



# App Development Report

Evaluating the pass it on app

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## Terms of Reference

A report submitted to fulfilment the requirements for:  
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# Contents

- Introduction .....2
- Design and development.....2
  - Discovery .....2
  - Design.....2
  - Development and testing .....7
- Implementation .....7
  - Features and functions .....7
  - Screen shots ..... 10
- Evaluation..... 11
  - Other apps ..... 11
  - User testing and feedback ..... 12
  - Improvements ..... 13
- Summary ..... 13
- Resources ..... 13
- References..... 13

# Introduction

The 'pass it on' mobile application (app) is a social enterprise prototype designed for the Android platform. It allows users to join or log into the app and list and view surplus items that other users no longer want or need. The app is capable of allowing users to recycle any second hand item and potentially charge a fee for them and it could be used nationally, but currently only focuses on free surplus food items available in and around the Edinburgh area due to the growing issue of food banks (The Guardian, 2015).

Inspiration for the app came when a friend who worked for a sports clothing store was forced to shred perfectly good clothing and trainers. Placing them into a skip in order to make room for the new season's stock. It seemed wasteful and unfortunately it is an industry standard to bin stock including food items (BBC news, 2013) rather than recycling goods to third parties. It made sense to create an app that would allow anyone to give away surplus items to someone else who might have use for them.

## Design and development

### Discovery

The app is primarily designed to be disruptive and change the behaviour of users and local businesses by providing a positive outlet for them to offload items that would otherwise go into the landfill. The app is not primarily designed for commercial profit. However users could be allowed to charge for second hand items in future to incentivise them to recycle more.

### Target audience

Anyone who has an Android phone who lives in Edinburgh and is interested in a sustainable lifestyle and wants to recycle or save money.

### Form factor

The app is designed for Android mobile devices with a touchscreen. The app is aimed at devices using a minimum of API 19 on Android 4.4 (KitKat) to target the most users (70.9%) possible while taking full advantage of the phones available features by reviewing the latest stats (Android, 2016). The app is also targeted at small to x-large mobile screen sizes.

## Design

### The name

The app name 'pass it on' is designed as a direct instruction and perhaps a desire for users. The tagline is simply recycle surplus designed as a simple descriptor of intent.

## The logo

Designed to resemble the universal recycle symbol, while incorporating a positive but subliminal smiling face. The logo uses a natural green shades and provides a good primary colour for the main app palette giving a good level of contrast between text and background colours.



## The launch icon

A minimalist version of the logo in various resolutions.



## The colour palette

Below is the colour palette that has been used in the app.



Primary  
Action-bar

Primary dark  
Buttons

Primary text  
Borders

Title text  
Reverse text

Accent  
Warmings

## Use cases

Two use cases were designed to help design and develop the app and its features and functions.

### Use case 1: Recycling surplus

A housewife has some surplus cans of tinned fruit she doesn't want to throw in the bin. She's looking for a free app that's easy to use and enables her to advertise the cans to someone in the local area that might want them.

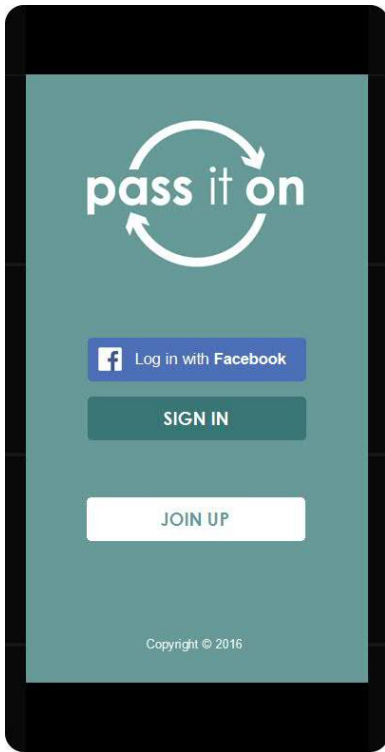
### Use case 2: Looking for items

A student is trying to save money on his weekly shopping budget, as his funds are running low. He's using the map in the app to look for suitable food items he can get locally for free and locates a box of onions, so he messages the owner to arrange a collection.

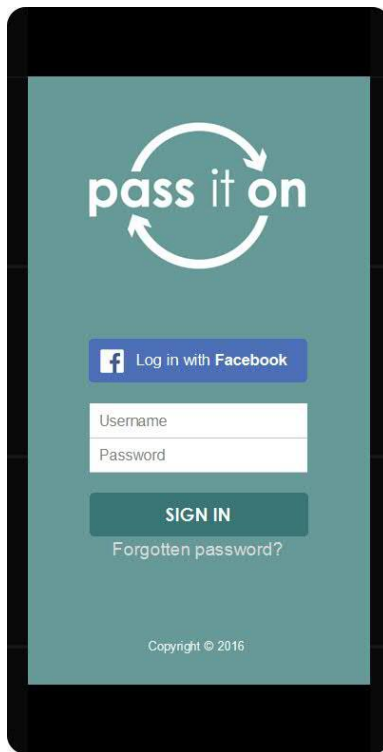
## Wireframe designs

Here are the initial wireframe designs created using Just in Mind.

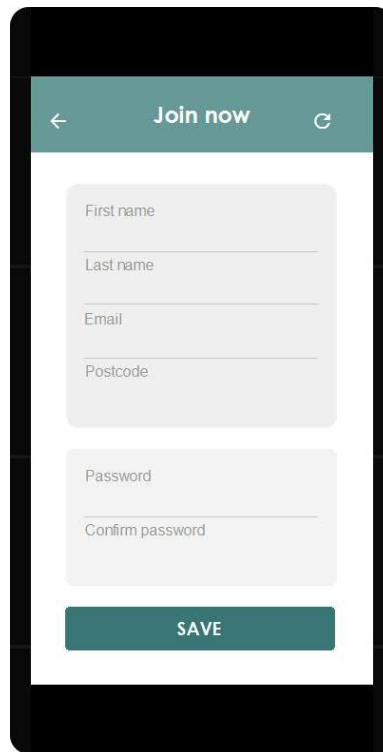
Main launch activity



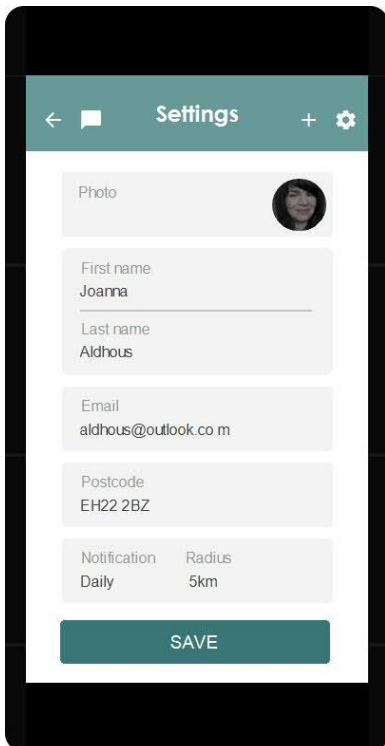
Log in activity



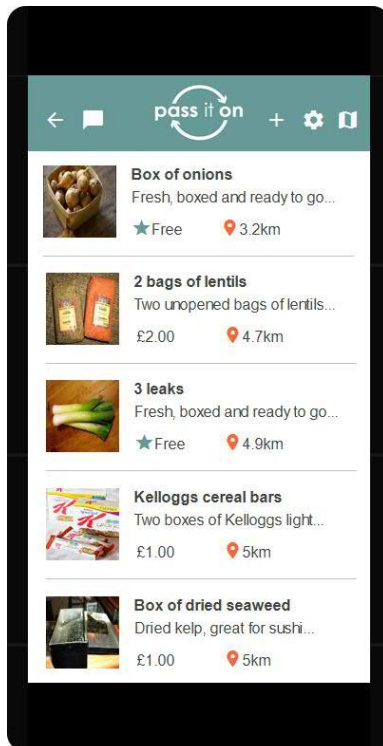
Join activity



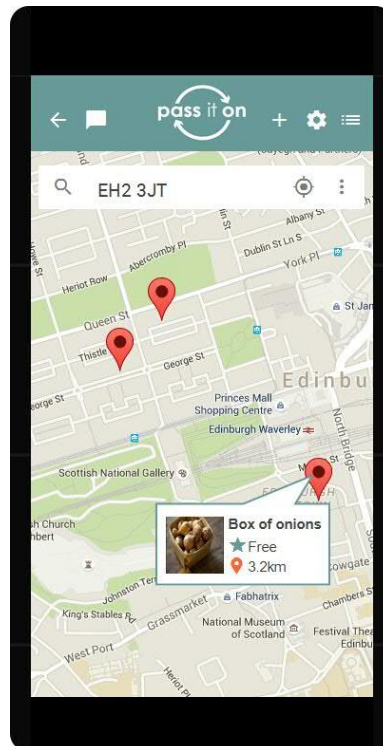
Settings activity



Items activity



Map activity



## Add a new item activity

← Add item

Photo

Title

Description  
e.g. quality, quantity...

Pick-up Location  
EH22 2BZ

Pick-up Times  
e.g. weekday evenings only

List for Price  
5 days £0.00

SAVE

## Item activity

← pass it on

**2 bags of lentils**

Two unopened bags of lentils weighing 500g each. They are in date. Please get in touch if there's anything you would like to know

**Pick up Times**  
Weekends are best

7 days ago	£2.00
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SEND A MESSAGE

## Message activity

← Chat

Hi Joanna  
If the lentils are still free I can pop round tomorrow evening?

Thanks, John

Hi John  
Sure thing, the lentils are here.  
Can you drop round at 7ish?

Cheers, Joanna

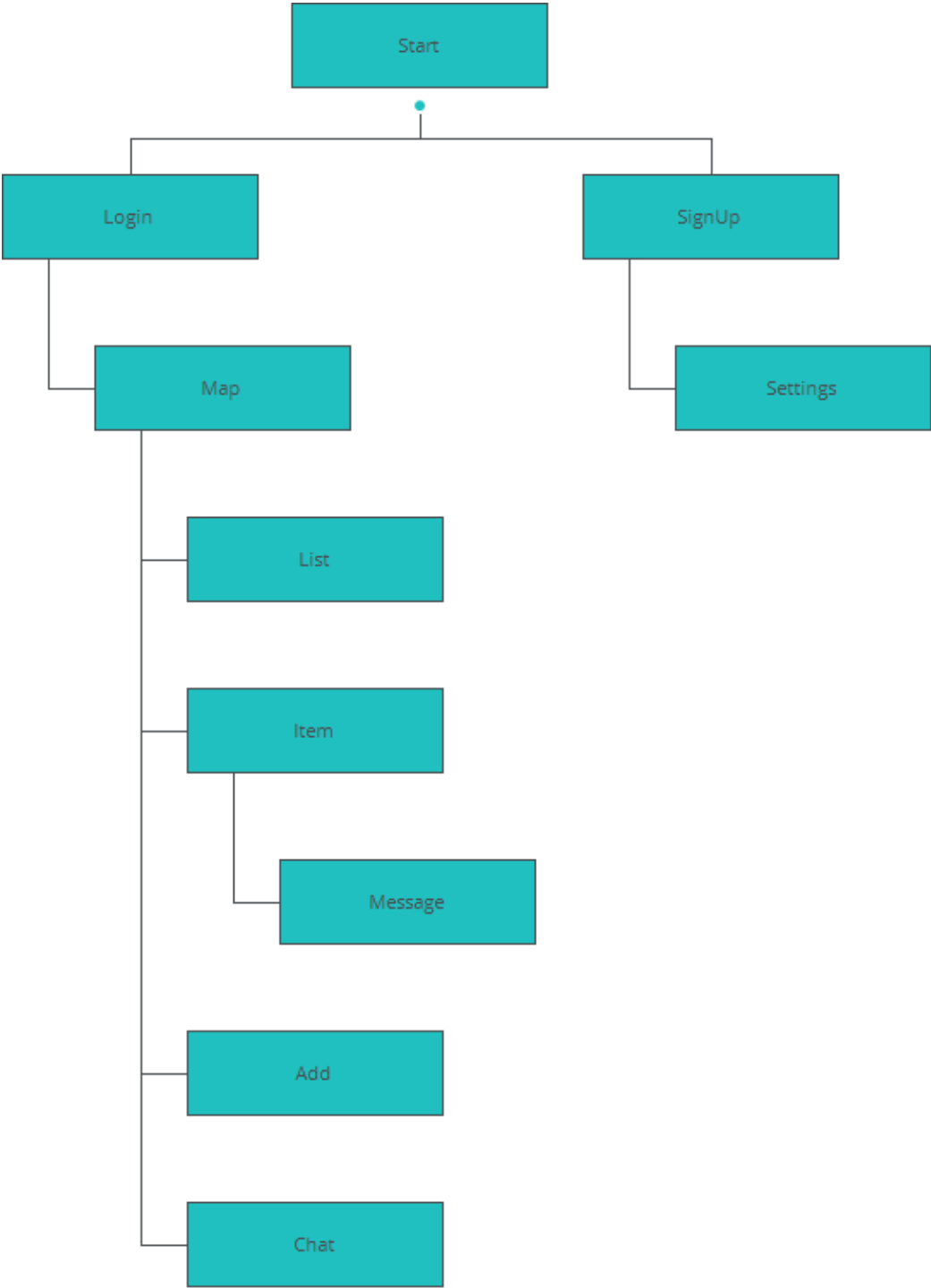
## Usability

Here are the usability guidance points for the app. They take priority over any conflicts which may occur in the initial designs.

1. Design elements should be native to the Android platform
2. Native icons should be used whenever possible
3. The activity purpose or title should be clear
4. The user should be able to navigate easily
5. The navigation should be responsive and scalable
6. The activities should work in portrait and landscape
7. The activities should be responsive to resizing on different screens
8. Colours should have good levels of contrast to ensure they are legible
9. Buttons should be large enough to be seen and pressed
10. Form fields should be labelled appropriately
11. Form fields should include hints to help users
12. Forms should include the minimum validation needed
13. Error messages should be obvious
14. Users should be able to edit or delete items they add
15. Use existing design patterns to enable users to interact easily

# Sitemap of activities

Below are the activities and a loose structure of the way they relate in terms of hierarchy.



## Development and testing

Each function was created independently using tutorials, development and reference guides (cited and referenced) as a separate project to avoid creating complexity and issues in the main 'pass it on' app. The functions were compiled, run and tested using the Android emulator to test various models and screen sizes as well as an Android device to resolve visual and functional issues. When each function was ready it was then integrated into the main 'pass it on' app project and recompiled and tested again to ensure it had not caused any conflicts.

### Logging

The live logcat and event log windows were used to view general issues and when the app was run on devices and emulators and proved invaluable for identifying issues thrown up by user interaction and activity intent changes occurring within the app.

### Troubleshooting

Google was used to investigate solutions for random errors that arose where there appeared to be no obvious solution.

## Implementation

The final implementation is very similar to look and feel of the original wire frames with some minor changes made to adhere to mobile design patterns, usability standards and based on user feedback.

## Features and functions

Features and functions were developed for material design (Android, 2016) and the v7 AppCompat library to provide support for the Action Bar user interface design pattern and the material design user interface (Android, 2016).

### Login

Users log in by pressing the 'sign in' button on the main activity. The login function was created using the Login Activity template (Android, 2016). As this is only a prototype to show the look, feel and behaviour of a fully-fledged app dummy login details have been set up.

- User: [guest@guest.com](mailto:guest@guest.com)
- Password: add more than 4 characters

Simple validation and messaging appears if no details are added, if an incorrect email/user is added or if the password is too short. The errors use the accent colour shown in the style guide.

Upon filling in the password the user can select 'sign in' using the soft keyboard if desired to avoid having to exit the keyboard and manually pressing the submit button on the form.



## Account settings

Users can join up by pressing the 'join now' button on the main activity. The account settings function is a simple form to gather basic user details such as the postcode for item locations and contact numbers for messaging these are stored in a database using SQLite (Tutorials Point, 2016). The user can also update their details at any time after they have registered. If a user wishes to delete their account they can do it with one click, however there is a warning provided.

## View items

Users automatically get directed to the items activity (Tamada, 2011) once the sign in or have joined up, which provides a list of available surplus food items in the local area. The list is scrollable and each item has a thumbnail image, title and description of the item. Users can view more details by selecting an item from the list.

The detailed item view provides a larger image of the item along with the title, full description and location along with the best pick-up time. The user can also send a message to arrange collection.

There is also navigation present allowing users to add their own items or view items in the map view to see visually if items are nearby.

## Add an item

When users want to list a new item they only need to provide minimal details to list an item, which is stored in a database using SQLite (CodePath Inc, 2016). Users can add a photo by pressing the large camera symbol shown at the top of the screen to open they're camera. They can then take photos of the item until they're happy with one they want to include (Govind, 2014).

Once the user has added the title, description and the best times to pick-up the item they can submit the listing by pressing the save button and it will appear in the list of locally available items. Again there is minimal validation on the item details form and the user can delete the item if for any reason it is no longer available or they have changed their mind about listing it. They can navigate to the item and select 'delete item' from the navigation.

## Message

When a user sees an item they want, they can contact the owner to pick it up by messaging them. The user simply presses the message button and use the in app messaging system and never see any contact details directly. Users can also view existing messages or new conversations by selecting the speech icon displayed in the navigation.

The message feature mimics the SMS service (Thakur, 2014) at present as there is no server available to process messages. However it does give a good indication of the look and behaviour the message service may have. Each user message is coloured differently and appears on the left or right side of the message view to make it easier for each user to read messages.

## Map view

The map activity uses the Google Map and location API v2 (Google, 2016) to allow users to see their own location and where they are in relation to any available items. They can select markers on the map to view basic details about local items and the map can also help them to navigate to a particular location to pick up an item. However the markers and info boxes on the map do not link directly to the individual item details at present.

## Responsive layouts

The activity views have been developed primarily for portrait mode and use linear layouts. However vertical scrolling (Android, 2016) is enabled to activate when required, primarily in horizontal mode or small screens. Icons are developed in vector form, so resize to look clear on higher resolutions.

The views also resize as components such as button, photos and form fields are set to match parent wherever possible and text sizes are set to 'sp' scale-independent to scale proportionally.

In addition the speech bubbles used in the messaging activity and info boxes used on the maps have been developed using 9-patch images (Android, 2016) to resize to accommodate contents.

## Navigation

The navigation is constant once a user logs in and appears in the form of an action bar. The title descriptor is clearly visible for each activity on the left hand side with icons and an extended menu appearing on the right hand side.

However the navigation layout has altered from the original wireframe design of a centralised layout similar to that used in iOS and has instead adopted the correct native behaviour as set out in the mobile design patterns for Android.

The icons have text descriptions which appear if the screen is large enough to display them.

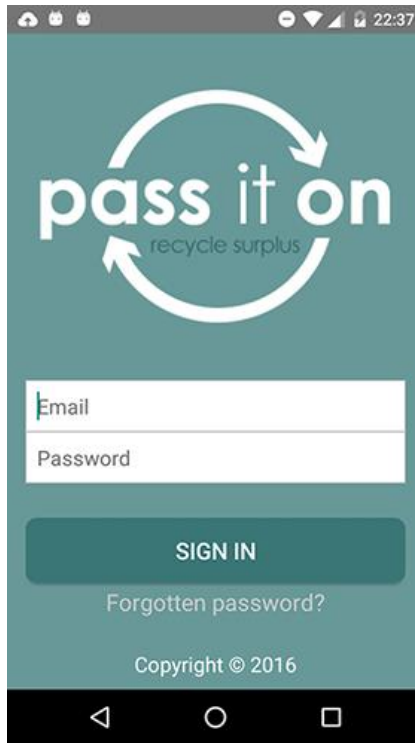
## Screen shots

Here are screenshots of the implemented app running on a Moto G v2 phone.

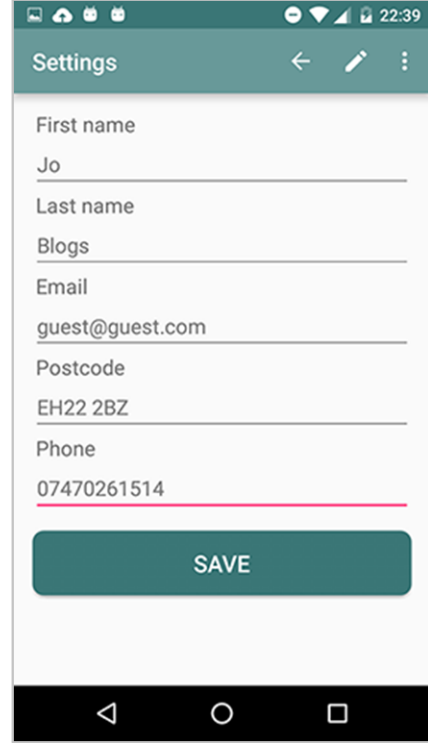
Main activity launch view



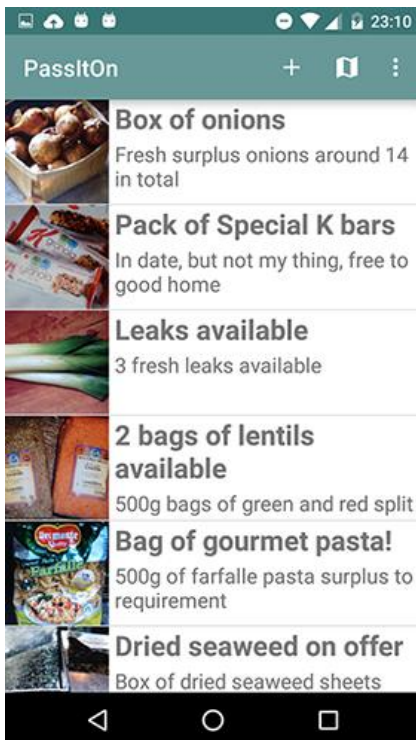
Login activity



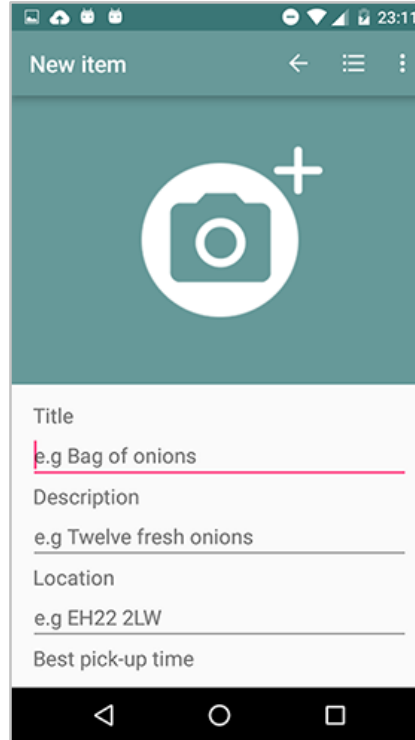
Join up activity



Items list view



Add item activity



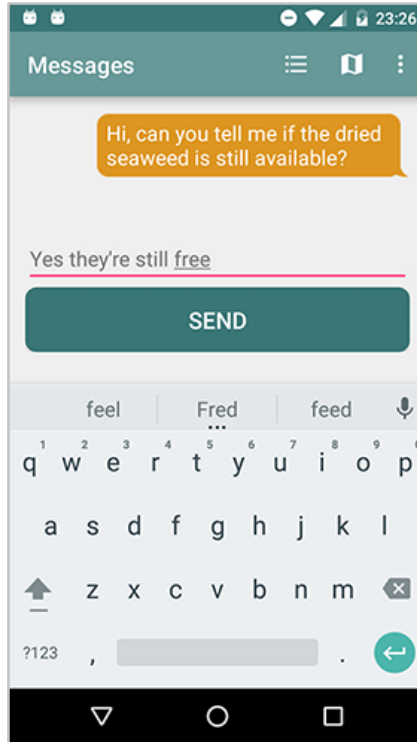
Add item with details



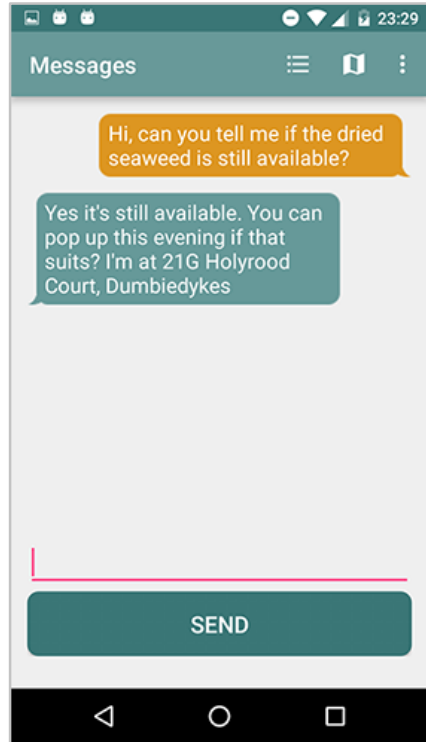
### Detailed item view



### Replying to message



### Message activity



## Evaluation

Some functionality was too complex to implement well in the available time. In addition external resources were required such as a server to implement the messaging successfully and using the geo location to transform the postcodes to longitude and latitude co-ordinates for the Google maps API was beyond current development capability and more time would be needed for this.

Aside from this the prototype looks good and works reasonably well and shows the main features and functions envisioned in the initial concept and wire-frames with usability improvements. A lot was learnt along the way about the Android platform and activity life cycle, as well as manipulating content. Feedback was also quite positive as discussed later on.

## Other apps

There only app similar to the 'pass it on' app that can be reasonably compared is Olio.

Olio is a food sharing app (Olio, 2016) that lets users charge for surplus food in the UK. The app behaves in a very similar way in that it has a sign up activity, lists items and provides a detailed item view, as well as a map view. But this is likely because they activities are logical choices in enabling the user to complete the necessary tasks in order to advertise and locate food items.

However the Olio app looks to be very well funded and polished. They have obviously spent a lot of time and energy to create the features included in the app. The user profile page includes a user photo. The app is integrated with Facebook and has social media functionality built in. These are all nice to have features and although not included in the 'pass it on' app do not detract from its functionality.

Given the amount of resource and time that was available to build the 'pass it on' app and the fact it was the first app created by the developer it looks very clean and professional and is not far from being further developed into a commercially viable app.

## User testing and feedback

Five participants used the app to do several tasks while being observed and undertaking an interview. The tasks set were as follows:

1. Join up - register with the pass it on app and update your phone number
2. Log into the app using the dummy details and list a new food item
3. Locate an item you're interested in and message the owner about it
4. Delete your 'pass it on' account

**Task 1.** Nearly all the users felt the dark grey background made it harder to read the text on the join up form and so the background was changed to a light shade. In addition the form field actions were set to next and done to help users complete the form and tab to each field more easily.

**Task 2.** All users succeeded at logging in and found adding a new item very quick and easy, although they wished they could edit the item if they made a mistake rather than having to create a new one. However they also felt it was so easy to add a new item this wasn't a big issue.

**Task 3.** All users liked the look and feel of the messaging activity and said it was obvious to locate on the item page. However they wished that the markers on the map linked to the individual items directly, rather than being forced to go via the items list page. Unfortunately there was not enough time to add this functionality.

**Task 4.** Most users went directly to the settings view and managed to delete their account immediately however some users stated that the title 'Settings' was confusing. Given this is the title was renamed 'My account'.

## User feedback

Users commented that the app looked better than many apps currently available in the Android Play store and liked the colour palette used. A user also mentioned that it would be good to see their own location on the map, so this functionality was implemented.

## Improvements

There are many improvements that could be implemented into the 'pass it on' app. Here are the most obvious:

- Facebook API could be integrated in place into the app for the log in and profile function
- An edit function could be added for items listed
- The list of items could show additional details such as the location
- The info boxes on the map could link directly to the item details

## Summary

Undertaking the challenge to design, implement and evaluate a prototype mobile application for the Android platform was a little daunting having no Java programming skills. However it was important that this did not influence the initial idea and if possible the final application. The final prototype is very close to the initial design concept in both look and feel as well as functionality.

## Resources

Icons were all created using the Vector Asset Studio (Android, 2016).

Example food items were populated with photos from Google images for speed to illustrate how listed items might look. However the 'pass it on' app does not include any photos and when the app is compiled it is completely empty, so new items need to be added from scratch using the add item activity itself.

All graphics included in the app have been created by the developer from scratch using Adobe Photoshop.

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