

# My Shopping Buddy – a Mobile Application for Diabetics

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## ABSTRACT

This poster outlines the development of a mobile app – My Shopping Buddy. This app is to provide nutrition information for diabetics and help promote healthy food choices among New Zealanders. An agile software development process was adopted for this project, which involved prioritising risks and developing a quality assurance program. One of the learning outcomes realised from this project is that technology-rich activities can sustain high levels of student engagement and peer collaboration. As a result, this app is now available on Google Play.

**Keywords:** Diabetes, Agile, Mobile app, Android

## 1. INTRODUCTION

Diabetes is the fastest growing health issue in New Zealand. Almost 7% of adult New Zealanders, or approximately 200,000 people, have Type 2 diabetes. Eating healthy foods could be helpful to manage the condition of Type 2 diabetes (Southern Cross Medical Library, 2006).

The temptation to pick unhealthy foods is always there and unless information or advice is immediately available (e.g., when shopping) often people with diabetes can tend towards picking less suitable foods. To improve healthy food choices, Diabetes Christchurch engaged Ara Nutrition Department to develop a Nutrition Information Pack which can be used by people with diabetes while shopping.

As smartphones are now widely used, Diabetes Christchurch was keen to transform the pack to a mobile app, so that the nutrition information can be more easily accessible. Diabetes Christchurch in collaboration with Ara Nutrition Department engaged Ara Computing Department to help develop a mobile app, as an app is less likely to be lost or torn and is much easier and quicker to update.

## 2. OBJECTIVES OF THE APP

My Shopping Buddy was intended to be a technology based tool to help people with diabetes to make healthy food choices. The following objectives were outlined for the app:

- Recommending healthy foods suitable for people with diabetes using a rating based guide available on Diabetes Society Smart Shopping guide.
- Providing an interface for users to check sugar, fat, and fibre content of a food item based on the Diabetes Society guidelines
- Providing some food choice ideas
- Creating a reusable shopping list

## 3. SOFTWARE DEVELOPMENT PROCESS

An agile development approach was adopted. Requirements and solutions developed evolved through several iterative steps between the clients and students. It helped promote teamwork, collaboration and process adaptability throughout the project life-cycle with increased face-to-face communication and reduced amount of written documentation.

The agile approach helped break tasks into small increments and every aspect of the development was continually revisited throughout the lifecycle of the project by way of iterations. Iterations are short time frames (sometimes called sprints) that normally lasted about 1-4 weeks. Each iteration involves working through a complete software development process characterised by planning, requirements, design, analysis, coding, and unit and acceptance testing.

Further, agile development efforts were supervised by the clients to ensure alignment between patient needs and organisational goals.

Besides the agile approach, risk assurance plan was generated using the Microsoft Operations Framework (MOF) Risk Management Discipline, and about thirty (30) different risks were identified, prioritised, analysed, monitored, and reviewed. This process helped minimise overall risk, and quicker project adaptability. The progress made in terms of work and possible roadblocks were discussed among the student and supervisors in brief sessions continually.

A quality assurance plan was designed and implemented to ensure the quality of the app. Some OOP best design practice, e.g., SOLID, DRY, KISS, have been applied to assure software design quality. JUnit-based unit tests have been created to test the functionality. Selected user groups have been used to test

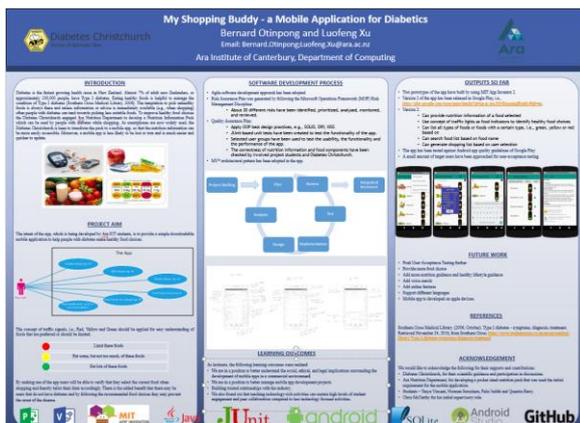


Figure 1: Poster

This poster appeared at the 8<sup>th</sup> annual conference of Computing and Information Technology Research and Education New Zealand (CITRENZ2017) and the 30<sup>th</sup> Annual Conference of the National Advisory Committee on Computing Qualifications, Napier, New Zealand, October 2-4, 2017.

the compatibility, the usability, the functionality, and the performance. The correctness of nutrition information and food component data were checked by involved students and Diabetes Christchurch staff.

#### 4. LEARNING OUTCOMES

As tutors, the following learning outcomes were realised, which has been factored into our teaching and managing students in industry based projects:

- We are in a position to better understand the social, ethical, and legal implications surrounding the development of mobile apps in a commercial environment.
- We are in a position to better manage mobile app development projects with students using the agile methodology.
- Building trusted relationships with the industry and delivering outcomes of value.
- We also found out that technology-rich activities can sustain high levels of student engagement and peer collaboration compared to less technology focused activities.

#### 5. OUTPUTS

Two prototypes of the mobile app were developed using MIT App Inventor 2. Based on the recommendations from the client, another version of the app was produced using Android Studio, which is available to download publicly via Google Play at: <https://play.google.com/store/apps/details?id=nz.ac.ara.MyShoppingBuddy&hl=en>. This version provides the following:

- Can provide nutrition information of a food selected

- Use concept of traffic lights as food indicators to identify healthy food choices
- Can list all types of foods or foods with a certain type, i.e., green, yellow or red
- Can search food list based on food name
- Can generate shopping list based on user selection

Figure 2 below shows the various screen shots of the mobile app interface addressing the objectives above.



**Figure 2: Various screen shots of the app interface**

Furthermore, My Shopping Buddy prior to its release was tested against Android app quality guidelines of Google Play, (see

[https://developer.android.com/guide/practices/ui\\_guidelines/index.html](https://developer.android.com/guide/practices/ui_guidelines/index.html)).

#### 6. REFERENCES

Southern Cross Medical Library. (2006, October). Type 2 diabetes - symptoms, diagnosis, treatment. Retrieved November 24, 2016, from Southern Cross: <https://www.southerncross.co.nz/group/medical-library/Type-2-diabetes-symptoms-diagnosis-treatment>