تدَّخر جُهدًا في سبيل إسعادي على الدَّوام

ثم أشكر الذي مد لي يدَ المساعدة والعون خلال هذه الفترة، أستاذي المشرف على الرسالة الأستاذ الدكتور خلدون حسن عبد الامير الذي لم يدَّخر جهدًا في مساعدتي، فقد فتح لي بيته، كما هي عادته مع كل طلبة العلم، وكنت أجلس معه بالساعات الطوال أقرأ عليه ولا يجد في ذلك حرجًا، وكان يحثني على البحث، ويرغبني فيه، ويقوي عزيمتي عليه فله من الله الأجر ومني كل تقدير حفظه الله ومتعه بالصحة والعافية ونفع بعلومه.

كما أشكر جميع القائمين على كلية تكنلوجيا المعلومات وعلى رأسهم معالي الدكتور حسين عطية عميد الكلية، وسعادة رئيس الكلية الدكتور الحارث عبد الكريم وفقهما الله لكل خير لما يبذلانه من اهتمام بطلاب كلية تكنلوجيا المعلومات.

الاهداء

أهدي تخرجي هذا إلى من علمني العطاء وإلى من أحمل اسمه بكل افتخار وأرجو من الله أن يمد في عمرك لترى ثمارا قد حان قطافها بعد طول انتظار "والدي العزيز".

وإلى ملاكي في الحياة وإلى معنى الحب والحنان والتفاني وإلى بسمة الحياة وسر الوجود وإلى من كان دعائها سر نجاحي أغلى الحبايب "امي الحبيبة".

وإلى من له الفضل الكبير في تشجيعي وتحفيزي ومن منة تعلمت المثابرة والاجتهاد وإلى من بهم أكبر وعليهم أعتمد وإلى من بوجودهم أكتسب قوة ومحبة لا حدود لها وإلى من عرفت معهم معنى الحياة "إخوتي وأخواتي".

وإلى من تحلوا بالإخاء وتميزوا بالوفاء والعطاء وإلى من برفقتهم في دروب الحياة السعيدة والحزينة سرت وإلى من كانوا معي على طريق النجاح والخير "أصدقائي الأعزاء"

بتوفيق من الله، وبدُعاء من الام لم يبق سوى خطوات قليلة لإنهاء مسيرتي الدراسية، شكرًا لكل من مد لي يد العون أهدي تخرجي هذا لكما يا أمي وأبي واسأل الله التوفيق لي ولكم.

Supervisor Certification

I certify that the Project entitled (*Emergency alert application / By using text messages via SMS*) was prepared under my supervision at the Department of security / College of information technology / University of Babylon, by the student (Ahmed Ali Hadi) as partial fulfillment of the requirements of the bachelor's degree' in Information Networks.

Signature:

Name: Dr. Khaldoon Hasan

Date: / / 2023

The Head of Department Certification

In view of the available recommendation, I forward the Project entitled "Multi-factor Authentication (MFA) Using face recognition and Graphical Passwords" for debate by the examination committee.

Signature:

Name: Dr. Khaldoon Hasan

Date: / / 2023

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Abstract

Abstract

Emergency Alert Application is a mobile-based platform aimed at enhancing community safety and providing timely warnings and alerts during emergency situations and critical situations. This project addresses the need for effective communication and rapid dissemination of critical information to individuals and communities facing threats such as natural disasters, public safety incidents and other emergencies.

Taking advantage of the spread and connectivity of smartphones, the Emergency Alert App creates a network of users who can receive and share real-time updates and alerts. By leveraging site-based services and user-generated content, the app enables users to stay informed about potential risks and take appropriate action to ensure their safety.

Key features of the emergency alert application include instant alert notifications based on real-time data from official sources, verified user reports and automated sensors. Users can also actively participate in community reporting by sharing valuable information and incidents, thereby enhancing situational awareness and enabling faster response and assistance. The application uses site-based services to provide relevant alerts specific to the user's current geographical area, allowing them to make informed decisions regarding their safety.

In general, the application of emergency alert provides a comprehensive solution for effective communication, community engagement, and timely alerts during emergencies, thereby contributing to the safety and well-being of individuals and communities. [6]

chapter one

Chapter one

1.1) Introduction

Emergencies are a global occurrence, often resulting in significant damage such as loss of life, theft, or attacks within a given area. These unfortunate events tend to transpire during times of disaster. Road accidents and acts of violence are common examples, leading to numerous challenges. Accidents can result in sudden fatalities or severe injuries, making it incredibly challenging to seek assistance during such critical moments. However, as technology advances, there are applications available to aid us in such situations, and this is where our emergency alert application comes into play.

The "Emergency Alert" app has been developed and made available to users, free of charge, through the Google Play Store for Android phone users. This application proves highly beneficial to users in various emergency scenarios by enabling the sending of distress messages and requesting help. It addresses emergencies such as traffic accidents, sudden attacks, or theft that may result in critical situations for individuals. Even if someone becomes lost or finds themselves in a non-existent location, the "Emergency Alert" app offers the appropriate and optimal solution to tackle such problems.

By sending distress messages to designated individuals, accessible through the app, users can receive assistance during such circumstances. Additionally, a call feature has been incorporated into the app, functioning without an internet connection. This aspect ensures that users can still ask for help even in the absence of an internet connection. It serves as a reliable messaging tool for

seeking assistance when internet access is limited. Users can reach out to friends or family members by simply identifying their contact numbers.

The "Emergency Alert" app serves as an instant messaging platform solely for requesting help. It is essential to note that the effectiveness of the app relies on the number of users present in a particular area. The more users utilizing the app within a given region, the better the response to emergencies and the prevention of abusive incidents, as depicted in Figure 1. Consequently, it is advisable for friends and family members to utilize the app, making it easier to request help, even if they are located far apart across the country. Whether one is in need of food, medical supplies, or assistance with injuries in an unfamiliar location, the "Emergency Alert" app offers a reliable means to seek support.

Figure (1)

The proposed application is among the essential apps that should be installed on your smartphone, providing you with ease and simplicity in times of distress. It proves invaluable for both yourself and anyone accompanying you, especially in non-Internet locations. The app has been developed to cater to users aged 12 and above, offering numerous features that make it exceptional, optimal, and a convenient solution during emergencies.

1.2) Problems solved by the application

The emergency alert app is specifically developed to address a wide range of issues and emergencies that individuals may encounter. It serves as a vital tool for critical health situations, traffic accidents, fires, house demolitions, and various other problems. The primary objective of the app is to provide immediate assistance in resolving these issues. It has proven to be highly beneficial for numerous individuals, ensuring their safety and well-being. Installing such programs on your personal device is undoubtedly the best solution to enhance your safety wherever you may be.

1.3) The purpose of the work

What does the emergency alert app do?

The primary objective of this emergency application and security alert app is to provide timely notifications in case of emergencies through a simple button interface. Its purpose is to prevent accidents and enhance the overall quality of public safety and life. These apps utilize GPS coordinates to ensure your safety no matter where you are. They prove particularly useful during the following commonly encountered emergency scenarios:

Personal Safety

Personal safety and security are key reasons for using emergency alert app development. A person alone is subject to numerous threats such as theft, kidnapping, rape, domestic violence and loss in case of visiting a new place. These apps can help you communicate with known people, family or police for immediate assistance. You just need to hit the panic button apps, and the notification app will be sent to the contact point effectively to ensure your security and safety.

Staff safety

Organizations must have these emergency alert apps at the click of a button or application-related security alert apps that will ensure the safety and security of their employees' workplace. This applies to any function and provides a single solution to all the organization's problems. Just hit the fingerprint button and get help. But some jobs need it the most, such as police shows, safety or security guards, miners, firefighters, etc.

Health emergencies

Health emergencies are not uncommon either, and by developing an emergency alert app or developing a security alert app from anywhere. These emergency alert apps will notify the hospital or ambulance in case of illness, accident or health emergency. At the same time your family and friends will be notified and get access to your site

Family Security

Emergency apps are also designed to keep you and your family safe in a more easy way. Especially if you have elderly parents or children at home while you are at work or outside the home, these safety and security alert apps will let you know when they need you with an alert message.

Safety while Driving

Drivers benefit greatly from these security alert apps. This includes taxi drivers, truck drivers or driving personal vehicles. Security alert apps allow them to be more confident and secure while on the road. This will prevent assault, theft, accidents and other emergencies through GPS coordinates and pay notifications to families and relevant authorities.

Disabled persons' security

People with disabilities have difficulty performing some common tasks, such as accessing something. Security alert apps help them when they are away or their caretaker is away. Or even if they live alone, these alert app development systems will inform relevant bodies that can help them in time of need. It will provide them with this security even when they are alone [6]

chapter two

chapter two

Emergency alert apps are mobile applications created to promptly inform users about possible emergencies in their vicinity, such as extreme weather conditions, natural calamities, or other critical incidents. These apps typically employ geolocation technology to deliver targeted alerts based on the user's location, ensuring the timely dissemination of potentially life-saving information.

The specific features and functionalities of emergency alert apps may vary depending on the particular app and the region they cater to. However, they generally offer users up-to-date details regarding emergencies, including guidance on how to ensure their safety and where to seek assistance if required. Some apps may also incorporate additional features such as real-time weather monitoring, evacuation route mapping, and tools for communicating with emergency responders.

2.1) ITU's work on emergency communications

The International Telecommunication Union (ITU) provides support to its member States in the creation of Local Emergency Communications Plans (NETP). These plans aid local authorities and policymakers in guaranteeing the uninterrupted operation of information and communication technology (ICT) networks and services throughout all phases of disaster management. As stated in Section 5.3 of the Federation's strategic plan for 2020-2023, it is expected that by 2023, every country will have implemented a local emergency communications plan as an integral part of their local strategies for reducing disaster risks.

Developing local contingency communications plans is crucial for establishing a comprehensive strategy and protocols that facilitate the exchange of information among various levels of government, communities, and public and private institutions. These plans play a vital role in enhancing resilience to disasters. At the Federation's 2018 Conference of Plenipotentiary Delegates (PP-18) in Dubai, United Arab Emirates, held from October 29 to November 16, 2018, several decisions were approved, including a revised decision on providing support to small island developing States and landlocked developing countries.

Support was extended to four Pacific islands (Vanuatu, Samoa, Solomon Islands, and Papua New Guinea) and two countries in the Americas (Bolivia and Guatemala) for the development of local contingency communications plans. Additionally, the conference facilitated local and regional workshops and forums on the utilization of information and communication technologies (ICTs) for disaster management. One notable event was the Global Forum on Disaster Communication (GET), which brought together public and private stakeholders, including the United Nations and non-governmental entities. These gatherings served as platforms to discuss and address emerging issues, requirements, and opportunities related to the use of ICTs in disaster management and risk reduction.. [1]

2.2) Use of ICT at all stages of disasters

Figure 2 illustrates the various stages involved in disaster risk management, encompassing both the pre-disaster risk management phase and the post-disaster crisis phase. These phases are generally applicable to both natural and man-made disasters. The chart presented in Figure 2 represents the pathway of disaster risk management

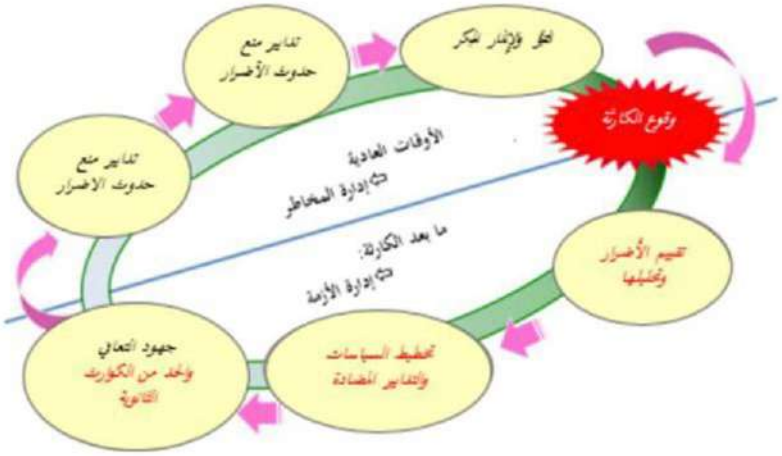


Figure (2)

Risk Management - Pre-Disaster

- Damage prevention measures: Enhance the resilience of ICT and reinforce it with standby support capacity.
- Harm reduction measures: Develop organizational planning and policies; forecast supplies and equipment in advance; provide training and capacity-building; offer guidance and preparedness to communities and citizens.
- Prediction and early warning: Utilize sensors and early warning systems; analyze big data to provide general estimates.

Crisis Management - Post-Disaster:

- Damage assessment and analysis: Collect information on the impact of the disaster (e.g., affected areas, number of victims, damage/impact analysis); assess the impact on ICT networks.
- Policy planning and countermeasures:

  1) Implement disaster response plans.

  2) Deploy countermeasures to address disaster damage.

  3) Provide leadership, guidance, and coordination with first responders (e.g., local government staff).

  4) Request support from government agencies, police, military, and relief organizations, if necessary.

- Secondary recovery and disaster reduction efforts: Share information (e.g., evacuation centers, relief supplies); restore networks and rebuild infrastructure.

ICT supports and facilitates all the aforementioned phases of disaster management, with varying demands for different systems, services, and applications throughout the cycle. Figure 3 presents a general overview of ICT usage in the post-disaster period, with the vertical and horizontal axes representing the duration and nature of the demand for these services, respectively. During the initial emergency response phase, there is a heightened need for real-time communication, such as telephone and email, which play a vital role in life-saving activities like search and rescue operations. At this stage, people's primary ICT requirements often revolve around ensuring the safety and security of their family, friends, employees, and assets.

Once the initial recovery phase begins, restoration efforts commence. However, the duration of recovery depends on the severity of the disaster. [2]

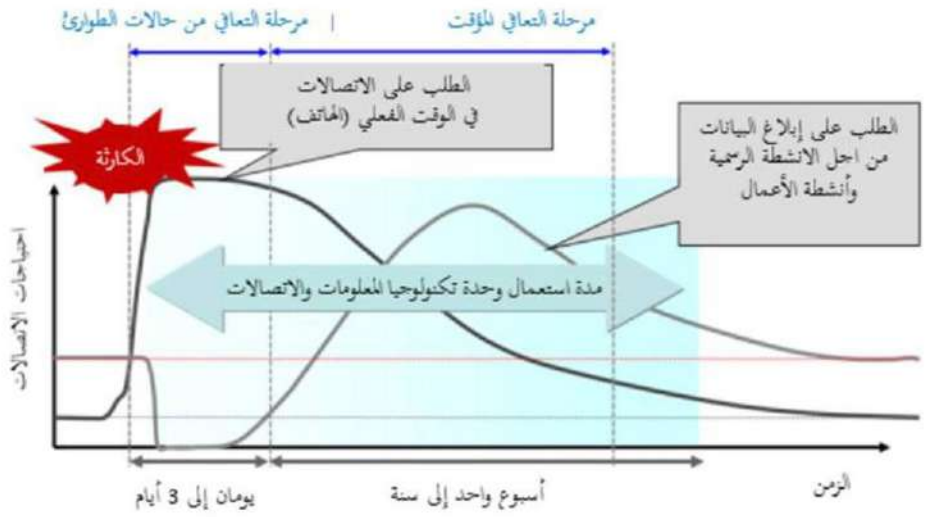


Figure (3)

2.3) Some applications approach to our application at work

2.3.1) First Aid App

The interface of the app is as in Figure 4 and is available in the Bli store and as you are in Apple Store

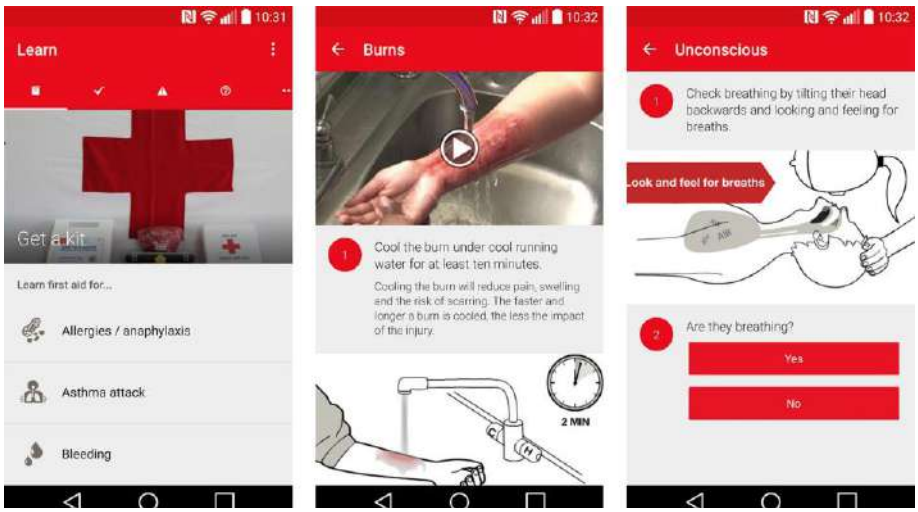


Figure (4)

The IFRC's official first aid app gives you immediate access to the information you need to know to deal with the most common emergency first aid. First aid knowledge has never been so easy, through videos, interactive contests and simple step-by-step tips.

The term "first aid application" is very broad, and there are many first aid applications available on different platforms. Without a specific application name, it is difficult to provide accurate details. However, I can provide information about a popular first aid app called "First Aid by American Red. Cross "

"First aid by the American Red Cross" is an official first aid application developed by the American Red Cross, a well-known humanitarian organization. The app provides users with basic first aid information and instructions to help them respond effectively in emergencies. Here are some general details about this app:

Creator: The "First Aid by American Red Cross" app was created by the American Red Cross.

Year of Creation: The exact year of creation may vary based on the specific version and updates. The app has been available for several years, with regular updates to enhance its features and contents.

Features: The app typically offers a range of features, including:

1) First aid instructions: step-by-step guidance for dealing with various emergencies, such as asphyxiation, bleeding, burns, CPR, etc.
2) Videos and photos: Visual aids, including videos and photos, to provide a better understanding and guidance of the performance of first aid techniques.
3) Safety Guidelines: Information on preparedness, prevention and public safety advice for different situations and environments.
4) Interactive tests: educational competitions to test knowledge and promote learning about first aid techniques and procedures.

5) Emergency contact information: access to emergency contact numbers of the user's area or location.
6) Customization: Some versions of the app allow users to customize content and save preferred instructions for quick access [8].

2.3.2) Application Life360

The interface of the app is as in Figure 5 and is available in the play store and as you are in Apple Store

Figure (5)

Life360 program, the idea of Life360 program service first emerged after the devastating Hurricane Katrina in front of Chris Holz in the United States of America, when he founded this service to help victims and those affected, and it was developed as one of the most important means of emergency reporting in the United States and the entire world

Life360 is a popular family and security tracking app that offers a range of features to help families stay connected and ensure the well-being of loved ones. It provides features such as location tracking, group messaging and emergency assistance. Here are some basic details about the application: Life360

Builder: The Life360 was created by Chris Hulls and Alex Haro. They co-founded the company in 2008.

Year of Creation: Application launched. Life360 in 2008

Features:

Lets Life360: Share location in real time

1) Family members share their real-time location with each other on a private map. This feature allows users to track the whereabouts of loved ones and ensures easy coordination.
2) Geo-fence and place alerts: Users can set up virtual boundaries, known as geo-fences, to receive alerts when family members enter or leave certain locations. This feature is particularly useful for monitoring the arrival or departure of family members from home, school or other important places.
3) Group messaging: The app provides a group messaging feature that allows family members to communicate with each other within the app. Easy and comfortable communication between family members.
4) SOS/Panic button: Life360 includes SOS/Panic Button feature that users can activate in an emergency. When turned on, it sends an immediate alert to selected family members, notifying them of the user's emergency and presenting their location.
5) Driving safety: The app provides driving safety features, such as accident detection and driving behavior analysis, to help promote safer driving habits among family members. It can notify designated contacts in the event of an accident or provide insights into driving behaviour.
6) Crime reports and safety features: Incorporate crime report Life360 and safety features in some areas. Users can access local crime data and receive safety notifications to stay informed about their surroundings. [9]

2.3.3) React Mobile App

The application icon will be as shown in Figure No. (6)

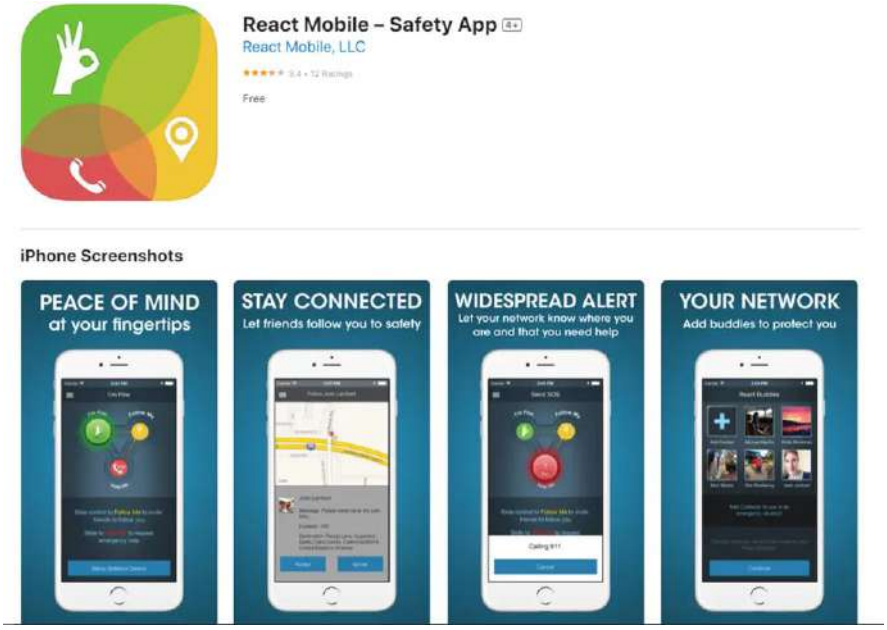


Figure (6)

React Mobile is a personal security app designed to enhance personal security and provide assistance during emergencies. Users are allowed to quickly alert their contacts or emergency services when they feel threatened or unsafe. Here are some basic details about the app: React Mobile

Originator: Created. React Mobile by a company called React Mobile Inc

Year of Creation: Application launched. React Mobile for the first time in 2013

Get help quickly and don't walk alone with React Mobile!

This app works with React Sidekick, Bluetooth panic button

React Mobile is a simple but powerful personal safety solution that changes how people ask for emergency help. React Sidekick personal safety device pairs with React Mobile security app so that users can send a large-scale

emergency alert quickly without having to access and unlock their phone. The React Mobile security system is the fastest way to access an extensive network of family and friends at the most important times.

Have you ever worried about your safety? Want to protect your loved ones?

React Mobile TM keeps you connected and safe when you feel unsafe. Share your site with reliable contacts and get home safely.

With real-time tracking, help comes faster.

Use the React Mobile security app to share your GPS location with friends and to track loved ones. React Mobile allows your friends to follow you to safety and gives you a lifeline for the most trusted contacts and local authorities in emergencies.

If you're worried about your safety, simply pass the app control to the yellow button "Follow Me," which allows you to choose contacts you want to share your site with. Your contact list will then send an email and text message with a link to your GPS website. Through this link, your loved ones will be able to track your location in real time. As soon as you reach safety, swipe to the green button "I'm safe" to let them know you're okay.

Wide network alert in case of emergency

Emergency assistance is at your fingertips. Simply pass the app control to the red button "SOS Help Me" to send a large-scale emergency alert to an unlimited number of friends. "Help Me" notifications are sent via email and text messages and can be sent optionally to Facebook و Twitter. The app automatically contacts local authorities when sending a "help me" message. React Sidekick users can simply play and "click" on the Sidekick button to activate a widespread reaction emergency alert.

Who is React Mobile?

The React Mobile security app is ideal for those with an active lifestyle, and brings peace of mind when: jogging alone, walking alone or in parking lots, getting to know new customers, traveling to new places, and getting to know. React Mobile is also a great tool to give to children and adolescents so they can easily seek help in emergencies.

Main features of the application

1) Share the site with friends - track in real time "follow me"
2) Worldwide Emergency Support
3) Send emergency alerts via email and text message
4) Post emergency alerts on Facebook and Twitter
5) Support 911 automatic connection (local authority)

Sidekick makes our app more powerful:

1) Get quick help - one-click activation
2) If the screen is down, override the phone lock to send an alert
3) Standard gender neutral and stylish design

Notes:

1) The app uses Bluetooth Low Energy (BLE) to communicate with your Sidekick. Maximum range 100 feet.
2) The app uses location services to register the last known site, based on your phone's geographic location data.
3) Continuous use of GPS or Bluetooth working in the background can significantly reduce battery life.
4) Works with iPhone 4S and newer versions

As shown in:
Runner's World و Travel and Leisure و SHAPE و SELF و Outside Magazine و Huffington Post و TechCrunch و Geekwire و ELLE Magazine و About.com. [10]

Regarding our application, we have incorporated the finest aspects from the aforementioned features to make it the ultimate application of the future. For instance, we have implemented a user-friendly feature that allows users to send notifications with a simple touch or by directly contacting a designated security center. Additionally, we have implemented a secure login method to ensure the program's protection against hacking attempts. We have established stringent conditions that all users must adhere to in order to safeguard their personal access to the application.

2.4) Tools used in app programming

2.4.1) Programming using Java Language

Before beginning the programming process in the Java language, it is necessary to have the crisis kit available. This kit consists of essential tools and software specifically designed for writing programs in Java. Once the program is written, the next step is the translation process, commonly known as compiling.

There are multiple approaches to writing and translating Java programs:

1) Using the Java Development Kit (JDK): This is a library provided by Sun, which allows programmers to write Java programs using any text editor. The software needed for this process is already included in Windows.

2) Utilizing intermediate software: There are various software options available, such as "NetBeans" and "JCreator," which assist in writing, translating, and correcting errors in Java programs.

Java has different editions available:

1) J2SE (Java 2 Standard Edition): This edition is used for studying the Java language and developing applications that run on computers, commonly known as desktop applications.

2) J2EE (Java 2 Enterprise Edition): This edition is specifically designed for creating large-scale applications for enterprise-level companies. It offers extensive capabilities and resources.

3) J2ME (Java 2 Micro Edition): This edition is focused on wireless devices, particularly mobile devices. It is tailored to run on such devices. illustrates the functioning of the Java language. [3]

When developing apps in Java using Android Studio, you can leverage the robust features and tools offered by both the Java programming language and the Android SDK. In this process, we utilize the most suitable version of Java that we previously mentioned, which is J2EE (Java 2 Enterprise Edition). This edition provides a comprehensive set of functionalities for creating enterprise-level applications.

2.4.2) Features of Java Language

The Java language is designed to be compatible with various operating systems, including Windows XP, UNIX, and others. It is often referred to as a sibling of the C++ language, both of which were created by Sun Microsystems. Java is recognized as a versatile and inclusive programming language, encompassing elements from various programming languages.

The introduction of Java in 1990 addressed several significant issues:

1) Memory allocation problem

2) The complexity of C++, which was widely used prior to Java's arrival, as Java blurred the intricacies of C++

3) Enhanced security and safety, particularly in networking, achieved by eliminating the concept of pointers found in traditional languages.

Highlighting the advantages of the Java language would be an extensive task, as it boasts numerous benefits. Its advantages have led to the replacement of other programming languages. This brief overview only scratches the surface of Java, which has sparked a major revolution in the realm of software development. [4]

chapter three

chapter three

We have developed and created the Mobile Emergency Alert for Hazardous Situations, an Emergency Alert System that operates on a networked infrastructure. Its primary purpose is to swiftly distribute crucial public safety information to the general public. This system is specifically designed to deliver important alerts and warnings during various emergencies, including severe weather conditions, natural disasters, missing children alerts, terrorist attacks, and other significant incidents that could directly endanger lives or property. The emergency alert system plays a vital role in keeping the public informed and ensuring their safety during such critical situations. It provides essential and timely information that can potentially save lives and mitigate harm.

3.1) Proposed model

In this study, we have proposed a new model that addresses the weaknesses in current applications as shown in Figure (8)

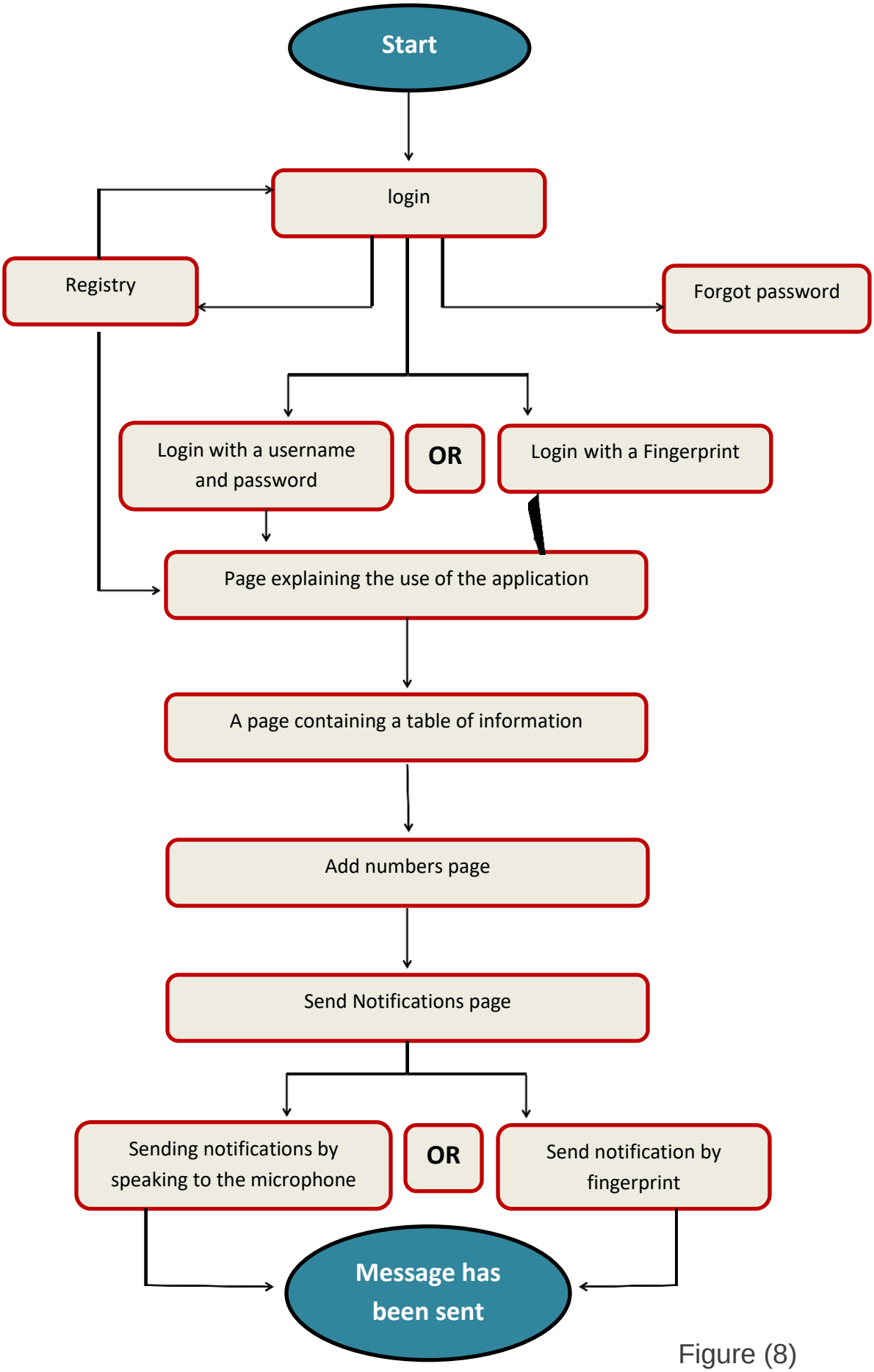

Start
login
Registry
Forgot password
Login with a username and password
OR
Login with a Fingerprint
Page explaining the use of the application
A page containing a table of information
Add numbers page
Send Notifications page
Sending notifications by speaking to the microphone
OR
Send notification by fingerprint
Message has been sent

Figure (8)

3.2) Application interfaces

3.2.1) Welcome Interface

This page serves as the welcome screen for all users, as depicted in Figure (9). It is displayed at the start of software usage and features the application logo, a welcoming message for users, and a button to proceed to the next page. Let us now proceed to Page 2 and 3.

Figure (9)

3.2.2) Login Interface

Here, we present a registration page that requires every user who wishes to utilize the app to log in, as illustrated in Figure (10).

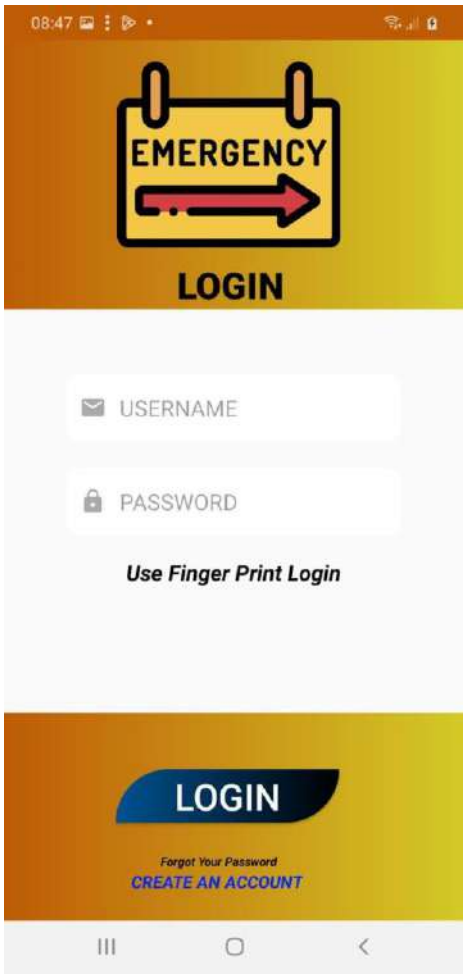


Figure (10)

```
BiometricManager biometricManager = BiometricManager.from( context: this);
switch (biometricManager.canAuthenticate( authenticators: BIOMETRIC_STRONG | DEVICE_CREDENTIAL)) {
    case BiometricManager.BIOMETRIC_SUCCESS:
        Log.d( tag: "MY_APP_TAG", msg: "App can authenticate using biometrics.");
        break;
    case BiometricManager.BIOMETRIC_ERROR_NO_HARDWARE:
        Toast.makeText( context: this, text: "fingerprint no", Toast.LENGTH_SHORT).show();
        break;
    case BiometricManager.BIOMETRIC_ERROR_HW_UNAVAILABLE:
        Toast.makeText( context: this, text: "", Toast.LENGTH_SHORT).show();
        break;
    case BiometricManager.BIOMETRIC_ERROR_NONE_ENROLLED:
        // Prompts the user to create credentials that your app accepts.
        final Intent enrollIntent = new Intent(Settings.ACTION_BIOMETRIC_ENROLL);
        enrollIntent.putExtra(Settings.EXTRA_BIOMETRIC_AUTHENTICATORS_ALLOWED,
                value: BIOMETRIC_STRONG | DEVICE_CREDENTIAL);
        startActivityForResult(enrollIntent, REQUEST_CODE);
        break;
}
```

```
6 usages
@Override
public void onAuthenticationSucceeded(
        @NonNull BiometricPrompt.AuthenticationResult result) {
    super.onAuthenticationSucceeded(result);
    Toast.makeText(getApplicationContext(),
            text: "تم تسجيل الدخول بنجاح عن طريق بصمة الاصبع", Toast.LENGTH_SHORT).show();
    Intent intent=new Intent( packageContext: LOGIN.this, ABOUTPROGRAMING.class);
    startActivity(intent);
}
```

Fingerprint Code

The login page showcases the app logo and features dedicated fields for the user's username and password. To enhance convenience, users have the option to

utilize their fingerprint instead of manually entering the password. By pressing the "Use Fingerprint Login" button, they can securely access the app without the need to input the password each time.

3.2.3) Change password Interface

Users have the option to change their password in case they forget it by selecting the "Forgot Your Password" option. Upon clicking this option, they will be redirected to the password change page, as illustrated in Figure (11).

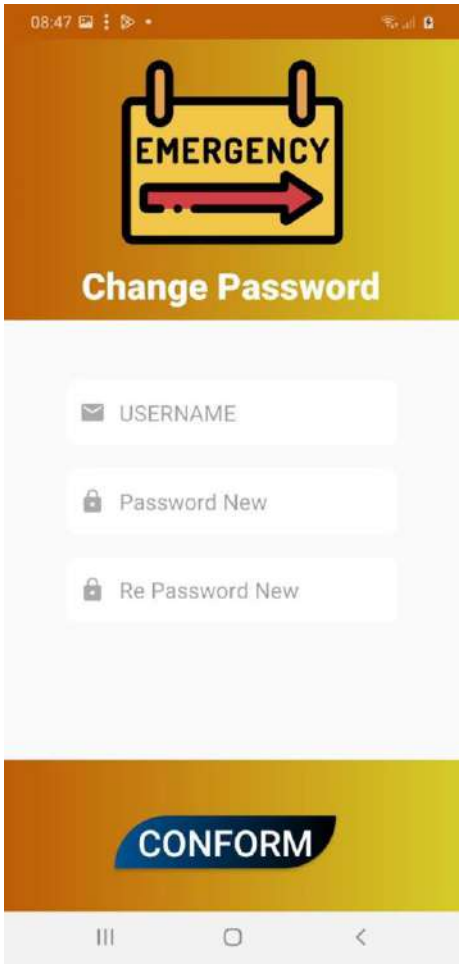
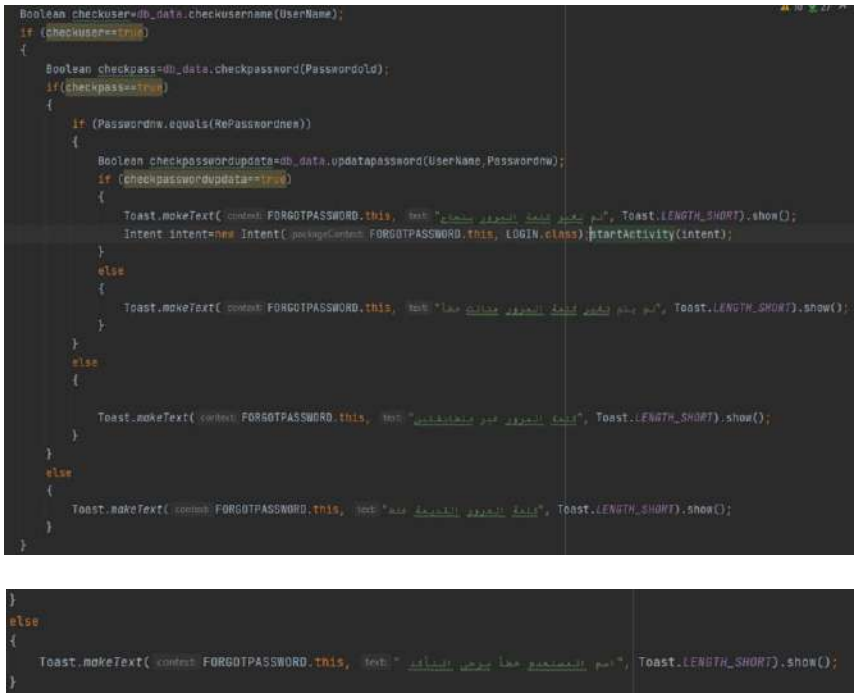


Figure (11)



Password Change Code

3.2.4)Create account interface

Additionally, if the user does not have a pre-existing account, they can create a new account by providing all the necessary user details, as shown in Figure (12). This can be done by clicking the "CREATE AN ACCOUNT" button on the login page.

Figure (12)

```
1 usage
public boolean isValidEmail(String email) {
    return Patterns.EMAIL_ADDRESS.matcher(email).matches();
}
1 usage
public boolean isValidPassword(String password) {
    // Regex pattern for password validation
    String pattern = "^(?=.*[0-9])(?=.*[@#$%^&+=])(?=\\S+$).{8,}$";
    return password.matches(pattern);
}
```

Email and Password Terms Code

This page requires the user to enter all the specified fields in order to create an account and access the app. If any of the fields are left empty, the application will not proceed with the account creation and display a message or notification alerting the user about the missing information. Once all the required details are

entered, the user can click on the "CREATE AN ACCOUNT" button to create their account and access the app. There is also a "Login" button available on this page, which allows the user to return to the login page.

After successfully logging in, as described in the previous paragraphs, the user will be directed to a new page. This page features the app's logo and provides instructions on how to properly use the app. It also includes a "Next" button that allows the user to navigate to the next page, as depicted in Figure (13).

Figure (13)

3.2.5) Phone number of Emergency Center Identification

Upon clicking the "Next" button, the user will be directed to the next page, which displays a comprehensive table listing the names of various emergency centers along with their corresponding codes. These codes serve as a convenient alternative for users who may have difficulty pronouncing the complete names of the centers. By vocalizing the code associated with the desired emergency center, the application will promptly send an alert notification to the designated center. The table on this page provides the names and corresponding numbers of each emergency center, as depicted in Figure (14).

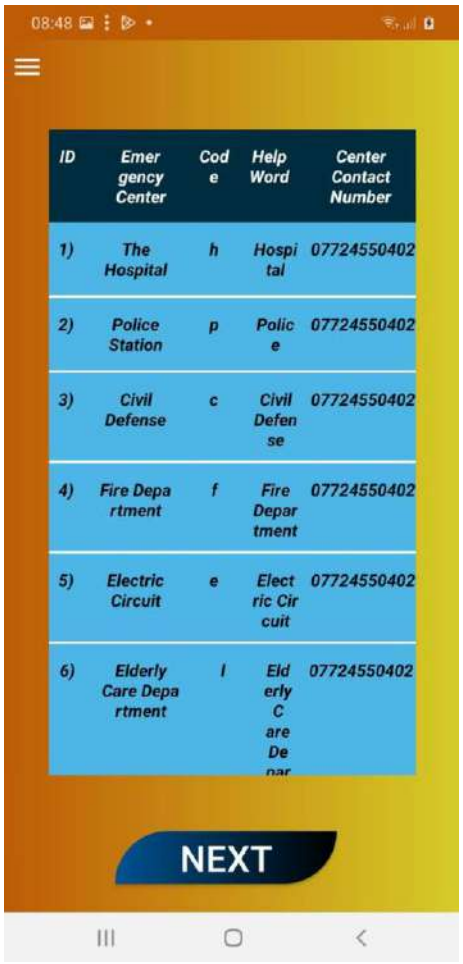


Figure (14)

```
<TableLayout
    android:layout_width="700dp"
    android:layout_height="wrap_content"
    android:layout_margin="40dp"
    android:background="@color/white">
    <TableRow android:background="#002C40">
        <TextView
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="2"
            android:gravity="center_horizontal"
            android:text="ID"
            android:textColor="@color/white"
            android:textSize="14sp"
            android:textStyle="bold|italic" />
        <TextView
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="6"
            android:gravity="center_horizontal"
            android:padding="12sp"
            android:text="Emergency Center"
            android:textColor="@color/white"
            android:textSize="14sp"
            android:textStyle="bold|italic" />
```

```
    <TextView
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="2"
        android:gravity="center_horizontal"
        android:text="Code"
        android:textColor="@color/white"
        android:textSize="14sp"
        android:textStyle="bold|italic" />
    <TextView
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="4"
        android:gravity="center_horizontal"
        android:padding="10sp"
        android:text="Help Word"
        android:textColor="@color/white"
        android:textStyle="bold|italic" />
```

Table Code

3.2.6) Enter family and friends numbers to send notification message

The page features a "Next" button, which enables the user to proceed to the next page. This subsequent page serves as a platform for inputting the contact numbers to which alert notifications will be sent when seeking assistance, such as family or friends' numbers. Each user is allowed to enter a maximum of four numbers, and it is mandatory to provide at least four numbers. In case the user has entered only three numbers, a notification appears, indicating the need for an additional number. If the user intends to input a new number, they can do so by selecting the option depicted as (15).

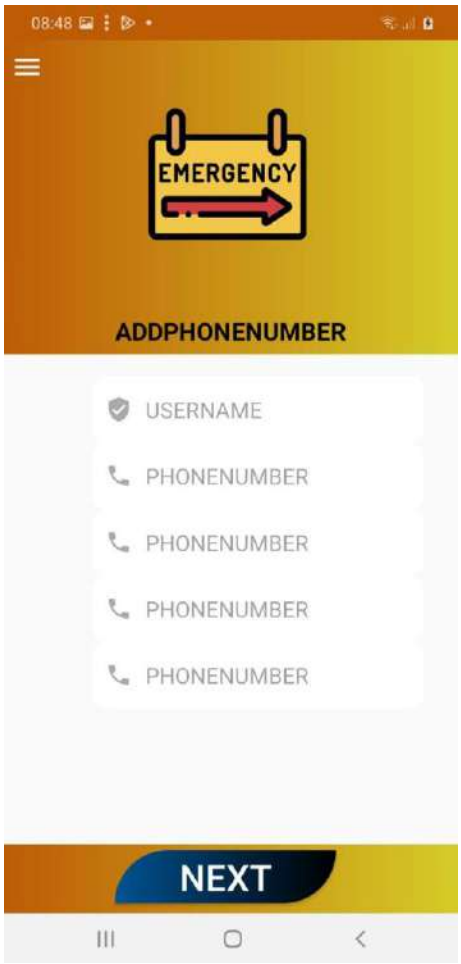
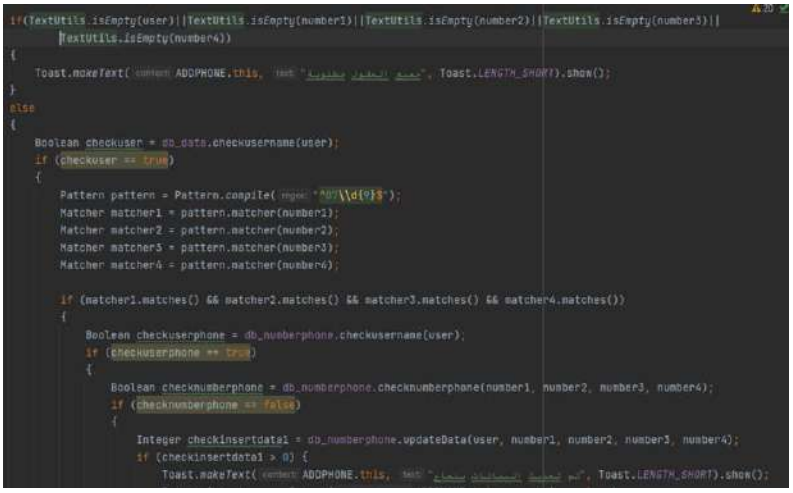
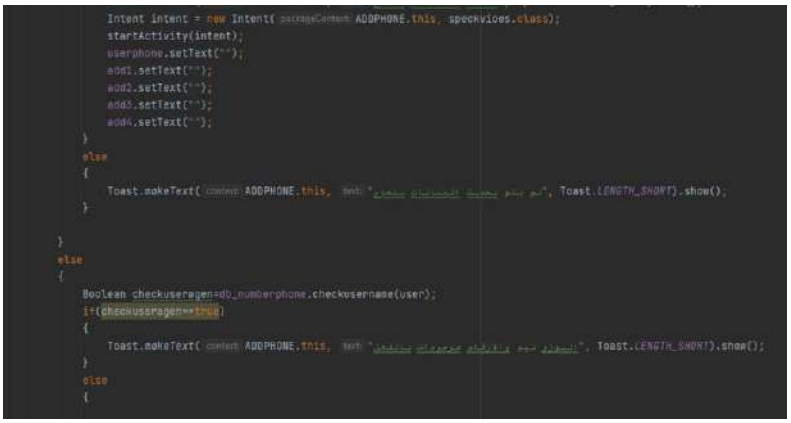


Figure (15)





Code for adding and updating numbers

3.2.7) Notification interface

The page features a "Next" button that takes us to the subsequent page, where we can record an audio message and send the alert notification to the designated center as well as the individuals whose numbers have been entered. If any of the phrases listed in the table from Figure 15 appear on this page, the numbers entered by the user will be displayed, as depicted in Figure (16).

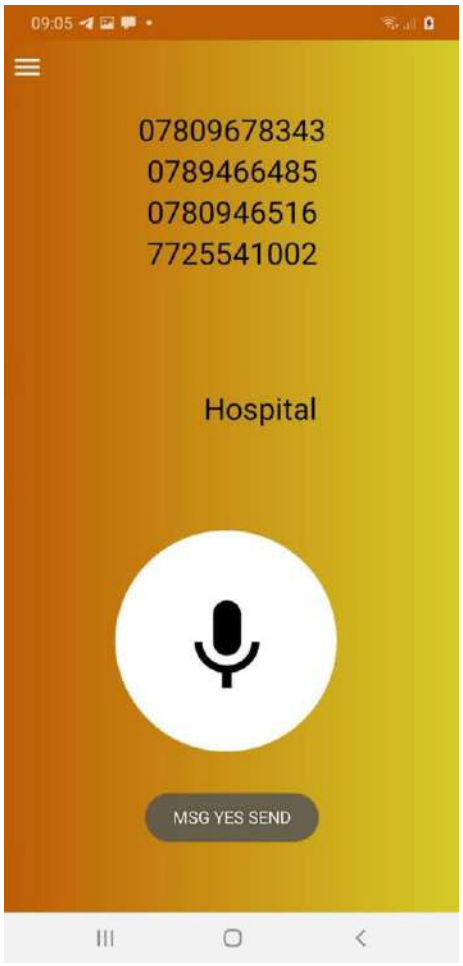


Figure (16)

```
private void sendsmslocation() {
    String phoneNumber = txtnum.getText().toString();
    String phoneNumber2 = txtnum2.getText().toString();
    String phoneNumber3 = txtnum3.getText().toString();
    String phoneNumber4 = txtnum4.getText().toString();
    String lat=locationTextView.getText().toString();
    String log=locationTextView2.getText().toString();
    String spesc=",";
    String location=lat+spesc+log;

    try {
        SmsManager mysms = SmsManager.getDefault();
        mysms.sendTextMessage(phoneNumber, null, location, null, null);

        Toast.makeText( context: this, text: "MSG YES SEND", Toast.LENGTH_SHORT).show();
        try {
            SmsManager mysms2 = SmsManager.getDefault();
            mysms2.sendTextMessage(phoneNumber2, null, location, null, null);
            Toast.makeText( context: this, text: "MSG YES SEND2", Toast.LENGTH_SHORT).show();
            try {
                SmsManager mysms3 = SmsManager.getDefault();
                mysms3.sendTextMessage(phoneNumber3, null, location, null, null);
                Toast.makeText( context: this, text: "MSG YES SEND3", Toast.LENGTH_SHORT).show();
                try {
                    SmsManager mysms4 = SmsManager.getDefault();
                    mysms4.sendTextMessage(phoneNumber4, null, location, null, null);
                    Toast.makeText( context: this, text: "MSG YES SEND4", Toast.LENGTH_SHORT).show();
```

```
                } catch (Exception ex) {
                    ex.printStackTrace();
                    Toast.makeText( context: this, text: "MSG NO SEND4", Toast.LENGTH_LONG).show();
                }

            } catch (Exception ex) {
                ex.printStackTrace();
                Toast.makeText( context: this, text: "MSG NO SEND3", Toast.LENGTH_LONG).show();
            }

        } catch (Exception ex) {
            ex.printStackTrace();
            Toast.makeText( context: this, text: "MSG NO SEND2", Toast.LENGTH_LONG).show();
        }
    } catch (Exception ex) {
        ex.printStackTrace();
        Toast.makeText( context: this, text: "MSG NO SEND", Toast.LENGTH_LONG).show();

    }
```

Code that sends messages

3.2.8) voice recognition interface

The functionality of this page is straightforward. By clicking on the microphone button, as depicted in Figure 16, you gain access to the interface for speech input, illustrated in Figure 17. Here, you can pronounce the name of the desired center to request assistance.

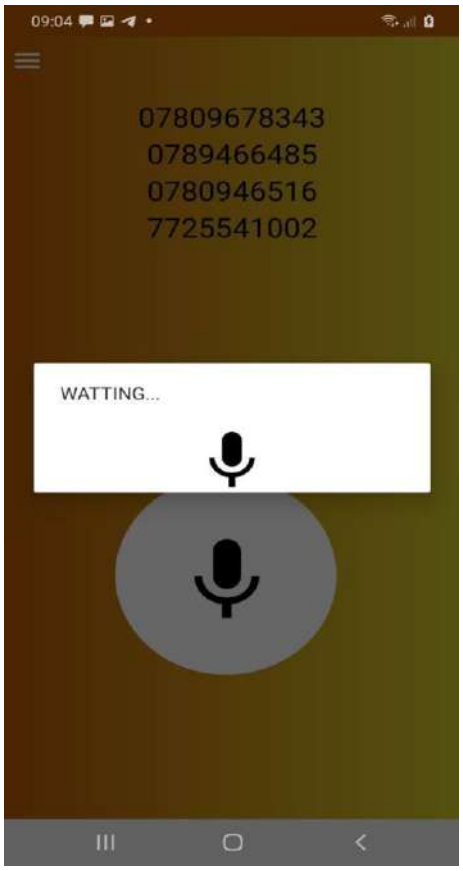


Figure (17)

```
if(ContextCompat.checkSelfPermission( context: speckvioes.this, Manifest.permission.RECORD_AUDIO)!=
        PackageManager.PERMISSION_GRANTED){
    checkPermission();
}

speechRecognizer=SpeechRecognizer.createSpeechRecognizer( context: this);
final  Intent speechIntent=new Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH);
speechIntent.putExtra(RecognizerIntent.EXTRA_LANGUAGE_MODEL,RecognizerIntent.LANGUAGE_MODEL_FREE_FORM);
speechIntent.putExtra(RecognizerIntent.EXTRA_LANGUAGE, Locale.getDefault());
speechRecognizer.setRecognitionListener(new RecognitionListener() {
    @Override
    public void onReadyForSpeech(Bundle bundle) {

    }

    @Override
    public void onBeginningOfSpeech() {
        ViewGroup viewGroup=findViewById(android.R.id.content);
        View dialogview= LayoutInflater.from( context: speckvioes.this).inflate(R.layout.alertcostum,viewGroup, attachToRoot: false);

        alertspeechdialog=new AlertDialog.Builder( context: speckvioes.this);
        alertspeechdialog.setMessage("WATTING...");
        alertspeechdialog.setView(dialogview);
        alertDialog=alertspeechdialog.create();
        alertDialog.show();
    }
```

Audio Capture Code

chapter four

chapter four

In this chapter, we will discuss the functioning of the app and provide guidance on its proper usage to ensure users avoid common mistakes related to account creation, login procedures, and adding contacts for alert notifications. We will emphasize the importance of executing these actions accurately and securely to maintain the integrity and effectiveness of the app's functionality.

4.1) Methodology

4.1.1) Login interface

On the login page, if we click the login button without filling in the required fields, we won't be able to access the app. Instead, a message will prompt us to enter our data. Alternatively, we can access the app using the fingerprint authentication feature. If we enter a username that doesn't exist, an error message will indicate that the username is incorrect, prompting us to enter a valid username. Similarly, if we enter an incorrect or non-existent password, the app will display an error message stating that the password is invalid, and we will be prompted to enter a valid password to access the app. However, upon entering a valid username and password, the app will successfully log us in, greet us, and redirect us to the next page within the app, as depicted in Figure (18).

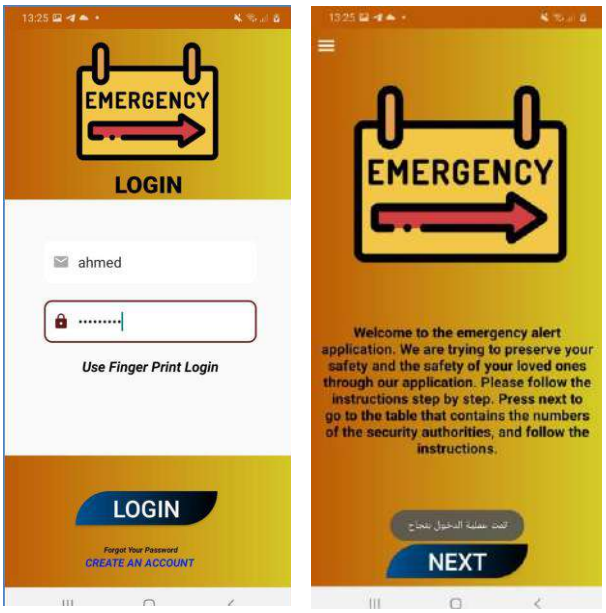


Figure (18)

4.1.2) Account creation interface

On the account creation page, it is necessary to fill in all the required fields. If any field is left empty, a message will appear requesting that all fields be filled. If a username that has already been used is entered, a message will indicate that the username is already taken, and an alternative username must be provided. When creating an account, the email address should be in the format example@gmail.com. If an invalid email format is entered, a message will prompt us to enter a valid email address. Similarly, the password must meet certain criteria, such as having a minimum length of 8 characters and including both numbers and special characters. If the password entered does not meet these requirements, a message will appear requesting a password that fulfills the specified criteria.

Regarding the selection of gender, if the user chooses the option "SELECT GENDER," a message will ask for a specific gender selection. The options for gender must be either "MALE" or "FEMALE." Once all the fields and criteria are successfully completed, the app will create a new user account and redirect us to the app interface for easy usage, as depicted in Figure (19).

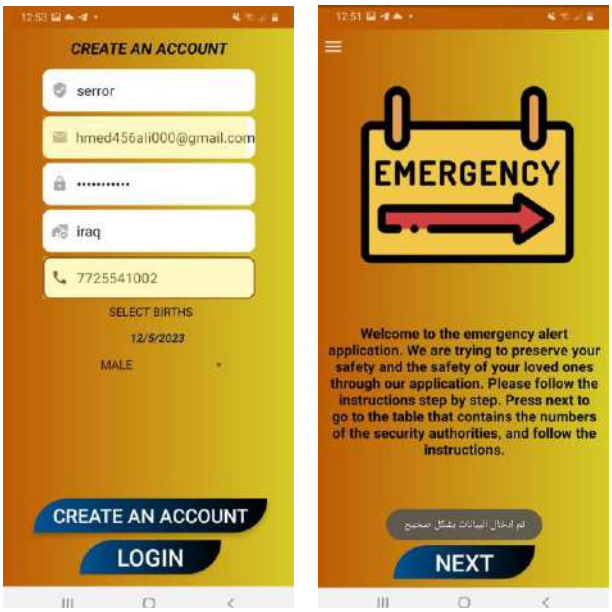


Figure (19)

4.1.3) Login interface by fingerprint

When the user selects the option "Use Finger Print Login," a fingerprint authentication window will appear, as depicted in Figure (20). By scanning their fingerprint, the user will be able to log in without entering a username and password, as shown in Figure (21). The fingerprint used for authentication is the same fingerprint used to unlock the user's personal device. This feature is available on devices equipped with a fingerprint sensor.

If an incorrect fingerprint is detected, the application will display an error message stating "Incorrect Fingerprint" (Figure 22). In such cases, when username and password login is required, the user will be redirected to the login page where they can enter their username and password, as illustrated in Figure (23).

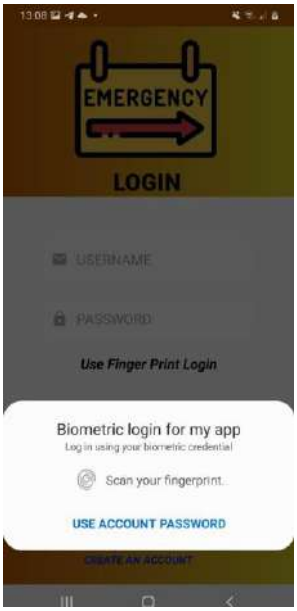


Figure (20)

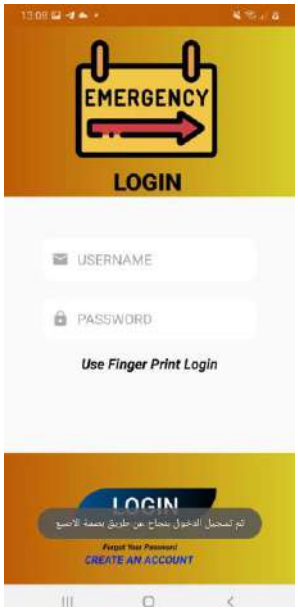


Figure (21)

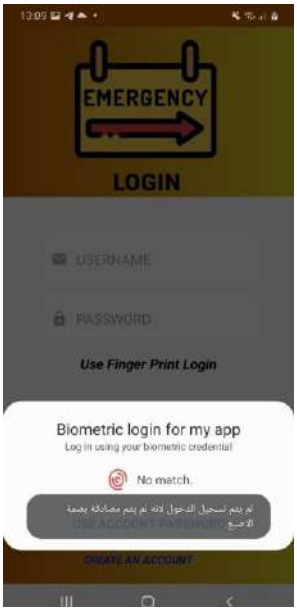


Figure (22)

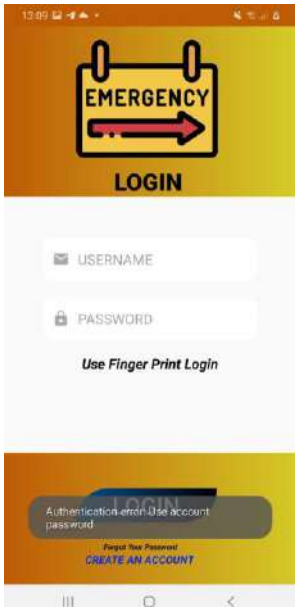


Figure (23)

4.1.4) Password change interface

When a user wishes to change their password, they need to click on the option "Forgot Your Password," as depicted in Figure (24). This action will redirect them to the password change page, shown in Figure (25). The user is required to enter their username accurately. If an incorrect or random username is entered, a message will be displayed indicating that the username is incorrect, as shown in Figure (25). However, when the username is entered correctly, the user must also provide the correct "old password." If the old password is entered incorrectly or randomly, an error message will be shown stating that the old password is incorrect, as depicted in Figure (26).

After entering the old password correctly, the user will be prompted to enter a new password. The new password needs to be entered twice, once as the initial entry and again for confirmation.

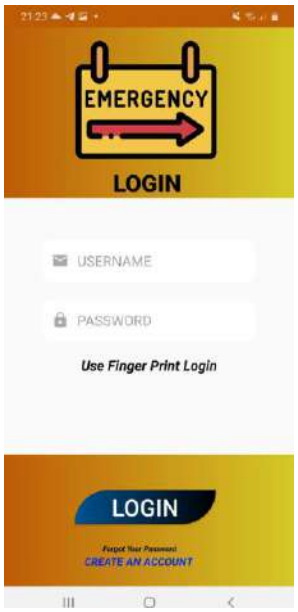


Figure (24)

Figure (25)

Figure (26)

Figure (27)

The new password must match the re-entered password exactly. If the two passwords do not match, an error message will be displayed stating that the new password is not identical, as illustrated in Figure (27). To proceed successfully, all the following conditions must be met: the username is entered correctly, the old password is entered correctly, the new password meets the specified criteria, and the re-entered password matches the new password exactly, as depicted in Figure (28). Once these conditions are satisfied, the user will be redirected to the login page with a success message indicating that the password has been changed successfully, as shown in Figure (29).

Figure (28)

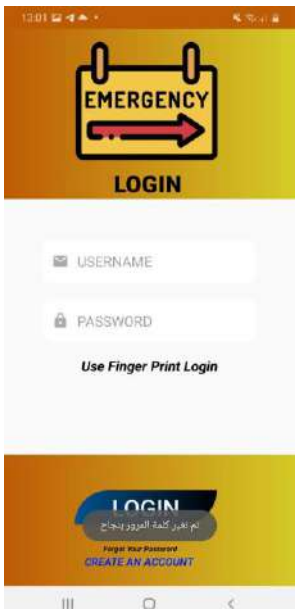


Figure (29)

4.1.5) Enter and update phone number interface

On the number entry page, it is necessary to fill in all the required fields. If any field is left empty, a message will appear indicating that all fields are required. Additionally, the username must be entered correctly. If an incorrect or random username is entered, an error message will be displayed stating that the username is invalid. However, when the username is entered correctly, the next step is to input the numbers.

When entering the numbers, they should consist of at least 11 digits and begin with the digits "07." Failure to meet these conditions or entering random or incorrect numbers will prompt a message requesting the correct number format. On the other hand, if the user enters a new set of numbers after entering the correct username, the app will replace the previously entered numbers with the new ones. However, if the user inputs the same old numbers, a message will appear indicating that those numbers already exist. Upon correctly entering the username and satisfying the specified conditions for the numbers, as shown in Figure (30), the app will update the numbers, delete the old ones, and direct us to the final page: the alert notification page for requesting help. A success message will confirm that the numbers have been successfully updated, as depicted in Figure (31).

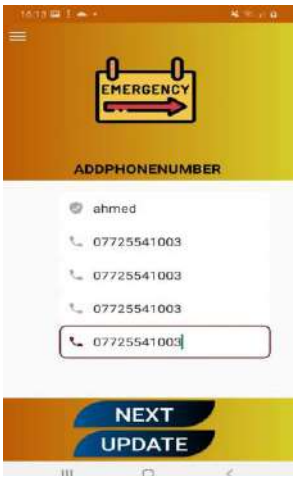


Figure (30)

Figure (31)

4.1.6) Voice recognition interface and send notifications

After adding the numbers and fulfilling the aforementioned conditions, we will be directed to the final page, which is the page for sending alert notifications when requesting help. This page displays the entered numbers to which notifications will be sent, as depicted in Figure (32). It features a button represented by a microphone icon. When pressed, it opens the voice recording window, as shown in Figure (33). Once the voice recording window appears, the user can pronounce any of the words listed in the previously explained table, which includes the names of the security centers.

For instance, when the user pronounces a word like "hospital," the application will detect this word, as shown in Figure (34). Upon recognition, the application will send notifications to the entered numbers as well as to the appropriate hospital, as illustrated in Figure (34).

Figure (32)

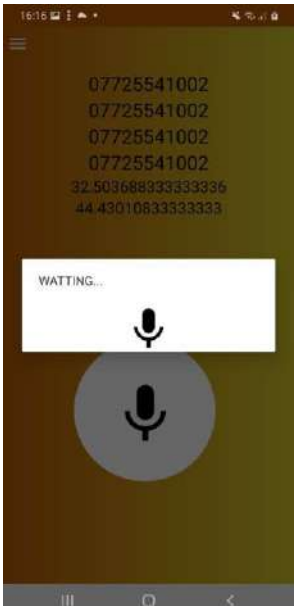


Figure (33)

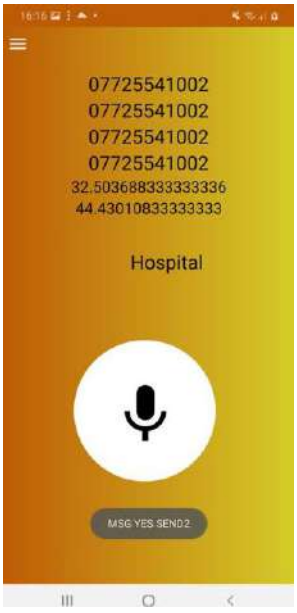


Figure (34)

The message sent by the app reads as follows: "I am in danger, and these are the coordinates of my location (Site coordinates)," as depicted in Figure (36). This serves as an alternative method to send notifications to security agencies, friends, and family members. In cases where verbal communication is not possible or the words mentioned in the table cannot be articulated, we can utilize the second method. This involves pressing the personal device fingerprint three times consecutively. Upon doing so, the app will transmit an alert notification to the specified contacts, as shown in Figure (35). The content of the message will remain the same: "I am in danger, and these are the coordinates of my location (site coordinates)," as displayed in Figure (36).

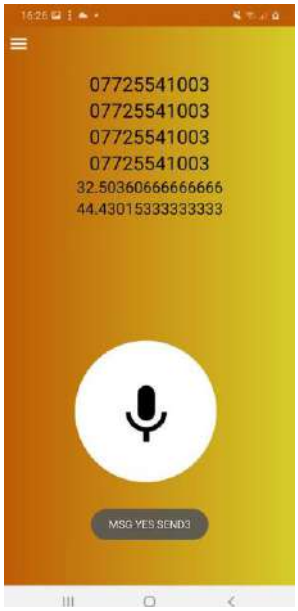


Figure (35)

Figure (36)

Note 1:

- When pressed three times consecutively, the message will be sent to the (hospital). and the message be sent to the designated contact.
- When pressed four times consecutively, the message will be sent to the (Police).
- When pressed five times consecutively, the message will be sent to the (Civil Defense).
- When pressed six times consecutively, the message will be sent to the (Fire Department).
- When pressed seven times consecutively, the message will be sent to the (Electric Circuit).
- When pressed eight times consecutively, the message will be sent to the (Elderly Care Department).
- When pressed nine times consecutively, the message will be sent to the (Orphan Care Department).

Note 2:

It is important to keep the GPS enabled at all times to allow the app to accurately determine the user's location coordinates.

That concludes our app. Thank you for following along and learning about its functionality.

chapter five

chapter five

Based on our work, it is evident that our application will contribute to achieving a higher level of personal security. It will effectively safeguard lives and enhance overall safety. By addressing emergencies where individuals are left helpless without any means of rescue, our application aims to significantly reduce the potential harm caused. As a result, our application emerges as the fastest and most advanced solution, leveraging modern technology that has become an essential part of our daily lives.

5.1) Future Work

We have planned future actions to enhance and modernize our application, guided by divine guidance:

1) Enhance login security by linking it to an official email and phone number. Users will receive a confirmation message through their official email or phone number to ensure authenticity.

2) Enable background functionality for the app, allowing it to operate 24/7 once the user logs in. The app will only stop when the user manually turns it off using a designated button, ensuring it doesn't consume excessive resources.

3) Integrate the app with the victim's device's rear camera to capture events that the victim identifies. The rear camera will activate when the user presses specific buttons on their personal device.

4) Establish connectivity between the app and smart devices such as watches, leveraging health applications present in these devices. The app will monitor the user's condition through heartbeat measurements, automatically sending notifications if certain limits are exceeded or fallen below.

5) Revamp the app's design and implement innovative ideas to provide a better and user-friendly experience.

6) Expand the availability of the app on various shopping platforms, enabling users to download it and utilize its features for their safety. This will also facilitate constant connection with security centers.

Through these future actions, we aim to continually improve our application, ensuring the safety and well-being of our users.

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And

Thank you