

ELA REMIND: A Medicine Box Reminder System for Elderly Living Alone (ELA) implementing the infrared Sensor, Internet of Things and Mobile Application

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Abstract— Studies had shown a high statistic of the elderly often forgetting to take their medicine each day due to their forgetfulness. And living alone far from their family, make things harder. As a human of 60 years old and above, they might have difficulties to remember and become alert of the medicine time. Thus, developing this ELA Remind which is a medicine box reminder system for Elderly Living Alone (ELA) by implementing the Infrared Sensor, Internet of Things and Mobile Application. By having this system, elderly will always be reminded on time to take their medicine every day without fail. In fact, it helps to check on their medication intake history to ensure that the elderly was taking the medicine as per schedule. At the same time, it helps reduce the wastage of medication as well. Besides, the most impactful element in this system is that the reminder will also be sent to the elderly's families so that they can monitor their elders remotely through the mobile application. In addition, this system will enable users or families to check back on the history of time taken of the medicine whenever needed.

Keywords—Internet of Things (IoT); ESP8266; Mobile Application; Elderly Living Alone (ELA); infrared sensor

I. INTRODUCTION

In Malaysia, about 7% of 1.4million people of elderly live alone [1]. This encompasses about 98,000 of the population living alone in Malaysia. One of the main challenges of elderly people living by themselves is medication. They tend to forget and ignore their medication which results in worsening their health condition. Adherence to medication is difficult for many people, especially the elderly. As the age increases, medication taken by the elderly will be difficult as their memory might cause some problems. IN A study carried out by a university-affiliated geriatric hospital, 10.1% OF 119 elderly patients failed to open at least one container of the medicine box that had been prepared due to the inability of poor vision, impaired cognitive functions, and low manual dexterity [2].

Besides, the New Strait Times also came out with an article on the common issues faced by senior citizens and the importance of taking medicine on time. Based on the Administering medicine, the elderly commonly faced issues such as forgetting to take medicine at the right time and failing to understand the right way to take the medicine [3]. Medicine boxes which are multi-compartment boxes are often used by the elderly to avoid medication errors. Medicine box allowed the patients to know whether they have taken the medicine by checking the compartment of the medicine box. Besides, the patients must check on the medicine box manually and often by themselves without any reminder.

For the past 10 years, Internet of Things (IoT) has been used to improve healthcare services [4- 6] and many other areas such as parking area, fire monitoring and others [7-11]. The idea of overall IoT projects is to ease the user in monitoring the system remotely and to make this system smart, the system will be connected through a wireless network which enables it to be connected to the internet for future applications and integration. Besides, it is also distinguished by the wide range of the Wi-fi instead of Bluetooth or ZigBee communication.

One of the existing systems is the Intelligent Pill Box which is designed to be implemented for long- and short-term medication [12]. This system mainly targets the elderly that are attached to daily intake of medication to stabilize their health condition. The main objective of this Intelligent Pill Box is to prevent the elderly from abusing drugs and make sure the elders take their medication on time. However, the system will only notify the family members through the Skype application and all interfaces are in the Chinese language. Besides, the interface for the system is too complicated which makes it difficult to understand. Ahmad et.al [13] has designed an IoT Based Pill Reminder and Monitoring system targeting the victims of chronic diseases. This system works