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# E-Care Mobile Application for Elders and Disables.

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**Abstract** Mobile Applications have become ubiquitous in many aspects of our lives over the few years fueled by the widespread availability of tablets and smartphones. Hence, the emergence of various applications available in the market now has facilitated our daily tasks. Nowadays, the population of the elderly and person with disability is increasing worldwide and they often need assistance in their daily activities. This paper proposed a support system application that is particularly for the elderly and person with disabilities in seeking for help in their daily routine. Elder care (ECare) is an Android-based application in which the main function is to help elders and people with disabilities to seek for assistance from their guardians to perform some tasks in their daily activities and needs.

***Keywords:*** **E-care, elders, disables, Mobile application.**

**1. Introduction** Nowadays, the population of elderly and disabled person is increasing worldwide whereby most of the elders have encountered physical impairment which is temporary for some and permanent for the others. Life as an elder and a disable person has always been very difficult, besides that, they are encouraged not to walk around alone and they are unable to do their daily basic need by themselves. They need someone to assist them to do their daily routine, activities, and needs. Most of the families nowadays faced this problem as they have to provide constant attention to the needs of their elderly or disable person. The developer plan to develop a project based on System Development as this application will help elders and people with disability to seek assistance from guardians to perform some tasks. An example will be if an elderly member of the family is hungry and need to eat, he/she just need to press one of the provided buttons on screen then it will sound the alarm to the guardian who is in charge of taking care of this person.

1.1 For some elder people it is difficult to do their daily activities and they need to seek help from someone to help them.

1.2 Disable people need help to do their daily tasks so they need to seek assistance from someone.

The Objectives of this application is to create an account for that application and register himself/herself as the guardian of the elderly person. When the person is in need of help then he/she will press the button and it will sound the alarm to the screen of the person who registered as the guardian of that elder or disable person and show the right icon of that task. Then the guardian will know what the person want and then the guardian will go to him/her and fulfill his/her needs. For example, the elder person is hungry, at that time no one is near to him/her to cater to his/her needs, so he/she need to press the button which is for food then it will sound the alarm to the phone of the guardian and show the food icon on the screen.

**Elder and disable scope:** The elderly and people with disability who want to use the elder care (ECare) application, they are required to have this application near themselves. They can press the right button for the right task to ask their guardian for help.

**Guardian scope:** The guardians who are in charge to take care of the elderly or people with disability, they need to have this application in their smart phones. When the elderly or the person with disability is in need of help, he/she will press the button, and then the guardian will receive a notification of the icon on their phone screen.

**2. Why is Eldercare important?** According to United Nations 2017 report from the World Health Organization, the number of older persons in the world has increased substantially in recent years and that growth is projected to continue in the coming decades. Worldwide, there were 962 million people aged 60 years or over in 2017, an increase of 152 per cent over the 383 million older persons globally in 1980, as shown in figure 1. By 2030, this number is projected to grow to 1.4 billion and, by 2050, to more than double its 2017 size, reaching nearly 2.1 billion. Globally, the number of people aged 80 years or over is growing even faster than the number of older persons overall. In 1980, there were 36 million people aged 80 years or over worldwide. Since then, their number has increased almost fourfold to 137 million in 2017 and is projected to more than triple between 2017 and 2050, when projections indicate that there will be nearly 425 million people aged 80 years or over in the world.

Though there is much need for elder care in the world, there is also a lot of elder care occurring. Many households are providing informal care to one or more elderly persons.

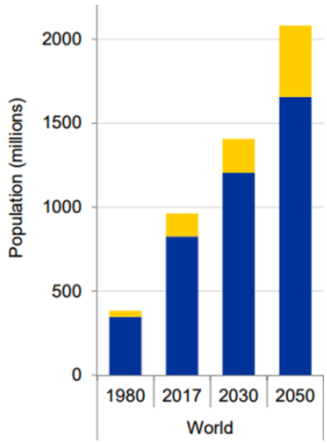


Fig. 1: Number of persons aged 60-79 years and aged 80 years or over for the world and development groups, 1980, 2017, 2030 and 2050.

(Data source: United Nations (2017). World Population Prospects: The 2017 Revision.)

**3. Literature review** In this section, we survey the related research to our work. Some existing work had addressed these issues and has come out with solution and invention. Besides, past inventions are stressed on issues such as the services of delivering the information and entertainment to the elder patients and provide robotic assistance to the elderly.

Hossain and Ahmed (2012) had proposed a support system particularly for the human caregiver that endeavors to understand and examine the elderly activities and determines what services to provide in different situations and when to notify the human caregiver about any incident that might happen in the care facility.

Meanwhile, Kaladevi et al. (2014) has developed an accident detection system using android smart phone. This system comprises of heartbeat sensor that is based on mobile technology which is integrated with the evolving android smartphone. The application for accident detection primarily measures the heartbeat rate using heartbeat sensor that has been embedded and integrated with the smartphone.

Srinivasan et al. (2014) has proposed a Public-oriented Health care Platform using web services technology. It is an automated application that will be taking care of transferring and manipulating the data systematically and send chronic diseases results by SMS through SMS gateway to the registered patient. Besides, the platform works by detecting a patient that fell down by using GPS technologies and attempting to send the accident location by SMS through SMS gateways to the stored authorized security numbers which is available in the patient's database.

Habiba et al. (2015) invented a system called “3rd HAND” that can assist the elderly and person with disability to perform some of their daily tasks without any helping hand. This system work by helping the users to switch on/off regular home devices such as light or fan

by using their voice commands and their location can be tracked when he travels outside alone with the system.

A telemonitoring system that consists of the fall detection has been developed by Panicker and Kumar (2015). It is an android application that collects the information from body sensor unit and automatic SMS facility is initiated to send text messages. Besides, the developed algorithm will alert family members, caretaker or medical practitioner with a short message service (SMS). The SMS contain the information including the location detection where is the exact location of the patient.

Moreover, Santoso et al. (2016) have proposed a mobile application named as "Berbakti" for the elderly. It is an application that provide simple interface particularly for the elderly who cannot use modern communication tools so fluently. Consequently, this application can expand the limitation and caring parent from far away.

Furthermore, we had surveyed some mobile application that is already established in the market such My Buddy Tag, Elder 411 and 911 and Elderly Care.

Firstly, My Buddy Tag is a device that is used to take care of small children who walk around and can be connected to smartphones by Bluetooth. The parents need to install this application on their smartphones and connect to that device which is with their children. After they have connected the device to their phones, parents can set the distance and the children should have one with them so that the parents can know where their children are in that area, if the children go outside of that range then it can sound the alarm to their parents. Beside this if something happen to the children it also it sounds the alarm to the parents and the parents can see the location of their children through email. In addition this device has one panic button which enable the kids in that limited distance to press if he/she is in emergency situations to seek help from their parents.

Secondly, Elder 411 and 911 are two separate apps created by the same geriatric care manager and, as one can see from their names, both are elderly-focused. They are your personal crisis management guide from Doctor Marion and available for iPhone users. Elder 411 is a more widely-applicable app containing general care giving information and tips on things like communication, financial matters, and safety. Elder 911 can help walk you through an emergency concerning an elderly loved one. There is a screen were you can select in relation to the senior (parent, spouse, etc.) and what stage of crisis they are in (before the crisis, at the hospital, post-hospital, etc.). From there, an assortment of checklists, steps, and pertinent information is available to help you manage an emergency situation.

Lastly, Elderly care is an app which helps to take care of elder people. It is filled with some inspiration and useful information in order to help caregivers in complicated situations. Furthermore, it has some good advice for daily life combined with information and some new findings. The users can register in the application so as to share their own experience or even ask some questions.

**4. Requirement Specifications** In the proposed application, the developer tries to implement some features and functions which enable one person to connect with another person. These features are made based on the need to of an elder or disable person. These features make it

easier to seek help from their guardian in performing some specific tasks. For the guardian, he/she will receive an alarm notification showing appropriate icon for the task on the screen of their smart phones.

**5. Development Approach** In this project, some observations were done by the developer to investigate the most appropriate methodology that should be used in developing the application. Methodology can be described as a method being used by the developers that allows the project to be completed in an effective and efficient manner. There are so many frameworks that are in existence and each of them have their own strength and weaknesses even though, not all frameworks and methodologies are suitable for one project. Thus, for this project which is elder care (eCare), the developer has decided to use System Development Life Cycle (SDLC) and the developer believe this method will be appropriate and suitable for this project. There are five processes involved in this cycle (as shown in Figure 2) which are planning, analyzing, designing, testing (implementation), and maintaining. Besides, this methodology is also known as the waterfall method.

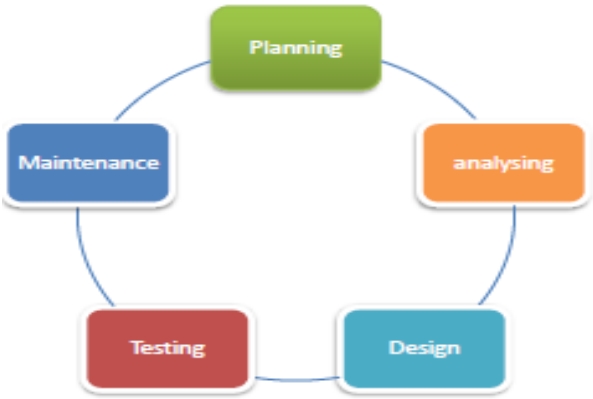


Fig. 2: Development approach.

**6. Logical design** In this section, the figures will briefly explain and indicate the use of activity diagram, case diagram and sequence diagram for developing the application.

6.1 Activity diagram

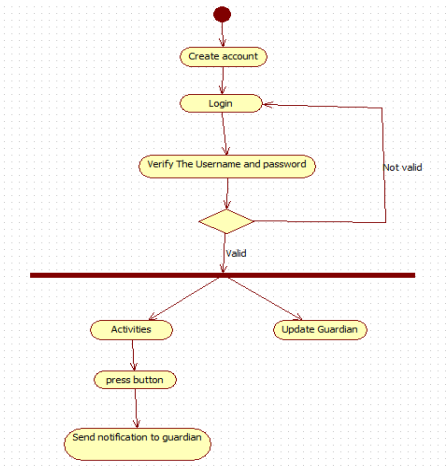

Fig. 3: Activity Diagram

## 6.2 Use case diagram

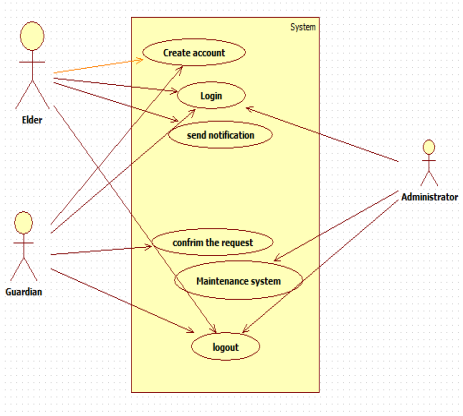


Fig. 4: Use case diagram

## 6.3 Sequence diagram

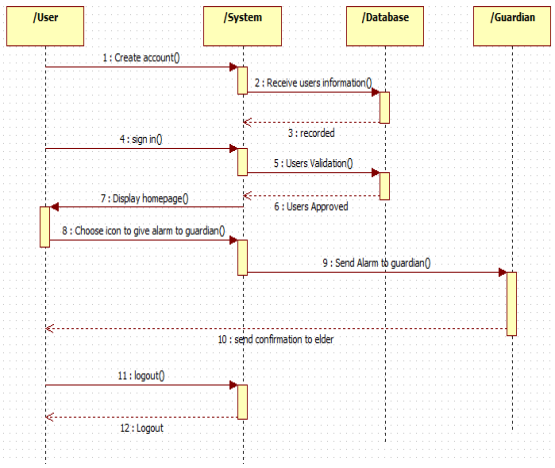


Fig. 5: Sequence diagram

**7. System Integration** In this part of system integration, the combination of all parts of the functions will be shown and the return result of the system that will be displayed to the users.

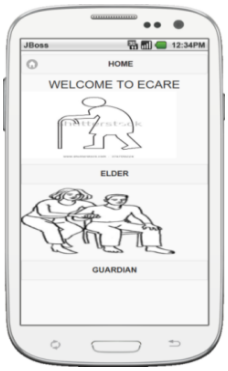


Fig. 6: Main interface

Fig. 6 shows the main interface of this application when the user opens the application. From here the user can choose whether to be identified as an elder or as a guardian.


Fig 7: Sign up interface

This is interface when the user is required to sign up for using this application.

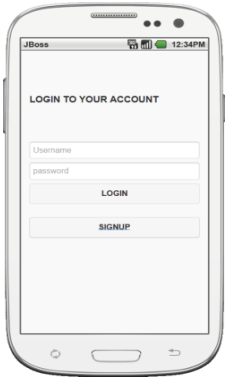


Fig. 8: Login interface

Fig. 8 display the login interface. When the users create their account, they need to login with a username and password that they used n signing up for the account.


Fig. 9: Homepage for elder/disable side

Fig. 9 shows the home page of application, as you can see above there are some icons as an indication for different tasks. The elder person just need to press the icon based on their need to sound the alarm to his/ her guardian.


Fig. 10: Notification received

This screen shows what will appear on the screen for the guardian. Then the guardians need to press the OK button which is provided on the screen to give confirmation back to elder/disable person.

**8. System testing** The developer implemented the test plan by approaching 10-12 people and showed the application to them in order to test the application and at the end asked them to answer the questionnaire related to the application which was provided by developer.

**9. Conclusions** This application is useful for the people who need to seek help from someone to perform daily tasks especially for the elderly and people with disability that need assistance from their caregiver. By using this application they can easily ask for help and it's also easier for the guardian to help that person and fulfill their needs.

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