Grocery Listing Application

# Overview

## Topic

The project scope includes designing and developing software that keeps track of grocery items currently being kept in the household. Consequently, using such data to assist in ordering consumed items, finding coupons to items, and notify when items are on a discount.

For additional developments, the software could be implemented to various platforms and hardware such as mobile apps, web interfaces for remote control and Raspberry Pi for local control. Statistical features such as graphs and charts may be generated to inform users of habits of consuming thus giving appropriate health recommendations.

The project when developed will considerably assist users in everyday routine by automation the process. More importantly, it will present more alternatives to managing grocery stocks. By simplify the process and provide statistical information, it will reduce meal preparation time, promote a healthy selection of grocery, which can lead to more home cooking meals ratio than fast food. Overall, the project if successful may provide a positive impact on user’s diet and lifestyle.

## Motivation

The project considered useful as it assists in making daily routine automatically, therefore users can spend more time more on food preparation and cooking which lead to better diet quality and health, according to Pablo Monsivais, Anju Aggarwal, Adam Drewnowski (2014).

## Landscape

There are many grocery listing apps and software on the market currently, such as Grocery Pal, Out of Milk, Grocery iQ ..., but their main features often are focusing on generating portable shopping lists. Consequently, existing a large market gap for grocery list tracking software which integrates itself into the smart home or IoT environment.

# Detailed Description

**Aim**

The aim of Home Hero will be to provide the user with information about their groceries currently being held within the household, it will provide users with information about each item that they currently have stocked including a general description of the item and the item’s expiry date. We aim to give users options when their household items run out or expire with features included that can provide the user with coupons for the item or notify the user when the item is on special at their local store.

We hope that in achieving this aim we will save the user time and money whilst shopping and reduce any food waste within the household while at the same time improving the user’s overall health.

**Goals**

To achieve the above aim, we have developed a few goals that we will need to work towards during the project’s lifecycle.

1. **Produce and distribute surveys quizzing the public about their current household item management.**

Finding problems with a person’s current way of stocking via surveys will help to decide which features to add to the application and which to leave out, this will involve creating the surveys ourselves and distributing them to a wide audience. The distribution of the surveys could be done in a few ways, depending on the reach we are trying to achieve some methods include; social media, through a website via a link or pop-up or by email/SMS. This is a important goal to achieve as Identifying the need for an application such as this is vital as it will give the application usability and result in a pleasing experience for the user whilst using the application.

1. **Using data from the surveys to brainstorm ideas/features for the application.**

Once the surveys are collected and evaluated, it is then up to the 6Tech Industries to decide which features to incorporate and which to leave out, which features get incorporated or not depends on limiting factors such as time frame and cost. After the most required features have been selected it would then be time to discuss how to best implement them. Identifying the appropriate features to add and how to best add them will form the basis of the application, this is a vital step as incorrect implementation could result in failure of the entire application.

1. **Design and Develop the application.**

Creating the application itself will be a vital step in achieving the desired aims, our goal will be to create the application with all the desired features while as the same time being aesthetically pleasing for the user. The application’s design and style will be what separates our application from other competitors. careful planning will be required to implement the desired features and designs. This step will be essential to broadcast our vision to the user in a way that will result in a pleasing experience.

1. **Incorporate current IT technologies**

We plan to establish internet connectivity within the application to allow the application to send and receive data. The application will use IoT (Internet of things) technology to receive data from supermarket chains regarding specials relating to current items the user has within the application and coupons that the user can use when purchasing more items. Data about user purchases will also be sent to supermarket chains to help them better improve their services to our users. This feature is vital as it is what differentiates our application from all the other item management applications.

1. **Incorporate effective security**

The user may need to input basic personal information to use the application, therefore an effective security system will need to be put in place to stop any potential threats, if no current staff can incorporate these security measures than hiring of employees to manage the security of the application is the appropriate option. This step is vital as if the security of the application was breached and the personal information of our users was used for alternative uses then 6Tech Industries could face legal action.

1. **Form Effective advertising.**

To reach a wider audience, the group will need to decide on an appropriate way to showcase the new application. There are a range of methods that could be used to inform the public of our application, these include; Using social media outlets, creating a video explaining the purpose and feature of the application, start a blog about the application or public speaking to showcase the application. If ineffective or no advertising is used it will result in a lesser usage of the application which would result in the application underperforming or becoming a failure.

**Importance of each goal**

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| --- | --- |
| **Description of goal** | **Importance Rating** |
| 1. Surveys for data. | Low |
| 1. Brainstorming application ideas/features. | High |
| 1. Design and develop application. | High |
| 1. Incorporate current IT technologies. | Medium |
| 1. Incorporate effective security measures. | High |
| 1. Form Effective advertising. | Medium |

The table above shows the importance of each goal previously mentioned;

**Low** – Goals that aren’t necessary but can be included to increase application quality.

**Medium** – Goals that are important to complete but could potentially be cut if time or budget factors are an issue.

**High** – Goals that must be completed to ensure that main aim is satisfied.

Goals with a high rating such as ‘**brainstorming application ideas/features**’, ‘**designing and developing application**’ and ‘**Incorporate effective security measures**’, are goals that have the highest priority over others and if the group is pressured by budget or timeframe issues other goals could be cut and those goals will be our main priority.

## Plans and Progress (updated 12/05/19)

## The project has been planned in many states, each of which is an improvement of the former. The initial intention of the team is to make a working beta version ready to deploy. Subsequently, using it as a core platform, the team can improve the project continuously by adding more features, making it a full system as set out in the plan.

## After considerations and agreed upon by the majority of 6Tech team members, the name "Home Hero" was chosen to be the official name of the project, credited to Zac Gearing. Also, 6Tech has set out a detailed plan for the whole project, covering most of the steps needed from start to finish, and should budget allowed, plans for project expansion.

## Initially, 6Tech will generate a prototype of the applications needed for the project. The prototype's scope is limit at basic user interfaces, functionality demonstration, as well as their relation to each other. 6Tech will then use it to test on user experiences and accessibility. Further adjustments could be applied based on feedback from testers. This prototype can also be used to demonstrate the project to investors and other parties of interest to acquire extra investment if the team decided to pursue project expansion.

## After the prototype approved by the team and project direction finalised, 6Tech will begin developing the core application to handle grocery listing, with primary features including but not limited to:

## - Grocery items list managing.

## - Reordering system.

## - Discount and coupons finding.

## - Barcode scanning.

## On a user's aspect, the process started with a list of user created grocery items which can be created manually or scanned from barcodes (barcode scanning feature will be available after the next stage finalised). When an item is out of stock, users will mark that off the system. From there, a range of options will be provided, whether take that item off the listing, or reorder using automatic reordering system. The ordering process could be made more efficient by including online discount code and price comparison.

## After core features are established and operational, the second stage of software development will initiate. Additional components will be included to further enhance software capability and better integration into smart home ecosystems. Integration of smartphone components can add more interaction to the software such as barcode scanning, remote controlling. The system program and database will subsequently transfer to a Raspberry Pi with touchscreen included providing users with a single physical device without the need of a computer. More importantly, this device can operate around the clock and continuously inform users of health advises and statistical information based on consuming habit.

## Roles

To be able to develop the project, developers must have experiences in Java programming language and skills in program integration to multiple platforms. Basic knowledge with different hardware components such as smartphones and Raspberry Pi is also a requirement. The project considered feasible as required skills are at an immediate level, therefore it should not be a difficulty getting developers with appropriate knowledge.

## Scope and Limits

## Based on the constricted time-frame, the scope of the project is narrowed down to developing a prototype of computer application. Using it as a core to expand more functionalities should time and budget allowed.

## Features to be developed:

## Making lists of grocery items.

## Basic inventory handling (add, delete, get item prices etc.)

## Features pending:

## Online ordering.

## Integrate into IoT system.

## Develop a mobile app.

## Integrate into Raspberry Pi

## Tools and Technology (Updated 15/05/19)

A mixture of software and hardware are needed to develop this system includes:

Software:

* Java SDK 11 on Eclipse 4.11 IDE
* Free GitHub repository for collaboration and version control
* Adobe XD (Free licence) to create the UI for the prototype
* Microsoft 365 subscription licence (Free when using student email) including:
  + Microsoft Word for Documentation
  + Microsoft PowerPoint for Presentation
  + Microsoft Access for database creation and handling

Hardware:

* RaspberryPi3 board with a touchscreen attached by GPIO ports
  + Held inside an enclosure to protect the unit from external damage
  + Installed with a lightweight OS like Raspbian Stretch Lite or RISC OS to operate

## Testing (Updated 15/05/19)

There are three main stages of testing during and after the development of the project: The Prototyping Stage, Development Stage, and Post-Development Stage.

* Prototyping: During the early development of the project, a small controlled group provides feedback to ensure consistent user experiences. The group is recommended to consist of users from various professional backgrounds related to the development of the project, in order to deliver fast and effective feedback to help progress development. When the primary function of the project is completed, the development process can move to the next stage.
* Development: When each function in the project is complete functional testing is performed in order to clear out as many conflicts and bugs as possible. Developers will generate a detailed list of procedures for testers to follow. Testers should not be the ones who developed the functions, however cross-checking and communication between testers and developers is recommended. Once all major functions are fully developed and sufficiently tested, the project can be released, and testing can progress to the next stage.
* Post-Development: After delivery, continuously receive feedback from users in order to fix any remaining bugs or conflicts, as well as improve on user experiences. Updates to the project may be necessary in order to stay functional with constantly improving hardware.

## Timeframe

--- In Progress –

## Risks

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| **Risk Statement**  There is a risk that/of… | | **Risk Owner**  Name and position | **Current Risk Level** |
| **1** | **Inexperience** - There is a risk that the project does not have adequately experienced staff to develop the software or run a project effectively. | 6Tech executives | Medium |
| **2** | **Procurement** –There is a risk that the contract is inadequate or ambiguous and the statement of requirements doesn’t reflect the actual requirement | 6Tech executives | Low |
| **3** | **Staff turnover** –There is a risk that implementation will be delayed due to Telstra and Supplier infrastructure constraints | 6Tech executives | High |
| **4** | **Estimation and scheduling** – There is a risk that estimating and scheduling development time may be inaccurate | 6Tech executives | Medium |
| **5** | **Design compromise** –There is a risk that due to quick turnaround the project could be rushed with compromises made in the design phase | 6Tech executives | Low |

[Detailed Risk Management Plan](Risk%20Management%20Plan.docx)

## Group processes and communications

--- In Progress --

## Skills and Jobs (Updated 17/05/19)

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| Job Title | Lead Programmer |
| Duties/Responsibilities /Goals | * Complete all programming goals outlined by Project Manager before the supplied deadline. * Collaborate with Graphic Designer to design and develop the program as assigned by Project Manager. * Participate in strategic planning for program development. * Collaborate with Community Feedback Analyst and Tester to debug/fix issues. |
| Skills/Requirements | * Strong Programming Skills * Java Programming * Software Design * Software Debugging * Software Documentation * Problem Solving Skills * Teamwork & leadership Experience |

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| --- | --- |
| Job Title | Graphic Designer |
| Duties/Responsibilities /Goals | * Complete all design goals outlined by Project Manager and Lead Programmer before the supplied deadline. * Collaborate with Lead Programmer to design and develop the program as assigned by Project Manager. * Participate in strategic planning for program development. * Collaborate with Community Feedback Analyst and Tester to debug/fix issues. |
| Skills/Requirements | * Graphic Design & Layout Skills * Customer Focus * Creativity & Flexibility * Attention to Detail * Experience with Adobe creative programs * Teamwork experience |

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| Job Title | Community Feedback Analyst |
| Duties/Responsibilities /Goals | * Analyze community feedback and discover issues within the program. * Perform data validation checks. * Participate in strategic planning for program development. * Collaborate with Lead Programmer and Graphic Designer to help debug the program. * Collaborate with Tester to discover bugs / issues. |
| Skills/Requirements | * Strong Analyst Skills * Problem Solving Skills * Experience with Analytics Programs (e.g. Microsoft Excel) * Teamwork experience |

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| Job Title | Tester |
| Duties/Responsibilities /Goals | * Ensure little to no issues / bugs remain in the program by the specified deadline * Participate in strategic planning for program development. * Collaborate with Lead Programmer, Graphic Designer and Community Feedback Analyst in order to eliminate any bugs discovered. |
| Skills/Requirements | * General Programming Skills * General Graphic Design Skills * General Analyst Skills * Software Debugging * Software Documentation * Attention to Detail * Problem Solving Skills * Experience with Analytics Programs (e.g. Microsoft Excel) * Teamwork Experience |