

Are you OK? An Android application for assisted living

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ABSTRACT

Assistive Technology is being used to enhance the care of elderly people. This paper introduces describes an Android application developed by the authors as part of the assisted living research projects at Wintec. The application allows a care-giver (carer) to check the wellness of their service user(s) at regular intervals. With user permission, information can be sent and stored on the cloud and Short Message Service (SMS) messages sent to a carer if needed. Basic testing of the application functionality is completed.

Categories and Subject Descriptors

K.3.1 [Computers and Education]: Computer Uses in Education – *collaborative learning, computer-assisted instruction (CAI), computer-managed instruction (CMI), distance learning*. This is just an example, please use the correct category and subject descriptors for your submission. The ACM Computing Classification Scheme: <http://www.acm.org/class/1998/>

General Terms

Design, Human Factors, Experimentation

Keywords

Assistive technology, cloud computing, mobile applications, Android, elderly care, disabled care, alerts.



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1. INTRODUCTION

The term Assisted Living (AL) relates to Information and Communication Technology (ICT) used to help people who wish to have their daily living requirements monitored by a ‘Carer’. There are some challenges that need to be taken into account (Sun, De Florio, Gui, & Blondia, 2009) but it is deemed beneficial.

The authors have started a series of AL projects that use some of the latest developments in technologies, particularly cloud computing, mobile devices and sensors, with the aim to find cost effective solutions and useable products. Though there are specialised solutions available, the long term goal at Wintec is to provide a range of solutions that people can choose from. These projects also focus on technology that can be bought ‘off-the-shelf’ and are affordable. One of these AL projects is the ‘Are you ok?’ (RUOK) android application.

2. APPLICATION DEVELOPED

The original idea was suggested to the authors at a ‘Choice in Community Living’ forum in Hamilton. It was raised that in some cases wearing a medical alert/alarm bracelet in public was not ideal, and an application on a mobile phone which can easily be attached to a wheelchair would be preferred.

A prototype application called “Are you OK?” (RUOK) has been developed for an Android smartphone (Figure 1). It triggers an alert dialog box at regular intervals set by the user. The user can select ‘yes’ or ‘no’ to indicate if they are well or not. If ‘no’ is selected, an SMS message is sent to a carer’s mobile phone if defined by the user. If the user misses an alert, a notification dialog box is shown, displaying the number of alerts consecutively missed and prompting the user to answer when they next check the phone. If three or more alerts are missed then an SMS is automatically sent to the carer. This value of three can be changed by the user to a convenient value. There is also an ‘Alert’ button that immediately sends an SMS to a carer. Menu items used to configure various parameter are also provided. User data can be filtered based on a device id number that is automatically detected by the application and sent to the GAE as ‘readingValue’

3. THE CLOUD

Initially Microsoft Azure was used successfully. However the Google app engine (GAE) database which is free of cost for less than 1GB of data per day (Google, 2013) is a more cost-effective solution at present. Application data is recorded on the phone’s micro secure digital (SD) card and sent to the cloud if Wi-Fi or 3G is enabled by the user. RUOK will prompt the user and direct them to the appropriate settings if not enabled.

Data is sent to the GAE when the user clicks ‘yes’, ‘no’, the ‘alert’ button, every time an alert has been missed and when an alert has been retracted. The application also records the date and

time that each application was started or stopped on the GAE. Figure 3 captures an example of data received by the GAE.

4. ETHICAL CONSIDERATIONS

There are concerns that technology which monitors people can be intrusive (Rauhala & Topo, 2003). Some propose that data should only leave the customer's premises with user consent (Tiwari, Warren, Day, & Macdonald, 2009), (Wolfgang, Panek, & Rauhala, 2008).

The RUOK application takes this into consideration allowing users to specifically enable Wi-Fi/3G before data is sent to the GAE. If the user chooses not to connect to the Internet the data will only be recorded locally on the phones SD card. However once enabled it does not prompt the user every time a piece of data is sent to the GAE as this is impractical. There could be an issue if the user does not want to send data to the GAE but does use 3G or Wi-Fi on their phone for other applications.

5. POSSIBLE ISSUES

If the phone's battery is not charged regularly the phone may automatically turn off, unaware to the user. Cellular coverage is also required and depending on the users location this may be an issue e.g. in some rural areas. There is reasonable coverage in most New Zealand cities (Google, 2013). In addition, the carer's phone also needs be working, with battery charge and cellular coverage.

Assistive technologies are an additional support and it would not be wise to rely on them completely. It is recommended that carers contact their clients regularly as well. However AL will hopefully reduce some of the carer's workload.

6. FUTURE WORK

The application needs to be tested over a longer period of time to ensure that that the application retains its current state, values and functionality over time.

Testing the application with an elderly or disabled person and experienced carers would give more insight into what features would be beneficial in a real-life setting. The authors are in conversation with the Community Living Trust (Community Living Trust, 2013) in Hamilton and there is a possibility of real-life testing later this year. Each person is unique and needs are widespread, however there may be specific cases identified which could be targeted.

A feature that is already being developed is the applications ability to record GPS location information. This would only be activated when the user enables GPS on their phone.

7. CONCLUSIONS

There are research and commercial products that use Android applications for elderly healthcare. The 'Are you OK?' application developed by the authors appears to have unique

functionality. Short term testing indicated that the application was largely working as expected and all errors discovered have now been addressed. However long-term and real-life user testing will give more insight as to whether additional features are required to make the application commercially viable.

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