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A Review on Online Ambulance Hiring Using Android App

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ABSTRACT: The era of Information technology has become a crucial part of our dynamic life for every human being in the world and usage of smartphones is rising exponentially. Elderly peoples who are unable to provide accurate information and utilize the emergency phone calls, users whom find themselves in an unknown location that can't be described or provide an accurate address when emergency occurs, casualties which caused by the late arrival of ambulance and searching for an available nearby ambulance have been some of the hustling factor that faced by current fast pace community. With more congested roads and insufficient information, the search and rescue operation become nearly impossible. This Android based mobile application project will totally change the native way of calling an ambulance and it will be more efficient and reliable for the emergency medical services (EMS). This app will help the user to get any available ambulance without calling the hospitals to check for the ambulance availability. The app reacts with just one tab on the button and it will send the notification of user's details and location via GPRS to nearby ambulance control centre. Then it's the authority's hand to approve the requested notification. Once the request is accepted, the GPS location will be sent to the ambulance driver which will lead to the user location. It also helps to prevent fraud calls and tracks down the culprit who misuse the EMS by diverting the service from better needy.

KEYWORDS: GPRS, GPS, Android, EMS, Ambulance Service.

I. INTRODUCTION

With current technology era where mostly everything runs on smartphones and applications, the need of quick and efficient services are almost important in every aspects especially when it comes to medical services. Patients are mostly having issues on searching for an ambulance, handling the locations and availability of the limited service in the time of emergency. The lack of such attention and information may lead to several casualties. The question arises when the user have to find ways to check the availability of the ambulance and for the ambulance to find the user's precise location in the quickest time possible. Thus the ambulance drivers must have proper information provided to them so that they won't get lost or find themselves searching for the exact location of the patient. This made the ambulance driver to loss and unable reach to the patient who need immediate medical attention. The main aim is to reduce the time of calling the operator and to request an ambulance, reduce fraud calls and to allow ambulance driver to locate the victim easily by using GPS signal.

II. LITERATURE REVIEW

To understand the current problem in depth, researching into various resources are needed to prove the reliability of the current system. Here, we will be analysing the problems statement and justifications

Emergency Medical Service (EMS):

Emergency medical service (EMS) is a service which is responsible for leading the department in providing proper planned and organized emergency management resources which is capable of responding to public emergencies whenever it is need. (Jadhav et al. 2014). Ambulance can be categorize as a limited resources in EMS and since the congested and rapid development of urbanization and concrete jungle in each and every part of the world, the route to search and rescue for human shelter is very complex. This reflects the performance of the ambulance driver to reach the emergency spot on time (Kumar & Benedict 2011).

These issues helps to identify that the need and responsibility of an EMS is vital and equally important to save lives, utilizing and improvising this system will sure helps the community to be safe and worry less on the service provided by the authority.

Remote Panic Button:

According to (Lee et al. 2013), the remote panic button works in such way that, if the user press the "Help Button" once, it sends an emergency triggering signal to the monitoring system and displays a message to notify the user that the remote panic button has being triggered. The controller will read the status of the unit and sends message (SMS) to the emergency service immediately.

From the article we can conclude that panic button can be used to transmit the notification or signal to ambulance when the user are alone or unable to help themselves in certain circumstances. This will help them request for help which required the use of the service of ambulance. It saves time from calling and request for help which will slows down the rescue process by any means.

GPS and GIS for Ambulance:

GPS stands for Global Positioning System is a satellite-based navigation system, the GPS Receiver retrieves the location information from satellite in the form of latitude and longitude real time reading (Pethakar 2013). This system can be used to track real-time positions of a vehicle and smartphones which whenever the GPS setting is switched on GIS stands for Geographic Information System which is a software used for linking spatial and non-spatial data.

Ambulance service in a congested area like Shah Alam, Kuala Lumpur and many major cities in Malaysia facing much constraints such as traffic lights, tolls, and devastating heavy trafficked roundabouts. If an inexperienced ambulance driver has taken a wrong route, the driver will result on late arrival on the emergency scene (Nordin et al. 2012). GPS and GIS can be implemented on the ambulance to track their location by the system archive and utilize the service of track the user and find the best route to the user as fast as possible. Integrated GPS component in the vehicles and smartphones will be useful for this project which we will be utilizing the main function in our application.

Android:

The usage of the smartphones is continuously on the rise in this 21st century era (Pieterse & Olivier 2012). Android is currently the world's most popular mobile operating system. It can be found from handheld devices, gaming consoles to vehicle systems. The most hardware that running Android OS comes in the form of handheld devices for example smartphones (Dering & McDaniel 2014) and it can be categorized as the most usable OS in current market.

As the end result, Android can be the best platform to develop this app because the amount of the user that having a smartphone with Android OS is undeniably huge. Thus this will have a proportional decent amount of user whom will download and utilize the service.

Panic Attack:

According to (Sharbini & Bade 2009), when a person caught with panic attack, they will act irrationally, bewildered and hysterical flight which lead us to make a conclusion that human unable to give a rational information when they needed. According to the author, the behaviour of the human in a disastrous situations already been studied and analysed after the actual facts which is been documented by the psychologist.

From the studies, we get to know that it's normal for most of the people to get panic attack and they will be helpless when sudden emergency or shock occurs. Panic attack not only makes human weak but also won't let them act rationally when emergency occurred on them which will lead them indecisive and helpless majority for the elderly.

II. CURRENT SYSTEM EVALUATION

Current ambulance system is been managed by native way which is engaged by calling. All of the current ambulance systems rely on calls from the user who gives information about any kinds of mischiefs. Most human operators use traditional based or computer aided dispatching system to send an ambulance. These types of systems might record wrong information from the caller, or transfer and enter wrong data into the dispatch system (El-Masri & Saddik 2011). The user need to call the ambulance service department to check for ambulance availability in their area and make a request to deploy one to designated location which reported by the user. All the important information required such as caller's name, location and emergency type will be collected through conversation. Computer Telephony Interface (CTI), Computer Aided Dispatching (CAD) system, Geographical Information System (GIS) are the main tools used by Malaysia Emergency Response System 999 (MERS) (Anas 2009).

These technology used to track caller by address, record caller information, tracks real time command and processes which able to tracks all the information related to calls and field unit activities. It captures incident related information, resource status and availability, visualizes location of calls, incidents, tracks vehicle & resources through GPS.

Advantages of Current System:

    i. User no need to have a smartphone and just need a normal cable phone to communicate with the operator.
    ii. The user's phone number will be recorded.
    iii. The user's details will be recorded from the conversation.
    iv. User can be tracked according the phone line used to contact the emergency line.
    v.

Disadvantages of the Current System:

- The user might accidentally provide wrong info or the operator might records wrong info
- User needs to call and give them exact location to able them to track and reach the user on time.
- User need to check availability of the ambulance to ensure they get the ambulance.
- The time taken by the ambulance to reach the user's location will be lengthy if they stuck in traffic or the mislead address provided by the provider.
- Will receive many fraud calls from and leads to misusing of the resources.
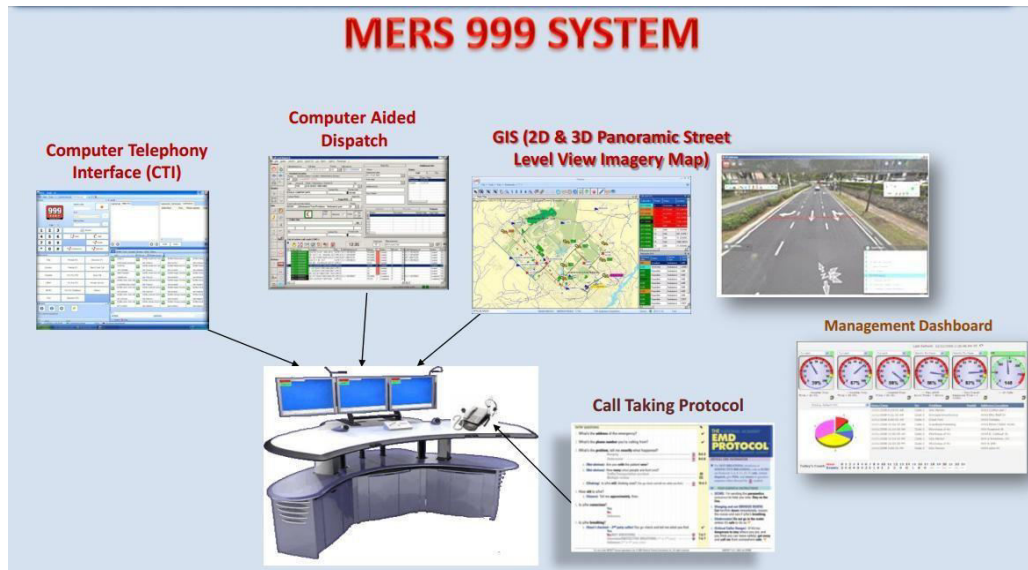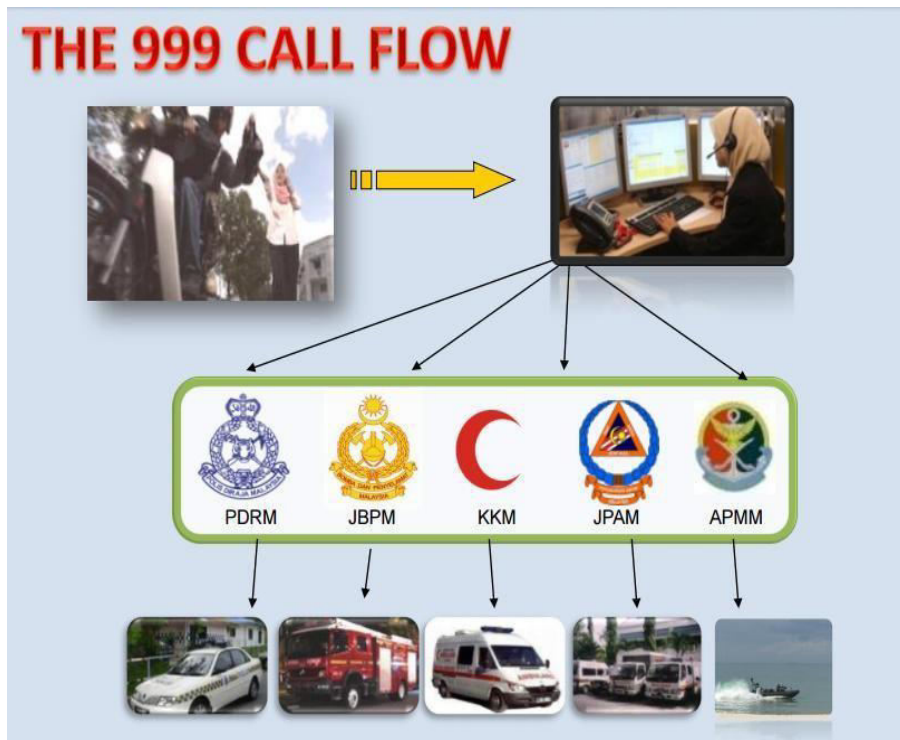
III. RESEARCH DESIGN AND METHODOLOGY

Qualitative Research method is been used to gather complete and detailed description for the quality researching purposes. It can be either closed-ended or open-ended, in-depth exploration of an aspect of life about which the interviewee his a substantial experience, often combined with considerable insight which brings the best way for to get information for research purpose. In this research the author has used interview for as a fact finding technique. This will help to gather the information from the users and the service providers, in the same time helps to rectify the problem statement and the proposed ideal system that convenient for both ends. The main aim of the research is to know what is the main issue faced by the user; the question came in as follow:

a.   What can we do to reduce the time of calling the operator and give all the details correctly?
b.   What if someone is stuck in new place, and they can't provide solid info of where they are when they called for emergency assistant?
c.   What can we do to reduce fraud calls?
d.   How Ambulance driver able to track the exact location of the caller when only operator able to view the GPS coordinate?
e.   How to help mobile phone owner to request for ambulance when they not sure which number to call? (As mobile phone emergency contact number is 122 instead of 999).

   3.1 Proposed System

To enhance and avoid these problems, an Android app with built in GPS technology will be utilized by the patient to send coordinate and user details to the ambulance driver's device which will be installed to all the ambulance's device hence able them to locate and reach the user in no time.
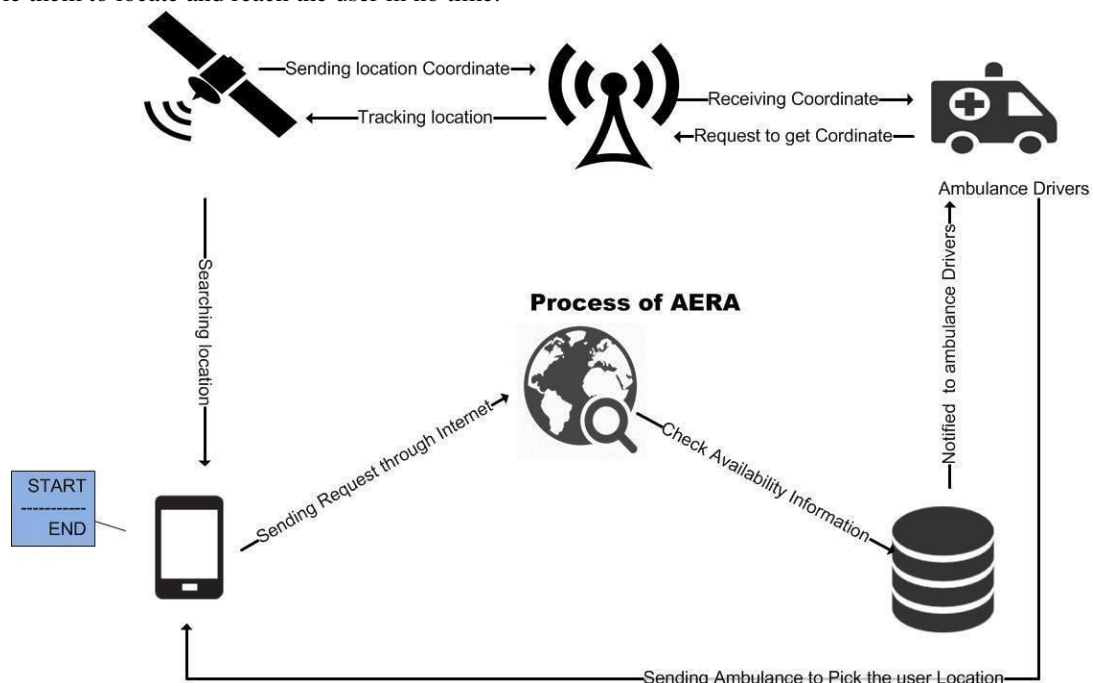

Fig.2 shows the process of AERA which shows the flow of the system.

As per Fig1, Users will send the notification from their smartphone to the server then will be sent to the ambulance control centre. The sent information is consists of user's details and GPS location. The admin of the system will check for available driver and will assign the task accordingly. The admin will also send the driver's details to the user so that

the user will know which driver will fetch them. The driver will take the responsibility to bring the patient to the nearest hospital as soon as possible. For this project, Android system will be used for the development.

The system will be functioning as below:
- Sends notification to ambulance admin system.
- The user can tap the button and the notification will be sent to the ambulance administration centre.
- Cuts off waiting time.
- The user doesn't have to call and check for availability of the ambulance anymore.
- Ambulance will be able to track the location of the user with GPS.
- Notifications that sent by the user will provide the GPS location of the user and also provides the user's pre-registered address.
- Safe and reliable.
- Provides the user all the information of the ambulance that accepted to fetch user Ambulance name, Driver's name, Ambulance number plate and Driver's phone number.

2. Comparison of current system and proposed system.

CURRENT SYSTEM (MERS 999)	PROPOSED SYSTEM (AERA)
• Computer Telephone system	• Android apps – cheaper
• Computer Aided –Dispatch: Dispatch Emergency Service to the location.	• GPS – Global positioning System integration
• Geographical Information System	• 2 taps and request for ambulance
• All in one emergency line (999).	• Sends notification request to Ambulance or Hospital.
• Find nearest medical centre and dispatches ambulance(if available)	• Send GPS and details to accepted Ambulance driver.
• Voice recording.	• User receives the details of the ambulance driver.
• Automatic Number Identification: Displays caller's number.	
• Automatic Location Identification: Looks up subscriber location info and location incident in digital map.	

Table 1. Comparison of current and proposed system.

IV. RESULT

Questionnaire for the application:

Questionnaire	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Is this app user friendly?	17	29	22	12	6
Is the app easy to navigate?	5	37	33	6	5
Is the app appears crisp and clear?	12	43	19	5	7
Is the language used easy to understand?	15	39	27	4	1
Is the color contrast appropriate?	12	56	13	5	0
Is it easy to download and install?	3	45	32	6	0

Is the file size is appropriate?	7	21	39	15	4
Do you think that the app will help you to simplify the process to request an ambulance compare to the current 999 emergency call using operator?	4	61	14	5	2
Is the loading/response time of the app is appropriate?	1	65	12	6	2
Will you share/ recommend this app among your family and friends?	8	52	21	1	4

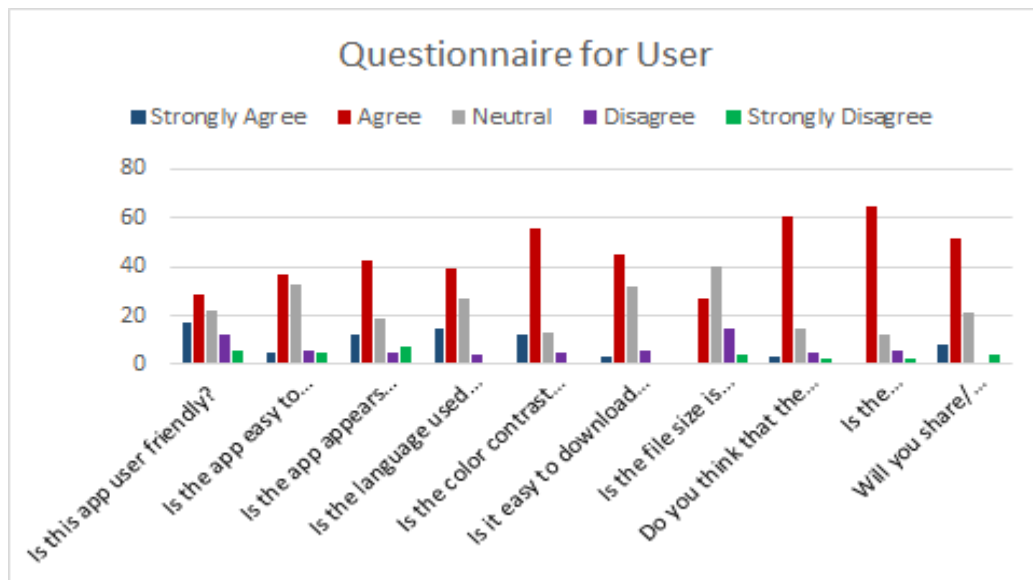Table 2. Accumulated data taken from users who tried the app functions.

Fig 2.1 Shows the Bar chart of the compiled data of the user based questionnaire.

We need to set our targeted audiences on those users that having android smartphones which will allow them to install and utilize this application. From the questionnaire that we have distributed, 86 of them have responded and the data's been collected from those 86 participants and compiled to the chart above. As we can see from the compiled data, we can summarize that 60% of the participant is satisfied with this application and agrees that this app will help the community to ease the process of ambulance request and will help to save lots of lives without taking much time.

V. CONCLUSION AND FUTURE ENHANCEMENT

This application has been developed with main functionality which shows the working on the basic level. There wasn't much effort given to the GUI such as great animation, Utilization of fragment implementation on pages and few others low level bugs that yet to be fixed.

For future enhancement in mobile application platform, Google map will be added to the user side app to show the assigned driver location and estimated time for the driver to reach the destination, this will allow user to feel secure that ambulance has been assigned and it's on the way to fetch the user, as an additional with it, voice command will be implemented using voice implementation system to allow them to straight send signal just by using voice command. To bring this system for current smart watch era, this system will also be integrated and linked with Android watch. This

will allow the user to easily tap the on the watch screen to trigger the alert and send request to the admin.

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Scan to save the contact details