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Declaration

We, Vanya Mutaftchieva and Ciaran Redmond, hereby certify that the material, which is submitted in this final report/thesis, towards an award of the Masters (MSc) in Creative Digital Media, is entirely our own work and has not been submitted for any academic assessment other than part-fulfilment of the award named above.

Date:

Signed: _____

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Abbreviations

AOIFE:	Association of Irish Festivals and Events
AD:	Agile Development
CDM:	Creative Digital Media
API:	Application Programme Interface
CSS:	Cascading Style Sheets
DB:	Database
GUI:	Graphical User Interface
GPS:	Global Positioning System
iOS:	iPhone Operating System
HTTP:	Hypertext Transfer Protocol
IDE:	Integrated Development Environment
MVC:	Model View Controller
PHP:	Hypertext Preprocessor (formerly Personal Home Page)
SDK:	Software Development Kit
SOTA:	State Of The Art
UI:	User Interface
URL:	Uniform Resource Locator
UX:	User Experience
UCD:	User-Centred Design

Chapter 1 Introduction

This document, prepared by Ciaran Redmond and Vanya Mutafchieva, is part of our final project for the MSc in Creative Digital Media at DIT and aims to detail the ideation, design and implementation of Festie, an iPhone app for events and festivals.

Since the use of User-Centred Design (UCD) principles and Agile Development (AD) tools and techniques has been central to every step of the creation of Festie, we have structured this document such that it follows the UCD and AD methodologies step-by-step-for all chapters of the document as this approach most accurately reflects our development process (Figure 1-1):

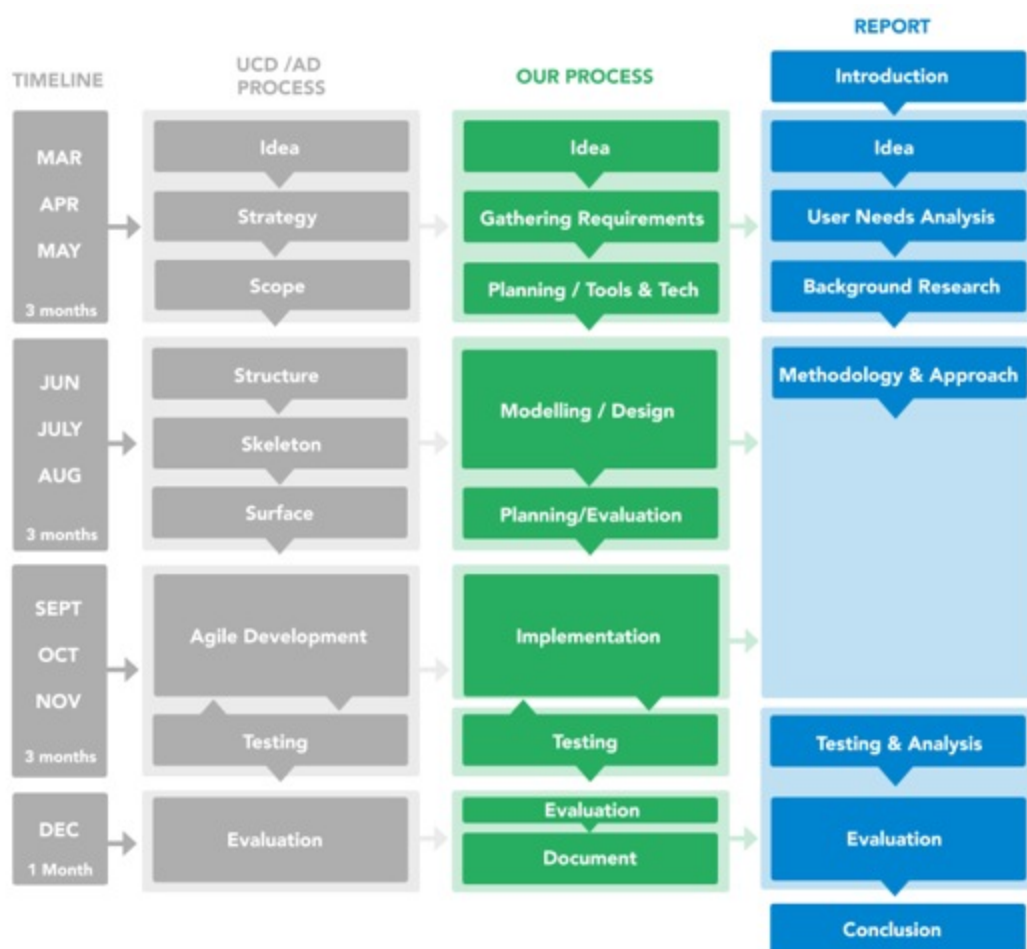


Figure 1-1 Report Structure Diagram

There are six key chapters in this document. Below we will briefly describe what each chapter will cover:

- **Idea** will describe our app idea regarding festivals and events, after which it will briefly refer to iterations of previous ideas. We will also look at research we

undertook to explore this domain and see how we decided the concept was viable to begin the next phase in the project.

- **User Needs Analysis** will begin by outlining our strategy for project execution and subsequently we will interpret our project aims and objectives. We will also look at analysing the user needs in greater detail with the creation of personas being the final output.
- **Background Research** will look at the project scope initially, followed by a thorough analysis of our competitors and state-of-the-art applications. We will look to analyse technologies relevant to our concept and finally define our functional and content requirements from all research conducted.
- **Methodology and Approach** will firstly outline the design process with specific concentration on the structure, skeleton and surface design of our app. This will lead to initial evaluation followed by the creation of an agile plan regarding implementation. The final section of this chapter will look at the implementation phase with a clear breakdown between content production and code development.
- **Testing and Analysis** will look at the varied testing methods used throughout the development of the app. We will discuss the purpose of each testing method, display the results visually and critically analyse the feedback.
- **Evaluation** will conclude with a full analysis and evaluation of the overall project objectives, functional and content requirements, as well as a review of the risks taken and our performance as a team. The chapter will conclude with a discussion about future work.

Chapter 2 Idea

2.1 Introduction

In this chapter we will first discuss our idea definition and also briefly mention previous idea iterations, after which we will give an overview of research carried out in the events and festivals domain.

2.2 Idea Definition

2.2.1 Festie

Festie is a mobile app, which helps event attendees exchange real-time information about what is happening around them, as well as to get verified information from the event organiser regarding locations of facilities or issues that arise during an event. It works by letting users leave short notes on a map, which are then viewed by others.

Festie is targeted at two types of users—organisers and attendees. The organiser's role is to set up an event, provide general information, create the event boundary and, if appropriate, add markers—locations of exits, toilets etc. During the event the organiser can interact with attendees by posting notes on the map and by commenting on other participants' notes. Content added by the organiser is distinguished from the rest by the colour green.

The attendees' role is to browse the event for notes and interact with other attendees and the organiser by posting notes on the map, commenting and voting on notes. Browsing notes is made easy by the filter and search functionality, as well as by the way the notes are presented on the map showing only most popular non-overlapping notes by default. If the user is interested in exploring further they can pinch and zoom the map to reveal more notes. Filtering of notes is also enhanced by the tags functionality, where users can tag their notes with either default or custom tags. Attendees can share the content of their notes on social media, as well as send their location using the Share My Location feature if they want their friends to easily find them in the crowd. All content added by attendees is represented by the colour blue.

2.2.2 Idea Iterations

Heresay

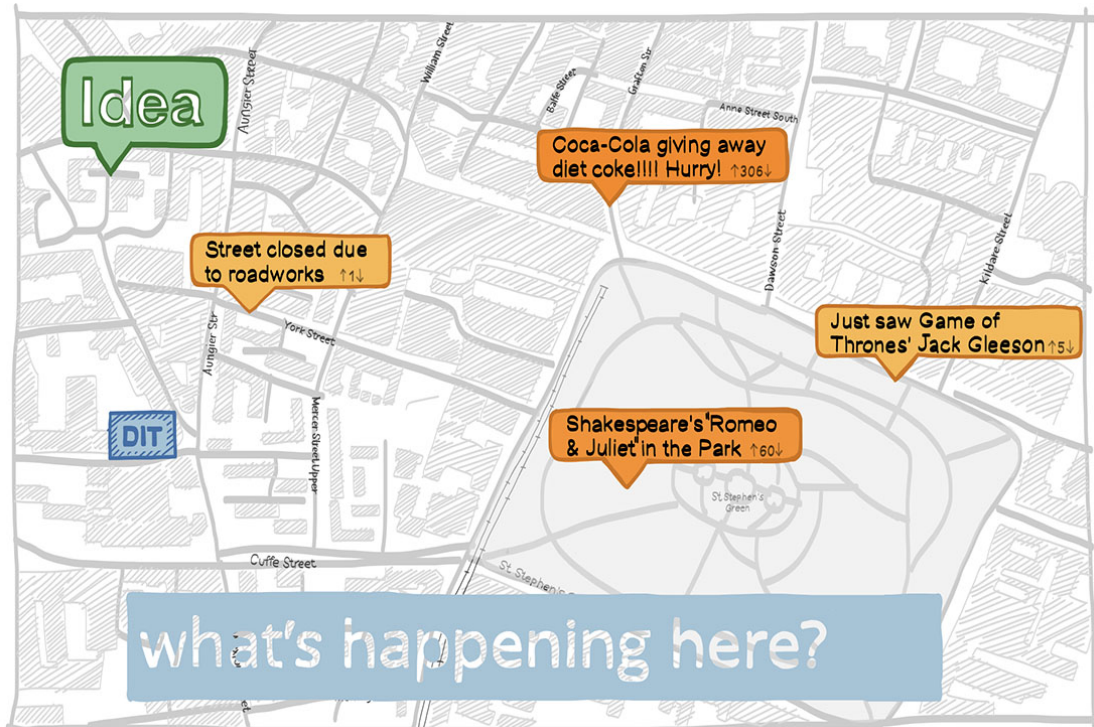


Figure 2-1 Heresay—the initial abstract idea (screenshot from Pitch 2, 18 Feb)

Our initial proposal was much more conceptual, exploring the idea of *Maps as a Digital Media*. We wanted to explore the idea of combining digital maps and mass collaboration to create a new type of media—a collaboratively authored digital artefact updated in real time that benefits both those who use it and those who create it. This type of mass collaboration would further benefit from the network effect (Wikipedia, Network Effect, 2014), meaning that the more people that use it, the more useful it becomes.

This vision however, based on feedback from the CDM team, was too broad a project to take on, so we instead decided to narrow the idea to a particular domain.

Pindex

With Pindex, which was about “users posting and browsing notes on a map in order to see what’s happening in their immediate surroundings”, we didn’t quite manage to distance ourselves from the broader concept of Heresay.

Neighbrly

Our next idea, Neighbrly, was for a “local social networking app, where you connect with other locals in your area to stay informed about local happenings, as well as share goods, recommendations and discuss issues that matter in your community”. Based on feedback at the summer sprint this also failed to focus the idea on a sufficiently narrow domain.

Festie

As a result the idea of Festie was born, which focused on the particular domain of events and festivals while still attempting to create a rich-media artefact of a mass-annotated digital map.



Figure 2-2 Festie—functional mobile app

In the remaining chapters of this document we will discuss step-by-step the progression from the initial abstract idea (Figure 2-1) into a functional mobile app (Figure 2-2).

2.3 Events and Festivals Research

Once the idea of Festie was decided on, we carried out research in the area of events and festivals to see if our concept was viable in this domain. We contacted a number of event organisers and different institutions including The Central Statistics Office, Fáilte Ireland and the Association of Irish Festivals and Events (AOIFE) to obtain figures to help us understand the current situation regarding festivals and events in Ireland.

We received a lot of useful feedback, with the most striking statistics coming from Fáilte Ireland. In brief, recent figures show a dramatic increase in festivals and events in Ireland over the past five years. Fáilte Ireland's Survey of Overseas Travellers Report indicates an increase of 82% in overseas attendees to Irish festivals and events from 2009–2013. Music festivals appeared to be the biggest draw for overseas attendees with 266,000 visitors arriving in 2013 to attend these events, a 34% increase over 5 years. (Appendix A)

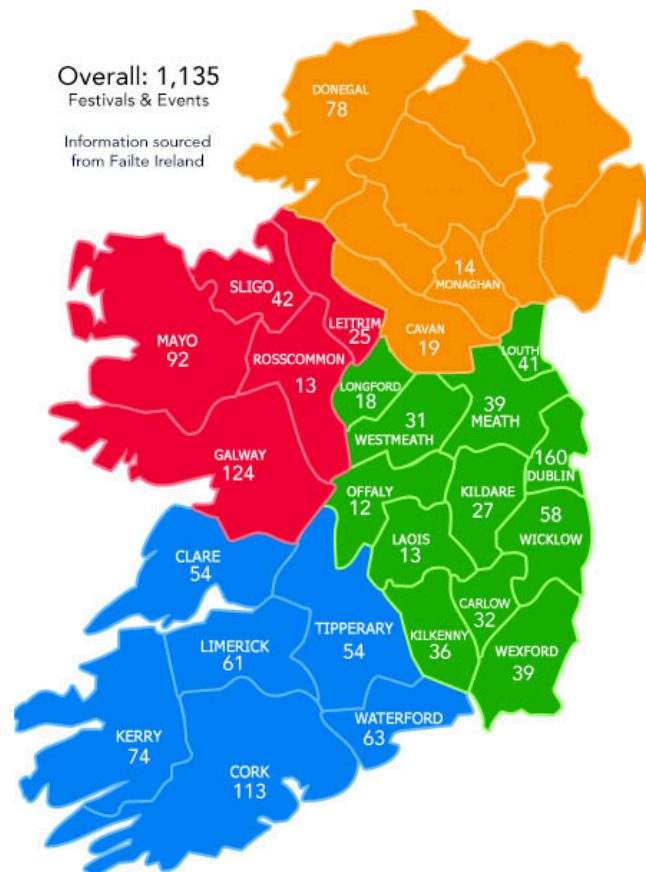


Figure 2-3 Number of festivals/events by county

Statistics provided by Fáilte Ireland showed that the scale of festivals in Ireland is significant with 1,135 festivals and major events taking place in 2013. We designed a map (Figure 2-3) to illustrate these statistics. It was no surprise that the top three areas were counties with major cities: Dublin (160), Cork (113) and Galway (124).

In order to get a clearer understanding about the types of festivals and events our app should target we took a sample of Irish festivals and reviewed some of their data: the location, boundary size, attendance size, service reception and type and we summarised the results in a table (Appendix A).

From this we decided that Festie should target medium to large size outdoor events.

In addition to looking at statistics, we asked Irish mobile app companies who had been commissioned to produce festival and event apps in the past about the level of demand for festival apps in Ireland in general. They provided very encouraging feedback:

“There is a good demand for festival apps - we’ve made a good business out of them for a few years... but the budgets in festivals are very tight.”— Shane McAllister, Founder, Mobanode.

“There is a strong business case for festival apps... Festivals receive sponsorship both from public institutions (The Arts Council) and commercial sponsors.”—Dermot Daly, CEO, Tapadoo.

From talking to both public institutions and industry experts it seemed clear to us that the festival market in Ireland was growing and we were happy to proceed with the Festie idea.

2.4 Conclusion

In this chapter we first explained the idea of Festie and the functionality it provides. We also briefly discussed previous idea iterations, after which we gave a brief overview of the research we carried out in the events and festivals domain in Ireland.

In the next chapter, Chapter 2 User Needs Analysis, we will first discuss our strategy for the project execution, after which we will define the project aims and objectives and we will conclude the chapter by extracting the user needs from user research we had conducted.

Chapter 3 User Needs Analysis

3.1 Introduction

In this chapter, User Needs Analysis, after having discussed our idea in Chapter 2, we will first briefly discuss our strategy for the project execution, then we will define the project aims and objectives, after which we will delve into analysing the user needs, by first identifying who our users are and defining and prioritising their needs based on user research, and second, by creating *personas*—fictional characters representative of the needs of the real users.

3.2 Creating a Strategy—why are we making this product?

Once we were happy to pursue the events idea for the app, our next step was to devise a strategy for the execution of the project. According to Jesse James Garrett, the best way to create a strategy while following best UCD practices is to answer two crucial questions at the outset of the project (Garrett, 2011):

1. What do we want our project to accomplish for our team (and all stakeholders, incl. CDM lecturing team)?
2. What do we want our product to accomplish for our users?

We derived the project aims and objectives from the point view of the team by answering the first question, while the user needs (the objectives imposed on the project from outside) were extracted by answering the second question.

Together, project aims and objectives and user needs formed our strategy. This strategy served as the foundation for every decision made by the team later on during the design and implementation of the artefact.

3.3 Project Aims and Objectives

We derived the project aims and objectives by combining together the project brief objectives (as detailed by the CDM team) with our own motivations and aspirations both as a team and as individuals. They are:

- 1) **Create Unique Idea:** produce a unique app idea and concept.

- 2) **Prove Need for App:** find a gap in the mobile app market and prove a need for our app following user and competitor research.
- 3) **Improve on the Current State-Of-The-Art:** differentiate from competitors by improving on the current state-of-the-art in the targeted events and festivals app domain.
- 4) **Adequately Address User Needs:** build a mobile app which addresses the needs of a specific target audience as identified through user research (observations, questionnaires, interviews, focus groups, feedback and iterative testing).
- 5) **Create Smooth User Experience:** build an app with a simple and clear user interface and navigation that allows for an enjoyable user experience.
- 6) **Produce High Quality Final Artefact:** deliver coding, content and testing plans to the highest standards possible consistent with the current skills and experience of the team (as well as new skills that will be acquired during the course of the project).
- 7) **Learn New Tools and Technologies:** avail of the opportunity to learn new skills and improve on existing ones while producing a finished polished artefact.
- 8) **Successfully Time-Manage the Project:** manage our project efficiently and effectively to reach the highest standard possible in the limited time frame available.

3.4 User Needs

3.4.1 User Research

After deciding on the project aims and objectives from the team's point of view our next step was to try to see our app idea from the point of view of the users. In order to create an app that people like and use we needed to first understand who our users are and what they need. The research we conducted with users between March and

August¹ enabled us to define and prioritise a list of what people need when using our app.

We devised a prioritised list of user needs by following the process suggested in Karl Ulrich's book Product Design and Development (Ulrich & Eppinger, 2011).

Here is a summary of our six-step process:

1. Connecting with users

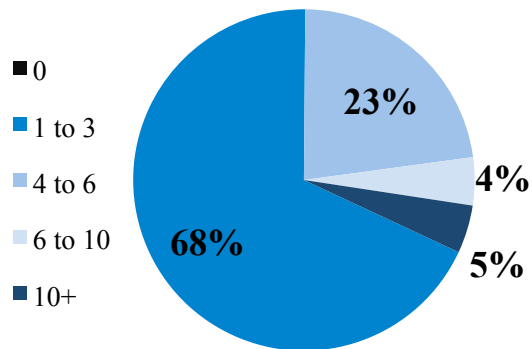
To gather general information about our users and their needs we initially conducted two surveys (with 53 and 22 respondents respectively), eight one-on-one interviews (three of which with event managers) and hosted one focus group of seven people. Also, on one occasion, we managed to observe, interview and/or survey 35 users altogether in their 'use environment' at the Electric Picnic Festival in Stradbally, County Laois.

The results below only show feedback received during those first few months of research. Later in the process (during implementation) we gathered a lot of additional feedback directly from users by attending five more festivals (See Section 6.5)

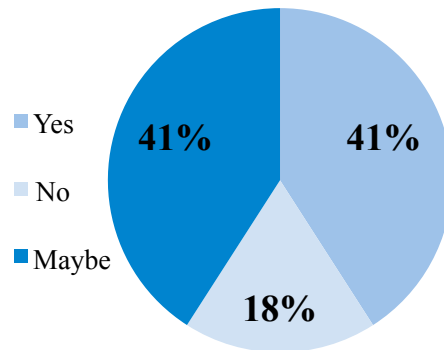
Attendee General Festival Survey

¹ The research period appears so long due to us changing our initial idea a couple of times before finally settling on the events idea in early July. In our final analysis of the user needs we took into account feedback received during the earlier stages of ideation (March to May), as well as the more

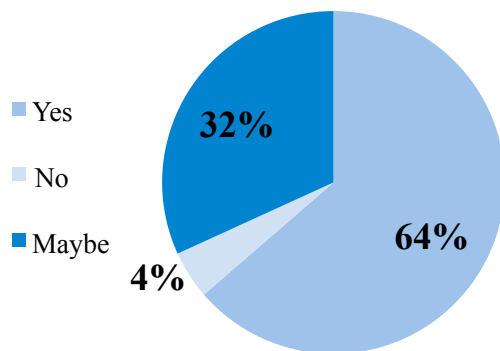
How many events / festivals have you attended in the last 12 months?



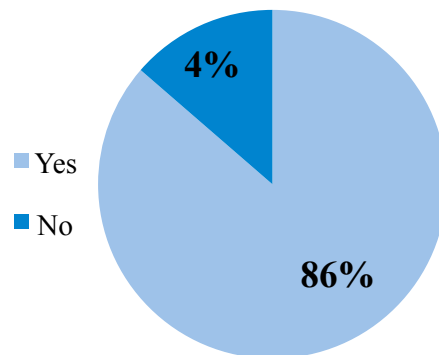
Would you use an app to communicate with attendees while at a event / festival?



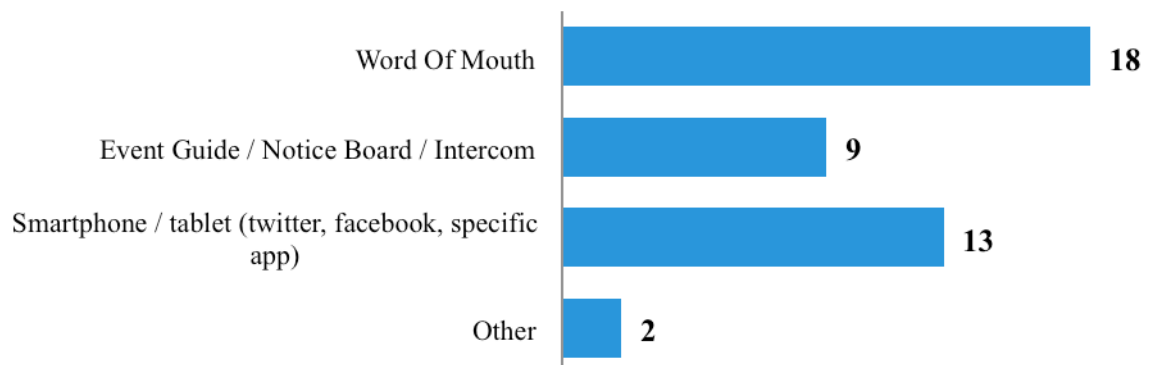
Would you use an app that displays the location of facilities such as entrances, exits, toilets etc. at the event / festival you are attending?



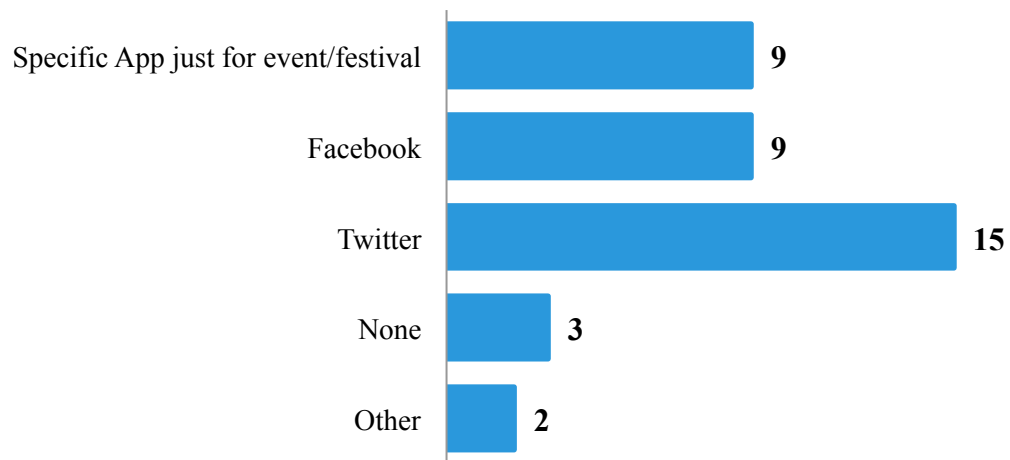
Have you ever found yourself lost or disconnected from a friend(s) while at a festival or event?



How would you find out information regarding an event / festival you are currently at?

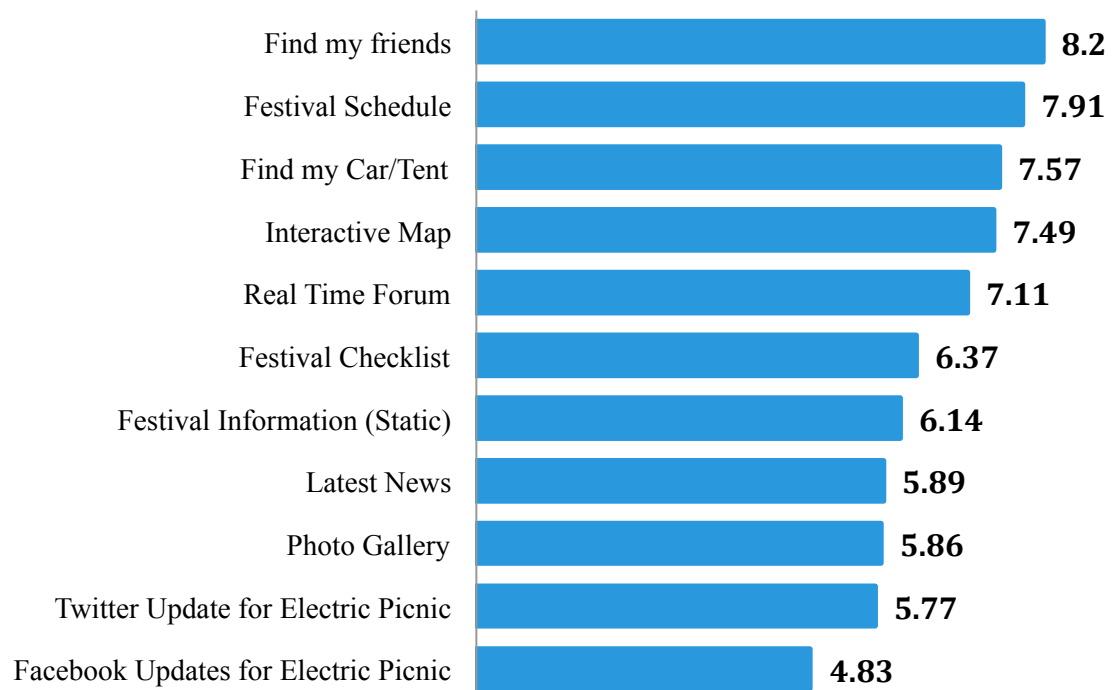


What apps have you used to get the latest information (updates, real time happenings etc.) while at an event / festival?



Electric Picnic Feedback

From your experience which features would you find useful over the weekend?
(10 being very useful, 1 being not useful)



Organiser Feedback

Would you use an app to communicate with attendees while at a event / festival?

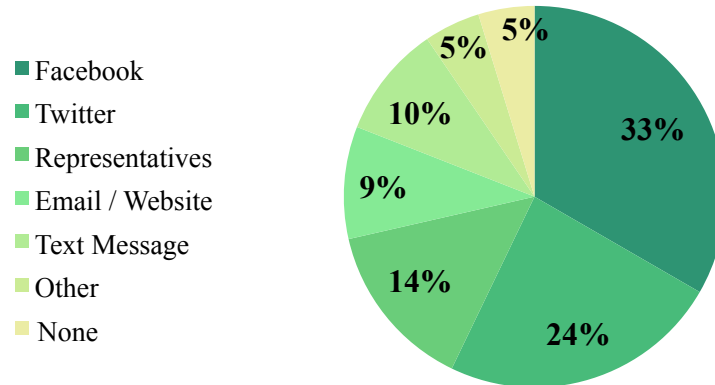


Figure 3-1 Survey Results

2. Collecting raw data

Once we formally documented all user interviews and the focus group, we started our analysis by extracting verbatim comments made by users. Here we'll show the comments made by just one user. For a sample of the rest see Appendix B:

Alan – Verbatim Comments

1. "Didn't know where anything was driving around looking for facilities."
2. "No information."
3. "Information centre too crowded - not going to waste time queuing."
4. "Maps of event had been vandalised."
5. "Unsure what pubs were good to go to."
6. "Parking frustrating - it would be good to see where parking areas or spaces are on near arrival to an event."
7. "Ate at fast food vans as didn't know where the best places for food were."
8. "Asked staff directions and information about times."
9. "Hard to manoeuvre around events with a big group"
10. "Key locations such as toilets/exists would help if presented well. When maps are cluttered it's even more confusing."
11. "I interact with other event goers to be sociable and to ask for directions."
12. "I would interact with other event goers through a social app to get advise if there is something good I'm missing out on, where the best atmosphere is, to be in the thick of the event."
13. "I have shared experiences from an event on FB, Twitter, Instagram, Snapchat."

14. “I (would) keep updated with the latest news/announcements while attending an event through word of mouth or some kind of notice boards.”

3. Coding the raw data into Needs Statements

After that we coded the raw data into user needs statements. To do this we followed Ulrich and Eppinger’s *Coding Rules and Conventions*. Per these conventions:

1. We kept the needs statements as *specific* as the raw data to prevent abstracting the users’ comments too much.
2. We expressed needs *without implying a design concept*, and by focusing on the *what* and not yet on the *how*.
3. We also avoided the use of words like “must” and “should” to prevent prematurely establishing relative importance of the needs.

Here is a sample (for the full list see Appendix B):

Original Statement by User	User Need
<i>“Didn’t know where anything was driving around looking for facilities.”</i>	Alan needs a way to find where facilities are. He wants to avoid having to drive around looking for them.
<i>“No information.”</i>	Alan needs a way to find information.
<i>“Information centre too crowded - not going to waste time queuing.”</i>	Alan needs to be able to find information without wasting his time queuing at information centre.
<i>“Maps of event had been vandalised.”</i>	Alan needs to be able to reliable find a map of the event.
<i>“Unsure what pubs were good to go to.”</i>	Alan needs a way to find out what pubs were good to go to.

<i>“Parking was frustrating - it would be good to see where parking areas or spaces are on near arrival to an event.”</i>	Alan needs a way to find out where parking areas or spaces are.
<i>“Ate at fast food vans as didn't know where the best places for food were.”</i>	Alan needs to be able to find where the best places for food were.
<i>“Asked staff directions and information about times.”</i>	Alan needs a way to find information about event times.
<i>“Hard to manoeuvre around events with a big group and people missing from the group become a problem.”</i>	Alan needs to be able to manoeuvre around events with a big group without losing people.
<i>“Key locations such as toilets/exits would help if presented well. When maps are cluttered it's even more confusing.”</i>	Alan need to be able to find key locations (toilets/exits) without the map getting cluttered or confusing.
<i>“I interact with other event goers to be sociable and to ask for directions.”</i>	Alan needs to be able to interact with other event goers to be sociable and to ask for directions.
<i>“I would interact with other event goers through a social app to get advise if there is something good I'm missing out on, where the best atmosphere is, to be in the thick of the event.”</i>	Alan needs to be able to interact with other event goers to find what he’s missing out on, where the best atmosphere is, and to be in the thick of the event.
<i>“I have shared experiences from an event on FB, Twitter, Instagram, Snapchat.”</i>	Alan needs to be able to share his experiences from an event on social networking services like Facebook, Twitter, Instagram, Snapchat.
<i>“I (would) keep updated with the latest news/announcements while attending an event through word of mouth or some kind of notice boards.”</i>	Alan needs a way to keep updated with latest news/announcements, i.e. word of mouth, notice board.

Table 1 Sample of Needs Statements extracted from users' comments

4. Clustering User Needs by Similarity

Once we had identified all the needs statements we then clustered them by similarity and designated one need (the more general one than the others) to serve as a *primary* need. That made the other needs in the cluster *secondary needs*.

See a sample below (for the full list see Appendix B):

Event attendee needs to be able to easily find out about the best places to go/best things to do at an event.

- Event attendee needs a way to find out what pubs were good to go to.
- Event attendee needs to be able to find where the best places for food were.
- Event attendee needs a way to know what she could do if it's raining, rather than just sit in her tent.
- Event attendee needs to be able to quickly find sellers of ponchos when raining without having to go out looking for them in the rain.
- Event attendee needs to be able to enjoy high quality food/drinks.

5. Latent User Needs

Still following Ulrich and Eppinger's process, we now looked for *Latent Needs*. These were needs not directly expressed by the users themselves but were rather the result of our subjective judgement as designers after having taken non-verbal cues from user observation during user research. These needs were as follows:

1. Event attendee needs to be able to access content immediately when they launch the app and not be presented with any other information such as instructions on how to use the app or prompts to sign in until absolutely necessary (e.g. when posting, voting etc.)
2. Event organiser needs to set an event boundary

3. Event attendee/organiser need to be able to scan an event at a glimpse

6. Prioritised User Needs

Taking all of the above into account we finally drew up a prioritised list of *User Needs*:

Attendee

- 1) **Interact with event goers:** Event attendee needs a way to interact with other event goers at events to enable them to follow what's going on, ask for directions, be sociable and look for help from people at the event.
- 2) **See real-time updates:** Event attendee needs a way to see real-time updates about the length of queues to help reduce queuing times at events (at info centre, entrances, exits, toilets, showers, at the bar).
- 3) **Access event info:** Event attendee needs to be able to easily find information about the event, such as stage times, artists and accommodation.
- 4) **Access map of event:** Event attendee needs a map to be able to navigate around events.
- 5) **Easily find facilities:** Event attendee needs to be able to easily find key locations, such as toilets, parking, exits and first aid on a map.
- 6) **Easily find out about best things to do at event:** Event attendee needs to be able to easily find out about the best places to go to and the best things to do at an event.
- 7) **Easily find friends at event:** Event attendee needs a way to easily find their friends at events.
- 8) **Interact with organisers:** Event attendee needs a way to interact with the organisers at an event.
- 9) **Share on social media:** Event attendee needs to be able to share his/her experiences at an event on social networking sites such as Facebook, Twitter, Instagram and Snapchat.

- 10) **Keep updated with latest announcements:** Event attendee needs a way to keep updated with latest news/announcements.
- 11) **Have immediate access to content at app launch:** Event attendee needs to be able to access content immediately when they launch the app.
- 12) **View event at a glimpse:** Event attendee needs to be able to quickly get an overview of what is going on at the event.

Organiser

- 1) **Reliably convey event information to attendees:** Event manager needs a more reliable means of conveying event information to attendees.
- 2) **Make sure announcements reach attendees:** Event manager needs a way to make sure people will read event updates/announcements.
- 3) **Make sure attendees are informed of cancellations/delays:** Event manager needs a way to clearly present information to the attendees.
- 4) **Make sure information presented to attendees is clear:** Event manager needs a way to spoon-feed the information to the attendees and make things as clear as possible.
- 5) **Make sure attendees are aware of organiser's verified status and active participation:** Event manager needs a way to make people aware that official organisers are curating the content presented by the app (for real-time updates).

3.4.2 Creating Personas

In order to not lose sight of the real people behind the statistics and to make our users more real we deployed a common technique in UCD where we turned our users into personas (fictional characters, which represent the needs of each range of real users of our app).

We knew from our research that the majority of our audience fell into the 22–25 age group and were fairly comfortable with mobile app use and technology in general. This group of users went to events and festivals fairly often.

We also identified a second group of target users—people in their 30s and 40s, usually with young families. These users were not as proficient with technology and did not go to events and festivals as often as the first group.

A third type of user, which we decided on almost from the beginning even before conducting any user interviews, was the event organiser.

Based on our findings we created three personas—Sean and Angie (event attendees), and Susan (event organiser). Sean, Angie and Susan represented the range of user needs we kept in mind when making decisions about user experience during the rest of the development process.



Name: Sean

No of festivals attended

Age: 25

5 or 6 festivals each year

Profession:

Favourite Festival:

School Teacher

Castlepalooza Music Festival

Bio

Sean is an avid festival-goer, particularly favouring music festivals. He loves getting away from the constraints of his workplace to be free to socialise with others without any worries. He likes the advice of others on where to go and what to do at festivals. Sean also likes getting value for money when ticket prices are so high for music festivals. He doesn't like finding out he missed something of interest from colleagues after the event is over.

Goals

- To keep up to date with latest happenings
- To find the best things to do
- To locate facilities such as toilets easily
- To spend time proactively at the festival

Frustrations

- Missing out on major happenings within the festival
- No directions or signs to points of interest/facilities
- Lack of helpers for advice at festival
- Queuing for long periods
- Being uninformed and wandering aimlessly

Quote

"I love festivals but I get so annoyed wasting time queuing and missing out on cool bands and other acts I didn't even know were on!"

Figure 3-2 Persona 1—Sean (Attendee 1)



Name: Angie

No of festivals attended

Age: 37

1 or 2 festivals each year

Profession:

Favourite Festival:

Office Worker

Taste Of Dublin

Bio

Angie likes to attend festivals in her local area. She doesn't have an interest in a particular genre of festival and instead focuses on what is on near her. She usually just goes to the same festivals each year as it has become tradition and all of the locals usually go. She loves sharing her knowledge and experiences with other festival-goers particularly those who haven't been before. She likes to bring her kids along when it's a family oriented event and is always looking for the best ways to keep them amused.

Goals

- To let people know of her festival experiences, sharing tips and advice.
- To use time at festival effectively
- To respond to others who have issues and aid their experience

Frustrations

- Not being able to let other people know what they shouldn't miss out on
- Seeing people look for volunteers for advice
- Cumbersome, cluttered, paper venue maps

Quote

"Why not share your knowledge or advice, everyone is at a festival for the same thing....a good time!"

Figure 3-3 Persona 2—Angie (Attendee 2)



Name: Susan

Age: 30

Profession:

Festival Organiser

Festival Organised:

- Taste of Dublin
- Irish Beer and Cider Festival

Bio

Susan runs many events per year, the highlight being the Taste of Dublin. She provides urgent updates through twitter and speakers at the event but feels there could be better ways to communicate with attendees. She is always disappointed when she receives mails post-event from people who have had issues and wished she could have helped them on the day.

Goals

- To let people know of delays or issues that occur regularly at festivals
- To respond to attendees' concerns and enhance their experience
- To lay out a map that's easy for attendees to use and find facilities.

Frustrations

- Not being able to communicate with festival-goers effectively while a festival is taking place.
- Seeing attendees frustrated about issues such as queues and delays
- Receiving complaints after an event has taken place.

Quote

"Festivals are created so attendees can relax and have good time in a fun atmosphere, my aim is to ensure these experiences are positive"

Figure 3-4 Persona 3— Susan (Organiser)

3.5 Conclusion

In Chapter 3 User Needs Analysis we first briefly discussed our strategy for the project execution, then we defined the project aims and objectives, after which we delved into analysing the user needs.

In Chapter 4 Background Research, after briefly discussing the scope of the project, we will examine the competitive landscape and then expand our research by looking at state-of-the-art examples in other domains. Finally, we will conclude Chapter 4 by defining the set of requirements for the project.

Chapter 4 Background Research

4.1 Introduction

After having discussed our strategy, the project aims and objectives and the user needs in Chapter 3 User Needs Analysis, in Chapter 4 Background Research we will first briefly talk about the project's scope, then we will attempt to identify Festie's direct competitors in the events and festivals app domain, after which we will look for inspiration and examples of excellence by discussing current state-of-the-art apps in other domains.

After this we will briefly discuss various technologies that we considered using for the implementation of Festie.

We will conclude Chapter 4 by defining the requirements of the project, which will be gathered from the functional requirements (the feature set of the final app artefact) and the content requirements (the various content elements that will be required to produce the app). To help us do this we will first create a user scenario in which we will imagine the process our personas might go through while using the app.

4.2 Scope—what are we going to make?

With a clear sense of what we wanted as a team for the app (0) and what our users wanted (3.4) we were now ready to define the scope of our project. We did this by translating the project aims and objectives (0) and the user needs (3.4) into specific requirements (4.5).

Before articulating the app's requirements, however, we first looked into competitor apps for validation of our idea and for inspiration.

4.3 Competitor Analysis

4.3.1 Direct Competitors

While we didn't find any true direct competitors to Festie currently on the market, we will analyse the following apps because of some similarities in their concepts to Festie's concept.

1. Event/Festival Apps

We identified a number of Irish and International event and festival apps that have been released in recent years by the events' organisers themselves.

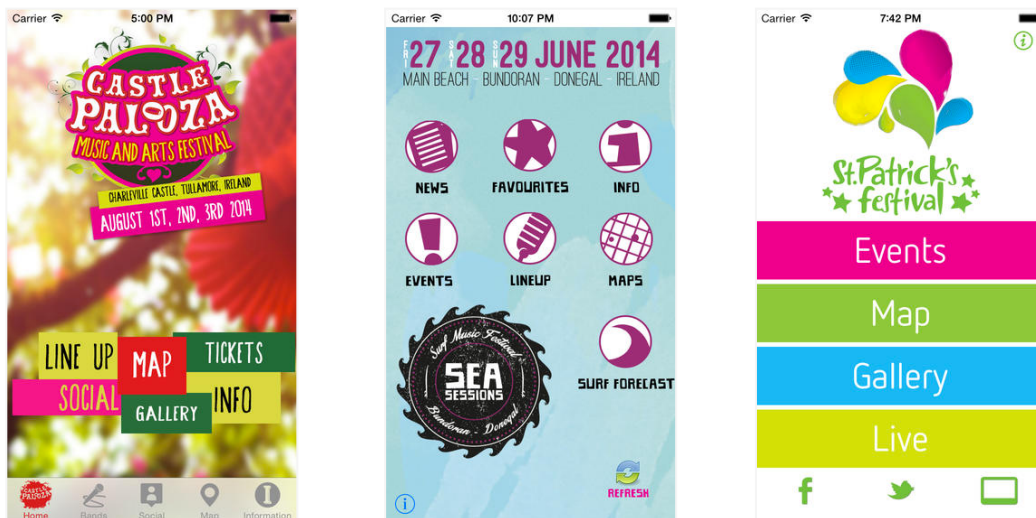


Figure 4-1 Specific Event /Festival Apps

However, upon examining these apps, we deemed them not to be direct competitors as none offered any means of interaction between attendees; rather most presented static content such as general information, opening hours, line-up, and sometimes a news feed and a (static) map.

Electric Picnic Festival—*music and arts festival*

In late August, just before we started work on implementation, the Electric Picnic Festival released an app, which included a *Chat Wall* feature where attendees could interact in a forum-like environment, thus making this app somewhat of a direct competitor.

During the three days of the event, in spite of the app itself being buggy and slow, the Chat Wall feature proved fairly popular among attendees (with hundreds of posts). We felt this was a great validation for the Festie idea and it was also very encouraging for us to encounter this app just before the implementation stage, as it suggested the project was worth pursuing.

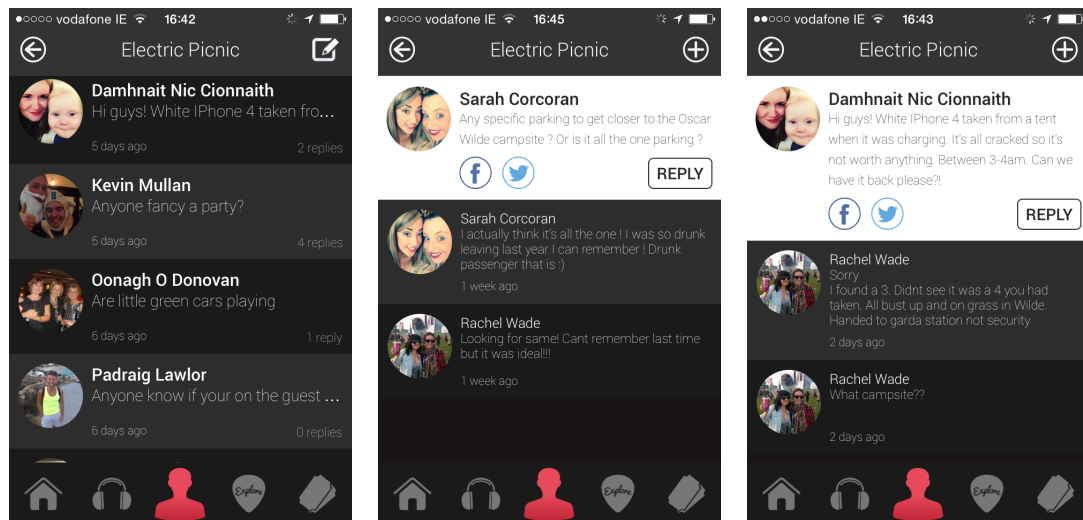


Figure 4-2 Competitor 1: Electric Picnic App

We also noticed attendees were talking about topics that we had identified earlier during user research as possible categories for Festie (3.4.1)—stage times, recommendations for things to do, lost and stolen property and locations of facilities. This was another indicator for us that user research was pointing us in the right direction.

The actual Chat Wall feature only included a simple list feed where people could start a thread or leave a comment with no possibility to add an image or filter the threads, and no interactive map.

Showmappr—*socialise your event*

Showmappr is an event app, which has somewhat similar ideas to Festie in that it helps you get a sense of what is happening around you at an event.

Unlike Festie, however, this app is targeted mainly at indoor events where users are encouraged to check themselves in exhibitors' stands or seminar rooms and leave comments about that stand or activity². Attendees can use the *Floorplan* feature to get an idea about which parts of the event are the busiest. Busyness is indicated through the colour of the pins, which changes between yellow, orange and red, as activities become less or more popular.

² Stands and activities at the event are marked on the map by coloured pins.

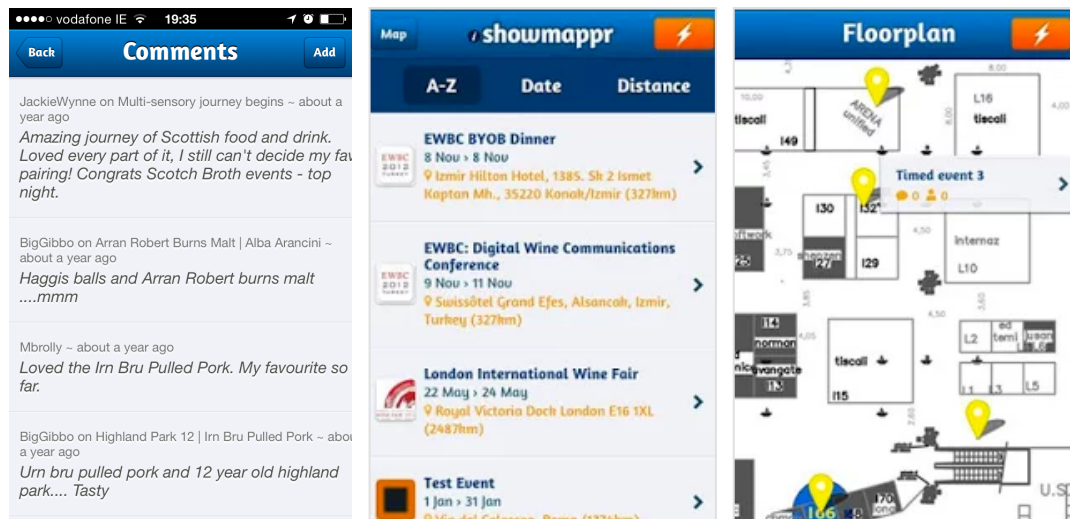


Figure 4-3 Competitor 2: Showmappr App

We thought this was an interesting idea but poorly executed as the *Floorplan* feature easily gets overcrowded with pins without any means to filter them or prevent them from overlapping, thus resulting in poor user experience.

Also the ‘socialising’ aspect of the app is limited to merely leaving review-style comments with no means of truly interacting with the other attendees or the organisers.

Overall we thought this app had great potential but due to its poor execution what we mostly took out of it in the end was anti-patterns—examples of how not to implement Festie.

Finally, we were not fond of the out-dated look of this app either, nor the confusing navigation.

2. Social Networks

Thanks to their huge popularity, we felt compelled to examine whether social networks represent competition for Festie.

Circle—the local network—*share and discover what's happening near you*

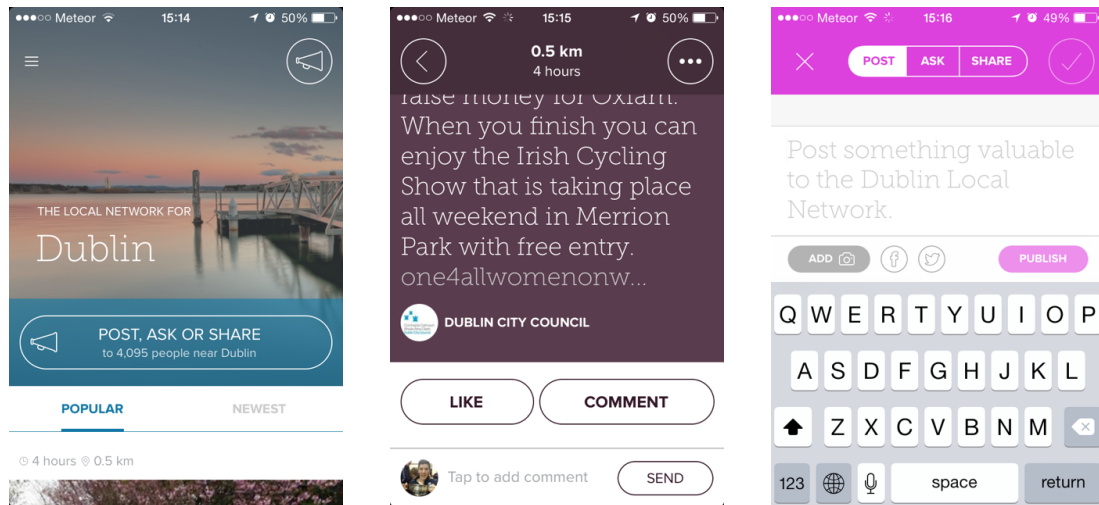


Figure 4-4 Competitor 3: Circle

Circle, a location-based social networking app, is the only app we found on the market that could be considered as being both a competitor (although not a true direct competitor, as it is not exclusively dedicated to events) and a state-of-the-art app.

The app works by displaying crowd-sourced information about what is happening near you and features a very attractive contemporary design, utilising parallax scrolling, overlapping of transparent images and dynamically changing text and colours. Users can choose between seven categories to view and post content—events, news, crime, traffic, family, sports and nightlife.

We will take a more detailed look at what we liked about this app in the Current State of-the-Art section (4.3.2). In this section we will discuss how Circle compares to our idea for Festie.

In terms of similarities and differences to our idea we consider Circle the only competitor (indirect) to Festie currently available on the market. Unlike Festie, however, its 'events' section is not about displaying information for one event only—the event you are at—but instead it feeds information about all the events people are talking about within given radius. Verified users (such as local authorities and event organisers) actively use the app to interact with other users—a feature we liked and were keen on implementing in Festie.

In terms of usability, this app performed relatively poorly forcing the user to scroll through an endless list of posts with no alternative way to view or filter the content.

Furthermore, even though the app is location-based, it surprisingly did not feature a map, thus denying users the opportunity to get a sense of where comments were posted from. We thought this oversight compromised the whole concept of local networking and that a map should have been included.

Facebook, Twitter, Snapchat

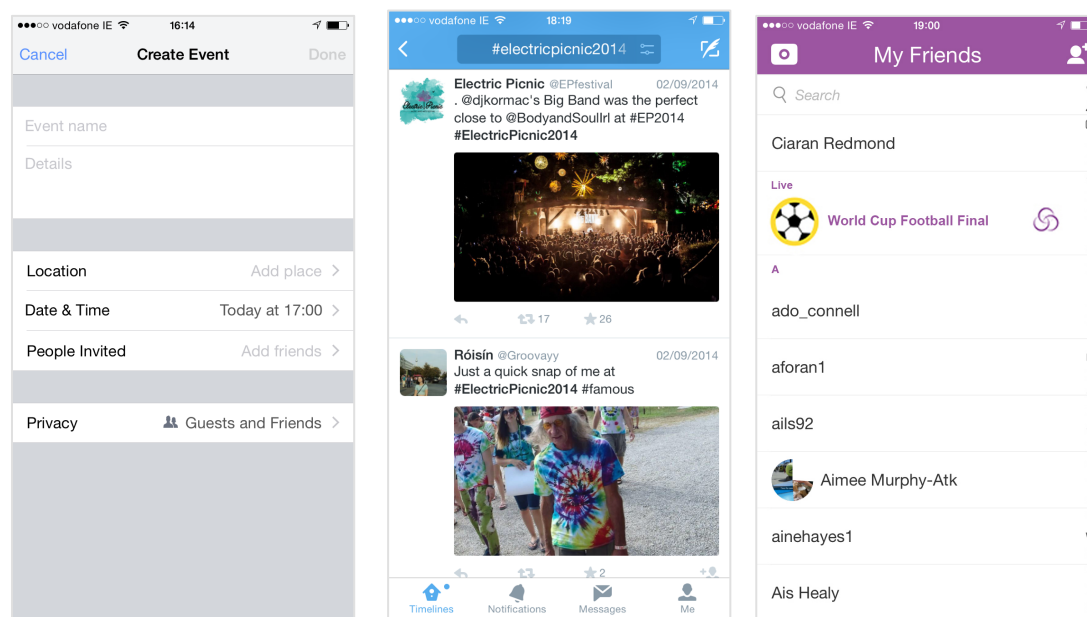


Figure 4-5 Competitors 4: Facebook’s events creation page, the use of an events hashtag on Twitter (*#electricpicnic2014*) and Snapchat’s new *Our story* feature.

Facebook and Twitter were repeatedly mentioned during user research (3.4.1), especially by event organisers, as currently the most reliable way to interact with event attendees, thus making them competitors. However, in our opinion their general-purpose nature prevents them from truly competing with a purpose-designed event app like Festie.

For example, **Twitter**’s hashtag convention could indeed work in the context of festivals and events but it gives the organiser no control over the subsequent discussion: even though organisers can request that a particular hashtag is used at their event, they can not enforce it; and without having one place to go to in order to

follow the conversation, attendees can never be sure they are getting the full picture of the event.

Facebook fares a bit better in this regard, as it gives organisers the ability to set up a dedicated page for their event (Figure 4-5) and also has the tremendous benefit that almost everyone is already signed up to the service. However, privacy concerns and the issue of it being a general-purpose tool still remains:

“I suppose it is a challenge to make sure your voice is heard, as Facebook has become so over-crowded with stuff” — organiser interviewee (Appendix B).

Snapchat—a service mainly associated with disappearing photo messaging and ‘sexting’—recently launched a feature called Our Story, which lets users attending events and festivals submit pictures and videos to a curated collection—a Story (Figure 4-5).

Unlike Festie, however, these collections are made available to all Snapchat users, regardless of whether they are at the event or not.

While there are some similarities between Festie and Snapchat’s Our Story feature in that they both offer user-generated content to provide a “quick glimpse” of an event, Snapchat’s focus on *“live broadcasting of raw footage from big events”* to consumers around the world (Fiegerman, 2014) means that it is only a tangential competitor to Festie.

4.3.2 Current State-of-the-Art

The following apps, although not direct competitors, proved to be a great source of inspiration while we were scoping the requirements for Festie. By adopting some of the features and approaches we liked in these apps we aimed to give our app an advantage over our potential direct competitors.

1. Pin Drop—bookmark locations

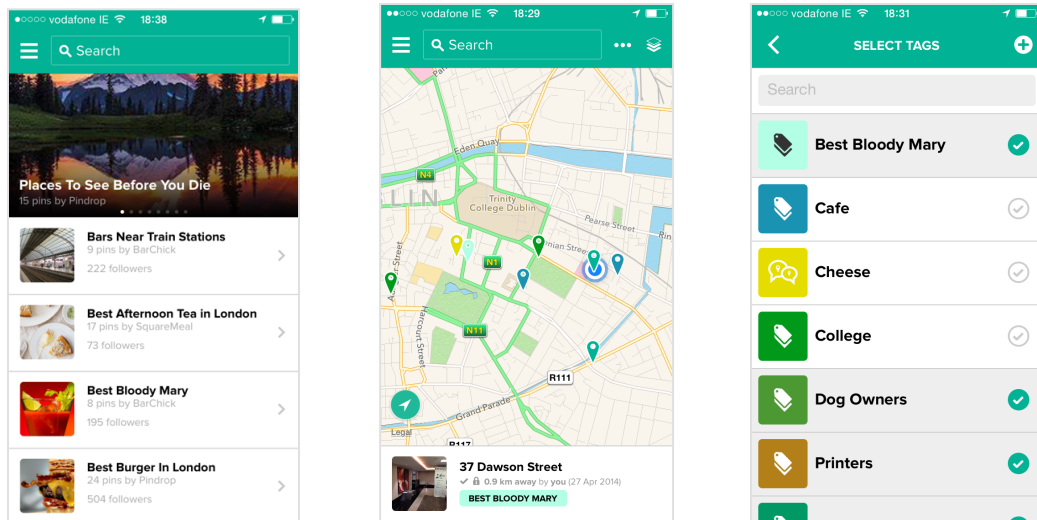


Figure 4-6 SOTA: Pin Drop

Pin Drop was a tool for keeping track of one's favourite places. Sadly, the company went out of business in September 2014³. Nevertheless we still consider this app *the* state of the art in the location bookmarking domain and it is still on top of our state-of-the-art-list.

What we liked most about Pin Drop was the fact that, despite being so feature-heavy, it was still easy to use with a simple, intuitive and straightforward navigation, and that the user was never more than two clicks away from the home screen—the map with pins on it. We decided to adopt this approach for Festie and have our map with the notes serve as a home screen and a main navigation hub.

Another feature we particularly liked in Pin Drop was how, unlike rival apps which came with set categories—thus forcing the user to use the app in a certain way—Pin Drop came as a blank canvas giving creative power to the users to come up with their own tag names and to collaborate on topics that actually interested them. While we were considering implementing a similar tagging feature when our app idea was still about curating local knowledge, this feature became even more relevant later on once we changed the idea to be about events.

2. Airbnb— *holiday rentals, homes, flats and accommodation*

³ Ironically, this happened in the same year that their app was nominated for the Webby Awards for best use of GPS and location technologies, which is how it attracted our attention.

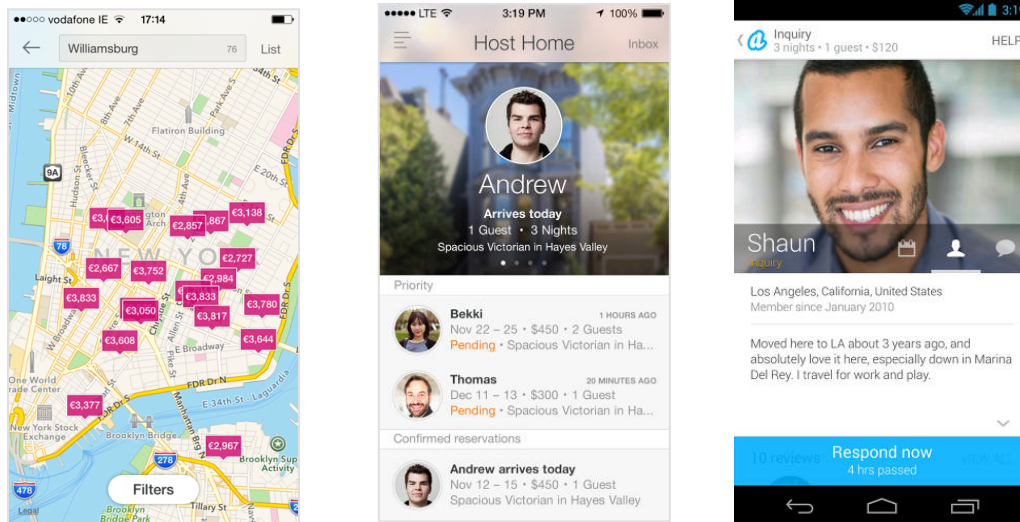


Figure 4-7 SOTA: Airbnb

Airbnb is an app we were aspiring to from early on in terms of its outstanding user interface and visual design, as well as its excellent map feature. This UX excellence is reflected in their very high ratings in the App Store.

The company underwent a major rebranding in July 2014, however, which also affected their app design. In terms of visual design we preferred the original version of the app with its clean, light and airy look, minimal use of colour, full-bleed photography, transparency effects and parallax scrolling. We decided to aim for a somewhat similar look for our app.

Airbnb was also the only mobile app we came across at this stage of our research that featured a piece of meaningful information (pricing in this example) on *every* note displayed on the map. We believe this greatly improved user experience and we hoped to incorporate it in Festie as well.

Another approach we liked and wanted to adopt was the way the app's layout would adapt itself depending on whether the user utilised the app mostly as a host or as a guest. Given the two types of users for our app (which was still subject to verification through user research at this stage), an organiser and an attendee, this approach seemed suitable for Festie as well.

3. Citymapper—the ultimate transport app

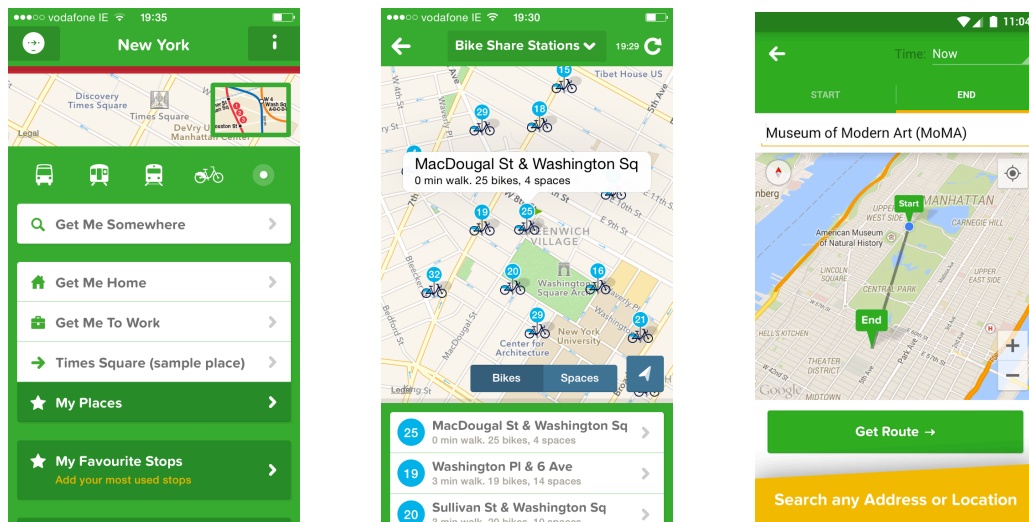


Figure 4-8 SOTA: Citymapper

We thought Citymapper was an excellent example of how to handle a lot of complex functionality in an elegant and calm manner, thus providing smooth user experience.

We were also especially interested in the way this app visualised data on the map by linking the list view to the map view and having the former serve as a legend for the latter. This is an option we thought of investigating during implementation.

Another feature we liked was the *Meet me Somewhere* feature where the user can send their location in the form of a pin on the map to their friends. As we saw in subsection 3.4.1 this emerged as a highly desirable feature during user research.

Citymapper was also the inspiration for the segmented control⁴ on the map screen. Again, we decided to incorporate this feature following user testing.

4. Findery—*social local discovery*

⁴ A segmented control is a horizontal control made of multiple segments, each segment functioning as a discrete button. Segmented controls allow users to interact with a compact group of a number of controls (Apple, 2014).

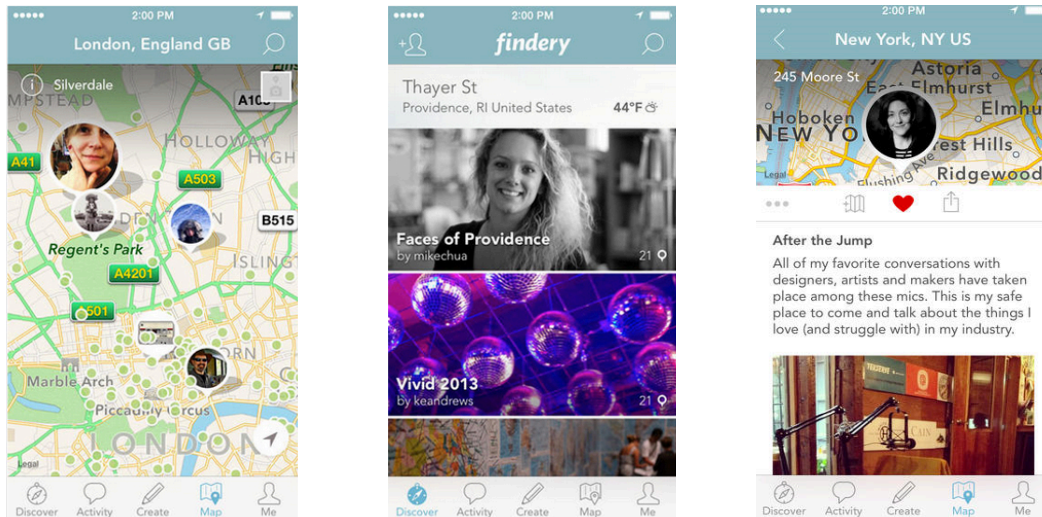


Figure 4-9 SOTA: Findery

Findery is an app that helps you explore your surroundings for past and current information. It is all about exploration and Findery cleverly presents their information on a map by showing detail for only a few of the pins at any one time, while displaying all the other pins as small green dots, thus preventing clutter on the map.

We decided that this could be an option worth exploring and a possible compromise solution in case our preferred option for visualising the notes (showing detail on every rendered note) proved difficult to implement programmatically.

5. Circle—the local network— share and discover what’s happening near you

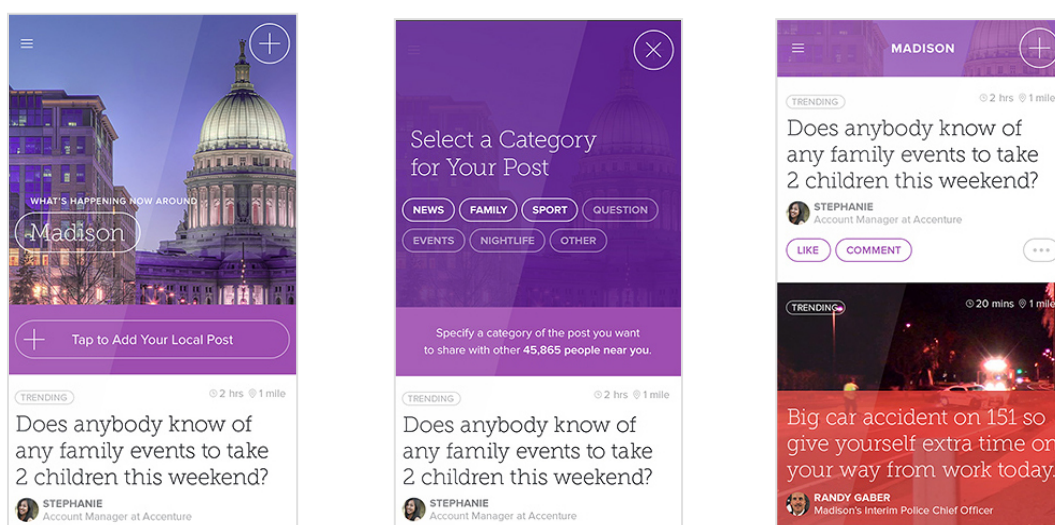


Figure 4-10 SOTA: Circle

As discussed in Section 4.3.1 Circle was the only competitor app we identified which we also considered to be state-of-the-art.

What we liked about Circle was how event organisers (with verified accounts) were actively participating in the discussions and users seemed to appreciate the opportunity for direct contact with them. This prompted us to investigate the introduction of a second type of user, an organiser, which we thought would make Festie much more useful in terms of the validity of the information presented to users.

In terms of the navigation between different screens this app offered clear and logical layout of the buttons, which we examined in greater detail after user testing of our own navigation design exposed some weaknesses (6.7).

In terms of sorting the information, even though Circle did not offer adequate filtering functionality, only allowing for the posts to be filtered by most popular or newest, examining their minimal approach became useful to us once it became apparent from user testing that our initial Filter feature did not offer optimal user experience (6.7).

4.4 Technologies

Parallel to the research of competitor and state-of-the-art apps, we also investigated what technologies might be appropriate to use for the implementation of Festie.

Device

As the project brief required that we build the app for one particular device only (and test it on that same device) we decided on the iPhone 5 as we both had iPhones and were familiar with the use of iOS in general.

In order to implement our app idea we wanted to take advantage of a number of the iPhone 5's features:

1) Screen size/Display

As screen real estate was important for us due to the need to display a lot of notes together on the map, we wanted to use the biggest iPhone currently available on the market, which at the time was the iPhone 5 (featuring a 4" “retina” display).

2) Location Technologies

The iPhone uses a combination of three location technologies (GPS/Assisted GPS⁵ /GLONASS⁶) to ensure that iPhone users can quickly get an accurate location in most circumstances.

3) Compass

The use of the built-in compass would help orient iPhone users with respect to which way they are pointing on the map.

4) Camera

The iPhone 5’s 8.0 megapixel camera would be used to take photographs, which users can then post as part of the *Post a Note* feature

5) Wi-Fi/Cellular Data

Festie requires a data connection for its operation. This can be provided either by cellular data using the iPhone’s 2G/3G/4G radio or WiFi feature.

Other Technologies

1) Geo-enabled Database

Geography and location are core to Festie’s feature set. In order to be able to detect events at the user’s current location we would require a database that supports rich geographic queries.

⁵ **Assisted GPS** uses cell tower IDs to quickly get the approximate location of the device.

⁶ **GLONASS** is the Russian satellite-based geo-location system, similar to GPS.

2) iBeacons

Due to the fact that satellite-based geo-location technology only works when you have a clear view of the sky we were considering at certain stages of the project the use of iBeacons to allow for Festie to be reliably used for indoor events as well. iBeacons work by broadcasting an ID to any iOS device close by, which in the case of Festie could be used to determine the location of the device more accurately. We purchased an RFduino⁷ device to experiment with this approach and checked how well it worked with some freely-available iBeacon apps.

4.5 Defining the Requirements

Having looked at our competitors for validation of our idea (4.3.1), and at state-of-the-art apps for inspiration (4.3.2), we were now ready to translate the project aims and objectives and user needs into specific requirements, i.e. what functionality and content our app should be offering to users.

In sub-section 3.4.2 we discussed how creating fictional characters called personas helped us better understand the user needs. Now, in order to help us determine the requirements, we used our personas again by having them fulfil the user needs as part of a short story called a *User Scenario*.

4.5.1 User Scenario

User Type: Event attendee

Use Case 1⁸

⁷ RFduinos are general-purpose device comprising an Arduino combined with a Bluetooth radio and can be programmed to behave as an iBeacon with a simple program written in C.

⁸ Use case is one particular way in which something (a system, for example) is used.

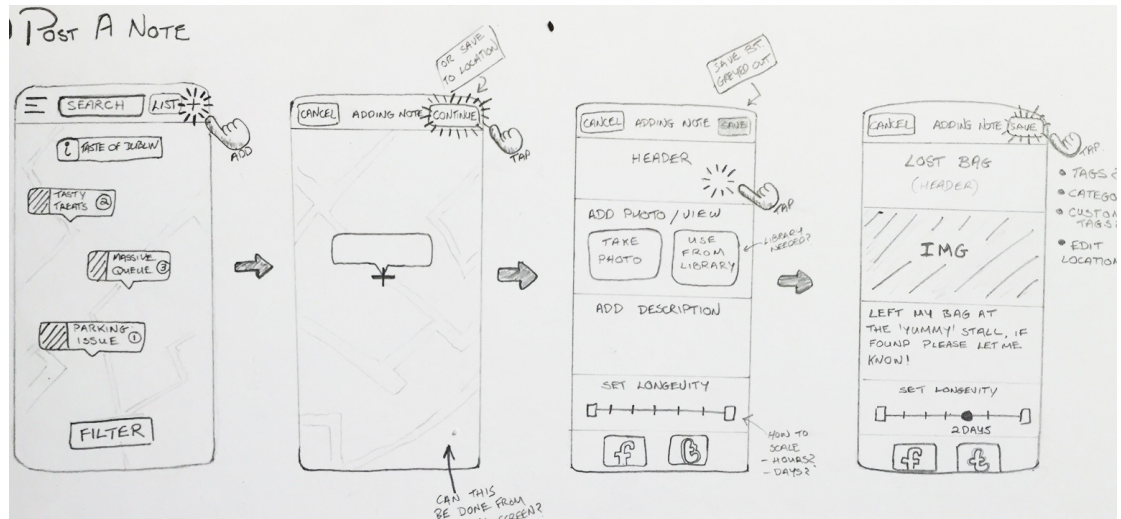


Figure 4-11 Use Case 1: This is the use case for Posting a Note

Angie is at the Taste of Dublin festival when she realises that she must have left her bag at one of the food stalls earlier on. She traces back her steps but there is no sign of the bag. Wondering who to speak to she is suddenly reminded of the Festie app, which she downloaded earlier this morning. She decides to check if anybody has seen the bag. She opens the app and is presented with the home screen, which displays a map with a collection of notes. She scans the notes but unfortunately there is no mention of her bag. She clicks on the "i" button hoping to find a lost and found phone number, without luck. So Angie decides to add a note. She clicks on the '+' button and the system prompts her to sign in or create a new account.

Angie clicks on the 'Create your account' button and is taken to the 'Create Account' page. Angie fills in her email address and types in a password, then types in a username and clicks on the 'Create my account' button. After doing this Angie signs in and is again taken to the home screen.

When she clicks on the "+" button she is taken to the Adding Note page where she adjusts the location of her note and clicks on the Next button. She is now taken to the Adding Note screen, here she types in a note title, clicks on the '+' button to add a photo and then clicks on the 'take photo or video' button and takes a picture, then she adds a description and leaves the Display Note For slider at the default one day setting. She clicks on the Twitter icon to post her note on Twitter as well. She now decides to adjust the location of her note before clicking on the Save button. Now the map view is displayed with Angie 's new note highlighted in the centre of the map.

Potential Requirements (derived from Use Case 1):

- View home screen
- General Info Button and Screen
- Sign Up
- Log In
- Post a Note
- Share on Social Media

Use Case 2

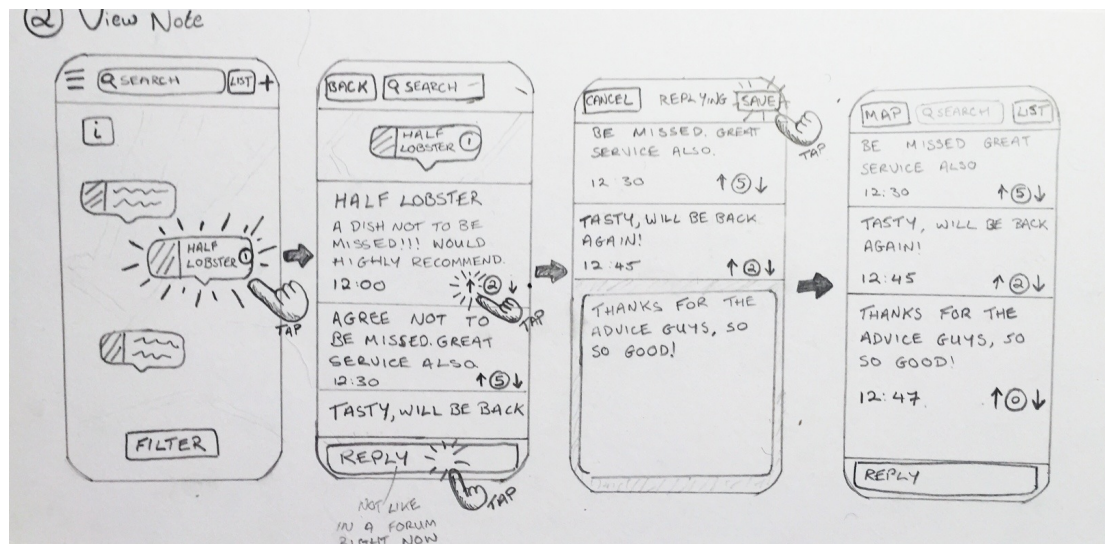


Figure 4-12 Use Case 2: This is the use case for Viewing A Note

A couple of hours later, after having found her bag, Angie is now eager to try some more food. She has her eye on the half lobster but is unsure whether to splurge or not. She is wondering what people are saying about it. She checks the app and immediately finds a note about the lobster and clicks on it. A new window opens and Angie can now see a heated discussion going on—it looks like people are raving about it. Decision made! After finishing her meal Angie clicks on the '+' button to up-vote the lobster note and then on the Reply text field. She types a comment, clicks the Submit button and immediately sees her comment displayed in the thread. Angie now notices a new comment, which is obviously spam. She decides to report it and

clicks on the Report button. A confirmation message acknowledges her report. She clicks OK to close the alert.

Potential Requirements (derived from Use case 2):

- View a Note
- Vote
- Reply
- Report

Use Case 3

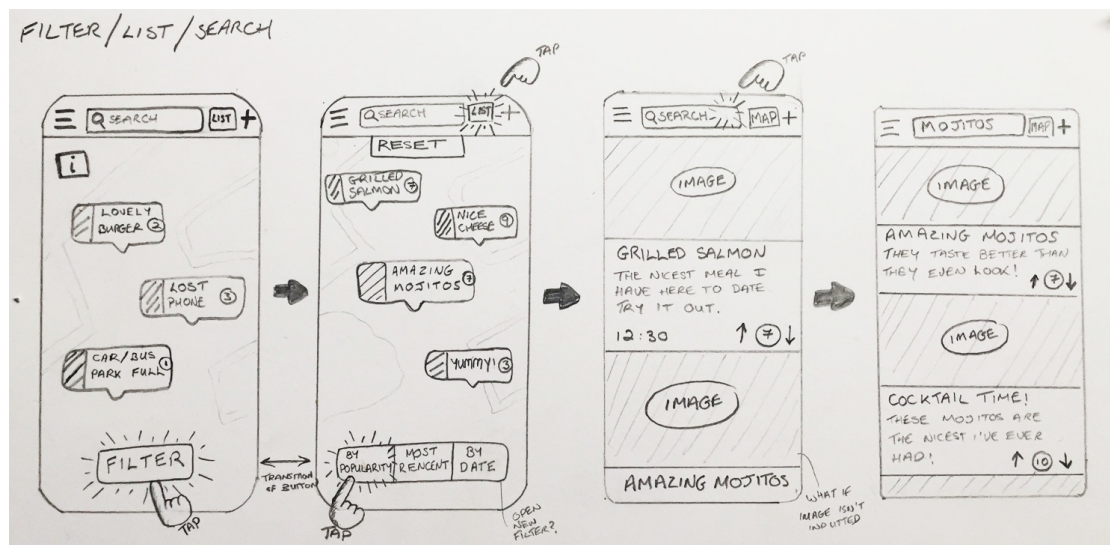


Figure 4-13 Use Case 3: This is the use case for Filtering/List/Search

Angie decides to browse the notes to see what else people recommend. She now feels like having a nice cocktail. She zooms in and out to make more notes pop up but doesn't see anything interesting. She clicks on the List button and starts scrolling down but there are too many notes. She wants to restrict the number of posts so she clicks on the Filter button and first presses the Popularity button, which filters the notes by popularity but doesn't find anything of interest. She then presses the Most Recent button, which orders the notes by submission time. Here she notices a note praising the mojitos from the Gecko stand. She presses the Reset button to make all the notes appear again, taps on the Search text field and starts typing "mojito". A

number of results appear in a list view underneath. She scrolls down and taps on a popular one—Gecko's mojitos seem to be the best choice!

Potential Requirements (derived from Use case 3):

- Filter Notes
- Search
- Notes Visualisation
- List View

Use Case 4

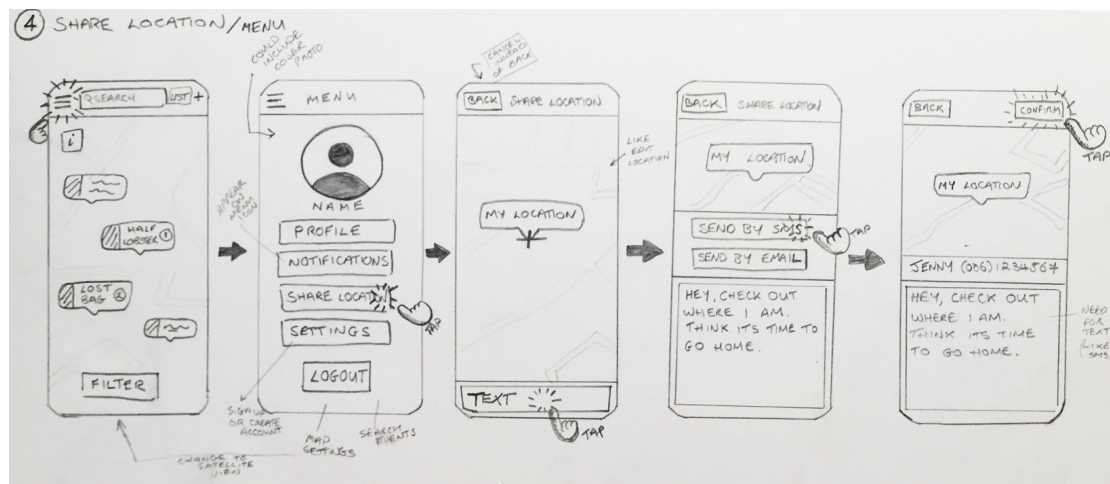


Figure 4-14 Use Case 4: This is the use case for Share Location/Menu

Finally, happy with her evening, Angie is ready to go home. She needs to let her friends know where she is in the crowd and also find the nearest exit. She clicks on the Menu button and clicks on Send Your Location option from the drop-down menu. A map appears with a mark for her current location and a text field. Angie taps on the text field and types in a message for her friends. She then taps on the Send by SMS button (there is another option Send by Email) and chooses a contact from her contact list. Angie then presses the Confirm button and the message is sent. She then taps on the map again, and the Menu drop-down menu disappears. Then she clicks on the Filter button, and after that on the Markers button. The map now displays markers

only. Angie notes where the nearest exit is. Meanwhile she has re-united with her friends and now they are all ready to go home. They head in the direction of the exit.

Potential requirements (derived from Use case 4):

- Menu
- Send Your Location

User type: Event organiser

Use case 5

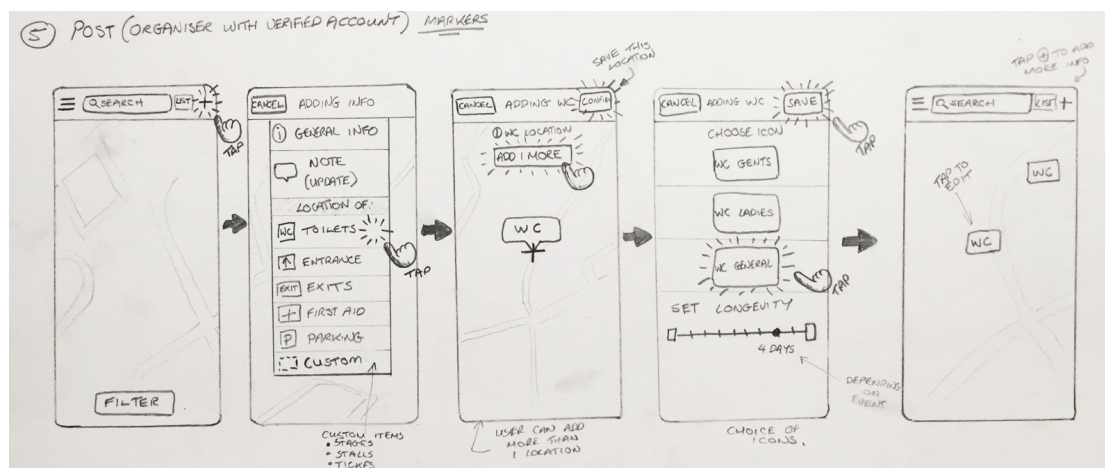


Figure 4-15 Use Case 5: This is the use case for Add A Marker (organiser)

Susan works for Taste of Dublin in the Marketing and Promotions department. This year some of her duties include updating their Facebook and Twitter pages, as well as the new Festie app. She signs in with the Taste of Dublin's verified account and proceeds to add information about the event including the locations of the entrances and exits.

She clicks on the '+' button and a drop-down menu with different options appears. Next Susan clicks on General Information, and a new screen appears where she adjusts the location of the event and clicks on the Next button. The Adding Event Info screen appears and Susan fills in the Event Title text field, adds a photo, and a description in the Add Description text field, and then clicks the Save button. The map view is now displayed with a little "i" button in the upper right corner.

Next, Susan wants to add a note about a delay in the opening time, he clicks the ‘+’ button, adjusts the location of the note, clicks the Next button, then adds a Note Title, Note Description, sets the note to be displayed for two hours, and clicks on the Twitter icon. Then she clicks the Save button and the map view is displayed with the note highlighted in the middle.

Finally, Susan wants to add markers for the locations of the toilets. She clicks on the ‘+’ button again, clicks on Toilets from the drop-down menu of options, then adjusts the location of the marker and then clicks on the Add One More button to add another marker. After adjusting its location she clicks on the Next button and reviews the information. Everything looks correct, so she presses the Save button and the map view is displayed with the two markers on it. Susan decides to edit the location of one of the markers—she clicks on it, and then on the Edit button, adjusts the location and saves.

Potential Requirements (derived from Use case 5):

- Post General Information (Organiser)
- Post Note (Organiser)
- Post Marker (Organiser)
- Edit (Organiser)
- Sign In with Verified Account (Organiser)

4.5.2 Functional Requirements

Having imagined the process our Personas might go through while using the app, we were now ready to draw up a prioritised list of functional requirements to help meet their needs:

- 1) The app will have a **Map** feature on the home screen.
- 2) The app will have a **Post a Note** feature for the **attendee** user.
- 3) The app will have a **Post a Note** feature for the **organiser** user.

- 4) The app will have a **Post General Information** feature for the **organiser** user.
- 5) The app will have a **Post a Marker** feature for the **organiser** user.
- 6) The app will have an **Edit** feature for the **organiser** user.
- 7) The app will have a **View a Note** feature.
- 8) The app will have a **Vote on a Note** feature.
- 9) The app will have a **Reply to a Note** feature.
- 10) The app will have a **Report Inappropriate Content** feature.
- 11) The app will have a **Login** feature.
- 12) The app will have a **Create Account** feature.
- 13) The app will have a **Filter Notes** feature.
- 14) The app will have a **Search Notes by Keyword/Tags** feature.
- 15) The app will feature **Customised Notes**.
- 16) Each note will **display the note title** (and if feasible a thumbnail).
- 17) The notes will be displayed on the map **without overlapping**.
- 18) The app will have a **Menu** screen.
- 19) The app will have a **Share on Social Media** feature.
- 20) The app will have a **List View** feature.
- 21) The app will have a **Send My Location** feature.
- 22) The app will have a **General Information** screen.

Some additional requirements (see below) were added to the list later on during the design and implementation stages as a result of user testing, based on our own judgement as a team, or due to feedback by the CDM team:

- 23) The app will be able to **detect events** that are currently happening within the user location.
- 24) The app will **store data locally**.
- 25) The app will have a **Slider Menu** feature.
- 26) The app will have a **Horizontal Scroller** feature.
- 27) The app will have a **Customised Map**.
- 28) The app will have a **Notifications** feature.
- 29) The app will have a **Show User Location** feature

4.5.3 Content Requirements

Because Festie's content is intended to be user-generated, the list of content elements that will be required to produce the app is relatively short:

The app will have high-quality graphics for the user interface elements (such as buttons, text fields and icons) and graphics for the customised and dynamically generated content (such as custom notes, custom map, custom markers).

For full content inventory see Appendix D.

4.6 Conclusion

In this chapter we first briefly talked about the project's scope, then we identified Festie's direct competitors in the events and festivals app domain, after which we looked for inspiration by discussing current state-of-the-art apps in other domains.

After this we briefly discussed various technologies we considered using for the implementation of Festie.

Finally, we concluded the chapter by defining the requirements of the project, by first creating a user scenario with five use cases, which led to the definition of the functional requirements and the content requirements for the app.

Formally defining what features and content our product should be required to have served to drive ambiguity out of the next steps of the process - the planning, design and implementation, which we will discuss in Chapter 5 Methodology and Approach.

Chapter 5 Methodology and Approach

5.1 Introduction

After outlining the scope, reviewing our competitors and defining our requirements for the app in Chapter 4 Background Research, we will begin Chapter 5 Methodology and Approach with a look at our design process by discussing the next stages of UCD (after the strategy and the scope): the structure, the skeleton and the surface.

Next we will explain how we prepared for the implementation stage by first evaluating our design and then planning for the next phase by creating a work schedule, deciding what tools, techniques and technologies to use, as noting the risks to be taken through implementation.

Finally we will conclude the chapter by looking at the implementation of our app. This will be broken down into two sections. First, we will look at content production and particularly the production of UI elements. And second, we will look at code development, where we will explain how the functionality of our application was implemented.

5.2 Design/Modelling

Having defined and prioritised our requirements, we now had a clearer understanding of what will be included in the final artefact. Moving from the abstract (the requirements) to the more concrete (the design), our next step was to describe how all the features and content would fit together to form a cohesive whole.

5.2.1 Interaction Design and Information Architecture (Structure)

Our first step in the design process involved describing the conceptual structure of our app (how our product will work). We used the tool Balsamiq to create an initial structure (**Figure 5-1**):

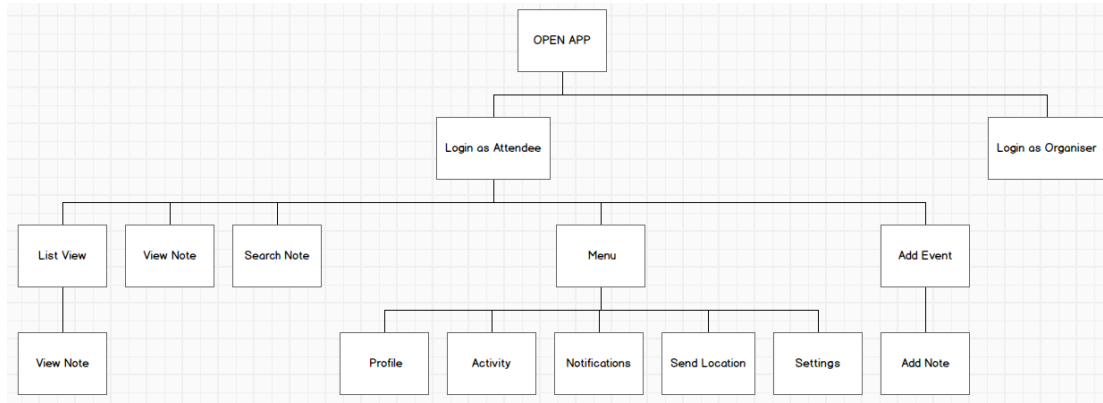


Figure 5-1 Original Structure Map for Attendee

This structure evolved throughout the design and implementation stages, as we had to take into account the fact that there might be multiple events, as we realised event boundaries could overlap. This and other updates to do with login functionality were reflected in an updated structure below (Figure 5-2):

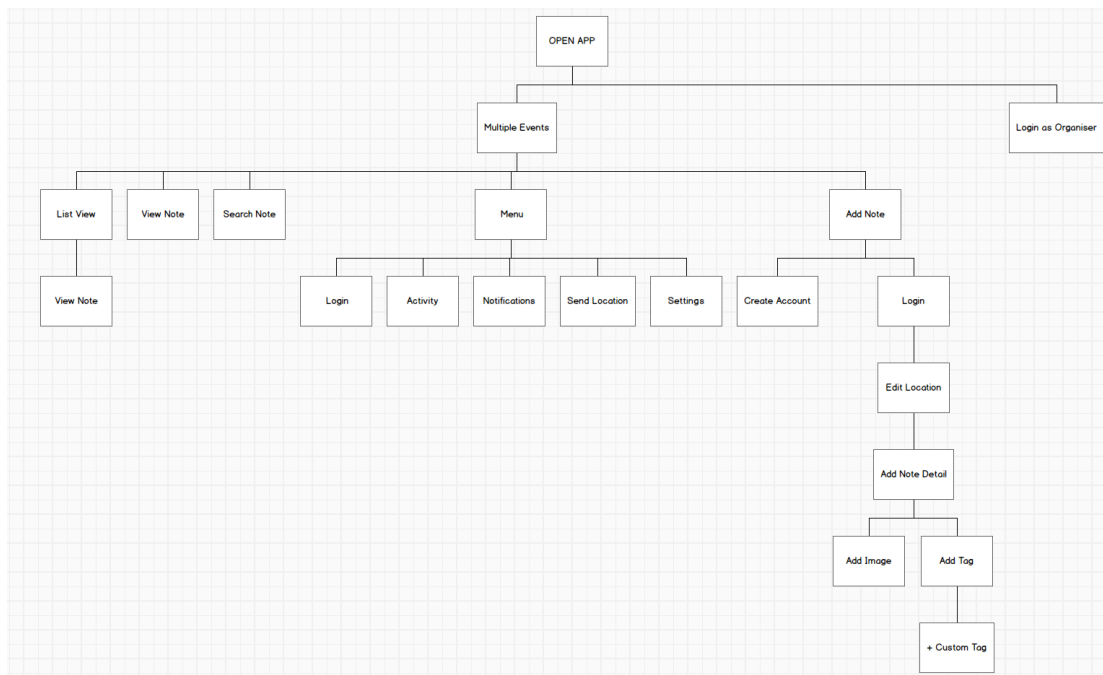


Figure 5-2 Updated Structure Map for Attendee

The organiser functionality followed a similar structure but had additional functionality, including Adding Event Details, Adding Markers and also Adding Event Boundary (Figure 5-3):

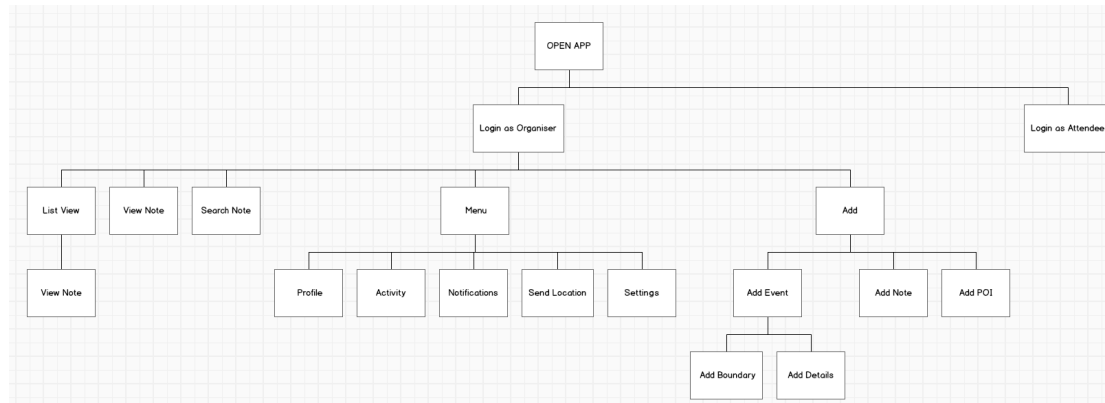


Figure 5-3 Original Structure Map for Organiser

Following UCD principles we combined interaction design and information architecture⁹ to create a navigational diagram:

⁹ Interaction design and information architecture are concerned with understanding the way the user thinks and behaves. **Interaction design** is about creating a structured experience for the user—describing possible user behaviour and defining how the system will accommodate and respond to that behaviour. **Information architecture** is about the organisation and presentation of content to the user (Garrett, 2011). Together, interaction design and information architecture form the structure of the app.

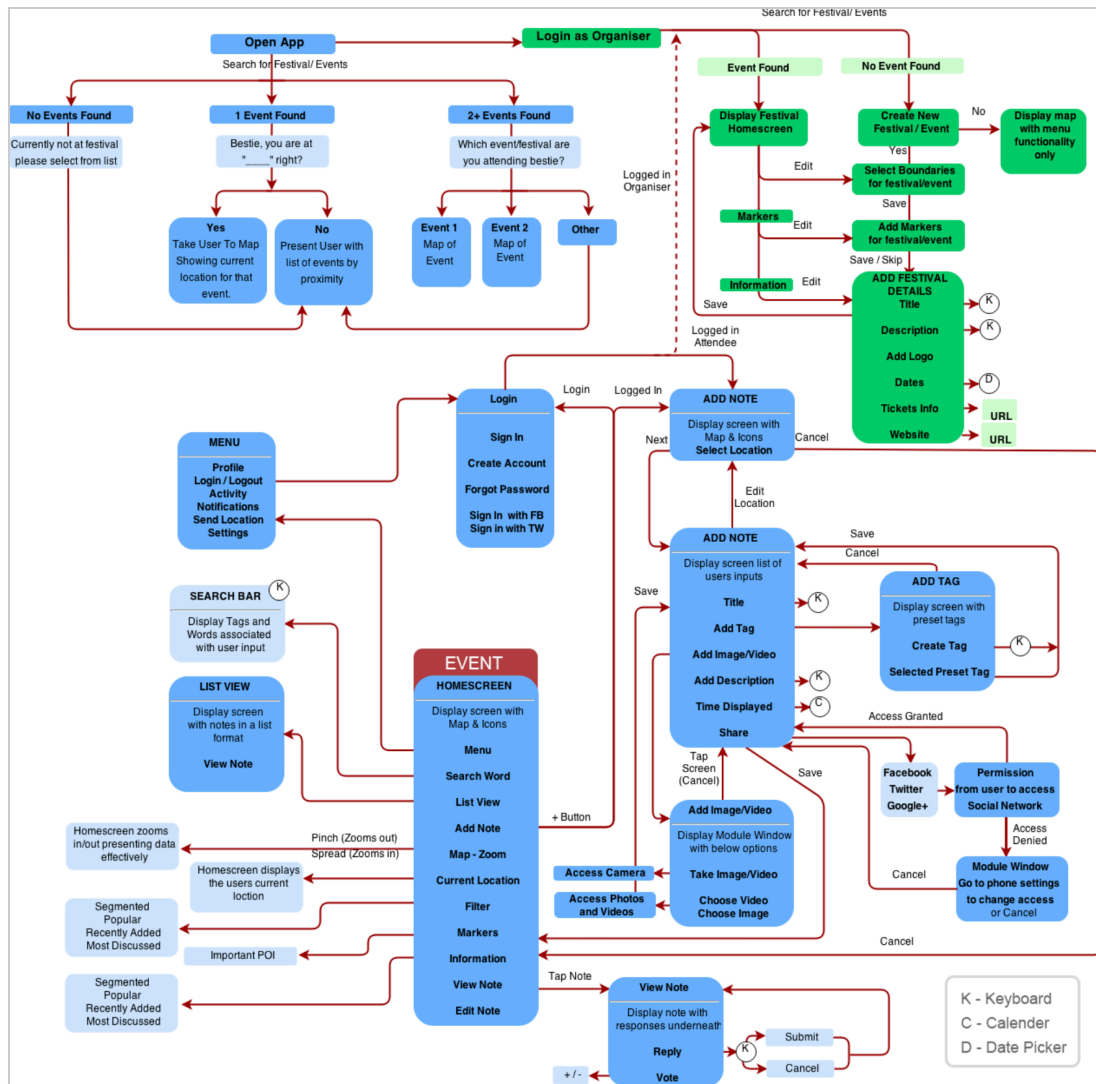


Figure 5-4 Navigational Diagram (iteration): Blue represents the attendee, green represents additional features of the organiser.

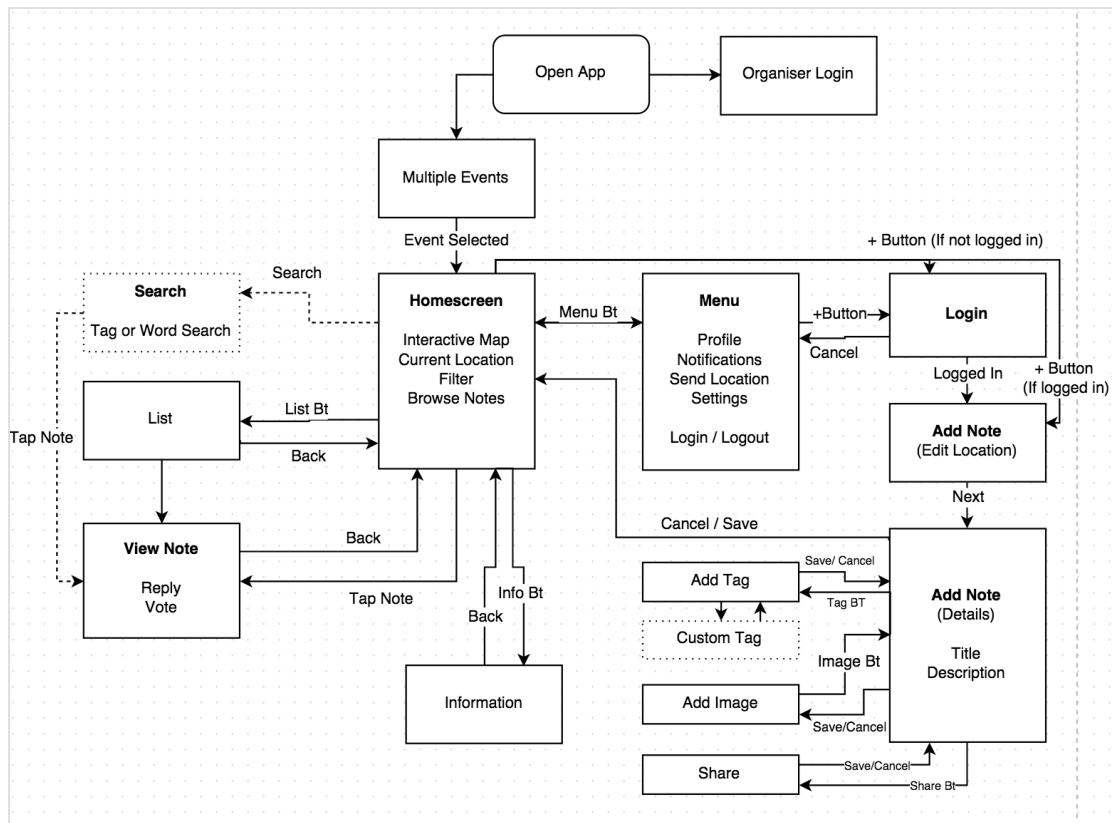


Figure 5-5 Final Navigational Diagram Attendee

5.2.2 Interface and Navigation Design¹⁰ (Skeleton)

While developing the structure and the navigation helped us define how our app would work by looking at the large-scale issues of architecture and interaction, our next step was about defining what form that functionality will take by looking at individual user interface components (buttons, text fields, icons etc.) and their relationships to each other.

¹⁰ **Interface design** provides the users with the ability to do things. **Navigation design** provides the users with the ability to go places (Garrett, 2011).

(i) Interface Design

Our main task during the interface design phase was to arrange the UI elements on all the individual screens in a way that would best enable interaction for the user. To do this we utilised some common design principles and techniques:

Making a Consistent Interface

This served the dual purpose of creating reliable expectations for the users of how things will work throughout the app, and helping us create an identity of our app in the users' minds. This was achieved by:

1. Consistently placing elements throughout our app and by having navigation elements always in the same place, while keeping them separated from the rest of the UI elements:

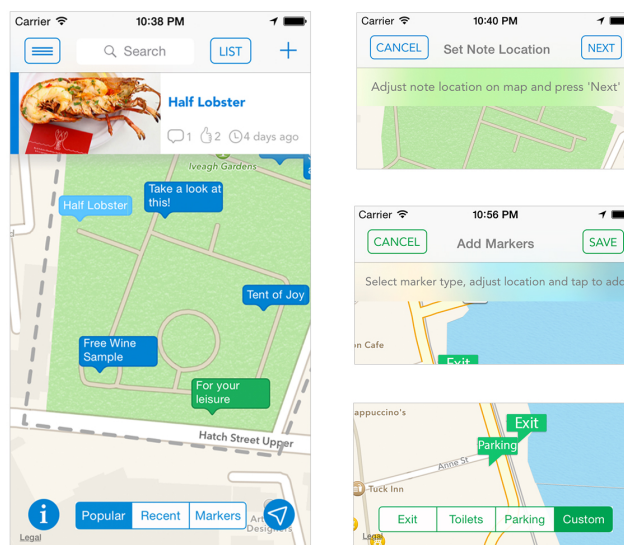


Figure 5-6 Clear divide between navigation bar and other UI elements

2. Using UI patterns familiar to the users, such as navigation, forms, tables, search, sort and filter to help them feel more in control while using the app. We also endeavoured to use standard iOS elements as far as possible:

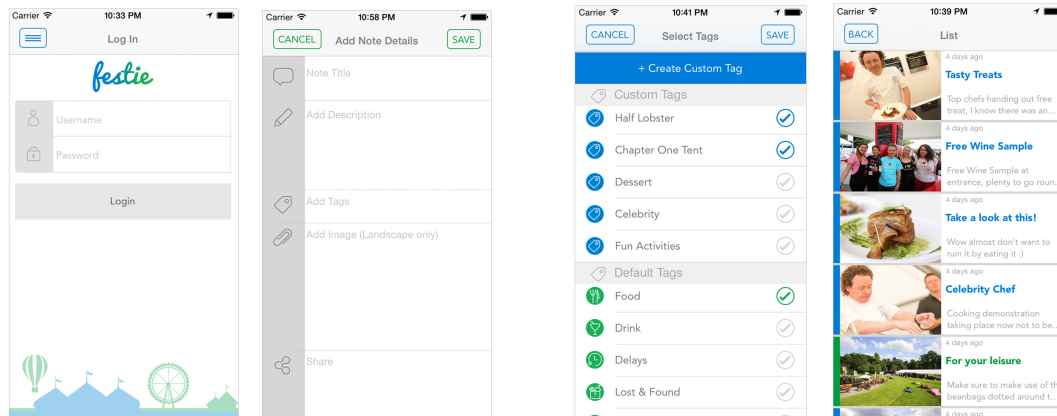


Figure 5-7 Example of consistency of forms and tables

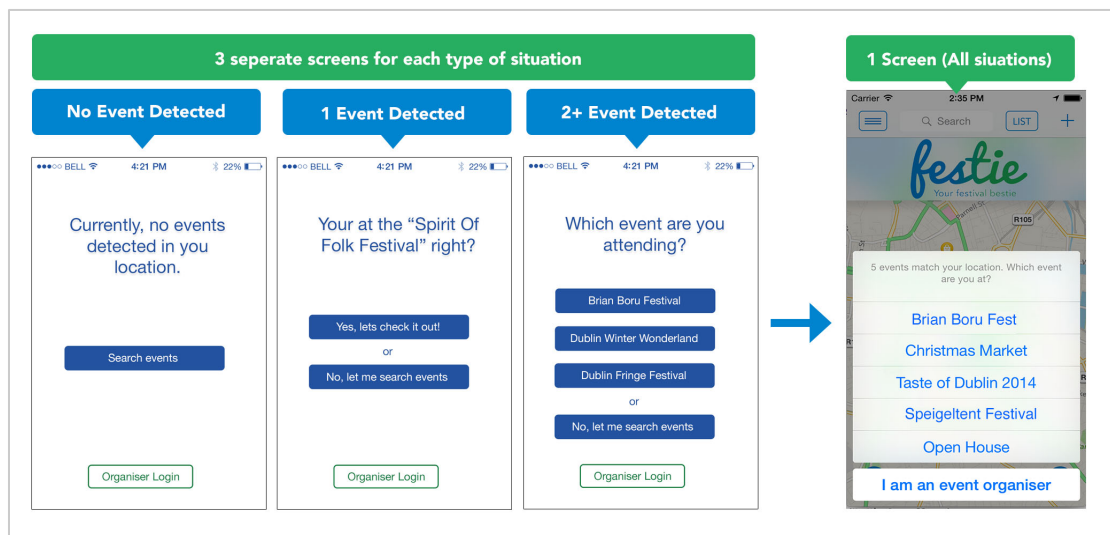


Figure 5-8 Early mock-up designs and final design for multiple events, condensing screens with default element.

Figure 5-8 above shows initial custom designs for the Events Detection screen, which we later on decided against and instead implemented the more familiar default iOS action sheet element.

3. Carefully planning what input elements we will need by eliminating or swapping out some inputs that may become stumbling blocks, as they could be tricky for people to use. We tried to keep our forms consistent in style, structure and interaction.

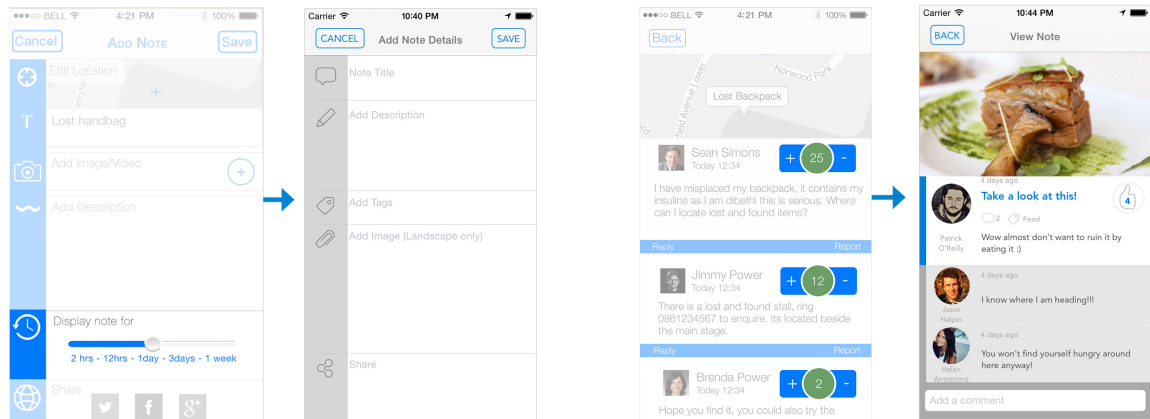


Figure 5-9 Early Prototypes show the removal of longevity and down voting in comparison to the final design implemented

4. Planning what icons we'll need and designing an icon set:

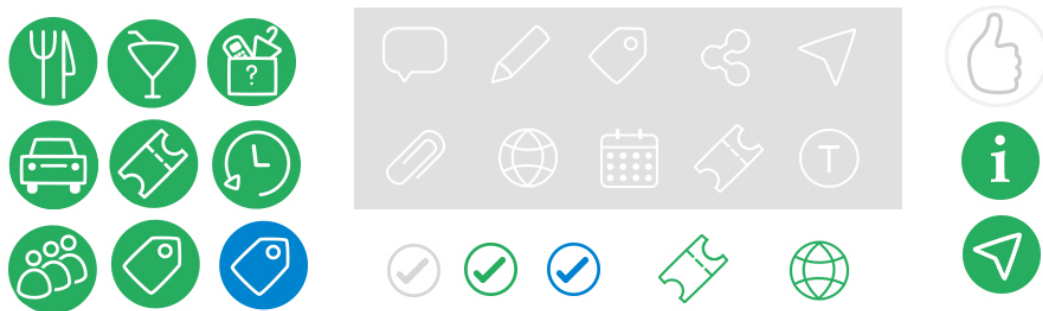


Figure 5-10 Final Sample Design Set

We planned our set of icons such that users would easily get used to their particular look and will be able to quickly recognise them.

5. Keeping in mind the following when designing our UI Kit (Figure 5-11):

- 1) **Colour scheme**—we kept our UI colours consistent with the overall colour scheme of the app. We used tools like Kuler and ColorSchemer to aid us in selecting colours that go well together.
- 2) **Style**—We followed flat design principles but not completely due to the fact that pure flat design lacks the *affordances*, which let the user know how something works (e.g. we added outlines to the navigation buttons to indicate

that these are indeed buttons). Affordances are critical for an interface that is easy to understand.

- 3) **Fonts**—We avoided the use of too many fonts overall and used fonts in our UI elements in consistent ways (all caps for navigation, mixed case for everything else), especially taking care to keep any form elements consistent so they are easily read and predictable. All screen titles were also kept consistent so that the user knows that they are in fact matching titles.
- 4) **Size**—We avoided changing the sizes of the UI elements between screen views so that the user can recognize them immediately when the page loads.
- 5) **Effects**—We used effects such as ‘blur effect’ sparingly and consistently

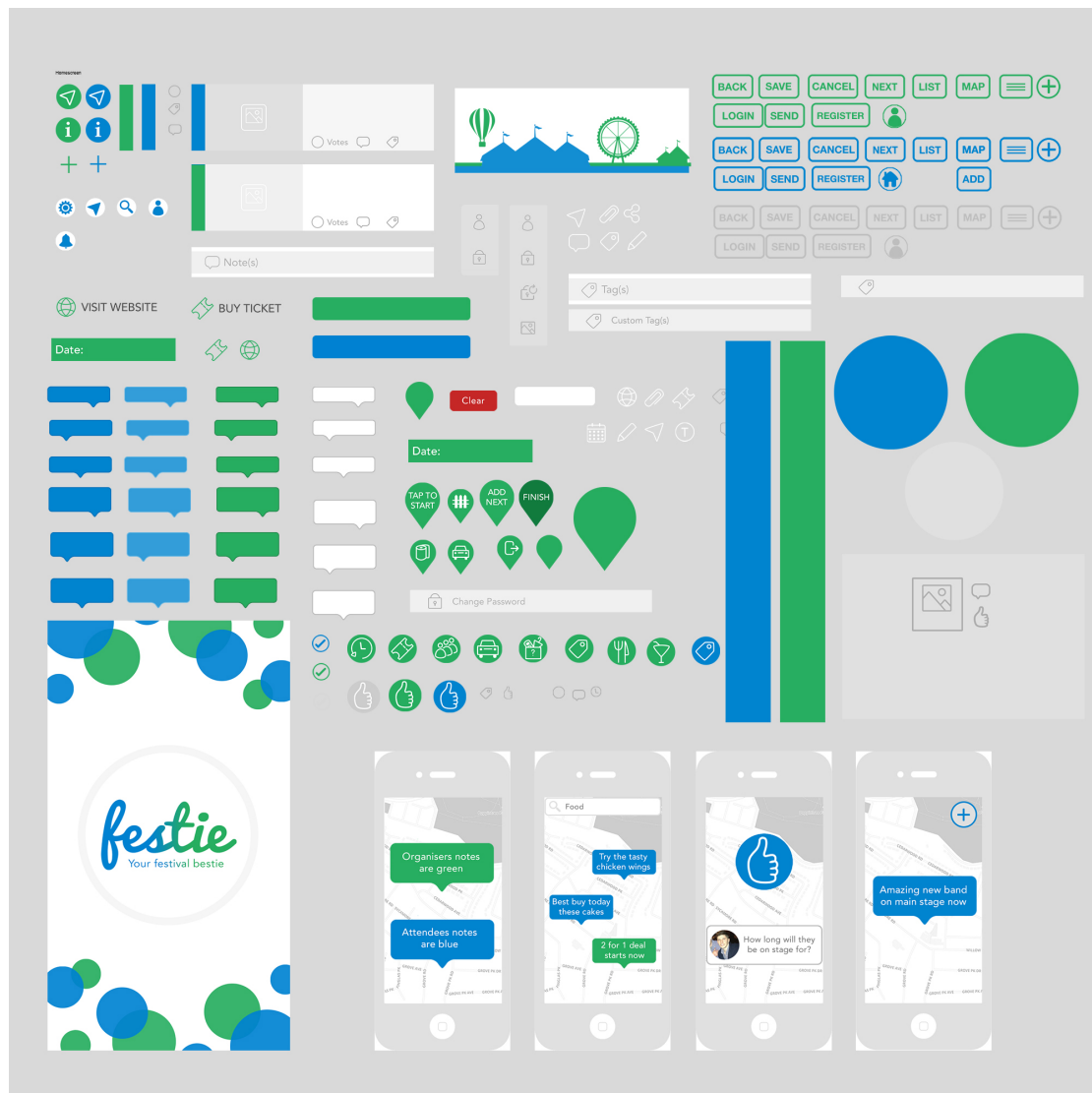


Figure 5-11 UI Kit used in final design

Making Important Elements More Prominent

We wanted important elements to attract the user's attention at first glance. To achieve this we made important elements more prominent and reduced the visibility of unimportant elements (or left them out altogether).

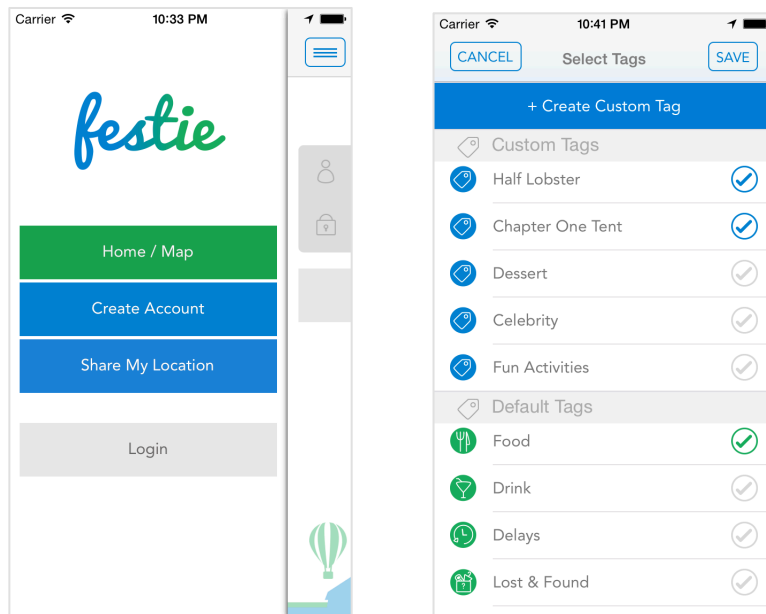


Figure 5-12 Menu shows green Home/Map button emphasising its importance compared to other menu items. Similarly on the Select tags screen, create you own tag is emphasised

Figure 5-13 below shows two iterations of our Add Note Details screen. At first we wanted to use blue for the icon strip to create consistency of visual design between screens but we quickly changed our mind and made this element less prominent as it wasn't as important as the 'interactive' text-field elements.

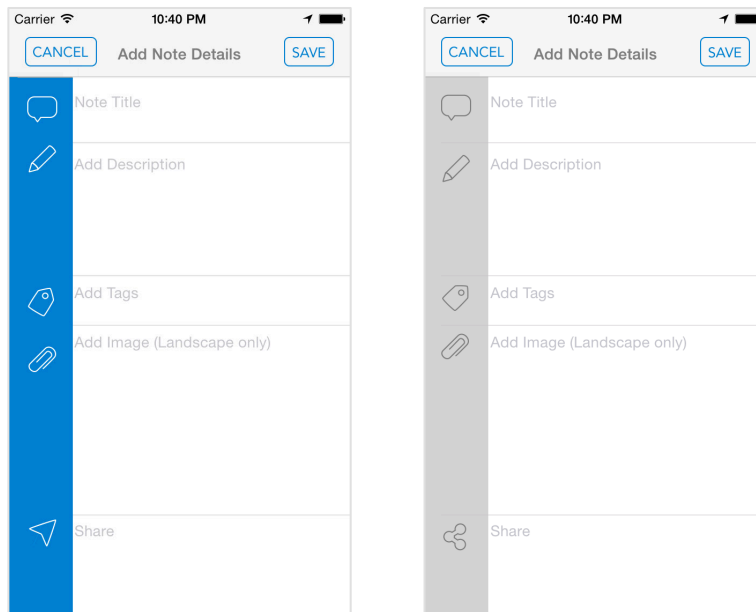


Figure 5-13 Shows iteration in sidebar colour to emphasise the input elements rather than icons

Carefully Selecting Default Options

The options selected by default when the interface is first presented to the user were carefully chosen. For example the default option for the segmented control at the bottom of the map (Figure 5-14) was decided based on user feedback (6.4).

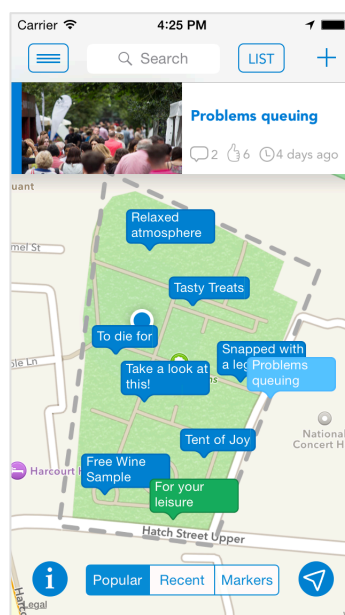


Figure 5-14 Final Design showing Popular as the default option for the segmented control

Using Text (Not Icons) For The Buttons and Markers

While this is not really a common design principle, it was something we were keen on using from the start, as we found from research that using words instead of icons for the buttons on apps leads to 20% more engagement by users (Wroblewski, 2014).

The only place where we were forced to use icons on buttons was the home screen—for the menu and the ‘+’ buttons on the navigation bar, as there wasn’t enough space to accommodate three buttons with text and a search bar together with their margins, as well as for the General Info and User Location round blue buttons on the map. See figure above.

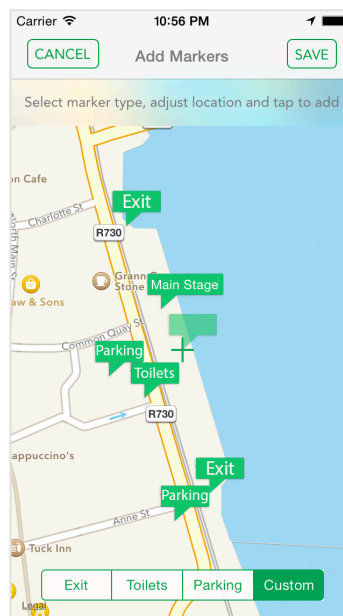


Figure 5-15 Example use of text instead of icons for buttons and markers

(ii) Navigation Design

The Navigation Design phase involved the arrangement of various elements to enable movement through the app. The main goal here was for every screen of the app to effectively communicate to the users where they were and where they could go from here:

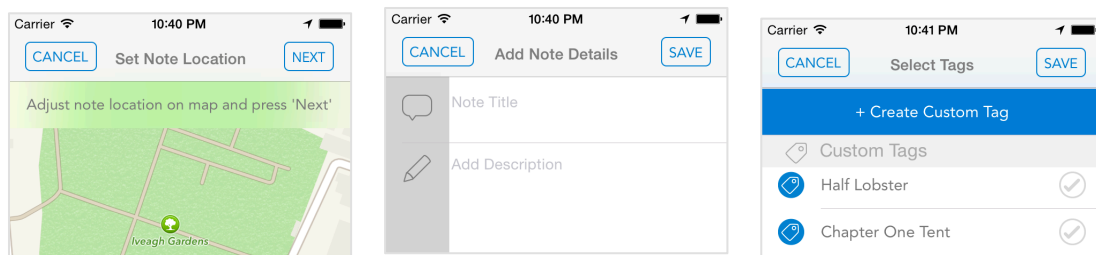


Figure 5-16 Navigation process for Add a Note: 1) selecting location 2) adding details 3) adding tag to details.

(iii) Screen Layouts (Wireframes)

By combining the interface design and navigation design together we were able to produce Screen Layouts, or Wireframes¹¹, to form a skeleton. We used Balsamiq to produce our wireframes (Figure 5-17):

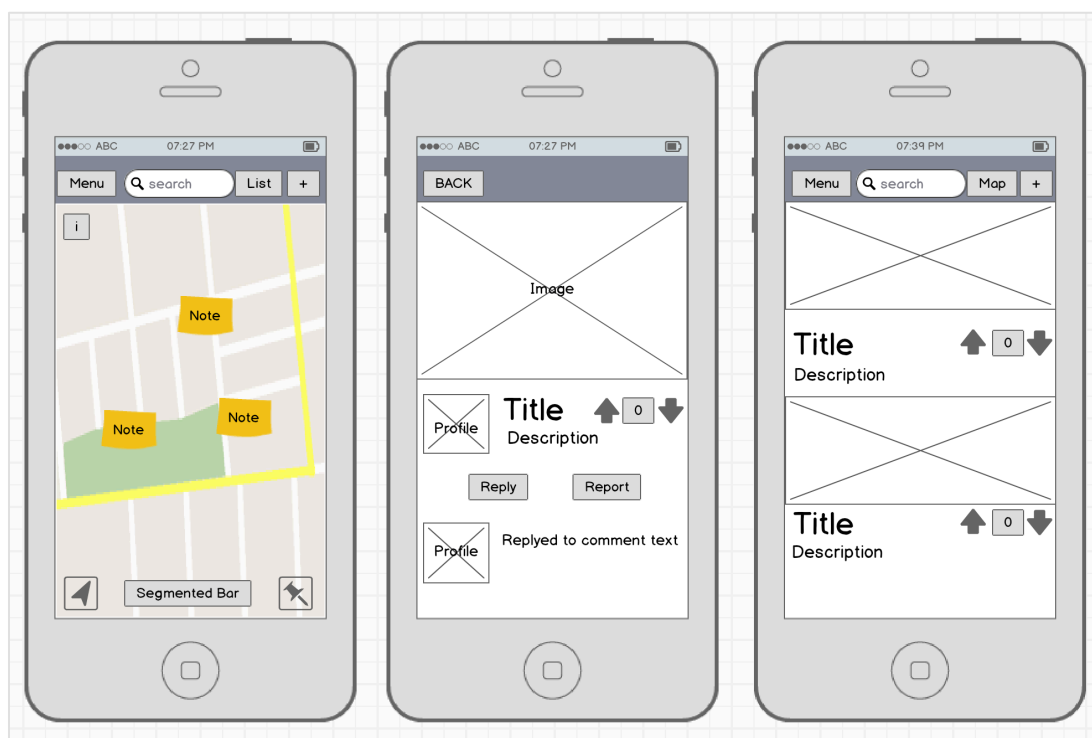


Figure 5-17 Screen Layouts (Wireframes)

¹¹ A *Wireframe* is a bare-bones depiction of all the components of a single screen and how they fit together (Garrett, 2011).

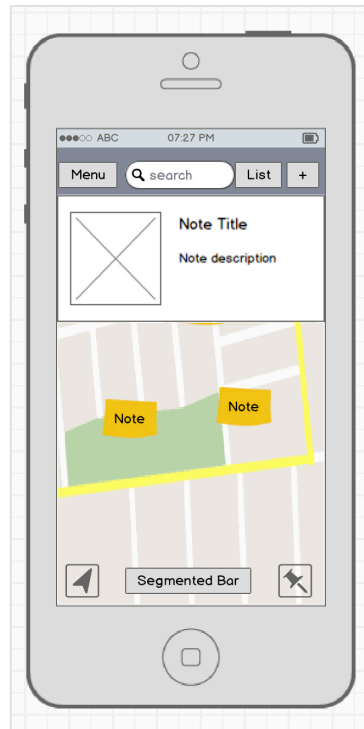


Figure 5-18 Additions to interface design at a later stage

The aim was that our wireframes would capture all the decisions we made regarding interface and navigation design in a single document, which would then be easily used as a reference during the implementation stage. They also served as the first step in establishing the visual design for the app.

These wireframes were reviewed and upgraded regarding major changes such as the addition of the Horizontal Scrolling feature (Figure 5-18).

5.2.3 Visual Design (Surface)

During our final step of the design process we combined content, functionality and aesthetics together into a finished design.

Our aims/process included:

Clean, uncluttered design

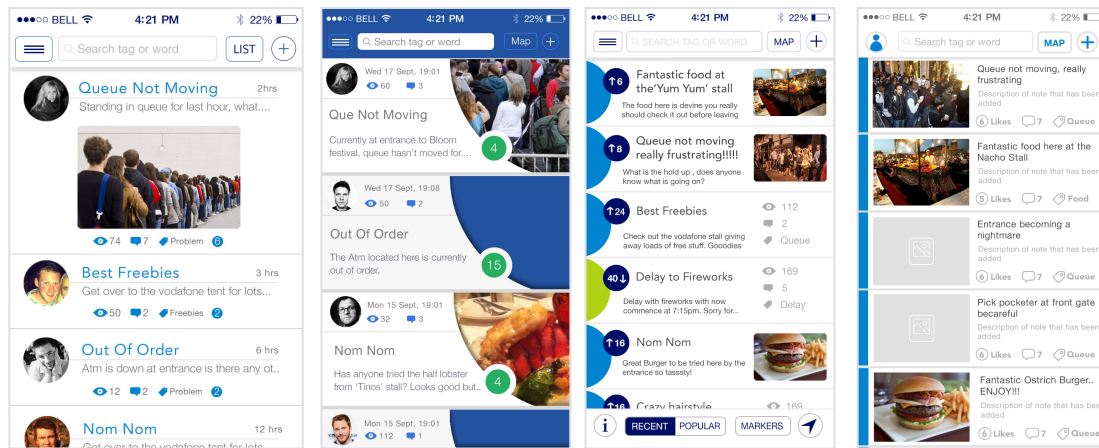


Figure 5-18 Iterations for List View leading to a clean uncluttered final design

The use of contrast to draw the user's attention—we made the elements that users really need to see stand out from the rest of the elements.

Uniformity between elements and screens—we maintained uniformity by carefully coordinating the colours, sizes and the position of form elements and icons on the screens.

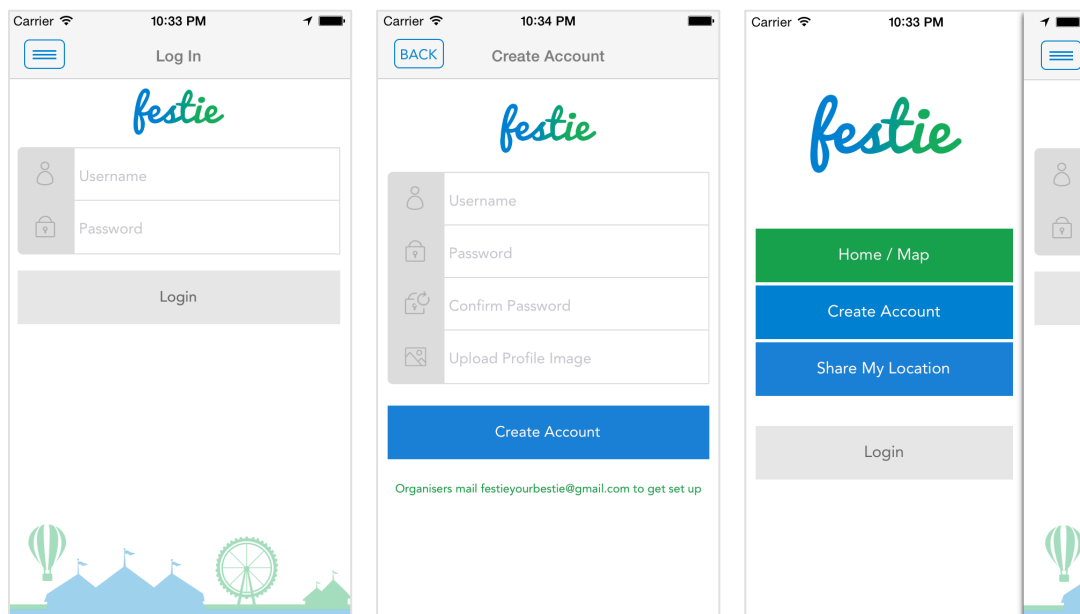


Figure 5-19 Example of uniformity for form elements—coordination of colours, sizes, icons and styles.

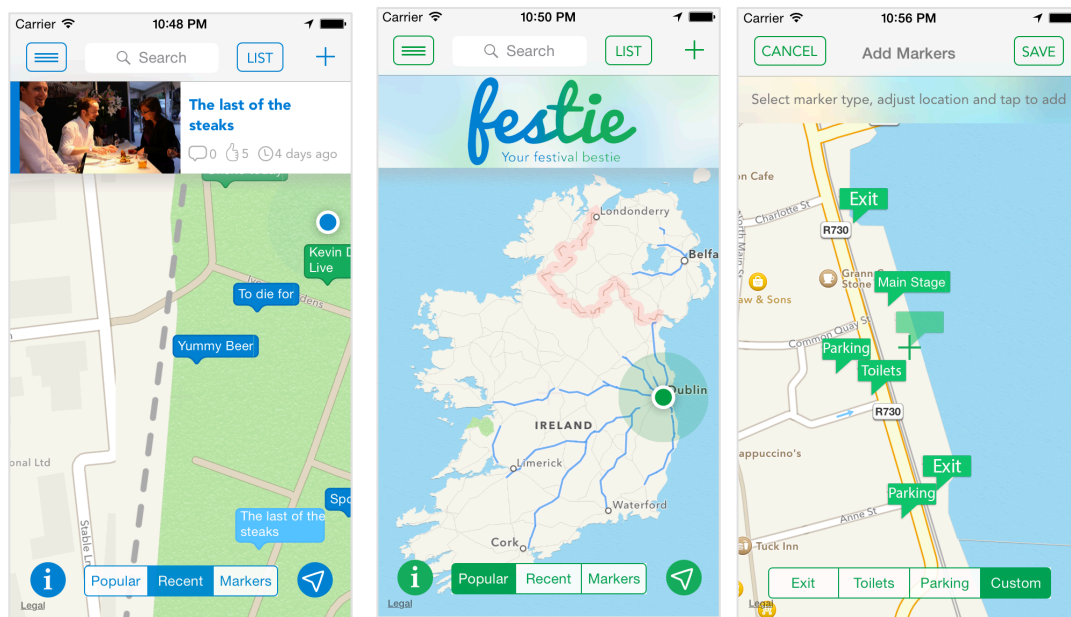


Figure 5-20 Example of uniformity of map screens for different users.

Consistent design language—we made sure that all of the elements of the design would work well together:

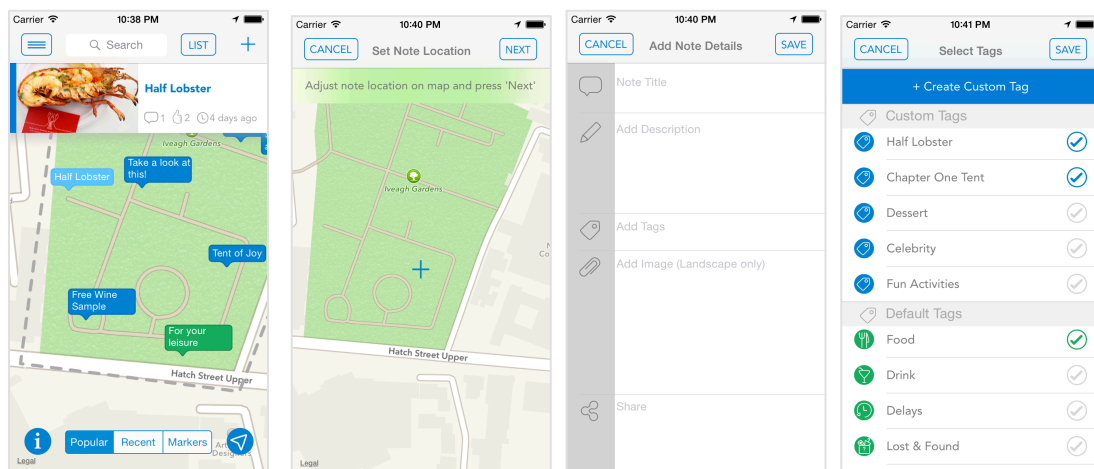


Figure 5-21 Consistency in the design language for map and form screens

Simple colour palette—we used brighter or bolder colours for the foreground of our design, and more muted colours for the background elements or less important elements:

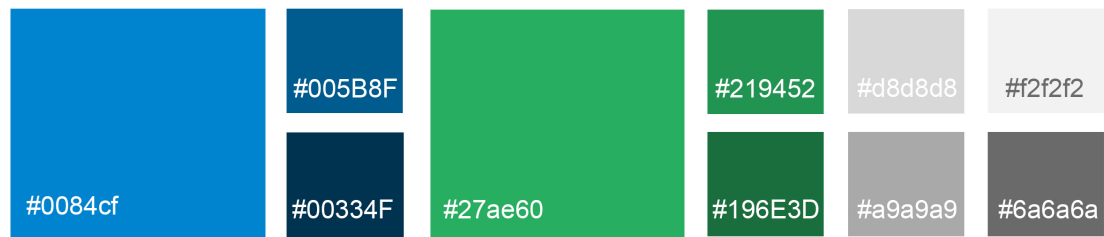


Figure 5-22 Colour Palette

Typography—we used small number of fonts in consistent ways—all caps for navigation and mixed case for everything else. We used Avenir as a main typeface for the custom elements and Apple’s system typeface for all default iOS elements:

Navigation Buttons

LIST

SAVE

All other Buttons

Popular

Recent

Markers

Clear Boundary

Notes

Free Wine
Sample

For your
leisure

Figure 5-23 Typography

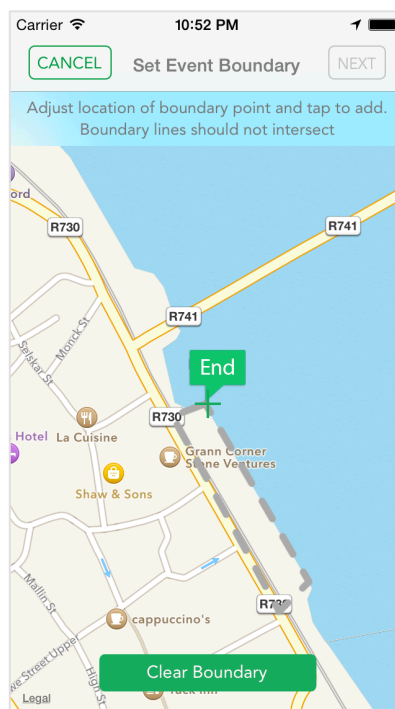


Figure 5-24 Set Boundary screen showcases a range of typography used

Effects—We used effects such as ‘blur effect’ sparingly and consistently

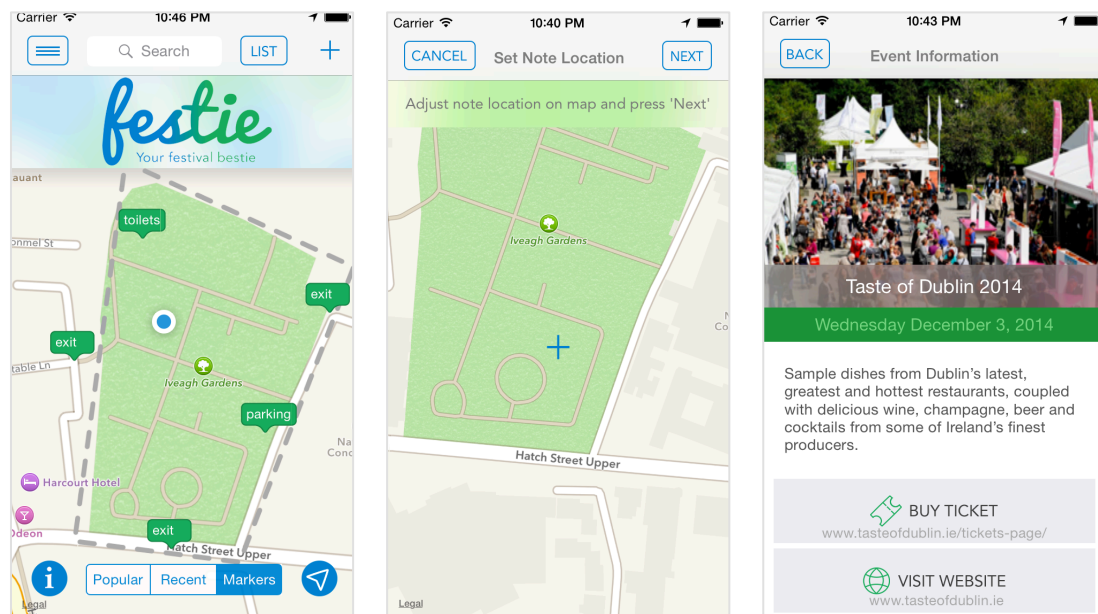


Figure 5-25 Blur effect used sparingly and consistently throughout design

Design Comps (visual mock-ups)—we created design composites, which showed how all the pieces work together to form an integral whole.

We constructed each screen in Photoshop using the elements from our UI Kit. Then we brought each of these screens together in the form of the overall structure of the app:

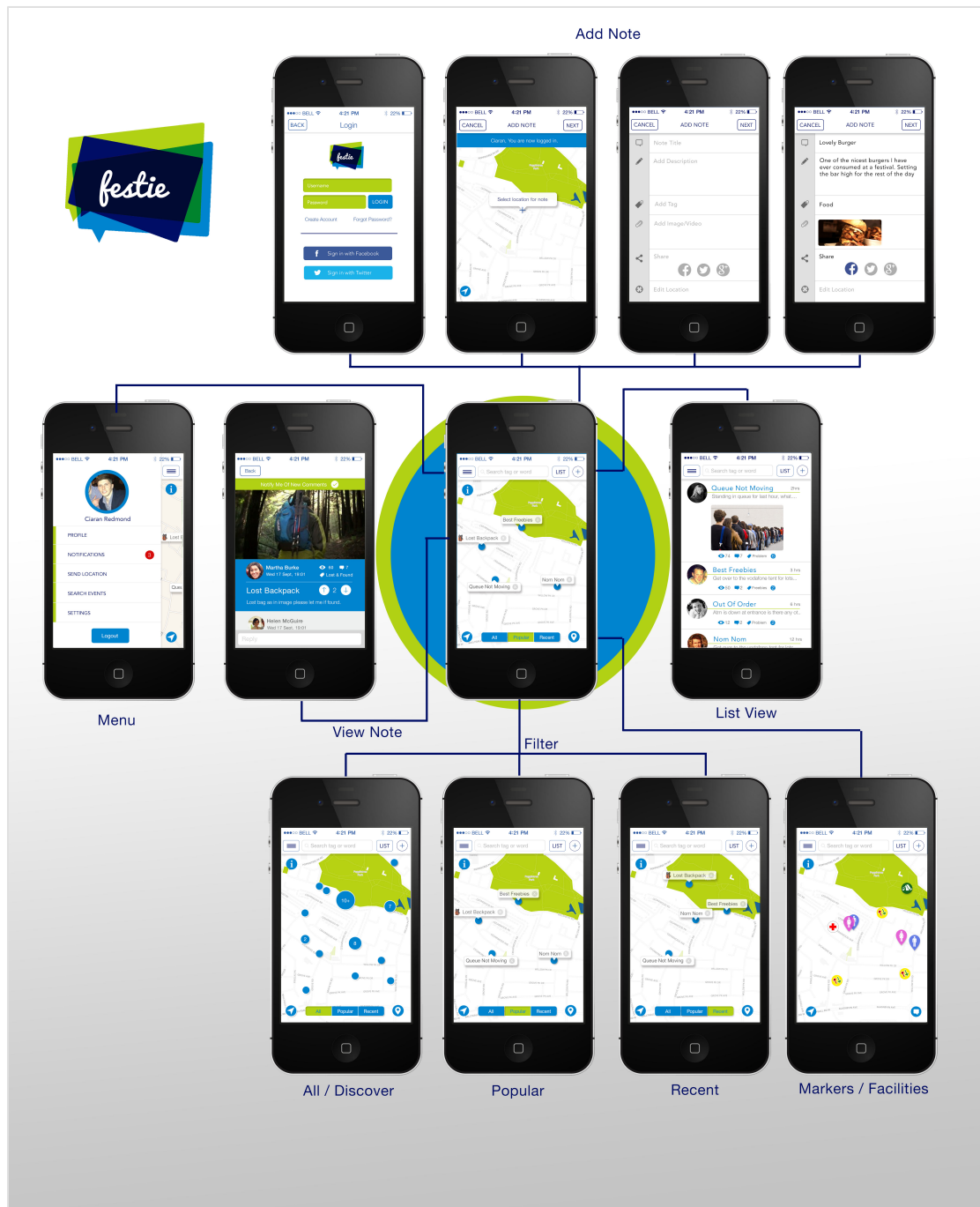


Figure 5-26 Early design comp for key screens and logo



Figure 5-27 Final design comp and logo

5.2.4 Data Model

During the design stage, parallel to developing the design of our app in terms of user experience and graphical layout, we also looked at the design in terms of its

functional layout. We produced a Data Model¹², which was based on the use cases and the user scenario discussed in Section 4.5.1:

See Appendix C for use cases and data model.

5.3 Evaluation/ Planning

After the design stage and before implementation we tested our design with users (6.3.2) in order to better evaluate the proposed solution. This resulted in re-examination of some of the requirements and the production of a more complete specification, as discussed in sub-section 4.5.2.

Next, in preparation for the implementation stage we created a work schedule and made decisions on what tools and technologies will be appropriate to use to build the app.

5.3.1 Work Schedule

We also created a work schedule for the next stage in order to determine how much work would be required for the implementation of the code and the production of the content:

¹² Creating a *Data Model* is a way to represent the data required for the implementation of an application.

Schedule - Implementation Stage

Week No	Coding Schedule	Content Schedule
September 2014		
week 1	set-up, database, home screen (map)	home screen UI elements
week 2	post a note (by attendee)	post a note (by attendee) screens elements
week 3	post/ edit (by organiser)	post/ edit (by organiser) screens elements
week 4	testing 1 + evaluation + alterations	
October 2014		
week 5	view note/ vote/ reply	view note/ vote/ reply UI elements
week 6	log-in	log-in UI elements
week 7	filter notes	filter UI elements
week 8	testing 2 + evaluation + alterations	
week 9	search	search UI elements
November 2014		
week 10	notes visualisation	notes visualisation design
week 11	menu	menu UI elements
week 12	testing 3 + evaluation + alterations	
week 13	social media connectivity	social media UI elements
December 2014		
week 14	list view	list view UI elements
week 15	mark location/ send location to a friend	mark location/ send location to a friend UI elements
week 16	testing 4 + evaluation + alterations + release of the app	

Figure 5-28 Schedule - Implementation Stage

5.3.2 Tools, Techniques and Technologies

We chose the tools, techniques and technologies to be used during the implementation stage based on our design and after some research and consultations with industry experts:

Native iOS (vs. hybrid)—the decision to implement Festie natively on the iPhone was made after careful consideration.

“For” Factors:

- Desire to learn something new—we already knew web/CSS/JavaScript/PHP;

- Having a real project, the time (3 months) and a deadline makes for a perfect opportunity to learn a new technology;
- Desire to have very responsive app with rich visuals and first-class look and feel;
- Jobs market;
- Advice from industry experts;
- Personal preference for ‘real’ computer science languages like C vs. web development languages like JavaScript;

“Against” Factors:

- Very complex;
- Steep learning curve (we had only learned some fundamentals in the summer following an online course);

MongoDB—a NoSQL¹³ database with support for geospatial indexes and queries.

- In order to be able to detect events at the user’s current location we required a database that supports rich geographic queries. While any database can be used to store and query sets of geographic coordinates stored in conventional tables we sought a database solution that would make this straightforward and avoid having to write a lot of code just to perform simple geospatial queries involving points, boundaries and areas. We thus required a database that natively supports geospatial indexes.
- In addition, we wanted the flexibility afforded by a NoSQL database. This was important because we felt like the data schema would be evolving too fast to keep up with plain SQL. MongoDB appeared to be the best example of a NoSQL database that really supported geo-indexing properly, while also working well with Node.
- Finally, MongoDB has a lot of momentum and a large community behind it.

Node.js and REST API—a standards-compliant method to link the app to the data in MongoDB.

¹³ NoSQL is a type of database not using the relational model.

- Our app required a server component to centrally store user-submitted comments for viewing by other app users. To ensure straightforward addition of new functionality over the course of the project we wanted to make the connection between the client and server as general-purpose as possible. The choice of a REST-style API¹⁴ would lend itself to easy integration with the app and will help to not preclude future components built around the same architecture e.g. a web-based or Android Festie client.
- Our reason to use Node.js to implement the REST API was because Node.js is very fast and scalable (it can support lots of users in the future) and it uses JavaScript (which we learned in the Authoring Principles and Social Media Apps Modules).

Linux Server (VPS)—we would need a cheap and easy server.

5.3.3 Risks to be taken

We perceived certain risks for the development stage. Some of these were:

- Would our algorithm for dynamically displaying the notes on the small mobile device screen at different zoom levels be technically feasible?
- Is implementing a geographic search that is meaningful to people technically achievable?
- Is it reasonable to think we can learn and use the many technologies involved in the available time?

5.4 Implementation

5.4.1 Content Production

User Interface Elements

¹⁴ A **REST API** stands for Representational State Transfer and is a widely adopted pattern for building modern HTTP-based APIs (Wikipedia, 2014).

While in section 5.2 we discussed in detail the design process of our UI elements, in this sub-section we will focus on the methods and techniques we employed in the producing these designs into actual content to be incorporated in the final artefact.

Screen	Element	Description	Default or Custom
Initialization of Application	Launchscreen	This a custom element, it will appear on opening the application as an introduction to the app. It should display the logo.	Custom
Initialization of Application	Alert - Location Services	This is a default element, on opening the app users will be asked to turn on location services so the app can find the users current location.	Default
Homescreen	Menu Icon	Part of the navigation bar this button will used to access certain elements on the menu screen such as Profile, Login etc.	Default
Homescreen	Map - Search Bar	Part of the navigation bar, user will be able to search two items using this element (Tags and words) from the homescreen.	Default
Homescreen	List View Icon	Part of the navigation bar, this icon will be a text based button within a rectangle. This Icon will appear when the user is in the map view and it will take the user to the list view screen.	Custom
Homescreen	Add Button Icon	Part of the navigation bar, this button will not be text based (exception). This icon will take users to the Add Note functionality.	Custom

Our content production process started by deciding which UI elements should be iOS's default and which will be custom-made in Photoshop and Illustrator. For this purpose we prepared a Content Analysis Chart (see sample above). However, as work piled up during development, we had to revise this initial chart a couple of times and some of the custom designs were implemented as default elements instead.

Once we knew which elements would be custom-made we started the actual content production by making sure our work schedule matched the features being implemented in code at the same time.

The process we followed for the creation of custom elements (buttons, icons, markers) was relatively straightforward but time-consuming. First we researched the subject—for example for the creation of the *lost and found tag* icon we researched images and icons on Google to help us generate an idea of how this could be represented.

We were careful to choose designs that were consistent with other elements of our user interface and to use icons that are easily recognisable. Next we created some rough sketches and once we agreed on a particular design, we imported the final version to Illustrator, where we created the final vector drawing based on the initial sketch.

The vector elements were then transferred to Photoshop, where an asset sheet was drafted in preparation for slicing. For the slices' names we followed the naming convention for high-resolution images, taken from the iOS Guidelines:

`<ImageName>@2x.<filename_extension>.`

Next we carefully optimised the size of the slices to ensure that the download size of the app would be as small as possible.

Once the slices for a certain feature were created they were either added to their respective screens by Ciaran using Xcode's storyboards, or else passed on to Vanya to be incorporated in the app programmatically. See more about our workflow during the implementation stage in sub-section 7.2.4

5.4.2 Code Development

(i) Technical Overview

The *Technical Overview* will outline the technologies, tools and techniques we used to implement the project.

Client-Side

The Client side of the project is a native mobile application for the iPhone 5 running on iOS 8. We built it using the Xcode 6 IDE¹⁵ and the iOS SDK¹⁶.

We wrote the client-side code in the Objective-C programming language—an object-oriented superset of the C programming language.

Consistent with current best practices, we extensively used design patterns such as MVC¹⁷, protocols and delegates¹⁸, and target-action¹⁹ to help us define the structure of our data model and its interaction with the rest of our app.

Depending on our aim and the type of data we were using, we utilised four different means of passing data between classes and objects:

¹⁵ **Xcode 6 IDE** is Apple's integrated development environment.

¹⁶ The **iOS SDK** extends Xcode to include tools, compilers, and frameworks necessary for iOS development.

¹⁷ **MVC** (Model-View-Controller) is a paradigm for organising code, where the *Model* handles interactions with the database, the *View* encapsulates the aesthetics of the app and the *Controller* handles user requests, passing data to and from the *Model* and the *View* as needed.

¹⁸ **Protocols and Delegates**—in iOS *Protocols* are most commonly used to define methods that are to be implemented by other classes—*Delegates*. Using *Protocols and Delegates* allows for two classes to communicate with each other to accomplish a certain goal—parsing XML, copying an object etc.

¹⁹ **Target-Action**—this concept in iOS is equivalent to event handling in JavaScript, where one object (usually a control - button, slider, switch) sends a message to another object, when a specific event occurs (usually user interaction - tap, drag, value change).

- 1) Using a singleton for the data model (the *AppDelegate* class, which can be accessed by any class in the app via its *AppDelegate* method);
- 2) Through protocols and delegates;
- 3) Via *segues*²⁰;
- 4) Using notifications;

In addition to working with iOS frameworks and built-in libraries, such as CoreLocation, MapKit, UIKit, Foundation, and QuartzCore, we also used some third-party libraries, such as SWRevealViewController for the slider menu (Lluch, 2014) and IQKeyboardManager (hackiftekhar, 2014).

In terms of building the user interface, we used a combination of storyboards and code both for the screens and for the segues between the screens.

We used Git source control mainly for keeping backups and not so much for collaboration, as it was just Vanya who was doing the coding part of the implementation stage. Git was used:

- To ensure we were able to recover from mistakes and easily determine what went wrong i.e. what changes caused bugs that were found only later.
- To enable us to feel confident in making bold changes to the code, knowing that we could safely fall back to a stable base if necessary.
- As a backup mechanism in case files were accidentally deleted.

On several occasions we used Git to jump back to previous known good versions of the code, which was an invaluable safety net. This was particularly useful when getting up to speed with Xcode, when the consequences of some code changes weren't fully understood and the issues were noticed only later.

Server-Side

²⁰ **Segues** in iOS are objects used to carry out transitions from one scene to another.

The server side of the project is a web-based API to which our mobile app connects and transfers JSON data to and from MongoDB collections via a RESTful API using HTTP methods (GET, POST, PUT, DELETE etc.).

We built the server by creating the RESTful API in Node.js using the JavaScript programming language.

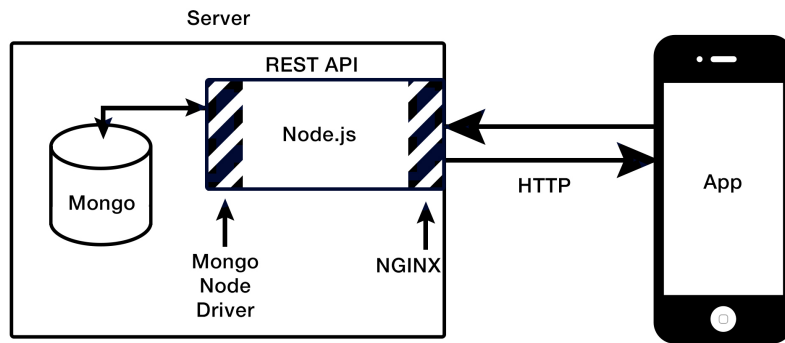


Figure 5-29 Server Side Diagram

We chose to use MongoDB for our database after some research (5.3.2), because of the close relationship between MongoDB documents and JSON, as well as for its support of location data and its implementation of geo-bounded searches ‘out of the box’.

We used RoboMongo as an admin GUI for our MongoDB database and Jade as a templating engine for web views of the database:

The screenshot shows a web browser window with the address bar displaying 'vanya.cremin.com/comments'. The page title is 'comments'. Below the title is a table with the following data:

content	author	notelid	created_at	_id
sooo yummy!!	Dennis Hennessy	54359a2c3a60e0aa1e9470ff	Wed Oct 08 2014 21:11:03 GMT+0100 (IST)	54359a573a60e0aa1e947100
music here is fantastic will come again	Dennis Hennessy	54363327fe6346ac20c90237	Thu Oct 09 2014 08:06:36 GMT+0100 (IST)	543633fcfe6346ac20c90238
wow love it!!	Dennis Hennessy	54363327fe6346ac20c90237	Thu Oct 09 2014 08:12:15 GMT+0100 (IST)	5436354ffe6346ac20c90239
Does anybody know where I can buy their album - it's not on iTunes...	Dennis Hennessy	54363327fe6346ac20c90237	Thu Oct 09 2014 08:13:11 GMT+0100 (IST)	54363587fe6346ac20c9023a
It's not for sale yet, will be out by Christmas. Thanks for asking!	Dennis Hennessy	54363327fe6346ac20c90237	Thu Oct 09 2014 08:15:42 GMT+0100 (IST)	5436361efe6346ac20c9023b
yes he is on stage at 7	Dennis Hennessy	5439057b071d407737ec9e19	Sat Oct 11 2014 11:37:13 GMT+0100 (IST)	54390859071d407737ec9e1a
Yes he is on stage at 7	Dennis Hennessy	5439057b071d407737ec9e19	Sat Oct 11 2014 11:37:30 GMT+0100 (IST)	5439086a071d407737ec9e1b
it is right beside the entrance	Dennis Hennessy	54391a61bcb5debf1defae6d	Sat Oct 11 2014 12:57:50 GMT+0100 (IST)	54391b3ebcb5debf1defae6e
I don't think there is a stall	Dennis Hennessy	54391a61bcb5debf1defae6d	Sat Oct 11 2014 13:20:23 GMT+0100 (IST)	54392087bcb5debf1defae6f
hello	Dennis Hennessy	5435a8dbfe6346ac20c90225	Sat Oct 11 2014 16:18:24 GMT+0100 (IST)	54394a402c43813526b8c65d
I think there on at 4	Dennis Hennessy	543949622c43813526b8c65c	Sat Oct 11 2014 16:18:56 GMT+0100 (IST)	54394a602c43813526b8c65e

Figure 5-30 Web view of the database (created with Jade)

We used NGINX (a web server) to protect access to our Node API.

(ii) Functional Overview

The *Functional Overview* will outline the functions of the app (what the app does and how it works) and it will follow our process step by step throughout the three-month implementation period (early September–early December):

Home screen/Map (requirement 1)

First we created the home screen for the app, which included the map. After some research—(Grothaus, 1013), (Keller, 2013), (Dilger, 2013)—we decided to use Apple Maps (as opposed to Google Maps), as they seemed easier for beginner iOS developers to quickly get started and because of the reported better customisability of their pins.

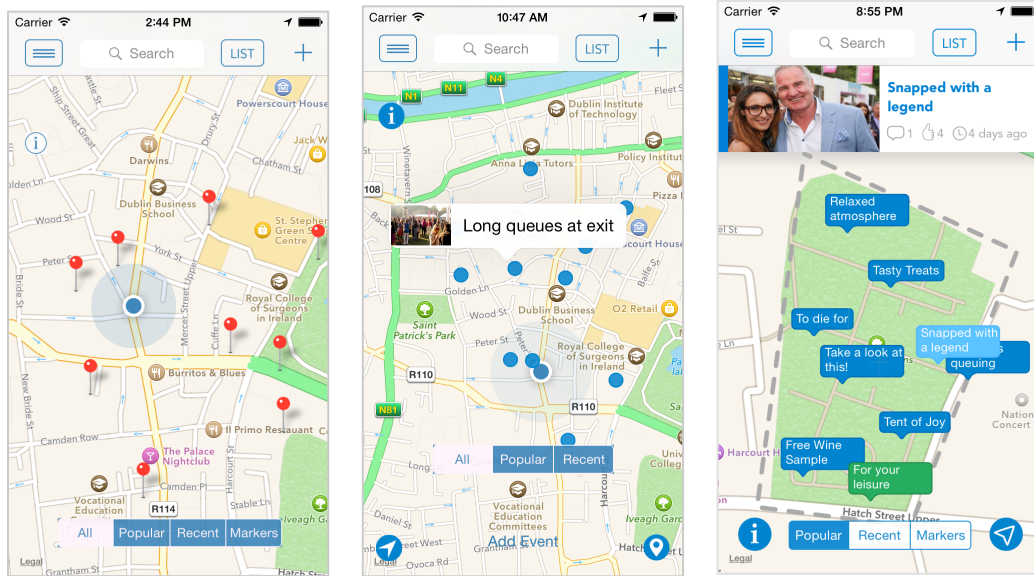


Figure 5-31 Iterations of *Home Screen* (7 Sept; 15 Oct; 10 Dec)

Server/Database/Data Model

Our next step was to build our server and database. We coded the server in JavaScript, following an online tutorial (Katz, 2014). This took more than a week to implement, as we were unfamiliar with the majority of the technologies involved—MongoDB, Node.js, Express (a third-party Node module), Jade (an engine for templated web views).

Once the server was ready for clients to connect and start transferring data, it was time to implement the methods for loading and persisting data from/to the server on the client's side and on the server's side.

Before doing this, however, we needed to define the **Model** of our app (See MVC—(i) Technical Overview). At this stage our Model consisted of four classes - *Event*, *Note*, *User* and *Comment*. For each one of these classes we implemented a variation of an `import` method (for loading data from the server) and a `persist` method (for saving data to the server).

At a high level the two methods work as follows:

```
import
```

(See code in Appendix F)

1. HTTP request object containing the URL <http://vanya.cremin.com/notes>²¹ is instantiated and its method is set to GET.

2. Next, a basic `dataTask` for transferring data from a web service is run asynchronously on a background thread and a callback block is used to notify us when the operation completes.

3. If there are no errors, a completion handler tries to parse the returned array of JSON dictionaries into an array of *Note* objects by using a custom initialiser (`initWithDictionary`), and once done notifies the view controller with the updated data.

`persist`

(See code in Appendix F)

The `persist` method works in a similar fashion with a few differences:

- When creating the URL there are two endpoints for saving an object: `/notes` when we are adding a new note, and `/notes/_id` when updating an existing note that already has an ID.
- The request object uses either HTTP PUT for existing objects or POST for new objects, rather than the default GET method.
- Because we are updating or adding an entity, we provide an HTTP Body in our request and set a ‘Content-type’ HTTP Header to tell the body parser on the server how to handle the bytes in the body.
- A basic `dataTask` is created again and the completion handler once again takes the modified entity returned from the server, parses it and adds it to the local collection of *Note* objects.

²¹ <http://vanya.cremin.com> is the host name pointing to our server. The “/notes” path indicates the specific collection name in this example.

- Similar to the `initWithDictionary` custom initialiser for the `import` method, the `persist` method has a helper module to handle the conversion of *Note* object into a JSON-compatible dictionary called `toDictionary`.

On the server-side we implemented the following three functions:

findAll (finds all objects for a collection)

```
CollectionDriver.prototype.findAll = function(collectionName, callback) {
  this.getCollection(collectionName, function(error, the_collection) {
    if( error ) callback(error)
    else {
      the_collection.find().toArray(function(error, results) {
        if( error ) callback(error)
        else callback(null, results)
      });
    }
  });
};
```

This method is linked to the */notes* path of the API and the GET method. It works by first fetching all documents in a particular collection and then converting them into JSON format.

save (saves a new object)

```
CollectionDriver.prototype.save = function(collectionName, obj, callback) {
  this.getCollection(collectionName, function(error, the_collection) {
    if( error ) callback(error)
    else {
      obj.created_at = new Date();
      the_collection.insert(obj, function() {
        callback(null, obj);
      });
    }
  });
};
```

This method is linked to the */notes* path of the API and the POST method. It takes the data that was passed, records a timestamp, and saves the document into the database.

update (updates a specific object)

```
CollectionDriver.prototype.update = function(collectionName, obj, entityId, callback)
{
  this.getCollection(collectionName, function(error, the_collection) {
    if (error) callback(error)
    else {
      obj._id = ObjectID(entityId);
      obj.updated_at = new Date();
      the_collection.save(obj, function(error, doc) {
        if (error) callback(error)
        else callback(null, obj);
      });
    }
  });
}
```

This method is linked to the `/notes/_id` path of the API and the `PUT` method. It first converts the passed `entityId` from JSON to BSON (the format Mongo uses internally), and then saves the passed object into that document ID.

Post a Note (requirement 2)

With the ability to retrieve and save data from and to the server, our next task was to implement the *Post a Note* functionality on the client. Our progress at this early stage and for the next couple of weeks was particularly slow because of the steep learning curve of the Objective-C language and the Xcode IDE, as well as due to the fact that we updated our IDE to the newly released Xcode 6²², which supports iOS8.

What we managed to implement at first was a very simplified version of the final *Post a Note* feature. See iterations below.

²² This transition caused some delays in the beginning, as we needed some adjustment to the new environment and also because tutorials for iOS 8 and Xcode 6 were not yet readily available online.

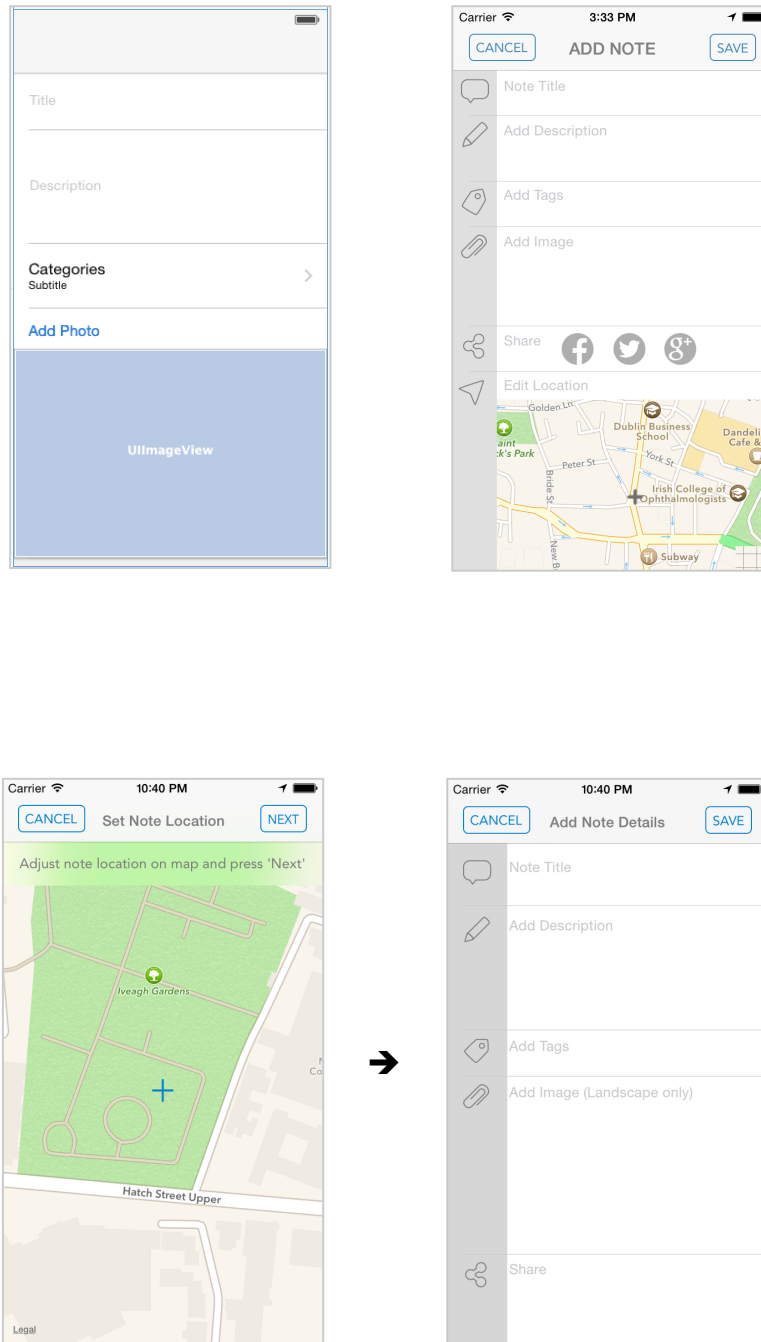


Figure 5-32 Iterations of *Post a Note* screens (15 Sept; 24Oct; 10 Dec)

Iterations from user testing—Post a Note (6.7):

Formal Test 1: Users had issues selecting an element, as space wasn't sufficient between cells in the table and it caused them to select the wrong cell on occasions.

They also repeatedly pressed the Cancel button by mistake, instead of Note Title. We went through a couple of iterations adjusting the cell sizes and also making the grey icon strip to the left wider to prevent users from pressing the Cancel button. We tested again at every iteration until the issue was fully rectified.

Also, initially, we had a ‘+’ button as an affordance to the Add Tags and Add Image cells but users opted to press the actual cell instead. We fixed this issue by removing the ‘+’ button.

Another usability issue with Post a Note was that when users posted a note on the map they couldn’t tell which exactly was their note. This was especially true in the beginning when we were still using the default red pins. Once we customised the pins into notes with titles this issue was not so severe but user feedback was still not 100% positive. We resolved this by making the newly added note appear centred and highlighted on the screen.

Formal Test 2: Users did not realise they had to pinch and drag the map at the bottom of the screen in order to edit the location of the note—instead they tried to tap it. We fixed this issue by removing the Edit Location cell altogether, relying entirely on the Set Note Location screen now to set the note location. This worked well and afforded a smooth workflow for Post a Note as witnessed in consecutive tests.

Protocols and Delegates/Core Data

In order to handle the complex functionality of the app in terms of passing data between model classes and view controller classes, we realised we needed to learn how protocols and delegates²³ work and how to put them into use in our app.

While the theory behind this pattern seemed simple, putting these ideas into action proved challenging and time-consuming. With the help of some good tutorials online (Muchow, 2010) and useful Stack Overflow threads—(mmalc, 2009), (AmebaSpugnosa, 2011)—we did manage to incorporate this pattern into the app.

²³ **Protocols and Delegates** is a very common design pattern in iOS development (See Protocols and Delegates—5.4.2(i) Technical Overview), where distantly related classes can communicate with each other to accomplish common goals.

This was a major milestone, as it allowed us to effectively use MVC and to successfully pass data between objects and classes for the rest of the development process. It also gave us some initial confidence that we are capable of handling the iOS learning curve.

At this stage, we also looked into the idea of using the Core Data framework for the *Model* layer of our app (instead of the model classes we had already created). However, in the end we decided not to change the *Model* to Core Data as spending the time to learn and incorporate yet another relatively complex new paradigm would have resulted in a greater delay to our already delayed work schedule.

View a Note (requirement 3)

The *View a Note* feature proved particularly challenging to implement due to its use of table views. There were a number of reasons for this:

- Table Views used protocols and delegates to display data, which we were still struggling to understand at this stage.
- The specific table view that we were trying to implement was particularly complex in that it had two sections—one to display the note data, and a second one to display the comments data—both using dynamic prototype cells, created by a custom class.

The main reason for our lack of success, however, turned out to be the fact that we were mixing up the three mechanisms iOS provides for generating new cells in a table view²⁴. This was mainly due to the fact that lots of the answers on Stack Overflow and online tutorials we were using were based on old-style code before the introduction of storyboards (introduced in 2011).

²⁴ The three mechanisms iOS provides to generate a new cell in a table view are:

- 1) by using a name—>cell mapping in storyboards;
- 2) by using of a custom class;
- 3) by using a custom class, but have storyboards initialise the layout of the cell for you first;

This experience taught us a valuable lesson that when it comes to iOS—a new rapidly evolving platform—the only reliable source of information is the official Apple documentation, published manuals and books²⁵. In terms of online sources, only recent (less than a year old) highly-ranked Stack Overflow examples and online tutorials should be considered safe.

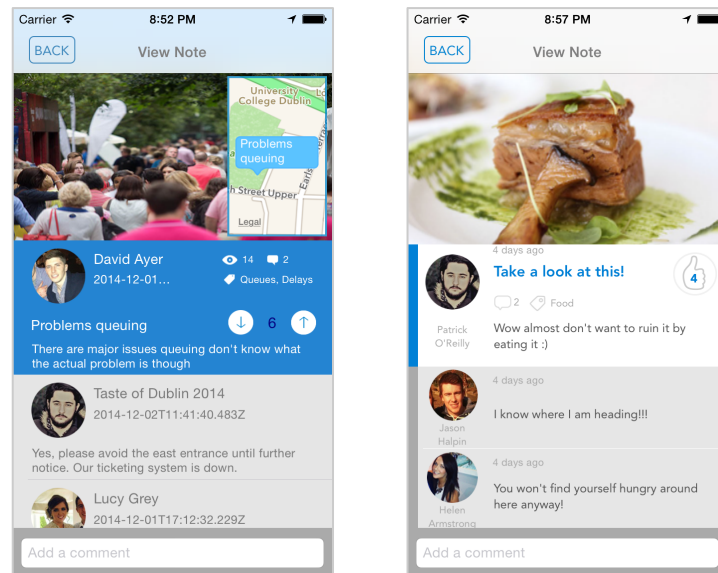


Figure 5-33 *View Note* iterations (27 Oct; 7 Dec)

Iterations from user testing—View a Note (6.7):

Formal Test 2: The users reported that the size of some elements appeared too small—this was a particular problem for the interactive elements, like the voting buttons, which were difficult to press. Users also pointed out that the screen looked too busy. As a result we removed some elements (the map, number of views, the strong blue colour) to reduce the visual noise. Another feedback we received was that users preferred if the newest comments appeared first, rather than last—we reversed the order of comments for our next build.

Search Notes by Keyword/by Tags (requirement 7)

²⁵ Our favourite ones being iOS 7 Programming Cookbook (Nahavandipoor, 2013) and iOS 7 by Tutorials (Wenderlich, 2013).

As we were gradually becoming more comfortable with the iOS development environment at this stage, implementing the *Search Notes by Keyword/by Tags* feature was relatively straightforward thanks to the use of the built-in class `UISearchDisplayController`, which manages the search bar and the table view that displays the search results.

We created two sections for the results table—one for notes, and one for tags. As the user types a keyword in the search bar, the results table underneath dynamically updates by displaying notes that contain the keyword either in their title or description (notes section), as well as the number of notes with matching tag names (tags section).

The user then can select to view individual notes or click on a tag name to display only notes with that particular tag on the map.

Search Notes by Keyword/by Tags iterations:

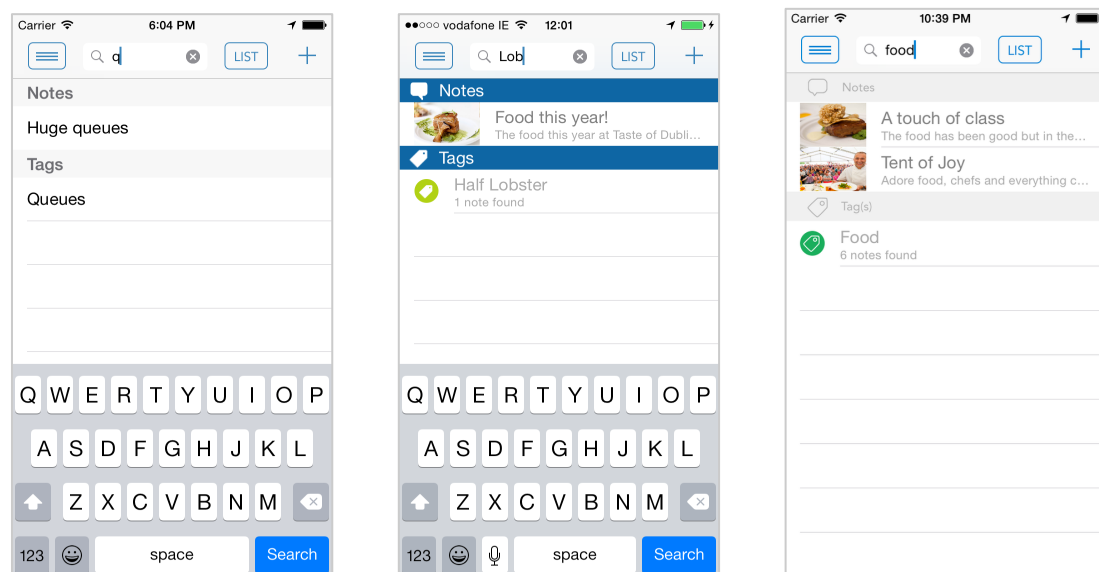


Figure 5-34 Iterations *Search Notes* screens (8 Oct; 7 Nov; 8 Dec)

Iterations from user testing—Search Notes (See Sub-section 0 Formal Testing):

Formal Test 2: Users noted that the strong blue headers were distracting. We made the headers light grey instead. This led to a more positive feedback on the next iteration of testing.

Log In (requirement 4)

Log In functionality was first hardcoded for one user only, and more complex functionality was added gradually later on to allow for the system to login all users with accounts and to dynamically display user data fetched from the server when posting a note or leaving a comment.

In the beginning we meant to support user authentication with their Facebook and Twitter profiles as well but later on decided to use the time instead to implement more interesting functionality—like the Horizontal Scroller.

Log In iterations:

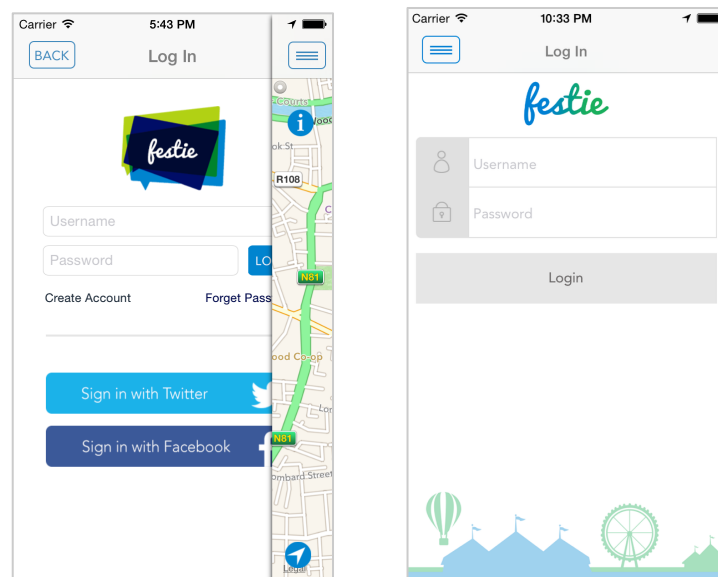


Figure 5-35 Iteration of *Log In* screens (15 Oct; 9 Dec)

Filter Notes—segmented control (requirement 6)

Filter Notes was another relatively straightforward feature in terms of implementation. It works by calling a `refreshAnnotations` method every time the user toggles between the *Popular*, *Recent* and *Markers* options on the segmented control.

Depending on what button was pressed, the `refreshAnnotations` method first sorts the notes array by most popular (calculated based on the number of likes) or most recent (calculated based on the time the note was posted) and calls the

`filterAnnotations` method (See requirement **8b** below), which displays the most popular (or recent) non-overlapping notes.

In the case of the *Markers* option no sorting or filtering is performed, the *Note* objects are simply replaced with *Marker* objects on the map.

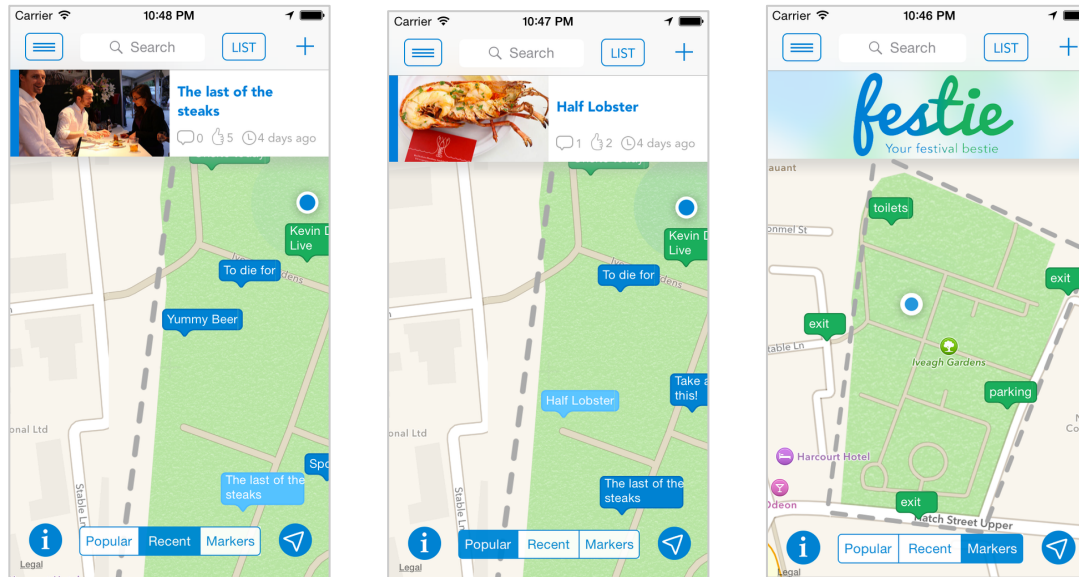


Figure 5-36 *Filter Notes* screens

Iterations from user testing—Filter Notes (See Sub-section 6.4 Testing through Social Media):

Initially we had an All button in the segmented control but after customising the notes an All button didn't make sense any more. We asked our users on Facebook in what way they would prefer to view the notes at launch. All was the least popular answer and Popular received 79% approval. Based on this we changed the segmented control to default to Popular and we removed All.

List View (requirement **12**)

The *List View* feature lets the user view all the notes for the current event in a list format. By now we were comfortable with the use of table views, which made the implementation of this feature a relatively easy task for us. *List View* underwent a couple of iterations later on, based both on user testing and design decisions (Figure 5-37).

Even though the feature was functioning well, some aspects of it—for example, making a connection to the *View Note* feature to allow the user to view the notes in further detail—remained to be fully incorporated later on when time allows.

However, as *List View* was low priority feature—third last in our requirements (4.5.2) time was never allocated for this connection to be implemented. As a result, currently, the *List View* feature only displays the data and does not allow for any further interaction apart from scrolling through the table view.

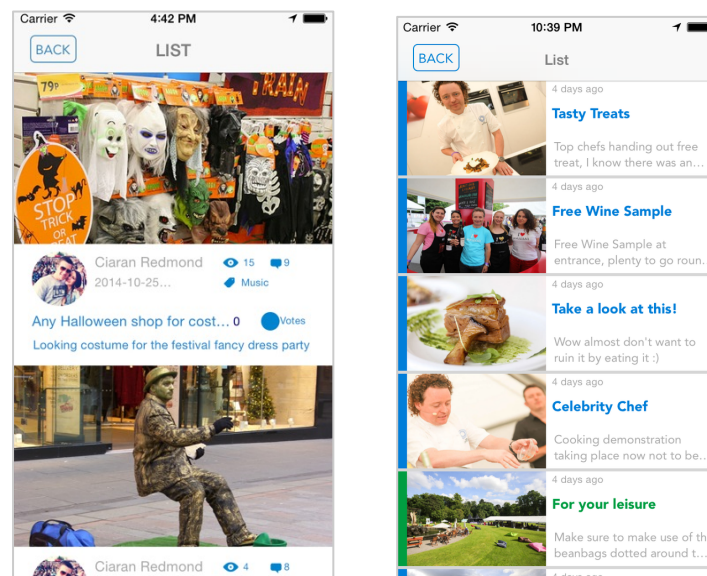


Figure 5-37 Iterations of *List View* (15 Oct; 9 Dec)

Iterations from user testing—List View (6.7):

Formal Test 2: The same issues with the small size of the elements were pointed out by users as with the View a Note screen. As a result we re-designed the layout to include less elements for the next iteration of the build.

Formal Test 3: For the final design we changed the layout once again as users were pointing out the inconsistent look between the Horizontal Scroller and List View. This change led to a much more positive user feedback at the next testing session.

***Slider Menu* (requirement 10)**

After a few failed attempts to follow online tutorials for the implementation of this feature, we finally resorted to using a third-party library, `SWRevealViewController` (Lluch, 2014).

The main difficulty here was that all the tutorials we found were using code to build the hierarchy of the screens, but our screens had already been build in storyboards and we wanted to avoid re-creating them yet again from scratch in code.

By using this library we were able to simply embed our existing screens into a custom navigation controller (`SWRevealViewController`) in storyboards with very little additional code writing.

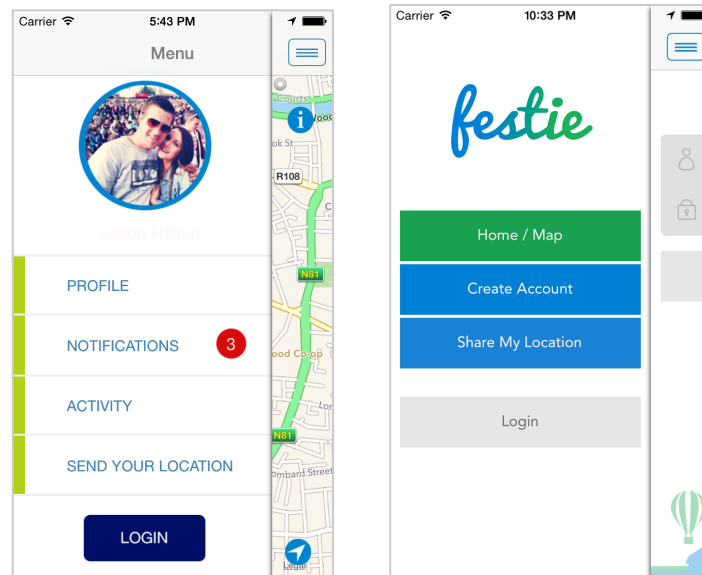


Figure 5-38 Iterations of Menu Screens (15 Oct; 7 Dec)

Notifications

We used notifications²⁶ on a number of occasions to pass information between different parts of the app—usually when we needed to send data from a background thread to the main thread without having to wait for the background thread to finish executing first.

²⁶ In iOS **notifications** are objects that can carry some data and can be broadcast from one object to multiple receivers. The receivers can then read the attached data when they receive the notification.

For example, in our `runEventsQuery`²⁷ method in `Event.m` we post a notification from `Event.m` (the sender) to two receivers—`MapViewController.m` (the home screen) and `AppDelegate.m` (acting as the singleton), passing them the event name the user has chosen when presented with the list of detected events (Figure 5-39). The two receivers then use the name passed to them to query the server and to import all the *Note*, *User*, *Comment*, and *Marker* objects for that particular event in the singleton, as well as to display all relevant data for the event on the map.

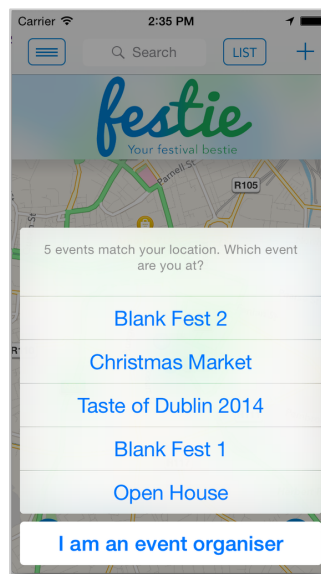


Figure 5-39 Notifying users of events in their vicinity

Custom Tags (requirement 18)

Our app gives the user the opportunity to label their notes using tags, which makes it easy to filter the information later on when browsing an event. Users can choose tags from a pre-defined list of default tags²⁸, or create their own custom tags. Custom tags, once created become visible to all users at the event.

²⁷ The `runEventsQuery` method queries the server for events within the user's current location and presents him/her with a list of detected events to choose from.

²⁸ We derived the **Default Tags** list (Food, Drink, Delays, Lost & Found, Queues, Parking, Tickets) from a combination of user research (3.4.1) and competitor research (4.3.1).

This feature works by having the array of default tags hardcoded in the client-side code, while the array of custom tags is imported from the server at the time the user confirms what event they are at. Every time a user creates a new custom tag, it first gets added to the array of custom tags for that event in the database, and after that the updated array is imported once again and the user interface is updated with the new data.

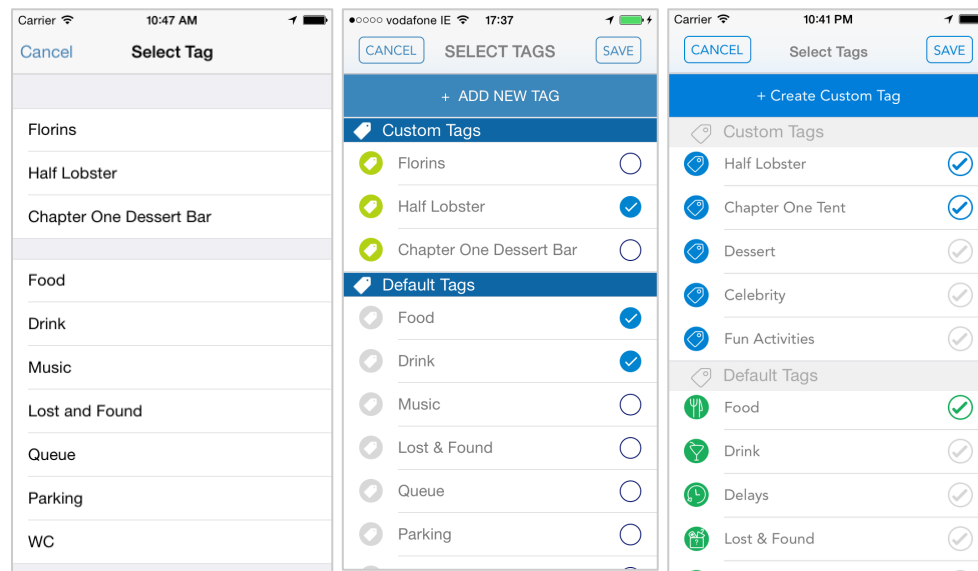


Figure 5-40 Iteration of *Select Tag* screens (6 Oct; 1 Nov; 7 Dec)

Iterations from user testing—Select Tags (6.7):

Formal Test 3: At this test users had trouble seeing the Add New Tag button. The reason for this was that the button was light grey so they thought it was just a header. To rectify this we made the button colour more prominent (blue) and added a ‘+’ in the button name to make the functionality of the button even more obvious. The following tests indicated that this was adequately handled.

***Custom Map* (requirement 21)**

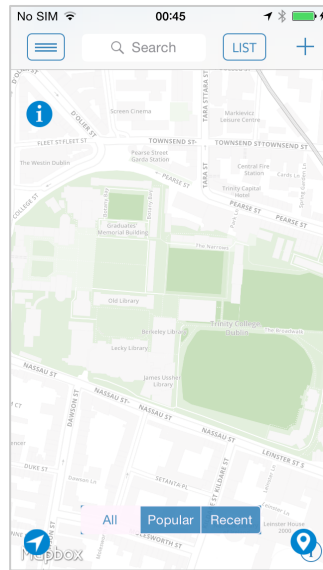


Figure 5-41 Implemented *Custom Map* screen

Next we investigated the possibility of customising the map but it turned out that Apple doesn't support customisation of their map features. Instead a third-party library, MapBox's MBXMapKit, allowed us to add some basic customisation by using their online map editor.

However, integrating this map into our app was not as straightforward as we hoped causing some of our custom notes to disappear underneath the layer of custom map tiles. Furthermore, this library added additional 24MB to the overall size of the app, which at the time was measuring at just 5MB in size.

After some failed attempts to debug the notes issue, it was time for a judgement call—we needed to decide which was the more valuable feature to us—the custom map or the custom notes—and focus on it only.

Even though it was hard to let go of the custom map after spending considerable effort on it, this was actually an easy decision to make, as the custom notes were really the essence of our app concept. The custom map was pushed way down our priority list—to be implemented in the future.

Custom Notes (requirement 8a)

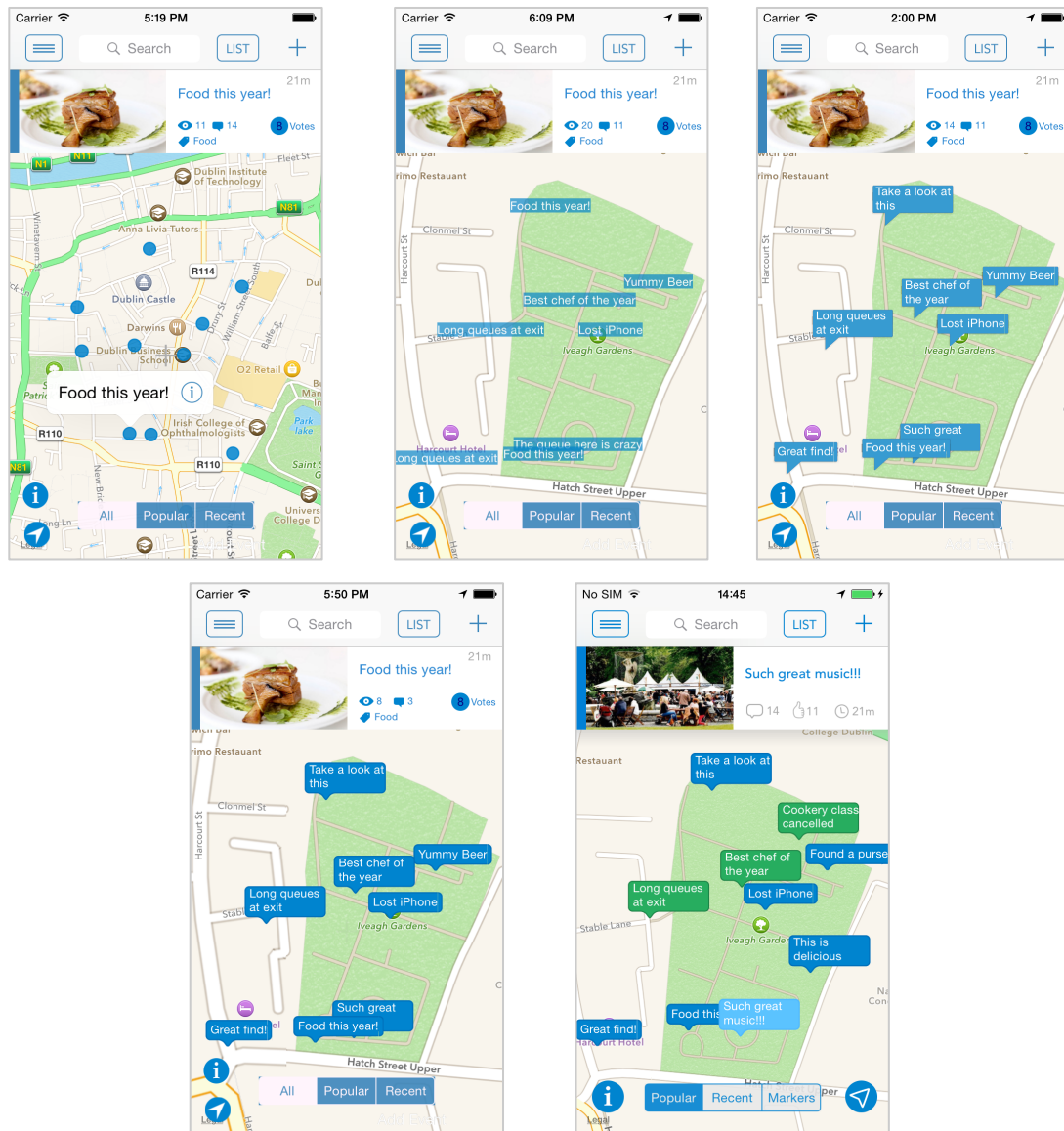


Figure 5-42 Iterations of *Custom Notes* (27 Oct; 1 Nov; 10 Nov; 16 Nov; 26 Nov)

Creating custom notes was of paramount importance for the overall success of our project. We knew what we wanted to achieve (Figure 2-1) was possible because the Airbnb app had done something very similar (Figure 4-7). However, what we couldn't know in advance was whether it was possible for *us* to implement it given our inexperience with iOS and app development in general.

Our first step in customising the notes involved simply using a custom image, a blue dot, instead of Apple's default red pin. Even though this looked better and might have served as an acceptable compromise in the end, it was only a stepping-stone to truly customising the notes.

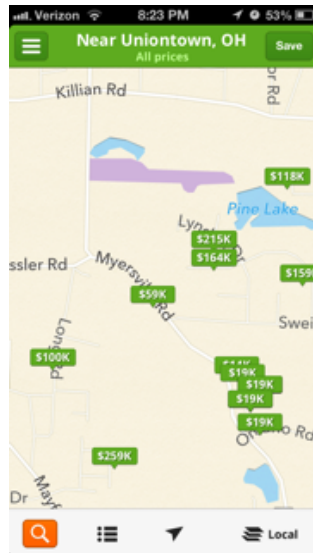


Figure 5-43 Trulia App

After a lot of research and not much success, in mid-November we finally came across a second app—Trulia (Figure 5-43) that used the same approach for their custom notes as the Airbnb app. Further research on this app led us to a Stack Overflow post suggesting how the custom notes might have been implemented. That said, the “explanation” was rather terse and cryptic²⁹ and required considerable further effort on our side to devise a way to implement it in code.

Eventually we managed to make our custom notes display in the exact same way as we planned originally. This was a pivotal development in the overall process and a proud moment for us.

At a high level, our custom notes are implemented as follows:

In the `viewForAnnotation` method in `MapViewController.m` we first use the note’s title text to calculate the size of its bounding box. If the text is shorter than 83 pixels we draw it on one line, and if it’s longer than 83 pixels we draw it on two lines.

Then we create a resizable image, the same size as the bounding box size with a bit of padding added to all four sides.

²⁹ “So render your dynamic text into a dynamic image. e.g. calculate your text, turn it into a string. Draw that string into an image, use that image. – Craig” (Craig, 2013).

Finally we draw the text on top of the resized image and pass the resulting image to the `viewForAnnotation` method to be drawn on the map.

The way resizable images work in iOS is rather brilliant. Here is a short explanation:

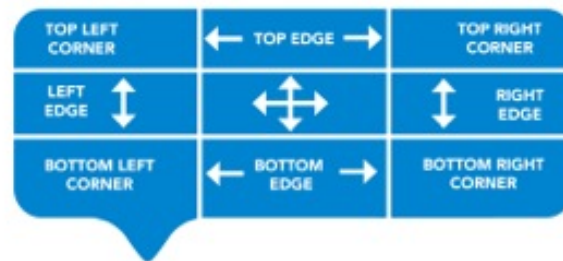


Figure 5-44 Our nine part resizable image for *Custom Notes*

In order to be able to dynamically resize your image you need to use what Apple calls a *nine-part image* (See the nine-part image we created for our custom note in Figure 5-44). The nine-part image can be easily resized both vertically and horizontally to any size you wish by keeping the corners unchanged and resizing all the other parts in the directions shown. In our case this meant that as long as we kept the note's arrow in the bottom left corner the notes would be stretched correctly to their dynamically calculated sizes without any distortions.

Iterations from user testing—Custom Notes (6.7):

Formal Test 3: At this test it became apparent that some users couldn't distinguish between a selected note and all the other unselected notes, as well as between organiser and attendee notes. By increasing the contrast between green and blue, and also the saturation and brightness of the light (selected) and dark notes (unselected).

Prevent Overlapping of Notes (requirement 8b)

In terms of preventing the notes from overlapping when zooming in and out on the map, we decided the best way to do this is the way the Airbnb app does it, i.e. instead of trying to show all notes at once, which Apple advises against in their documentation (Apple, 2014), to show only higher ranking non-overlapping notes.

We implemented this functionality as part of the `filterAnnotations` method in `MapViewController.m`.

```
// prevent overlapping of annotations
-(void)filterAnnotations:(NSArray *)notesToFilter
{
    // constants to help calculate proximity of annotations at different zoom levels
    float scaleFactorLatitude = self.mapView.frame.size.width / 100;
    float scaleFactorLongitude = self.mapView.frame.size.height / 30;

    float latDelta = self.mapView.region.span.latitudeDelta / scaleFactorLatitude;
    float longDelta = self.mapView.region.span.longitudeDelta / scaleFactorLongitude;

    // array of notes to show at current zoom level
    NSMutableArray *notesToShow=[[NSMutableArray alloc] initWithCapacity:0];

    // for each annotation
    for (id<MKAnnotation> annotation in notesToFilter)
    {
        // get annotation coordinates
        CLLocationCoordinateDegrees latitude = annotation.coordinate.latitude;
        CLLocationCoordinateDegrees longitude = annotation.coordinate.longitude;

        BOOL found = NO;
        for (Note *tempPlacemark in notesToShow) {
            if (fabs(tempPlacemark.coordinate.latitude - latitude) < latDelta &&
                fabs(tempPlacemark.coordinate.longitude - longitude) < longDelta)
            {
                if ([self.mapView.annotations containsObject:annotation]) {
                    [self.mapView removeAnnotation:annotation];
                }
                found = YES;
            }
        }
        if (found == NO)
        {
            [notesToShow addObject:annotation];
            [self.mapView addAnnotation:annotation];
        }
    }
}
```

Figure 5-45 Code snippet from `filterAnnotations` method

At a high level this functionality works as follows:

We pass to the `filterAnnotations` method an array of *Note* objects, sorted either by popularity or most recent (See the `refreshAnnotations` method in requirement 6 above).

The `FilterAnnotations` method places the highest-ranking note on the map first, and then before adding the second highest-ranking note it checks if it is on the same area on the map as the first one. If it is not it adds it to the map view. This process is repeated for every *Note* object placed on map.

When the zoom level or the visible region of the map changes `filterAnnotations` is called again and the notes layout is re-calculated. We had

some concerns about these repeated overlap checks causing a slowdown in the app as notes were rendered but our fears proved unfounded.

Iterations from user testing—Overlapping Notes (6.7):

Formal Test 1: The users complained about the overlapping of pins from the beginning, however preventing it was a major feature we were scheduled to implement at later iterations anyway. The results from Formal Test 3 (after its implementation) indicate that 100% of the users were satisfied with how this issue was handled.

Horizontal Scrolling Feature (requirement 16)

The *Horizontal Scrolling Feature* displays further detail about the currently selected note on the map (Figure 5-46). The user can either tap on a note on the map to display the corresponding note in the *Horizontal Scrolling Feature*, or browse the notes one by one by scrolling left and right on the *Horizontal Scrolling Feature*.

We implemented this feature by using a collection view with just a single row, and by switching the flow layout direction to horizontal. By doing this we made the collection view behave like a table view, but horizontally.

The trickiest part of implementing this feature was the coordination between the collection view and the map view and making sure that tapping on a note on the map displays the correct note in the collection view, and swiping a note in collection view highlights the correct note on the map.

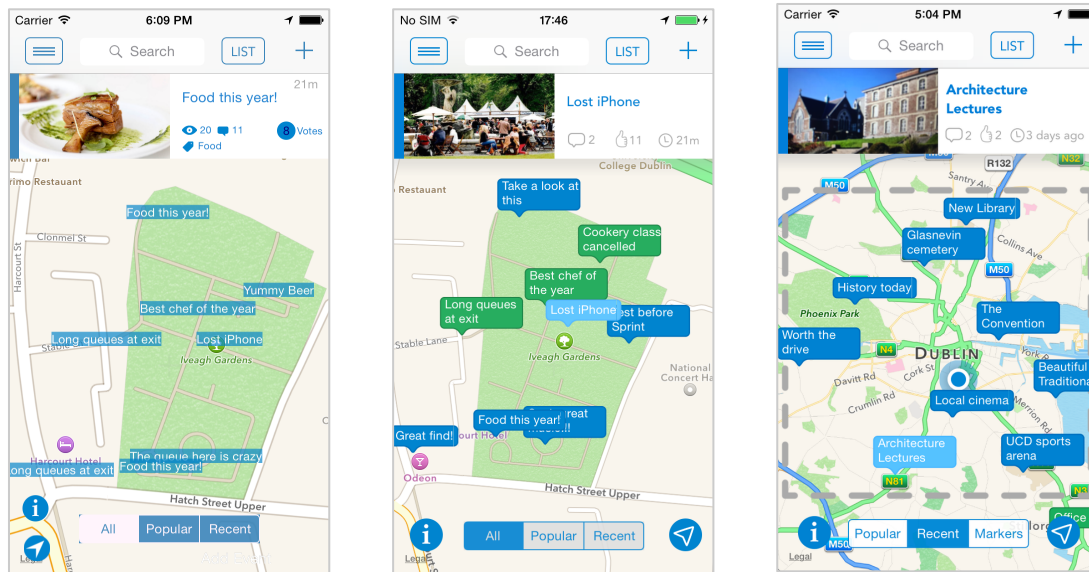


Figure 5-46 Horizontal scrolling feature iterations (7 Nov; 23 Nov; 10 Dec)

Iterations from user testing—Overlapping Notes (6.7):

Formal Test 3: Here users had the same issues with the small elements and with how busy the screen looked as with View a Note and List View. We addressed this in the same manner we addressed the other two features.

Another issue that was uncovered at this testing session was that the Scroller sometimes froze once the user reached the last note. This problem was not manifesting itself during debugging and proved hard to trace and fix. In the end the issue was found—it was due to inconsistency between the number of annotation objects in the map view and in the collection view and it only happened when the pulsating blue circle (user location) was visible on the map. The map view counted it as an additional annotation object, while the collection view didn't. Once it became clear where the problem was coming from, this was quickly fixed, and on the next test testing iteration we received more favourable feedback from users regarding the Horizontal Scroller.

Detect Events within User's Location (requirement 15)

At app launch, once the user's location is detected, this feature queries the server for events within that location through the `queryRegionForEvents` and the `runEventsQuery` methods in `Event.m`. When it receives a response back from the

server, it presents the name of the detected event or events (if more than one event is detected) to the user to choose from.

While we briefly discussed how the `runEventsQuery` method works in the *Notifications* paragraph and in footnote 27, here we will explain what the `queryRegionForEvents` method does.

```

- (void) queryRegionForEvents:(MKCoordinateRegion)region
{
    CLLocationDegrees x0 = region.center.longitude - region.span.longitudeDelta;
    CLLocationDegrees x1 = region.center.longitude + region.span.longitudeDelta;
    CLLocationDegrees y0 = region.center.latitude - region.span.latitudeDelta;
    CLLocationDegrees y1 = region.center.latitude + region.span.latitudeDelta;

    NSString* polygonQuery = [NSString stringWithFormat:@"{\"$geoIntersects\":{\"$geometry\":{\"type\":\"
        \"Polygon\",\"coordinates\":[[[%f,%f],[%f,%f],[%f,%f],[%f,%f]]}}}", x0, y0, x1, y0,
        x1, y1, x0, y1, x0, y0];
    NSString* locationInBox = [NSString stringWithFormat:@"{\"location\":%@", polygonQuery];
    NSString* escBox = (NSString *)CFBridgingRelease(CFURLCreateStringByAddingPercentEscapes(NULL,
        (CFStringRef) locationInBox, NULL, (CFStringRef) @"!*();:@&+$/,/?%#[]{}", kCFStringEncodingUTF8)
    );
    NSString* query = [NSString stringWithFormat:@"?query=%@", escBox];

    [self runEventsQuery:query];
}

```

Figure 5-47 QueryRegionForEvents method

```
db.events.find({location:
  { $geoIntersects:
    { $geometry:
      { type: "Polygon",
        coordinates: [[[-6.282584, 53.323015], [-6.249556, 53.323015], [-6.249556,
          53.354075], [-6.282584, 53.354075], [-6.282584, 53.323015]]]]
      }
    }
  }
})
```

Figure 5-48 Example of a query sent to Mongo

- First, it calculates the map coordinates of two opposite corners of the visible map area displayed on the screen (Figure 5-49);

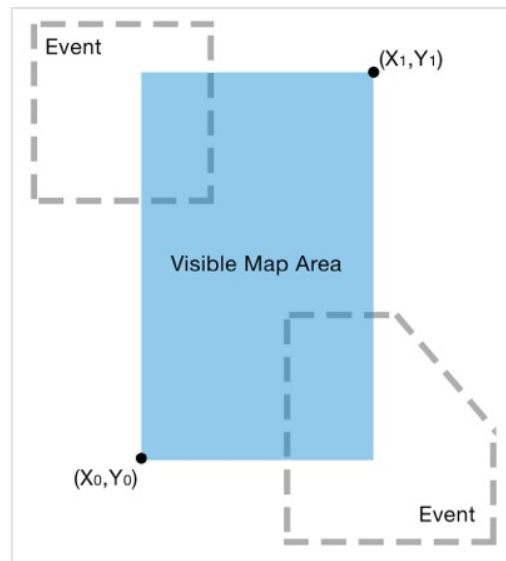


Figure 5-49 Diagram of multiple event detection

- Second, it defines a JSON structure for the query using MongoDB's specific query language. A query with a \$geoIntersects key specifies the search criteria as all the geometries that intersect with the defined GeoJSON geometry. \$geometry specifies the polygon defined by the provided coordinates and supplied as an array of longitude-latitude pairs at opposite corners.
- Third, it sets a query string to query the server.
- Finally, it passes the query string to the **runEventsQuery** method.

Post/Edit—Organiser (requirement 9)

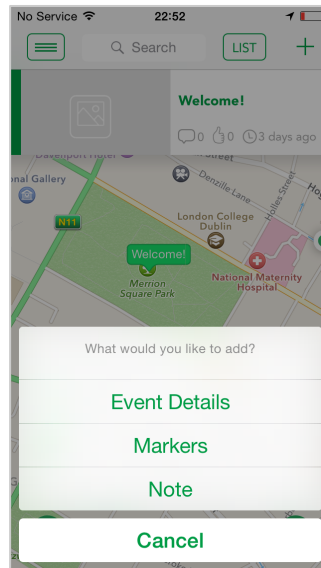


Figure 5-50 Post (organiser)

The organiser user can post three types of information:

- 1) A **Note**;
- 2) **General information** about the event, the functionality for which includes the *Event Boundary Selection Tool*;
- 3) **Markers** to indicate the location of important facilities (toilets, exits etc.);

The way organisers can use Festie works as follows:

If an event organiser wants to be set up to use Festie, they need to contact us first so that we can create a verified account for them.

Next, we create a username and password for that organiser, where their username matches the name of the event, and we also create a ‘Welcome’ note on the map at the approximate location of the event so that the map conveniently zooms into the area of the event once they login, allowing them to start the process of adding information.

The organiser can add content in the same manner an attendee user adds a note—by pressing the ‘+’ button. When the organiser user presses the ‘+’ button they are presented with a choice of things to do. We have arranged these options in the order in which we think they should be added. However, we are not forcing the organiser to follow this exact order as it might be the case they don’t have the relevant information

available yet. Once an organiser has added event details or markers to their event, these options will disappear from the list of choices.

Post Note (Organiser)

The functionality is the same as *Post a Note* for an attendee user.

Post General Information (Organiser)

The screenshot shows a mobile application interface for posting general information for an event. The status bar at the top indicates 'No Service', the time '22:53', and a battery level. The interface has a 'CANCEL' button on the top left and a 'SAVE' button on the top right. The main content area is a form with a vertical list of fields, each with an icon on the left and a text input field on the right. The fields are: 'Blank Fest 2' (with a 'T' icon), 'Event Description' (with a pencil icon), 'Add Image (Landscape only)' (with a paperclip icon), 'Starts' (with a calendar icon), 'Ends' (with a calendar icon), 'Ticket Info (URL)' (with a ticket icon), and 'Website (URL)' (with a globe icon).

Figure 5-51 *Post General Information* Screen

This feature really just mimics the *Add Note* functionality. The only new aspect to it is the use of the `UIDatePicker` class to allow the organiser user to select a date and time for their event.

Event Boundary Selection Tool (requirement 17)

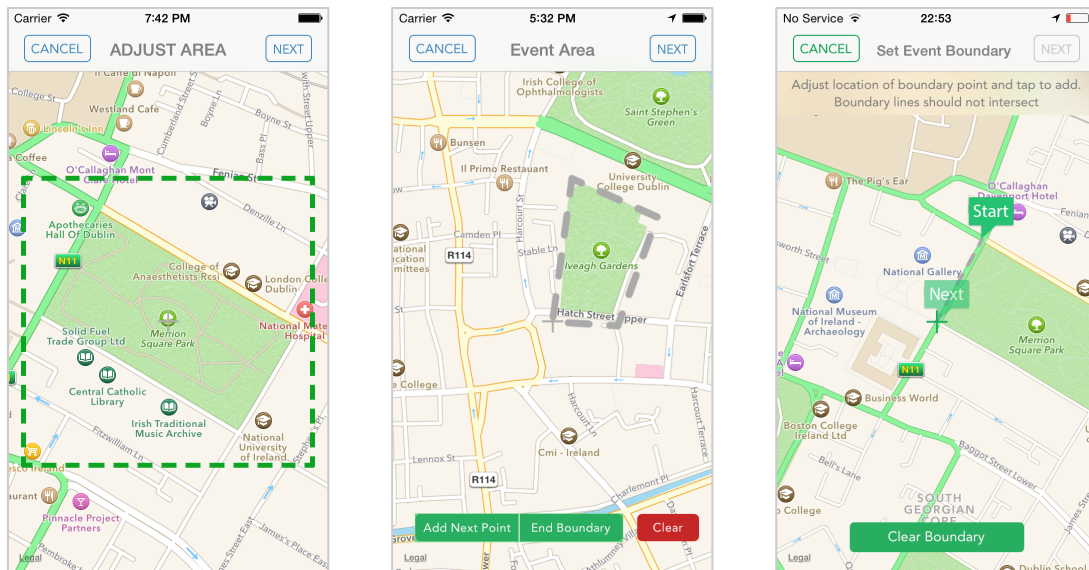


Figure 5-52 Iterations of Creating an Event Boundary (28 Oct; 11 Nov; 7 Dec)

The Event Boundary Selection Tool draws a boundary for the event and saves it in the database. This feature underwent a few iterations. We first implemented it using a square within which the organiser could adjust the position of their event. However, later on we created a more sophisticated version, which allows the organiser to create a polygon of the exact boundary of the event by tapping on successive points to outline the boundary of the event.

Two methods are used: `drawDashedLine`, which draws a polyline between each selected point (see more about how polylines are drawn on in iOS in the paragraph ***Display Event Boundary on the Map***) and `addNextPoint`, which draws an annotation on the map every time the user taps on the translucent ‘Next’ annotation and saves the coordinates of this annotation to an array which eventually is saved in the database once the user presses the *Save* button.

Iterations from user testing—Event Boundary Tool (6.7):

Formal Test 3: For this build we had three buttons at the bottom of the screen for the testers to use to Add Next Point, End Boundary, or Clear the boundary (to start all over again). Using these in conjunction with the Next Marker in the centre of the screen confused the testers and they had to clear multiple times before managing to create a boundary. This issue was addressed before the next test by removing the Add

Next Point and End Boundary buttons and instead making the Marker in the centre change its name from Start to Next, to End at the appropriate times.

Formal Test 4: This test indicated better results in terms of the boundary tool usability and the majority of the users had no issue creating a boundary.

Some users now became confused between the Next marker button on the map and the Next navigation button on the navigation bar and kept pressing the later without closing the boundary—this was addressed before the final deadline by deactivating the Next button until the boundary had been completed.

Final Test: As discussed in the testing chapter, at the final testing session a couple of users still had difficulty using the boundary tool (23%). However, we are still satisfied with how this feature functions, especially since we have provided the user with means to recover from their mistakes (the Clear Boundary button). We will attempt to improve its usability for future builds.

Add Markers/ View Markers

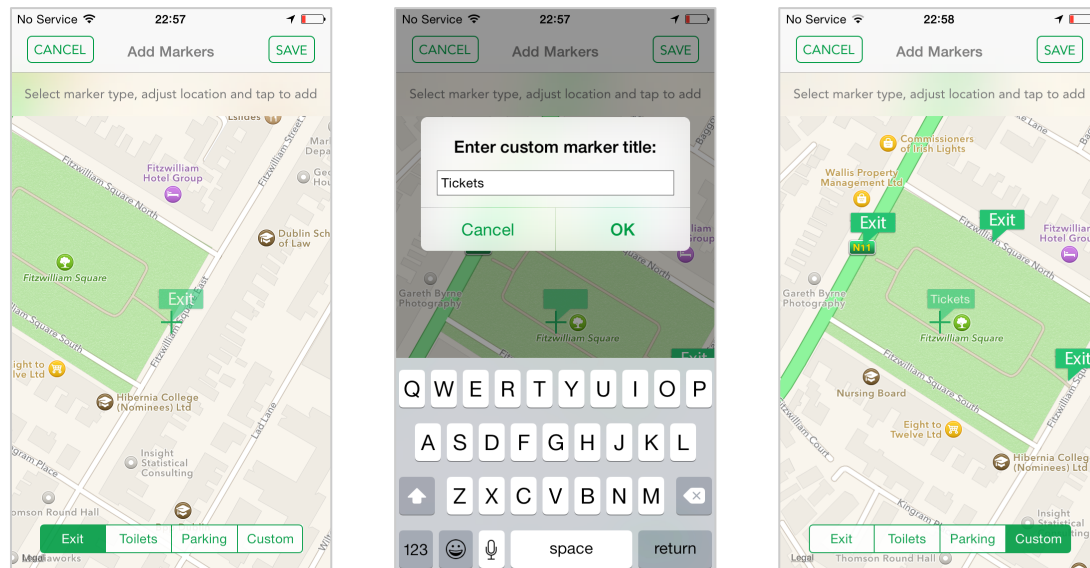


Figure 5-53 Add Markers screen

The *Add Markers* functionality works in a similar way to the *Event Boundary Selection Tool* by letting the organiser tap on annotations on the map to save them into an array of *Marker* objects, which at the press of the *Save* button get sent to the database. The difference is that the organiser here has a choice of three default

markers—Exit, Toilets and Parking, as well as the opportunity to create a custom marker where he/she could use any name for the marker he/she wants.

Display Event Boundary on the Map (requirement 19)

To draw the event boundary on the map we used map overlays and polylines.

In our `drawBoundaryLine` method in `MapViewController.m` we first create a polyline object from the array of boundary coordinates we fetch from the server for a particular event, then we pass this polyline object to a polyline renderer which tells the map where to draw the boundary on the map.

‘Share My Location’ Feature (requirement 13)

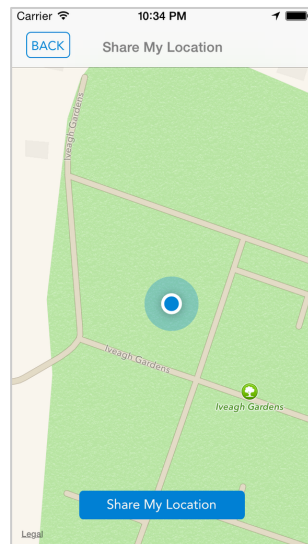


Figure 5-54 *Share My Location* screen

The *‘Share My Location’ Feature* lets you send your location to a friend to let them know where you are in the crowd, and gives you the choice to do this via a SMS message, email, or through Facebook, Twitter or other social media (if these apps are installed on your phone).

This functionality, implemented in our `shareLocation` method in `SendLocationViewController.m`, works as follows:

Once the user's location is detected and displayed on the map, the user can share it by pressing the *Share My Location* button. This signals the `shareLocation` method to capture a screenshot of the current screen view, then crop it into a landscape image and finally present the user with options for sharing it, through the built-in `UIActivityViewController` class.

Create Account (requirement 5)

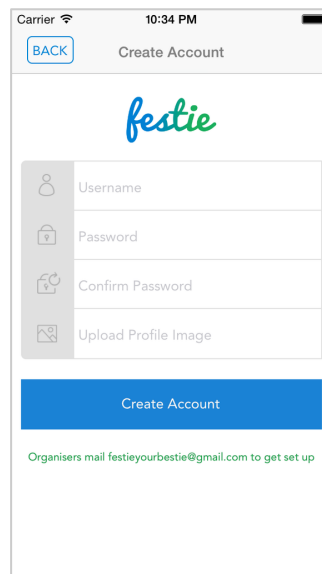


Figure 5-55 *Create Account* Screen

We won't delve into much detail here as this is similar in functionality to the *Login* feature.

General Info Screen (requirement 14)



Figure 5-56 General Information Screen

The *General Info Screen* is accessed via the blue circular 'i' button in the lower left corner of the home screen, and displays information about the current event, such as its name, image, opening time, short description, and links to the event's website and ticket info.

Show User Location (requirement 24)

The *Show User Location* functionality is accessed via the blue circular 'arrow' button in the lower right corner of the home screen. When pressed this button centres the map on the current location of the user. This feature is useful whenever the user has wandered off their current location while browsing the event and need to quickly go back to viewing what's happening in their immediate vicinity.

Organiser Login Workflow

Because the organiser functionality was left to be implemented at the end, it was only in the last week before submission that we started implementing the organiser login workflow properly. Even though we had designed a navigation chart (Figure 5-3) and had the workflow tested through a mock-up prototype in inVision, implementing this functionality in the exact way it was designed originally proved problematic.

The reason for this was that the organiser login was meant to happen at launch as one of the options among the list of detected events that was presented to the user to choose from when they open the app for the first time.

What we wanted to happen at this moment was for attendee users to choose an event and start browsing notes immediately without going through the trouble to sign-in (this worked fine), and for organiser users to choose the *I am an organiser* button, which will open the login screen for them so that they can sign in immediately.

Due to the fact that the detection of events functionality was implemented as a background thread in the Model (Event.m), it became apparent to us (after a lot of headache) that there was no way to trigger a segue to the login screen from a background thread in the Model, as segues are only possible between View Controllers. This meant that we had to think of a compromise (7.2.2).

The attempts to fix this issue cost us a few days of precious time in the very last week before submission but in the end all we could do was to have two consecutive alerts prompting the user to first press the ‘+’ button and then when another alert appear to opt to log in. This was very far from ideal solution and its inadequacy was reflected by user testing (6.8.2)

5.5 Conclusion

In this chapter we first looked at our design process through four main sub-sections. We initially talked about the creation of a structure for our app by combining interaction design and information architecture. Following this we looked at how we created our interface and navigation design, after which we discussed the creation of screen layouts (wireframes), which led to the visual design. Finally, we briefly discussed the creation of our data model.

In the next section, we discussed how we evaluated our design and planned for the implementation phase, by outlining a work schedule, discussing what tools, techniques and technologies we were planning to use and finally noting the risks, which we would be taking through the next phase.

We concluded Chapter 5 Methodology and Approach by looking at how the artefact was created through a combination of content production and code development.

Throughout the development stage we consistently obtained feedback from testers to help mould the application to completion. In Chapter 6 Testing and Analysis we will look at both informal and formal testing methodology used and critically analyse these results from user testing.

Chapter 6 Testing and Analysis

6.1 Introduction

After discussing design, planning and implementation in the previous Chapter Methodology and Approach, in Chapter 6 Testing and Analysis we will look at how formal and informal testing was conducted for our application.

We will begin by briefly talking about paper and digital mock-up prototyping, as well as testing through social media, which helped us acquire feedback on design. We will continue by discussing feedback we received on site at a number of festivals, followed by usability tests we conducted throughout development. We will analyse the testing results and explain how user testing during design and development helped us make decisions to improve the application.

Finally, we will conclude the chapter by critically analysing the results from our final tests, which included remote testing through Testflight, organiser trials and attendee trial at St. Stephen's Green Christmas Market.

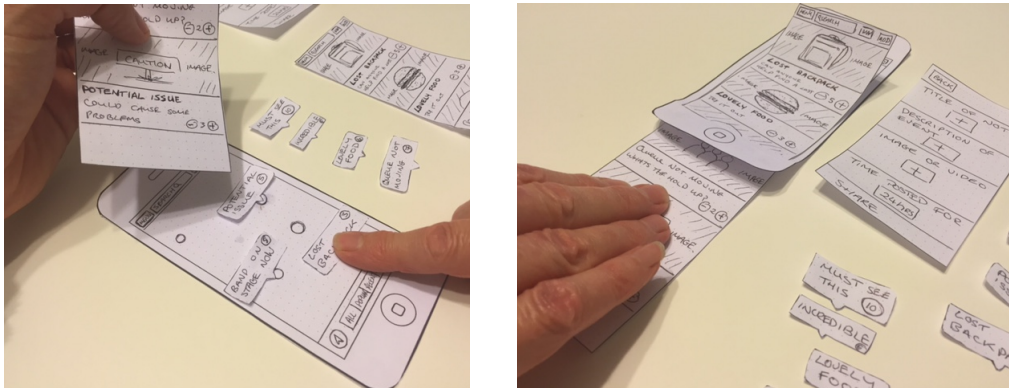
6.2 Testing Outline

The below table shows at what phases we tested, what the type of test was conducted and what we were testing for:

Stage	Type	Feedback
Design	Paper Prototyping	Initial idea feedback and structure
Design	Mock Prototyping on Device	Visuals, UI, layout, structure
Design	Testing through Social Media	Visuals, UI
Design / Implementation	Testing Onsite: Open House Festival	Survey/locationing/early functionality - Informal
Implementation	Development/Usability Testing -1	Key functionality (Attendee)
Implementation	Development/Usability Testing -2	Key functionality (Attendee)
Implementation	Testing Onsite: Wexford Opera Festival	Survey (Attendee) Functionality— informal
Implementation	Testing Onsite: Speigeltent Festival	Survey (Attendee) Functionality—informal
Implementation	Development /Usability Testing - 3	Visuals, UX, all functionality (Attendee/Organiser)
Implementation	Development /Usability Testing - 4	UX, all functionality (Attendee/Organiser)
Final Tests	Testflight	Survey/all functionality (Attendee)
Final Tests	Organiser Final Test	Survey/all functionality (Organiser)
Final Tests	Testing Onsite: Festival Stephens Green Christmas	Survey/all functionality (Attendee)

6.3 Prototyping

6.3.1 Paper Prototyping



Paper prototyping was a time-efficient way to get our concept in front of users and allow them to interact with the preliminary navigation system and UI content. This form of informal testing was beneficial in seeing if the initial use scenarios (See Section 4.5.1 User Scenario) were intuitive and worked well when all linked together.

We drafted one prototype and conducted informal tests to see how the app's workflow would be received. Users responded with positive feedback, as we had expected, due to previous paper iterations of previously similar concepts.

The feedback allowed us to rectify some of the UI placement, particularly for the Post a Note feature. Presented with several options, the users preferred the familiar form-like layout with a strip of icons to the left for the Add a Note screen, the design for which was inspired by the Pin Drop app (See Section 4.3 Competitors Analysis).

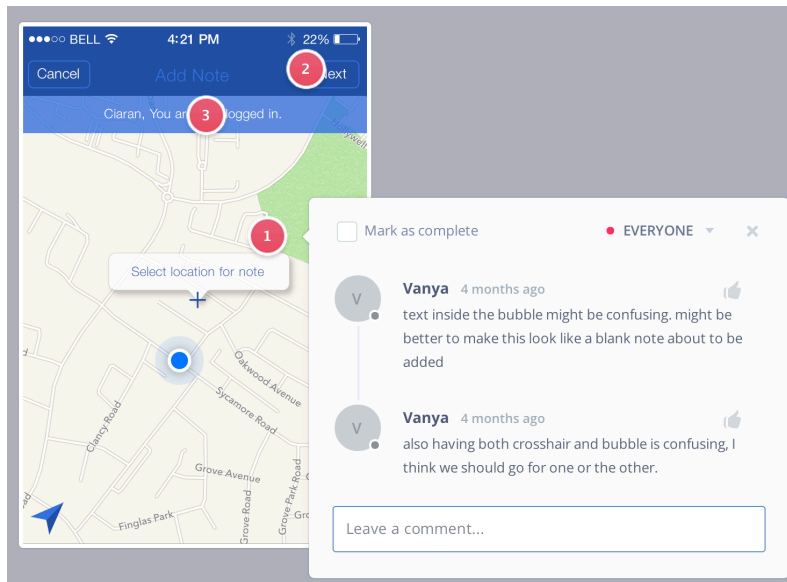
Although it was good to get our concept outlined on paper, it was difficult to portray core elements of our functionality effectively through this format, such as the sorting of notes as the user zooms in and out of the map.

We only used this form of testing to get early indication of whether our navigation system worked.

6.3.2 Digital Mock-ups

From paper prototyping we were quickly able to advance our idea and designs into digital mock-ups on our chosen device (See 5.2 for further details on Mock Ups).

By the end of the design stage we had iterated through three prototypes altogether. Initially we used Flinto, a prototyping tool, but as our prototypes developed and as we wanted to easily test and collaborate on design elements as well InVision became our number one choice for creating prototypes. This prototyping tool was much easier to collaborate on as a team and it was also easier to share with potential users for early feedback.



InVision proved immensely useful when testing different designs and visuals as they could be quickly created and produced through this medium.

In addition to informally testing with potential users face to face on the device, which was excellent for observing their thought process, we also sent surveys with a link to the latest prototype to both festival organisers and attendees.

Organisers:

At this stage we were in contact with three festival directors— Rebecca Kemp of The Rose Of Tralee Festival, Cillian Stewart of Castlepalooza Festival and Elizabeth

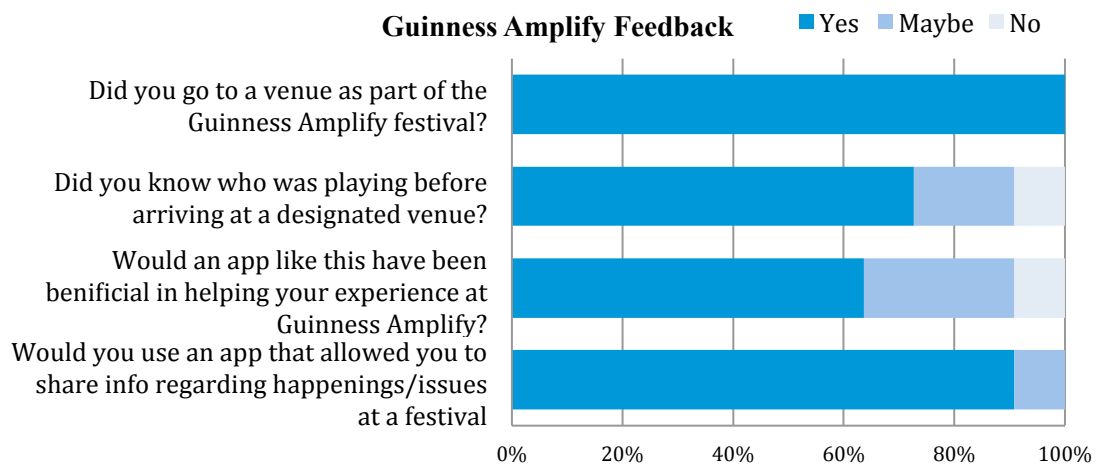
Whyte of Fringe Festival. All three gave us positive feedback based on the mock-ups and were willing to test a final version of the app:

“... we could provide this as an extra page on our own app”—Cillian Stewart, Castlepalooza Festival

“It would enhance our existing digital offering”— Rebecca Kemp, The Rose Of Tralee Festival

Attendees:

We sent another survey, including a mock-up prototype, to Guinness Amplify festival attendees; we had contacts that had attended the event and asked them to pass on the survey to others who had attended. We asked attendees to give us feedback from their experience at the festival as well as feedback on the prototype.



We received good feedback on both concept and design. 91% of people surveyed said they would use an app like this to share happenings at a festival. Here are some comments:

“The design is simple and looks easy use. Colour schemes are nice and appealing to the eye”

“Nice maybe a bit cold with white and blue, variation needed possibly. Just opinion though”

“Design seems very simple and looks like it could be used straight away by most people, which is a good thing.”

We looked to progress these designs through iteration. Feedback through prototyping proved vital in the development of our app. We found it particularly good for condensing our early workflows into a more manageable process that would easily link the attendee, the organiser, and the actual event.

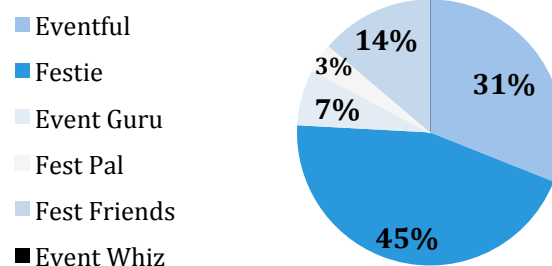
6.4 Testing through Social Media

When we began working on the app we set up accounts to provide social interaction between our team and potential users. Through the mediums of Twitter, Facebook and Instagram we were able to keep users up to date with our progress, as well as get constant feedback on (mostly) visual elements. A sample of results is outlined below:

App Name:

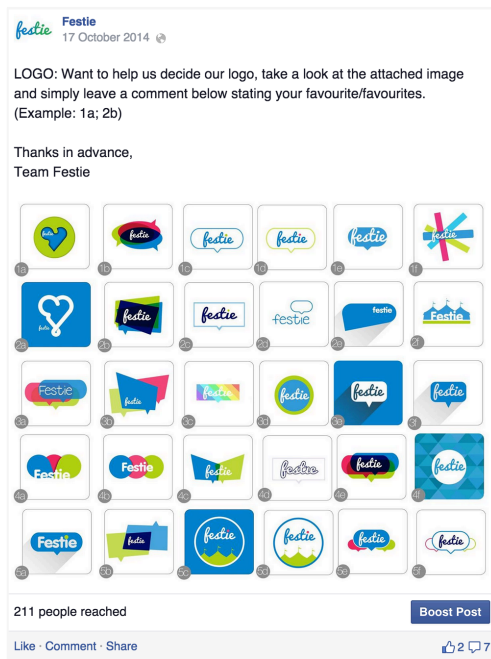
The app name was surveyed on three occasions due to our change in concept. Our final outcome Festie was decided following feedback from a Facebook survey (posted on the 10/09/14).

What do you think would be an appropriate name for such an app?



From here we developed our slogan, ‘Festie – your festival bestie’. We wanted to keep it relevant, simple, fun and memorable.

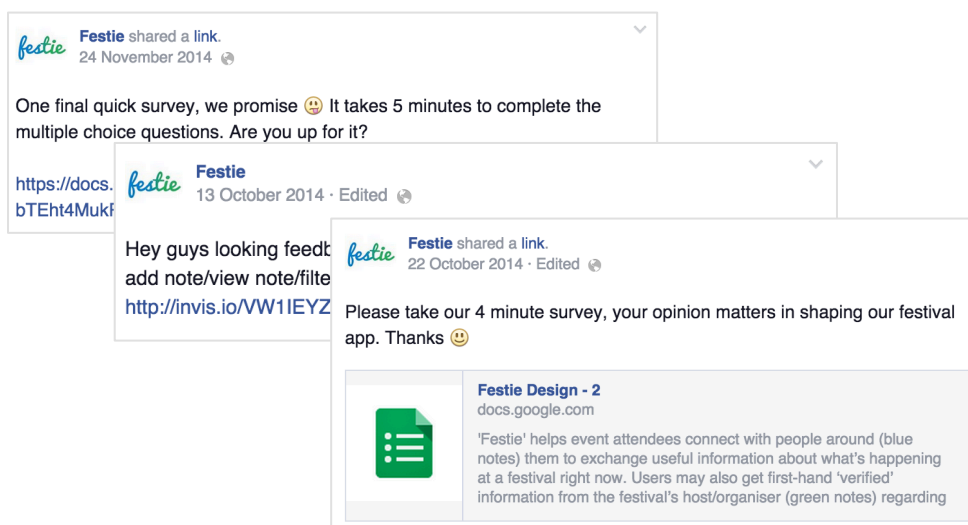
App Logo:



We could not decide on an app logo as a team and as a result we requested user feedback on a number of different designs on Facebook on 17/10/15. We used it as a base to formulate a final design (Appendix E).

Design Elements:

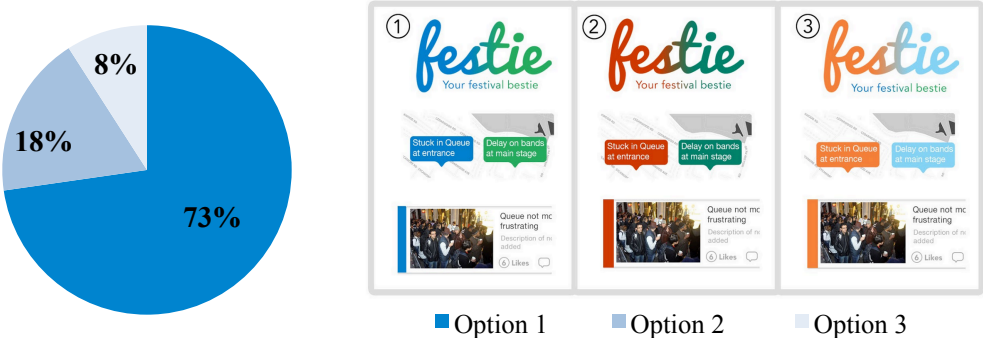
During the content production stage in order to quickly aid our decision-making process on various user interface aspects we requested user feedback on three occasions through Facebook surveys (posted on 22/10/14, 13/10/14 and 24/10/14).



Colour Scheme

We decided early on in the process that we would use a green and blue colour scheme. However, later on during usability testing a user highlighted their concern with the contrast between the two colours. We decided to create two alternative colour schemes and ask our followers which of the colour schemes worked best.

The organiser and attendees notes need to show contrast but also need to compliment each other, select the theme you think best achieves this.

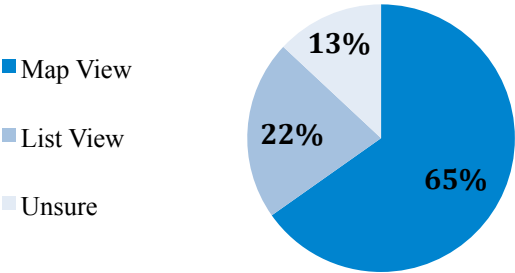


We were satisfied to see our initial scheme (73%) was preferred over the other two colour schemes, we decided against making any changes in this regard.

Map View vs. List View

We wanted to see user opinion on what they would prefer to actually view on the home screen, rather than presuming it was a Map View. We had noticed during competitor research that the Airbnb app used the alternative approach, where it offers users information through a list view first with the option to switch to a map view. (See Section 4.3.2 Current State of the Art)

Festie will have both but which would you rather search by while at a festival?

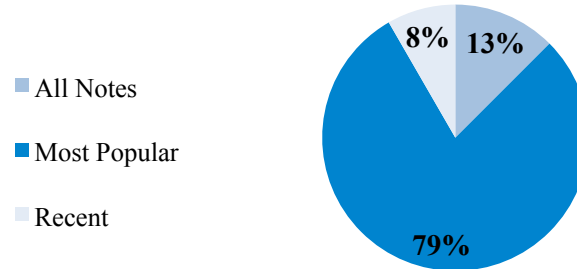


Although some users were unsure (13%), the majority preferred to use the map to view festival information. This was in line with our own initial design.

Default Filter of Notes on the Map

We wanted a greater range of opinion about what the user should see when they first enter an event on the map.

When you first open the app and see the festival you are attending, would you rather see?



79% answered 'most popular' in preference to 13% for 'recent' and 8% for 'all notes'. As a result we changed the buttons on the segmented control from All, Popular, Recent to Popular, Recent, Markers making Popular the default filter for when an event was loaded for the first time at launch of the app.

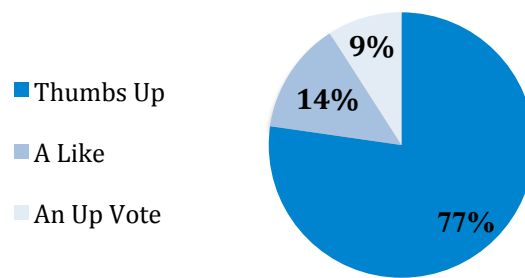
Voting Style

We initially wanted to use an 'up' and 'down' voting system, drawing inspiration from Reddit and other online forums. We thought this would be a good way for the crowd-sourced information to self-correct, as is famously the case with Reddit.

However, during informal conversations with users we were told that they might be discouraged to post notes if they were afraid that others might down-vote them—a Facebook-style 'Like' button would be better.

Personally, we were not keen on straight-out 'copying' such an iconic element that is the Facebook 'Like' button so we asked our users in what form would they like to give positive feedback to a note:

In Festie how would you like to give positive feedback on a note?



Thankfully, users strongly decided for the thumbs up, with 77% approving of this option. As a result we removed the down vote and implemented a thumbs up button instead.

Overall, feedback through social media had its good and bad sides. It was relatively easy to get a large amount of feedback in a short space of time but it was hard to formulate questions about an interactive piece of digital media through such static means. It was much easier to engage in face-to-face conversations with the person and explain what kind of feedback you are looking for using the app on the device.

Twitter was also used as social medium regarding our app this will be briefly discussed in the next section.

6.5 On-site Feedback

During implementation, as advised by the CDM team, we targeted specific festivals to gain insight directly from the users by showing them both prototypes and builds on the device, as well as having them fill in a survey. We used Twitter to attract the attention of attendees and organisers and to recruit some of the testers and we were retweeted by the Open House Festival and the Wexford Spiegeltent Festival.

We received feedback from six festivals throughout the whole process:

Electric Picnic (35 users tested)

We attended Electric Picnic in late August, right before the start of the implementation stage. During the three days of the festival we managed to get

feedback from a total of 35 users. Some of them were interviewed and observed using the mock-up prototype, while others were asked to fill in one survey during and one survey after the festival. At this point we were mostly looking for feedback on the features of the app. (3.4.1)

Guinness Amplify (11 users tested)

We did not attend this festival in person but sent a mock-up prototype through inVision and an online survey to people who had attended that week (See Device Prototyping in this chapter).

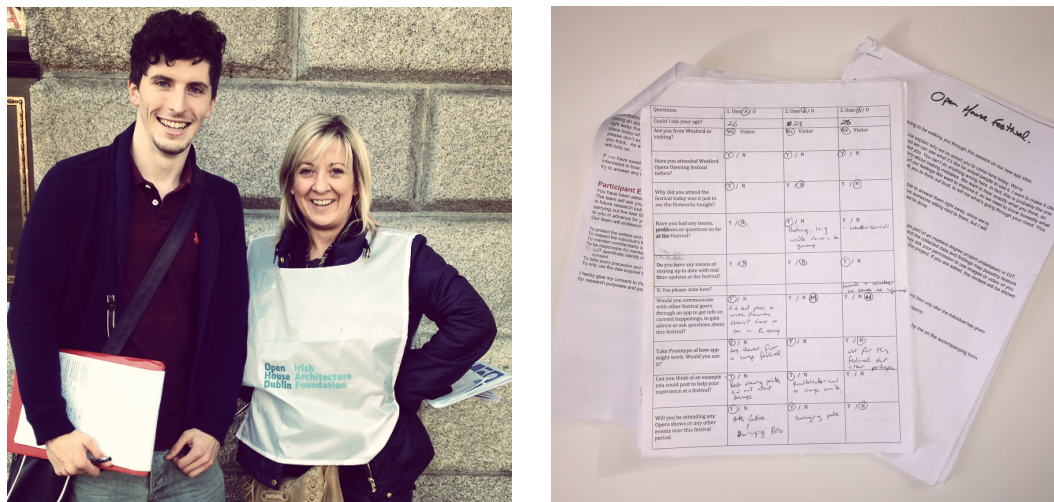
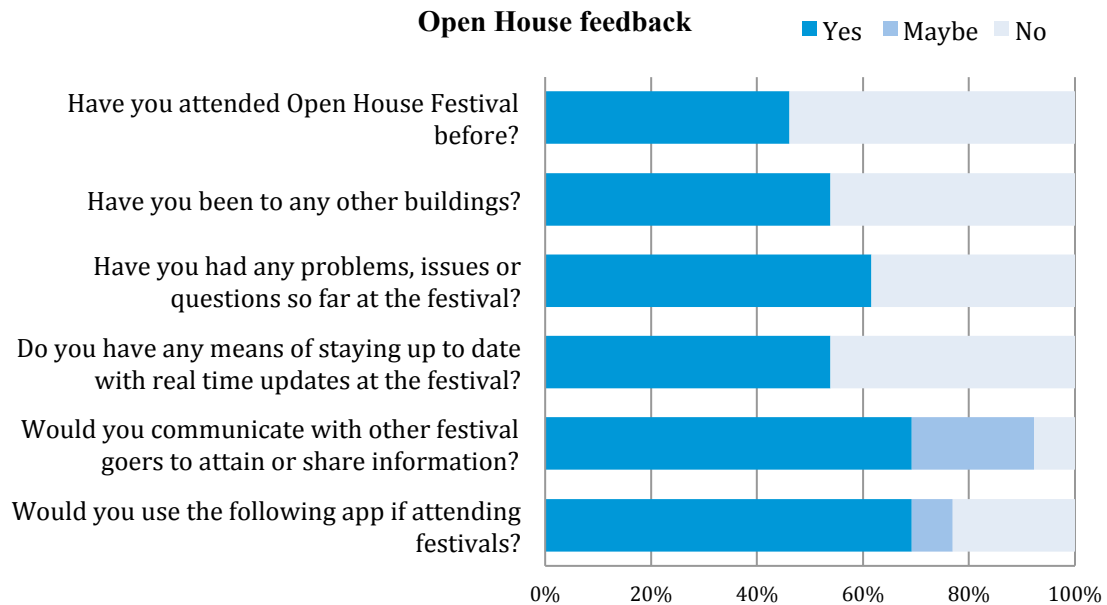


Figure-6-1 Volunteer providing feedback at Open House Festival and results taken from Wexford Opera and Open House festivals

Open House Festival (13 users tested)

At Open House we targeted more popular sites, such as Trinity College and GPO, where we knew people would be queuing for hours. This gave us the perfect opportunity to approach both attendees and organisers (Open House volunteers) for feedback. At this stage we wanted to know of any issues users were experiencing at the festival and whether they thought our app could address those issues. This was also a first opportunity to get our first build (featuring the Map, Post a Note and View a Note functionality) out and into the hands of users attending an actual festival. People were very engaging and provided good feedback.



People generally liked the concept, 69% stating they would use it at such a festival. Also results showed Twitter was the main source of staying up to date with real time festival events. 54% stated they didn't know of any means to stay updated at the event. 61% also reported about issues they were experiencing:

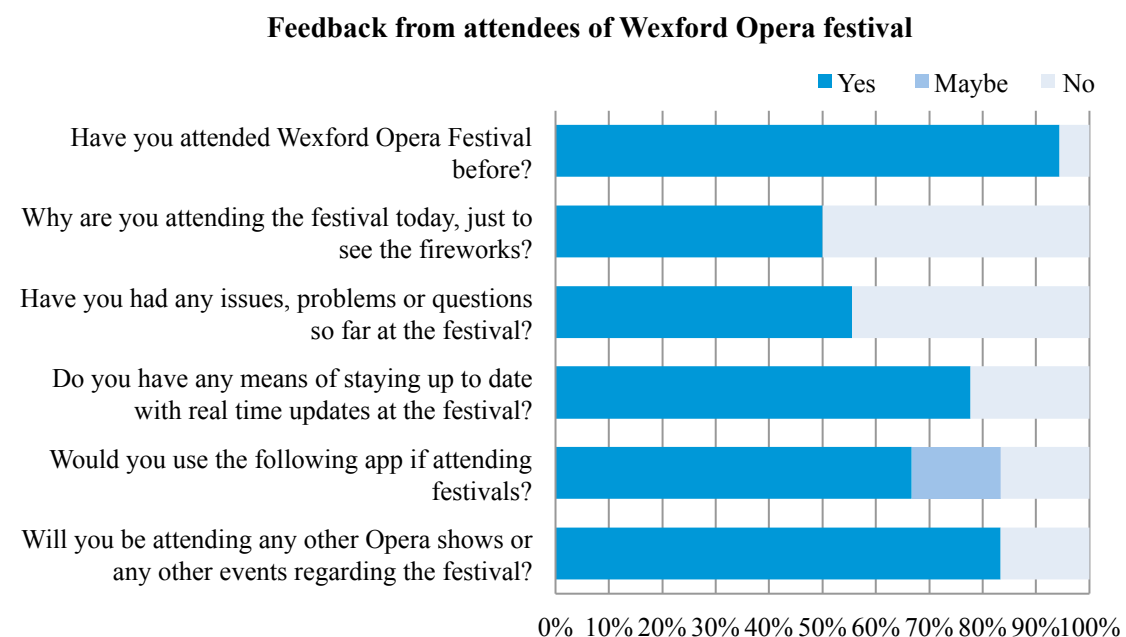
- Didn't know which buildings required booking in advance.
- It's difficult finding where certain buildings were on the paper event map
- Didn't know tour times or where tours were taking place
- Didn't know the length of tour queues at certain buildings
- Difficult finding routes to buildings
- Not actually knowing which buildings were involved in the Open House Festival
- The Open House website map was not very helpful in making informed decisions.
- Buildings far away, are they worth going to see?

All these examples confirmed insights we had from previous user research and later on informed our decision on what default tags to use for the Post a Note feature.

At Open House we also performed our first batch of locationing tests (6.6)

Wexford Opera Festival (17 users tested)—We attended the opening ceremony of this event on the Quay in Wexford Town so that we could easily find users to survey

as they stood around before the fireworks display. Again, people were engaging and willing to answer our questions and to take a look at the app.



More positive feedback on our concept was witnessed at this festival, with 83% stating they would use the app. We wondered whether this was due to the nature of the event which was more compact compared to Open House (which spanned the whole city of Dublin. The app was demonstrated rather than tested by the users as we were in the middle of resolving bugs introduced with the incorporation of the feature in the app earlier in the week. The majority of users (78%) had updates through the intercom and this is reflected in the statistics above.

Here are examples of issues attendees were experiencing at this festival:

- Where were the best places to view fireworks from
- Advice on exhibits taking place around town
- Road blocks/traffic issues
- Nearby venues, best pubs and restaurants
- Parking issues
- Updates on delays

Once again this information helped us decide on common issues that are likely to occur at all types of festivals in order to decide on the default tags for the Post a Note

feature. We wanted to keep the number of default tags to a minimum and relevant, as users would also have the option of adding a custom tags.

Wexford Spiegeltent Festival (8 users tested) – Attendee Features / Location Testing

This wasn't the best festival to test at as it was in a small indoor venue with only one main activity. However it was a good opportunity for us to conduct some locationing testing at an indoor venue.

In terms of user feedback we only informally tested with a number of colleagues and people known to us at the venue. Feedback wasn't as detailed and beneficial, as we had hoped. One user shared their opinion confirming our thoughts on the use of the app at indoor venues:

“Great idea for large festivals, not sure for Spiegeltent as it is such a small venue”.

Based on this experience and the feedback received we decided to not pursue the iBeacons idea (4.4)

St. Stephen's Green Christmas Market (final trial) (17 users tested) – Final Trial (6.8)

6.6 Locationing Testing

For an app like Festie it was important to test how accurately the device's GPS worked in detecting the current location of the user.

We contacted Dr Susan Hegarty, who teaches in the area of physical geography and geographical skills in St. Patrick's College to discuss the best means of obtaining a reading for coordinates at a specific location.

While Susan was willing to lend us a GPS device to test with, she suggested that for our purposes, it would be enough to determine the accuracy through a simple observation of how a number of pre-selected Google maps locations' coordinates correlated to the coordinates of a note added at the user's current location in Festie.

We used an online calculator³⁰ (MovableTypeScripts, 2014) to calculate the distance between coordinates. See a sample of the results for various locations in Wexford and Dublin:

Test Note Name	(Festie) Note Located at:	Location of user (Google Maps coordinates)	Inaccuracy (kilometres)
Testing 3.0	52.3086239815152, -6.480142847882723	52.308701, -6.480059	0.01029
Testing 3.1	52.3321234756111 -6.473755192623417	52.332183, -6.473647	0.009892
Testing 3.2	52.3241917791328 -6.478049846310231	52.324191, -6.478249	0.01354
Testing 3.3	52.3415701509715 -6.462018187393919	52.341474 -6.462014	0.0107
Testing 3.4	52.3264044759123 -6.481314957362147	52.326394, -6.481281	0.002646
Testing 3.5	52.3524066060183 -6.51005211744792	52.351447 -6.510144	0.1069
Testing 3.6	52.5025667279127 -6.565603608111637	52.5025 -6.565617	0.007475
Testing 3.7	53.3956209974195 -6.291512698736533	53.395419 -6.291515	0.02246
Testing 3.8	53.3498237202334 -6.26033998979195	53.349786, -6.260251	0.007244
Testing 3.9	53.3461807908027 -6.262958444979119	53.346119 -6.262976	0.006969

Table 2 Sample of Location Testing conducted

³⁰The calculator allowed us to calculate the distance and bearing between latitude and longitude points.

We knew in advance that GPS accuracy would not be perfect. As the table shows, from the ten locations tested, only one note was significantly imprecise. While the average error was 19 m, the median (which we were interested in) was around 10m. The median is a better measure of reality, as it tends to be more in line with what people will actually experience.

We also had to take into account the possibility that for the case of the outlier test above the GPS had not finished determining the location.

These results were considered satisfactory for us given that GPS accuracy is usually estimated at around 8m. In addition, as the European equivalent to GPS—Galileo—is being built at the moment (five out of thirty satellites are functioning already) we hope that Festie will be able to avail of its greater accuracy in the future—estimated at 1m.

6.7 Formal Testing

Formal Test 1 – (Build 0.61: 7 Users Tested)

All of our formal tests were conducted over the shoulder. There was more emphasis on functionality at this first test than user experience or visuals as the visual design was still being finalised and as we were just getting out of that initial ‘steep learning curve’ mode in terms of implementation we were eager to test whether the app was functioning well.

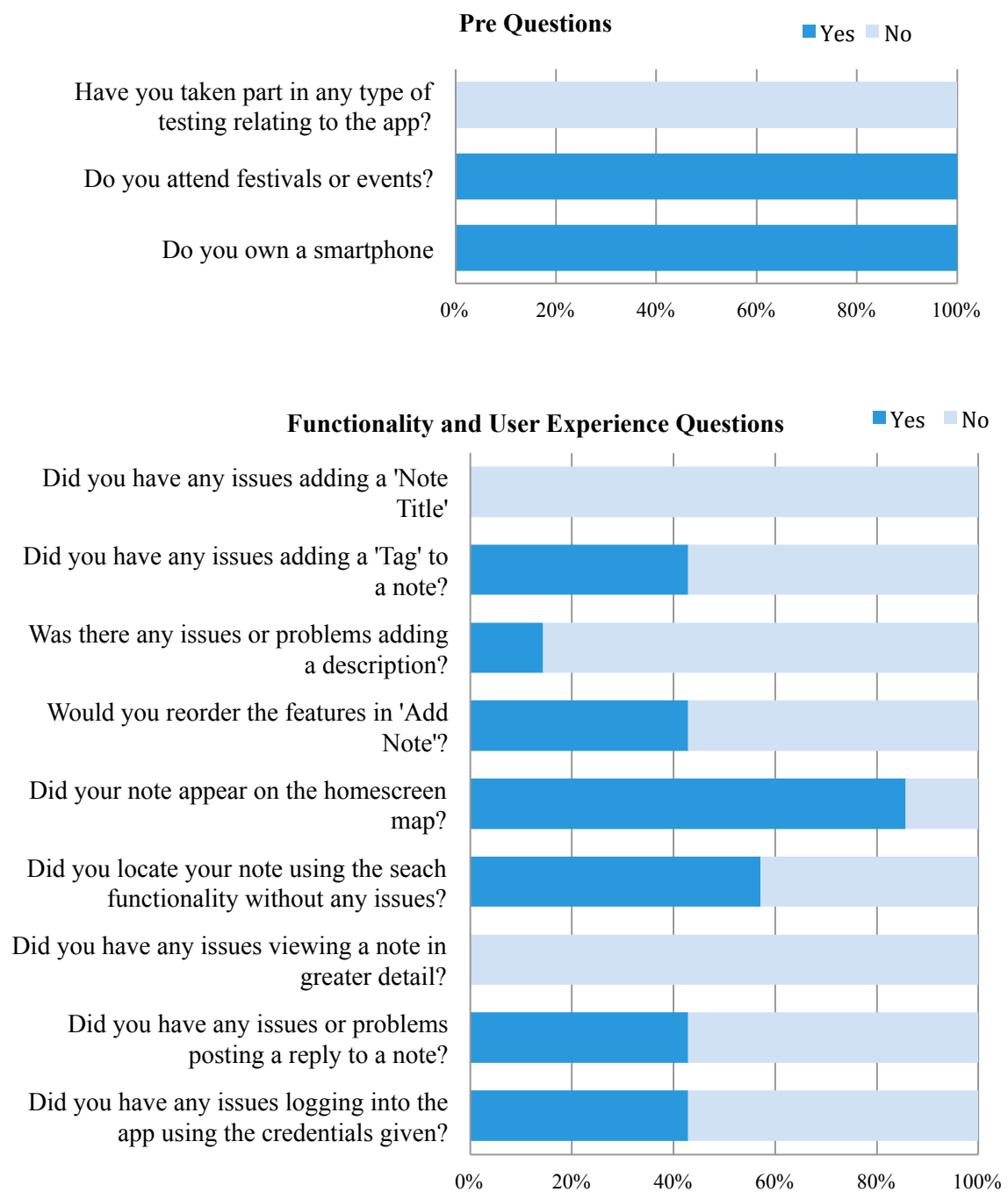
In our testing script we set users up with a task list related to the user scenarios we had created previously (4.5.1). Before undertaking the test, the user completed a set of pre-test questions and while they were going through the test, we made observations and took note of their actions, as well as of any issues or bugs they exposed. After completing the test the testers were asked a set of user experience and functionality questions.

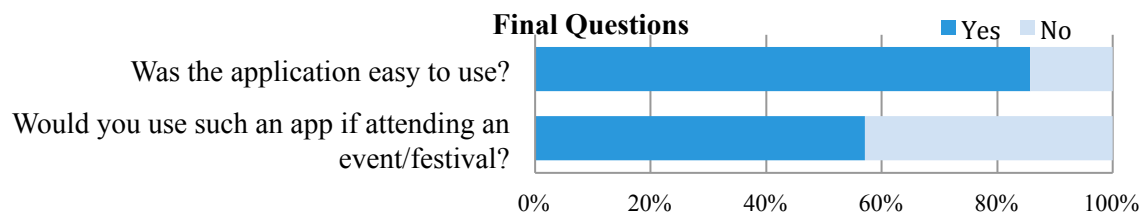
We wanted to test our server at this stage and were also looking for feedback on the most important features:

- Map/Home screen

- Post a Note – Title, Description, Tag
- Search
- View a Note (including Reply to a Note)
- Login – one credential
- Menu

Results:





Analysis

Some usability issues became evident for the Post a Note feature—users had issues particularly with selecting an element, as space wasn't sufficient between form elements and it caused users to select the wrong element on occasions.

When adding a tag, we observed that 42% pressed the 'tag bar' rather than pressing the plus button associated to the Add Tags cell. The same issue was observed for the Add Image cell. These were design elements that could be fixed relatively quickly and easily.

View a Note also had a layout issue that was only evident when a number of users replied on a note—if there was more than one reply the note and the first reply would overlap and become hard to read, this was pointed out by 42% of users. It was good to see that all users knew intuitively how to add a reply to a note using the comment bar positioned at the bottom of the screen.

Another interesting finding was that when a note was posted on the map even though all users acknowledged that their note was successfully added to the map, some had to guess which note was exactly theirs.

Highlighting a note a user added and centring it on screen would address this usability issue.

Overall statistics proved that the app was easy to use with (85% stated this), however a decreased number (57%) said that they would use it at a festival, which was inconsistent with the feedback we were getting at actual festivals.

The process of going through each test was slow at first as it was our first time performing this type of formal testing. Even though there were a number of minor

usability issues at this stage, we were delighted that the navigational procedures for adding a note and viewing a note seemed to be followed by users with ease. The overall workflow of the main features worked well together (though some issues were noted, as discussed above).

Formal Test 2 – (Build 0.65: 10 Users Tested)

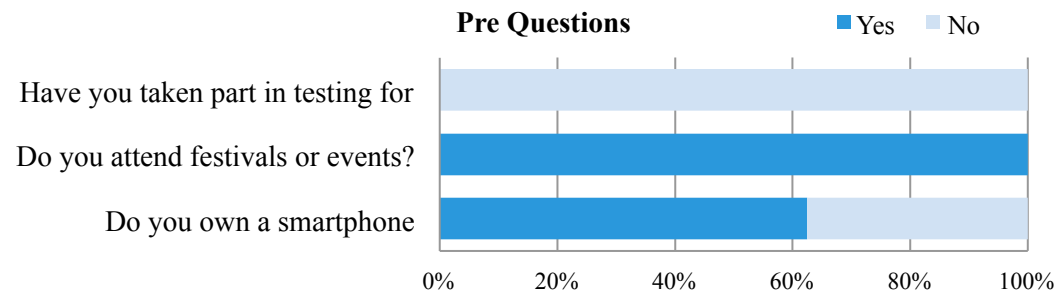
On this occasion we tested 10 users. The app had extended its range of features and functionality for this test, along with usability improvements following the previous round of testing. A number of design elements had been added to help user experience including the removal of default items such as pins.

A similar test task outline was followed but users now had the ability to trial the following additional features:

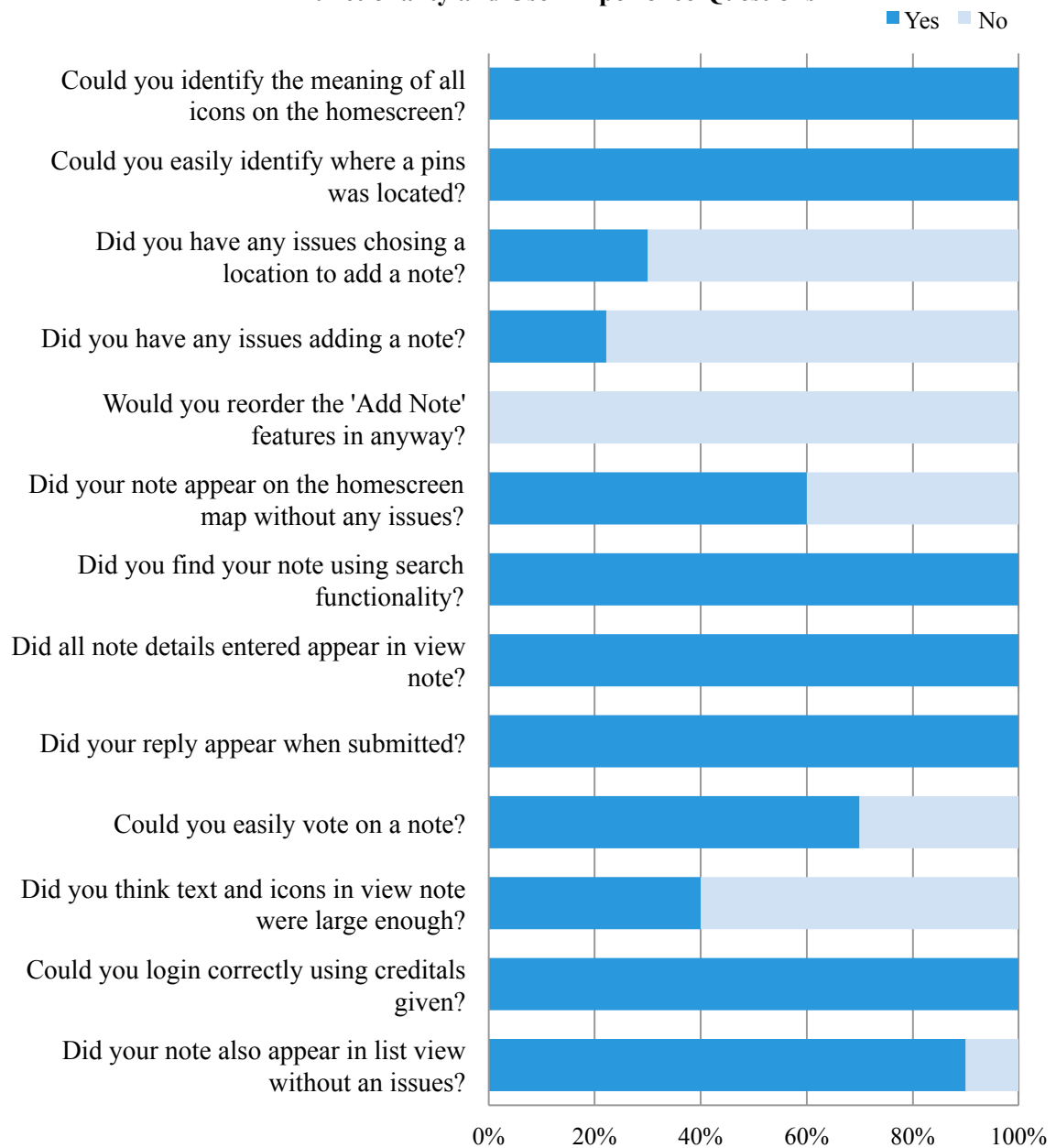
- Post a Note – Add Image, Edit Location
- Custom Pins
- Vote on Note
- List View
- Filter Notes (segmented control)

We asked the same pre-test questions, which was followed once again by the users testing the app by completing the outlined tasks and by us observing and taking notes. Then the users answered the post-test set of questions, some of which referred to issues in the previous set of tests to see if improvements had been made.

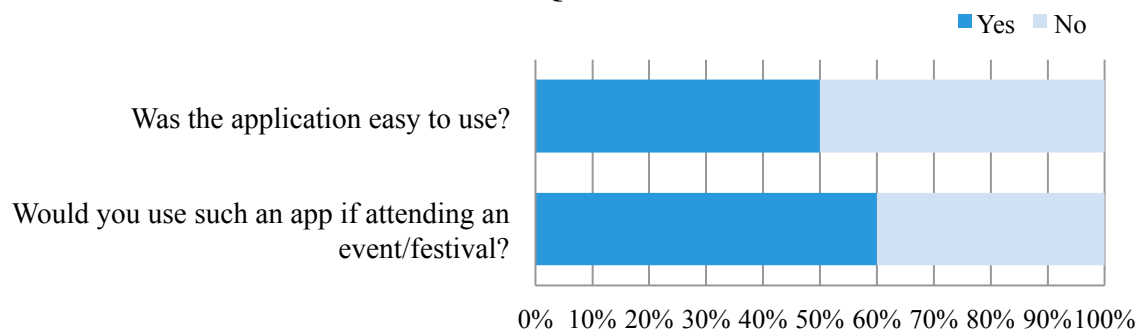
Results:



Functionality and User Experience Questions



Final Questions



Analysis

There were a number of new features added for this round of testing. We had changed the pin style to blue circles on the map. This was to be our fall-back idea should our preferred visualisation of notes not work effectively. 100% of testers could easily see now where pins were located on the map, which was an improvement from the previous test.

Also, positive feedback was received in regard to the reply functionality, which previously had overlapping issues. This was now rectified with 100% of user saying that their comment appeared when replying. The new search functionality (through keyword search) was working well and users were now able to login with a set of credentials (which was improved from the last build).

Users also had issues with the Edit Location cell of the Add Note screen in Post a Note—23% pointing it out. We removed Edit Location in our next build (5.4.2).

For this build, new elements such as voting were added to the app, but the size of buttons appeared too small for some users, as three users pointed this out. The size of elements in general in View a Note was too small as six out of ten people suggested. These were design and usability issue that we started resolving for the next build (5.4.2).

The order in which comments were presented in the View a Note feature was also noted in this build—the oldest notes appearing first forcing users to scroll to the very end to in order to see the latest update. We decided to reverse the order for our next build (5.4.2).

Filtering the notes was now fully working and users really liked how this option was accessible from the home screen. Users could filter ‘all’, ‘recent’ and ‘popular’ at this stage but this would change later on.

Overall there were improvements and users seemed to like the additional features such as voting on a note and filtering notes. There was still a lot of functionality to be implemented but generally users were becoming more understanding of what we were trying to achieve.

In order to keep track of bugs we decided to start a log, where we prioritised them in lists of high, medium and low priority.

It also became apparent we were going to need instructions related to certain screens. The Adjusting Note Location screen was an example of this, as users knew they were adding a note but looked for confirmation regarding whether they were doing it right when choosing the location.

Formal Test 3 – (Build 0.68: 10 Users Tested)

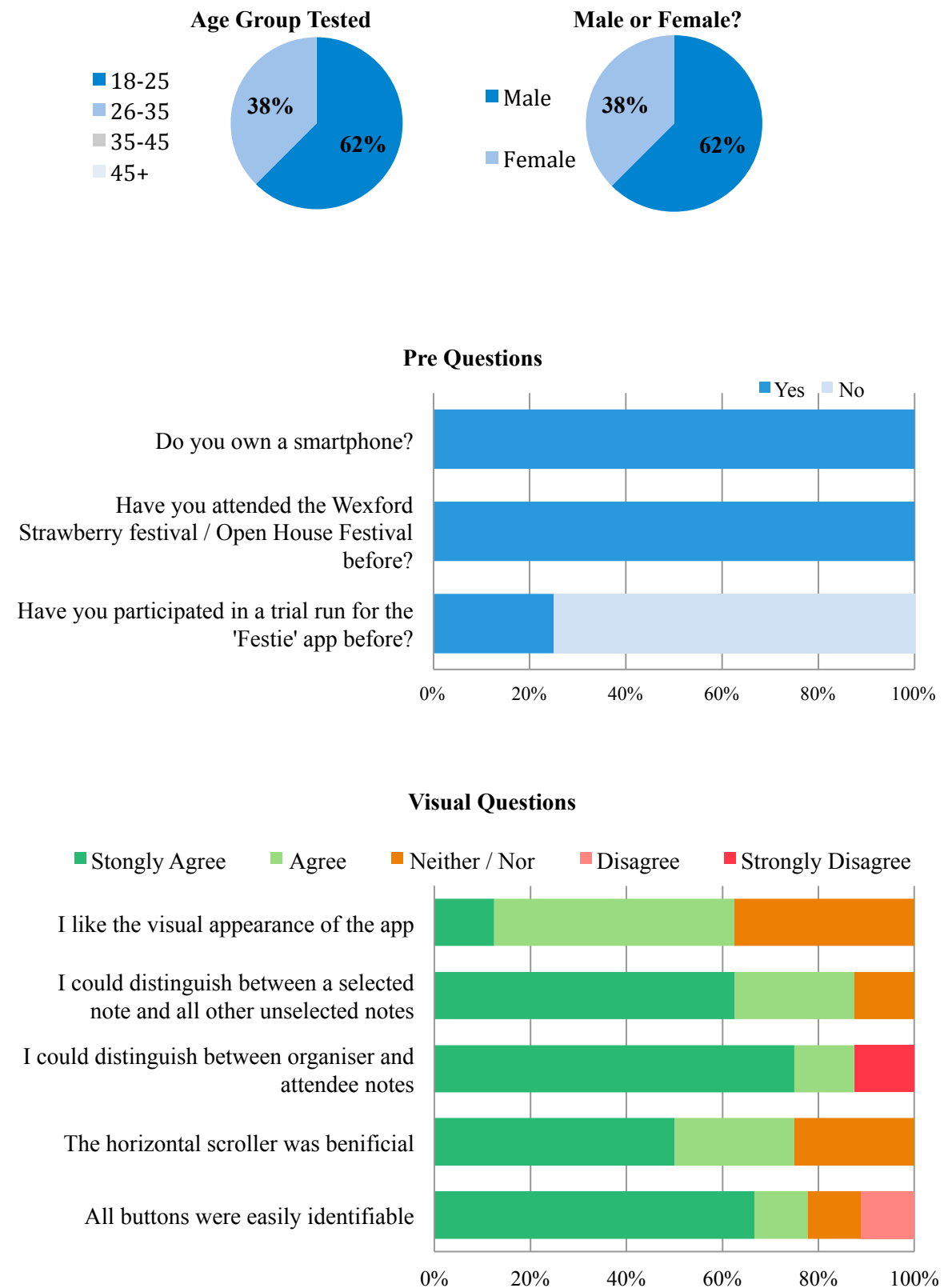
Our third formal test was conducted in the form of a mock trial. In order to help our testers imagine that they were at an actual festival we created a scenario for two festivals—Open House in Dublin and Wexford Strawberry Festival in Wexford and set up the app with the two events with pre-populated content for users to interact with.

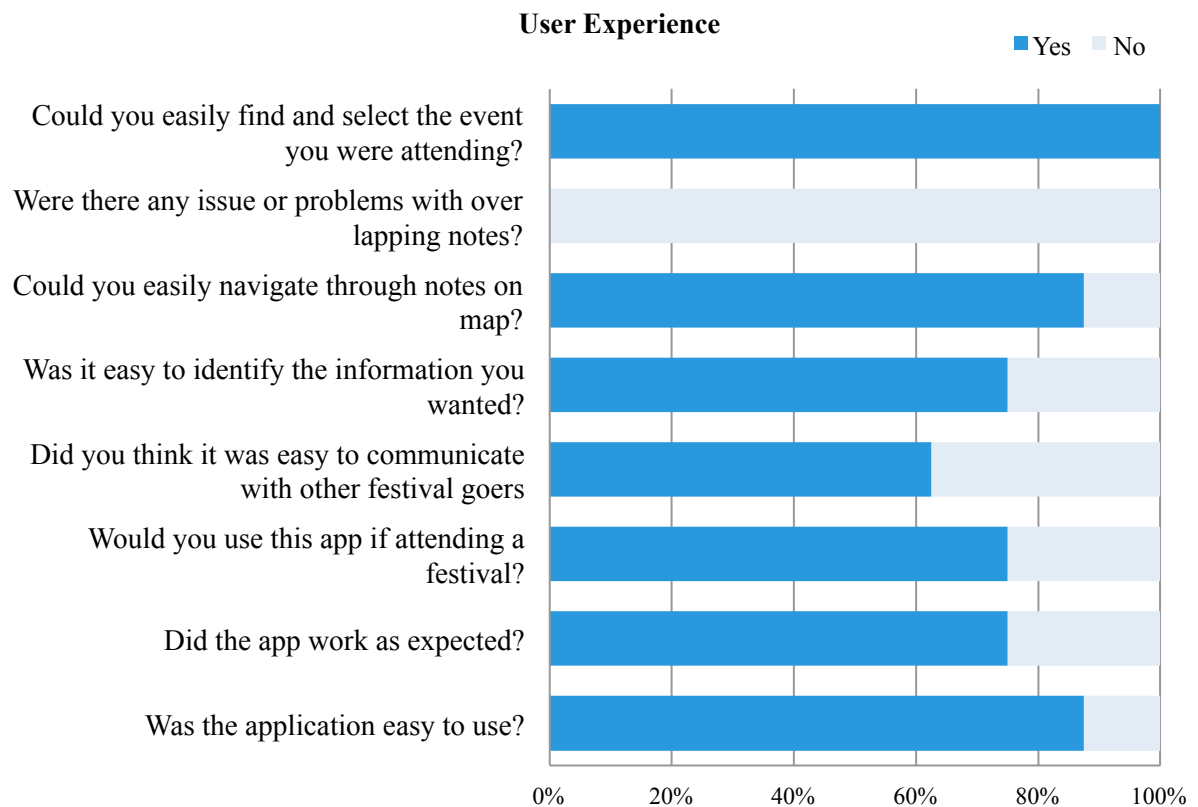
We were curious to see whether this might lead to a more positive feedback regarding the question ‘Would you use such an app if attending a festival?’. It was possible that participating in a make-believe festival (as opposed to just mechanically adding notes to a map) would help our testers see better value in what we were offering.

All key attendee functionality was now operational although a number of bugs were still being addressed. Some organiser functionality had also been added at this stage. For this test new features included:

- Horizontal Scroller
- Event Information Screen
- Boundary of Event
- Add Event
- Detection of Multiple Events
- Custom Notes Visualisation

Results:





Analysis:

All users had attended the Wexford Strawberry Festival or Open House festival, which made it easier to portray a scenario of actually being at one of these festivals.

Users deemed the newly implemented Horizontal Scroller beneficial with 75% saying that it added value. The feature seemed intuitive enough—we observed no user having any major difficulties using it to scroll through notes. There was a bug at the time that caused the Scroller to freeze whenever the user reached the final note (as noted by the testers)—this issue was rectified for the next build.

The new Detect Events Within User Location feature was functioning correctly, as 100% of the testers pointed out.

User reported that viewing notes on the map was now easier with our newly customised notes replacing the previous blue dot design. 100% of participants said that they didn't notice any issues with notes overlapping.

Despite the addition of many new elements (and some newly-introduced bugs) users seemed satisfied with how the app was working—75% of testers reported that the app worked as expected and 87% declared it easy to use.

For feedback on visuals and user experience we used a Likert scale for the first time to get in depth answers from the users. We believed this would reflect users' opinion better than simple 'yes' or 'no' answers. The feedback on visuals was generally positive.

We were able to test some early organiser functionality here for the first time as well—creating a boundary and adding event details. These were still being implemented however and as expected there were usability issues with the boundary building tool, which proved somewhat complex for testers to use, mostly being confused by the three buttons on the bottom of the screen (5.4.2).

Interestingly, our little experiment with the 'Would you use such an app if attending a festival?' question seemed to work. Testers, when given a scenario of actually being at a festival, and not just being asked to complete a set of tasks, seemed to appreciate the idea of using Festie at actual events more 75% now saying that they would use the app when attending an event. This was now nearly matching the results we were getting at the on-site user tests.

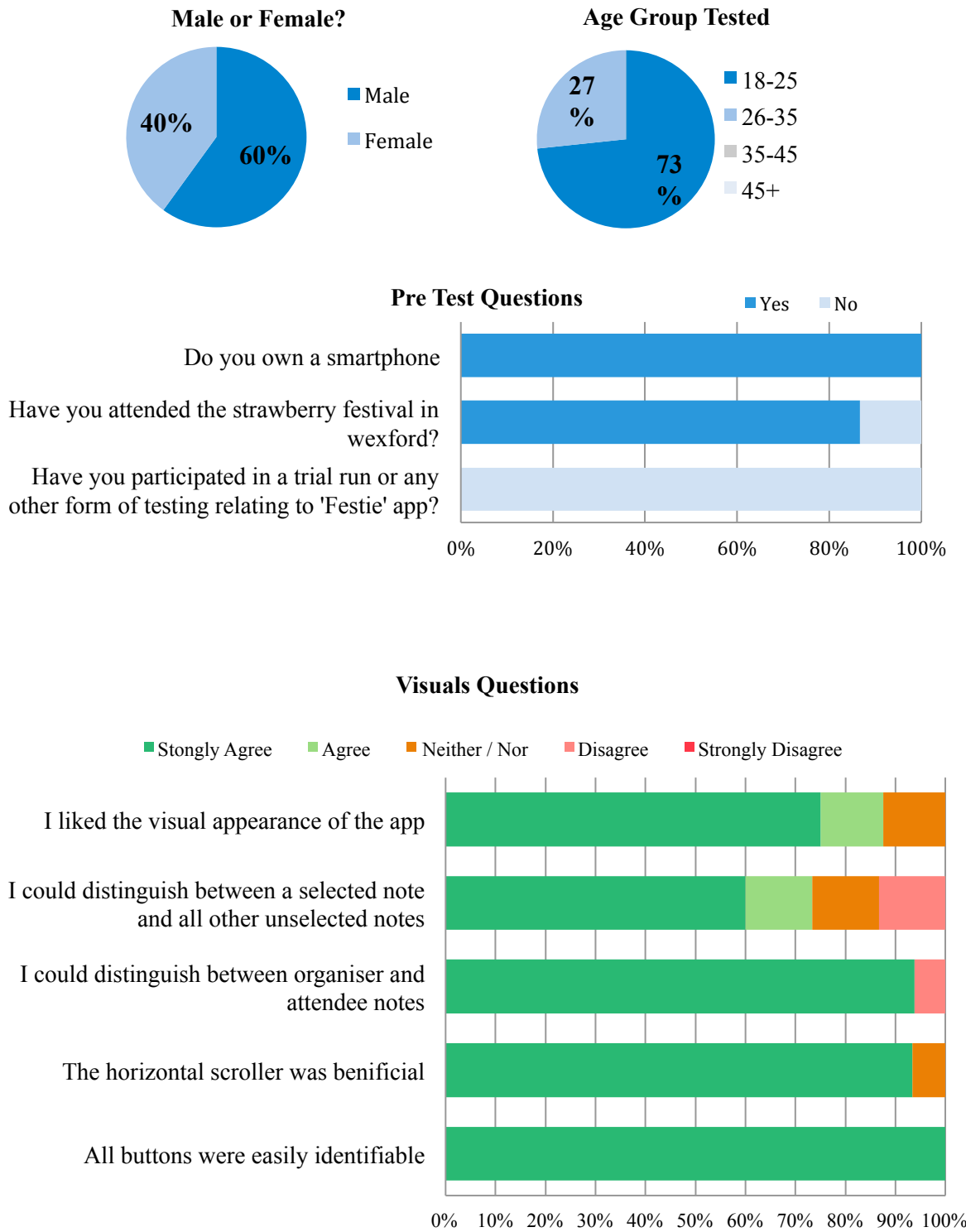
Testing 4 - (Build 0.68: 16 Users Tested)

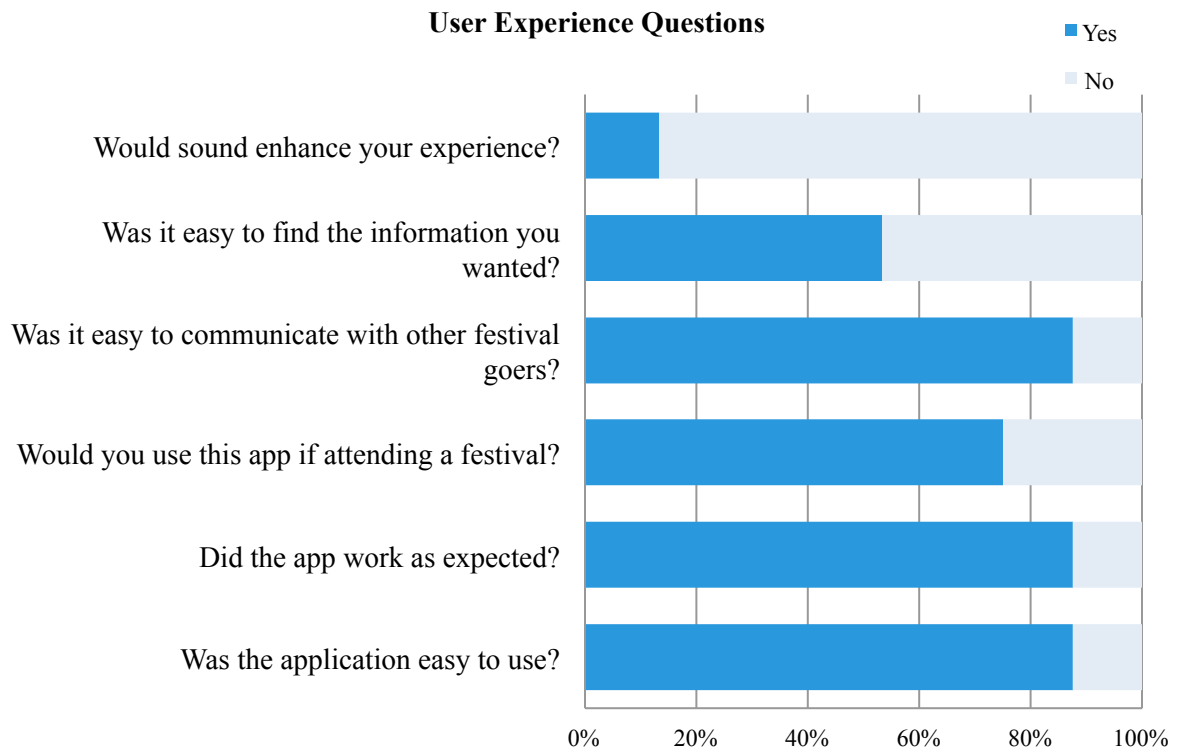
Our final formal test before submission was conducted amongst 16 users. As we neared the finish line we hoped to see major improvements in terms of usability and bug issues. For this test we used the same mock trial script as for Test No 3 (with some additions). New tasks included:

- Add Note (Share functionality)
- Share My Location
- Event Details (Organiser)
- Add Markers (Organiser)

We were taking a risk adding these elements so close to our final deadline, but we felt these would complete all use cases we constructed at the beginning of implementation (4.5.1) and still leave enough time to resolve final issues.

Results:





Analysis:

These results were the best we received over the process of the apps development. We received positive feedback regarding the visuals, which was good and we still had a few extra elements to add to give a polished look for final analysis—blur effects etc.

User experience also improved greatly, we investigated the idea of using sounds to enhance the user experience but 87% of users felt this unnecessary, pointing out that events and festivals tend to be noisy so there would be no real added value.

Users could now find information with improved search functionality for both tags and keywords but they were still not aware that this facility was available and had to be made aware of it. As a result we decided that we would create a video to showcase what functionality the app actually has to play to testers before conducting the final post-implementation tests.

There were also still minor bugs that we hadn't had time to resolve between tests, as implementing final features took priority over debugging. The users also seemed to

not notice them however as 87% now felt that the app worked as was expected (an increase of 12% from the last test). There were no major issues with navigation for attendees (87% agreed).

The newly implemented features worked well also, including Share My Location and Share (on social media etc.).

Attendee functionality had improved greatly; the layout of items in the Horizontal Scroller was much improved and presented in a much better simpler structure.

All Organiser key functionality had been added. However, there was issue with the navigation to the login screen, which required immediate attention.

Related to the organizer also, a bug was found where users could continue on to the next screen without closing the event—this was addressed before the final deadline with a simple solution, deactivating the save button until the boundary was complete.

While the app wasn't 100% perfect it had made major improvements and with our remaining time we could fully focus on fixing the remaining bugs and usability issues, as we stopped implementing any more new features at this stage.

6.8 Final Tests

A total number of 53 users tested the final build of the Festie application. Of these 28 (53%) tested via a Testflight build, 17 (32%) were tested at a trial, which took place at the St. Stephen's Green Christmas Market in Dublin city centre, and 8 (15%) organisers were tested at one-on-one sessions.

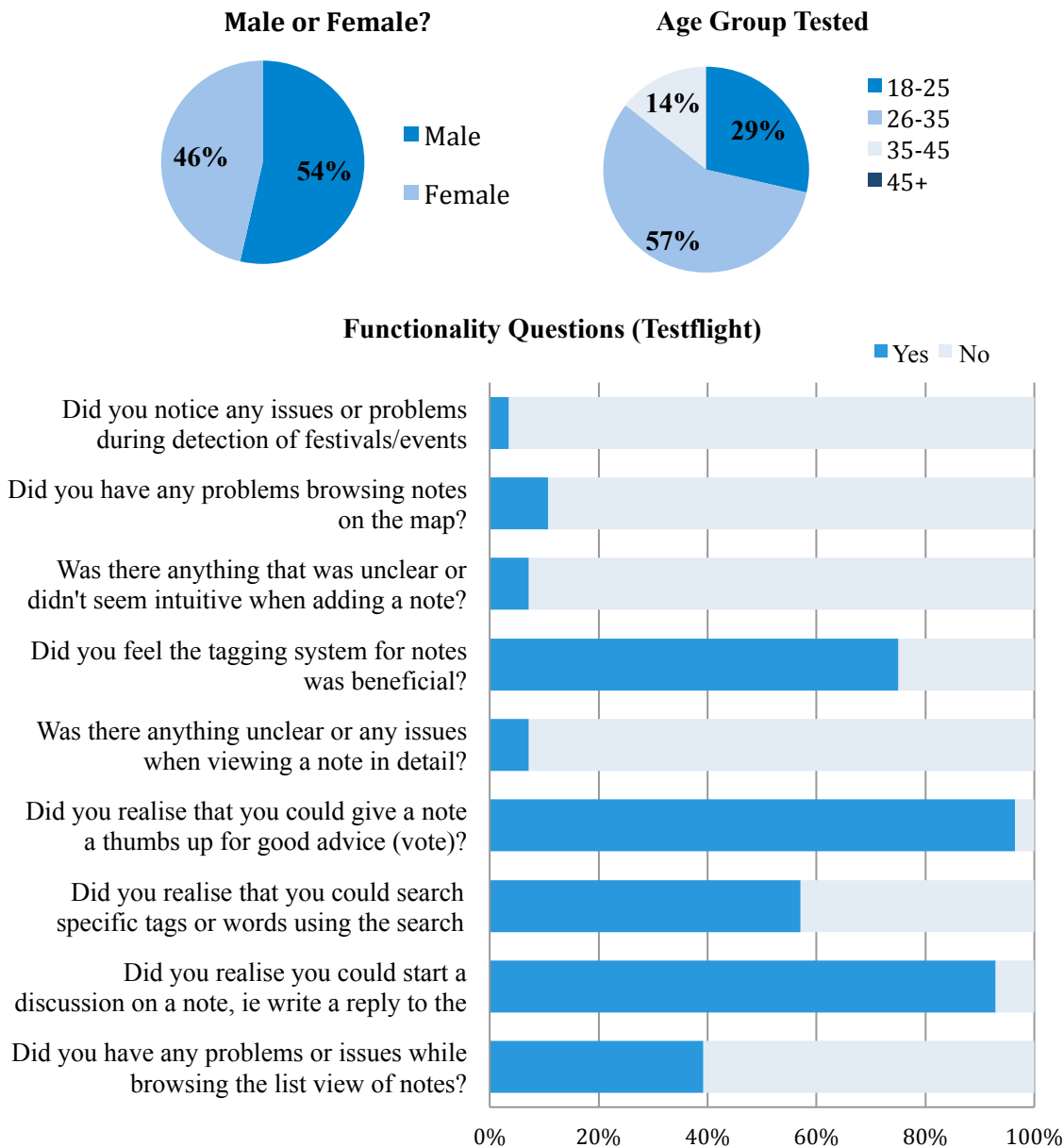
6.8.1 TestFlight

We used TestFlight as a means of quickly getting large quantity of feedback from users. It was a useful tool but it wasn't our primary source for testing as remote testing didn't suit our app concept very well because users needed to be within the vicinity of our mock-up events in order to be able to use the app.

For this final test we opted to scale up the boundary size of our mock events, Wexford Strawberry festival and Dublin Open House Festival to allow our Testflight testers to detect them from anywhere.

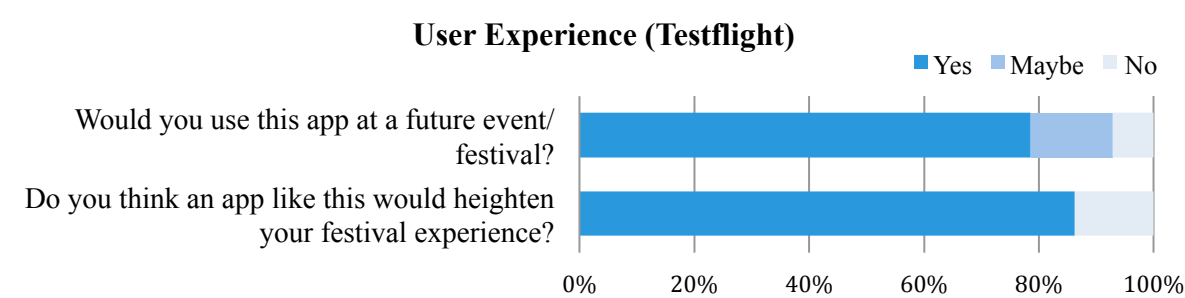
Once users signed up through TestFlight and the pre-populated content was added, we were quickly able to collect feedback through a Google Docs survey. It was interesting to see that remote and face-to-face testing yielded similar feedback.

TestFlight testers deemed the app useful in concept, with relative ease of navigation and use while functionality also received mainly positive feedback. The break down of the user profile can be seen below.



A concern we had from this feedback was issues with the list view. The list view had been low in priority of features, a connection between List View and View a Note was never implemented. Although users could see a list of notes these notes were not selectable, 40% of participants pointed this out.

42% didn't realize they could search specific tags or words to filter the notes. We think that was due to them not actually watching the video explaining the app's main functionality (a link to which was sent through Testflight)



A number of open-ended questions were asked. We were interested in feedback on what users liked and disliked, we also asked whether they thought this app would heighten their festival experience:

“Yes. It would highlight attractions within an event that you might miss.”

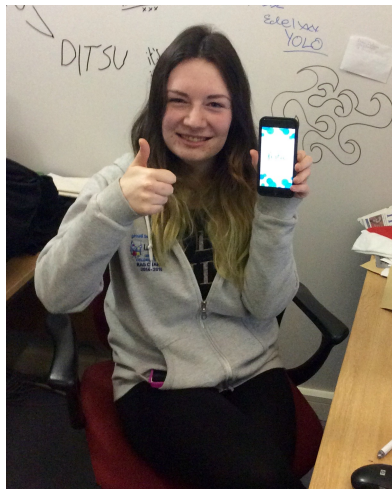
“Real time information very useful at a festival. Good to get others opinions and use them to make decisions on where to go”

“Easy App to use which would highlight the "best bits" at a festival, such as where to go for good food, drinks and to meet friends. Also great for noting areas to avoid, such as long queues. Brilliant!”

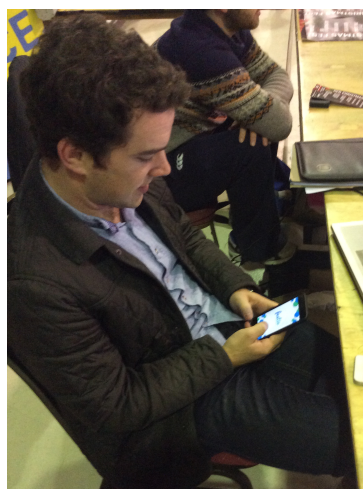
6.8.2 Testing with Organisers

Obtaining testers

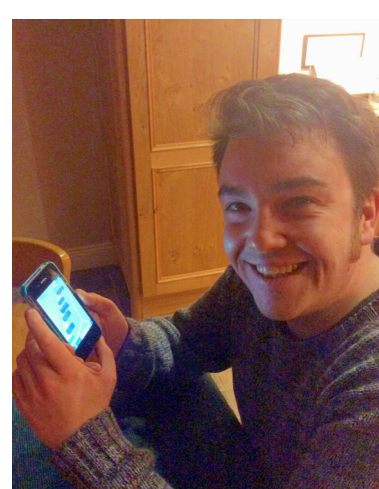
It proved a lot more difficult to find willing organiser testers than we originally thought. Eventually we found that the best means of obtaining willing organisers was to get college event organisers who were enthusiastic about helping. In the end we tested with eight organisers. We asked them what past events they had organized to get a idea of how suitable for their needs the app might be:



Ciara Murnane



Fergal Hynes



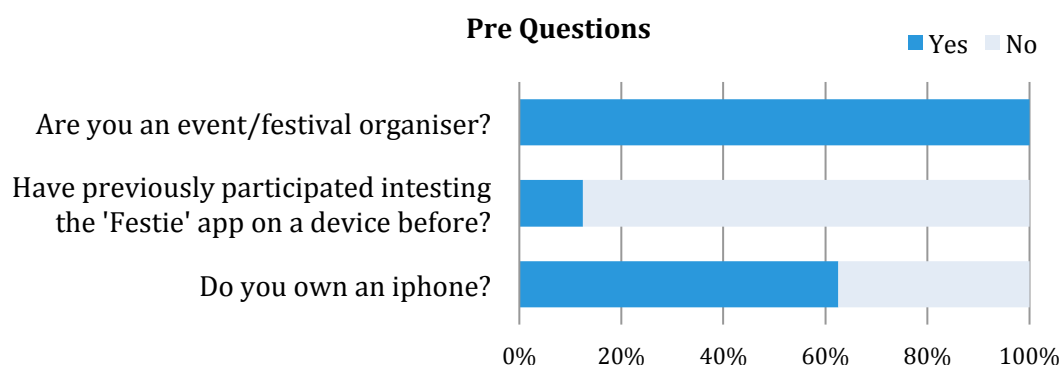
David Redmond

Name	Events / Festivals Organised
Ciara Murnane	DIT Events Officer: The main events are DIT Freshers' Week, Cirque du Freak Christmas on Campus, DIT Drama Festival.
Fergal Hynes	O2 (3Arena) gigs, Charlotte St. Festival Wexford, Currently president of UCD College.
Eamonn Bolton	Former President of St.Patricks SU. Also former event promoter for large group of pubs across Dublin.

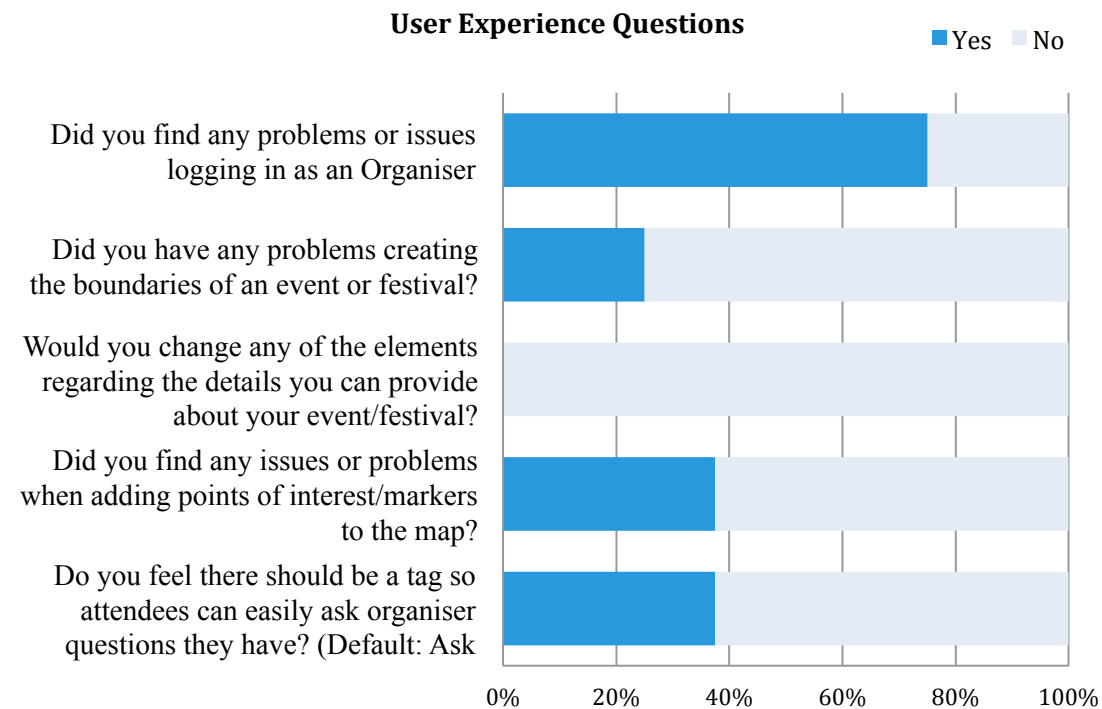
Seamus Redmond	Wexford Festival Opera, main role in marketing but also involved in smooth running of operations and events.
David Redmond	Organised 'Airbound Festival' which has held parties in Croatia, Berlin and London. Founding member of 'Nightflight Music', which also ran events abroad and in Dublin.
Thomas McCormack	Currently running Night Life Ireland for venues across Dublin. Also former president St Patricks College for a year.
Pierce White	Annual outdoor events including "Strawberry Fest" and "East Quay Music and Arts Festival" for MSL Concerts Ltd.
Brian Byrne	'Speigeltent festival', involved with weekly running of events in nightclubs also.

Pre-Test Questions

All users were asked questions before participating in the trial to determine whether they were familiar with the technology and also the subject that the application was related to.



User Experience Questions



The workflow was not perfect for an organiser user to sign in, though it was manageable. We knew there were too many alert screens to take the user to the login screen as 75% of users noted. This is high on our priority list to rectify in a future development.

The boundary-building tool worked very well for the majority of users, though there was a learning curve for two users who opted not to read the instructions that appeared at the top of the screen and immediately attempted to create a boundary. As a result some users learned through trial and error, having to clear the initial boundary and start again.

Users were satisfied with the festival details screen and felt the fields supplied provided adequate information regarding the event.

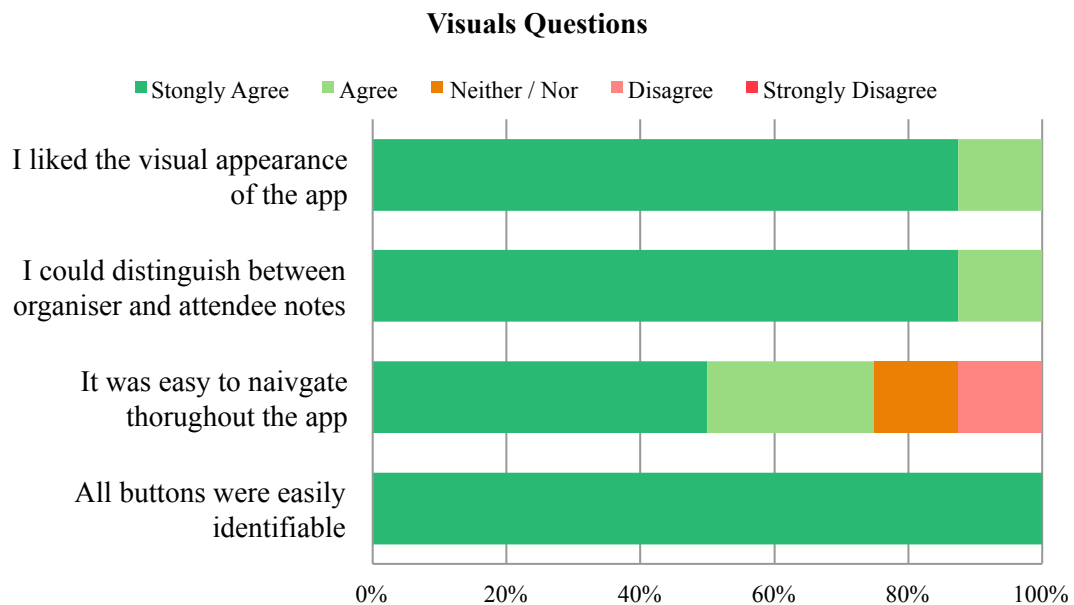
Users could easily add markers to the map but it was noted that there was no means of editing them once added. They found the custom marker very useful:

“.....so I can add whatever I want using the custom, I like that”

“...That’s very useful people don’t like using maps (paper maps)”

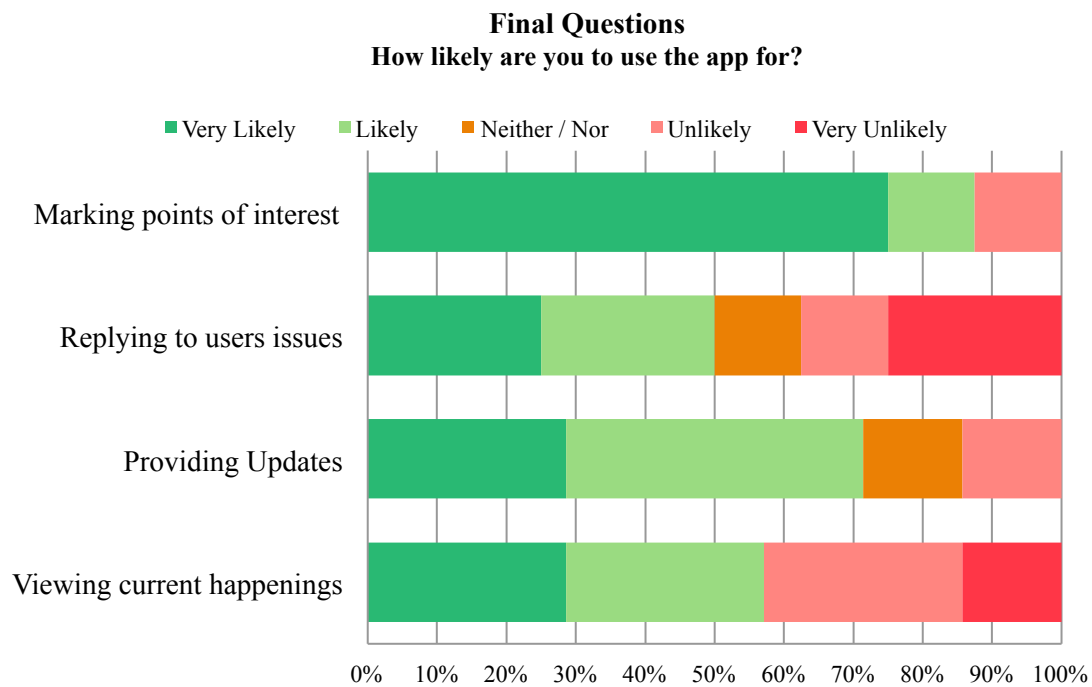
Visuals

For feedback on visuals and user experience we once again used a Liker scale to analyse the answers:



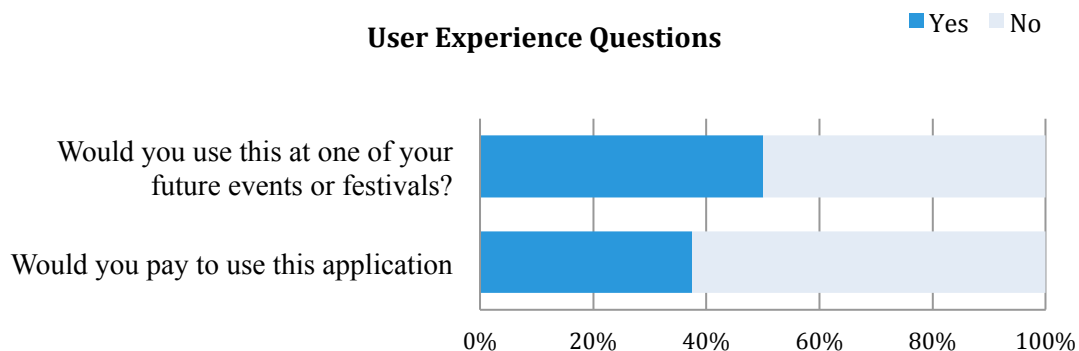
The majority of the feedback was positive for visuals. One user experience question that did provide mixed views was ease of navigation throughout the app. We believe this is once again a reflection on the initial user login navigation, which had too many alert screens.

Organisers also gave mixed feedback when asked ‘would they reply to users using this format?’ Some believed it could frustrate the user more if there was expectancy on the organizer to reply to the notes they had posted.



The most likely reason for an organiser to use the app was to mark points of interest (Markers) with 62.5% of participants stating that they were likely or very likely to use the app for this feature.

Final Questions



Final questions provided a split in decision. We asked users would they use this app at one of their festivals, 50% said they would, these were organizers generally with backgrounds in outdoor festivals. The remaining 50% expressed concerns of their events being too small—in nightclubs and pubs. This feedback was not a cause for concern as Festie best suits a different class of event.

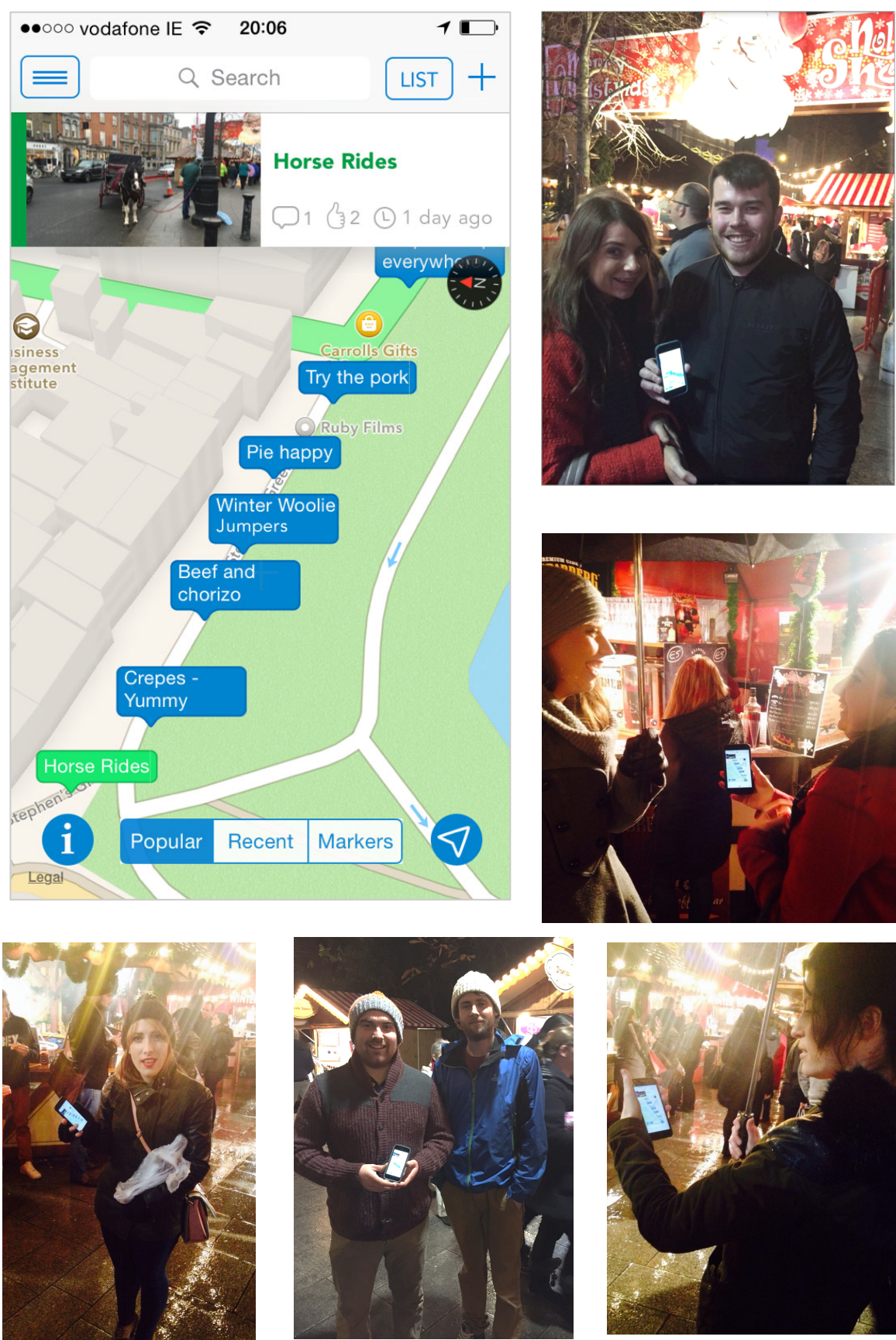
Also half of the users would pay for this application while the other half wouldn't. Again the split was distributed between outdoor and indoor event organisers.

Analysis

Overall Organisers gave positive feedback. In general they liked the concept and ease of use. They used the event-building tools easily but still pointed out minor issues as discussed above.

The boundary tool was particularly admired and users liked how this would detect an attendee if they were at or near an event or festival. There was also clear understanding between the difference in attendee functionality and organiser functionality as well as both sets of users notes.

6.8.3 Live User Trial



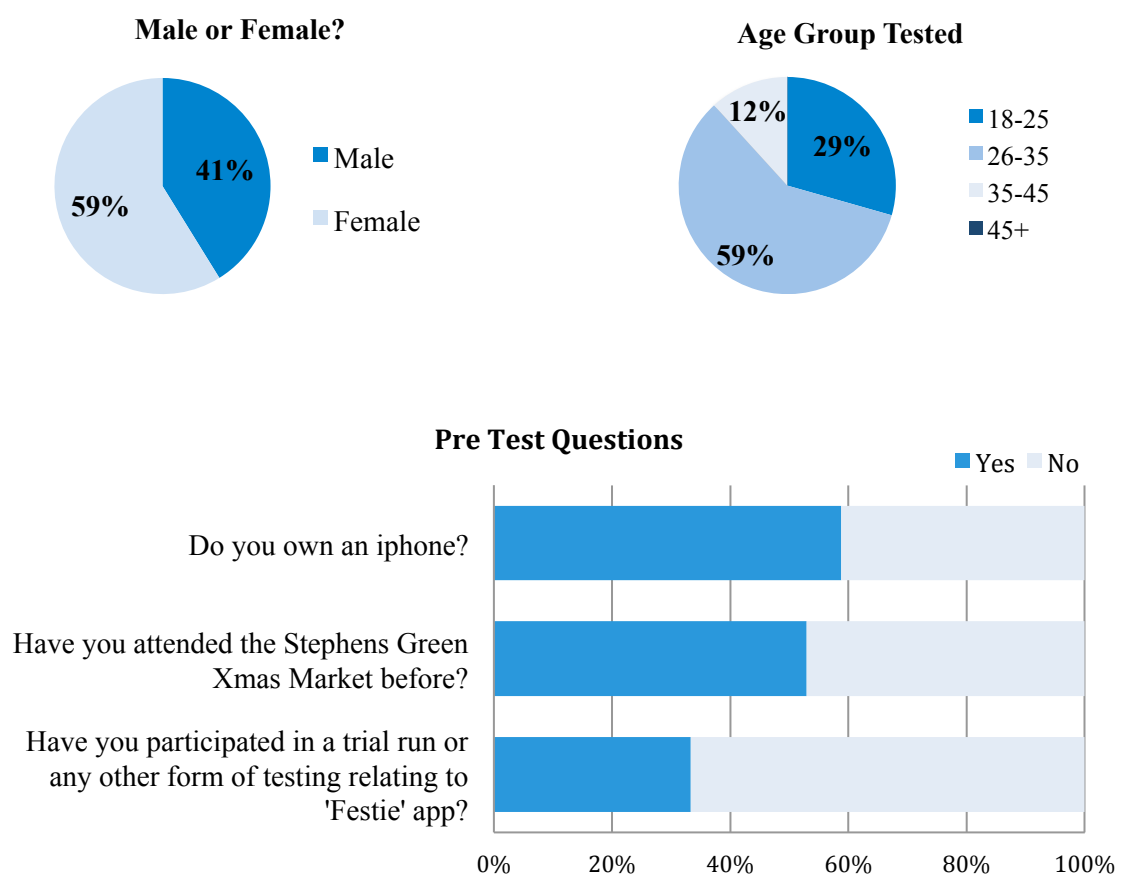
Obtaining testers

For our final trial we searched suitable festivals that we could test our app at. The event we chose was St. Stephen's Green Christmas Market in Dublin City centre. It wasn't a perfect event to test at as it was mainly Christmas stalls but it was the best on offer given the lack of festivals at this particular time of year. Festival attendees needed to be willing to meet at the specific venue, on one of the given days to trial the application. This was difficult, as this event didn't have a medium such as Twitter or Facebook to try recruit testers.

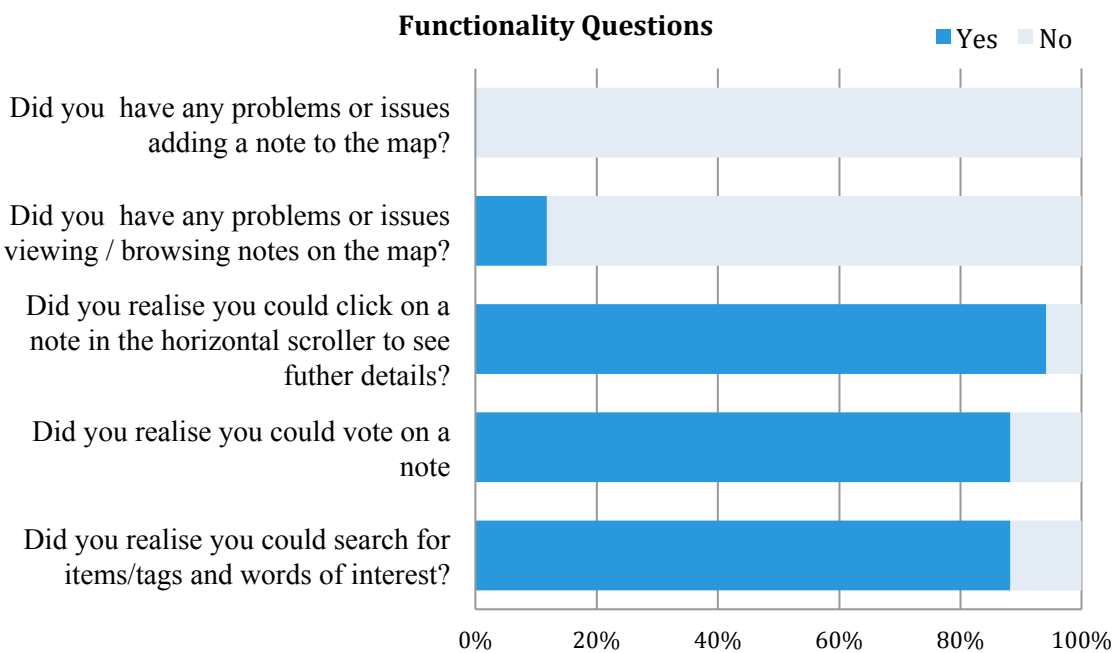
In the end we recruited testers through colleagues who work in the city centre. We ran the trial over a number of days, arranging with potential users to meet at the venue.

Pre-Test Questions

All users were asked pre-test questions. The results of these questions are listed below:



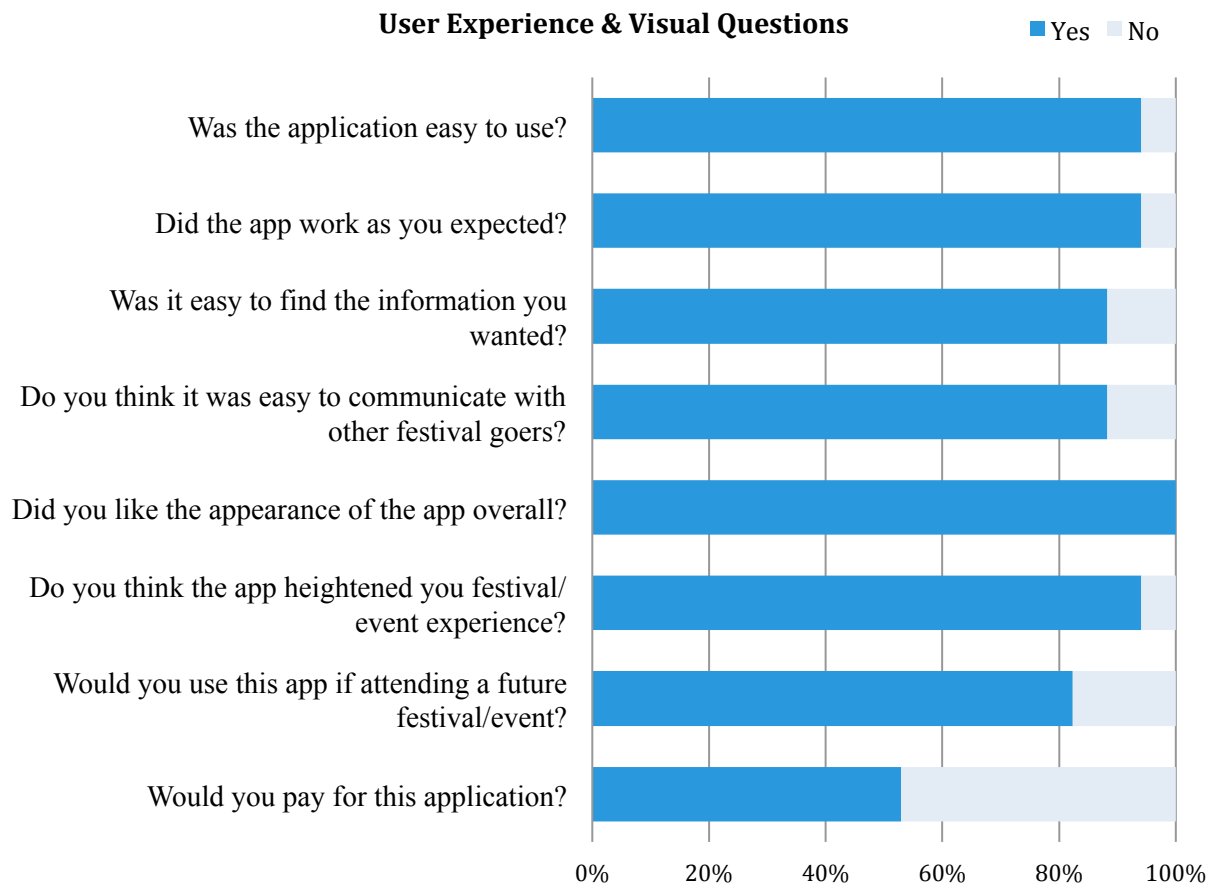
60% of participants had an iPhone, as expected, given that it is the most commonly used brand of phone on the market. 53% of testers had already been to the market. This was high but expected as the majority of testers were sourced from a nearby workplaces and the event had been running for 2 weeks prior to the test.



Functionality Questions

We received good functionality feedback. The venue was nice and compact and there was already an abundance of pre-populated notes for the user to interact with.

The ease of adding a note was evident as 94% agreed. Also we received a high score for ease of viewing notes on the map, this was something that had caused much trouble over the development period and it was good to see that the colour scheme, use of notes and Horizontal Scroller all functioned well together on the home screen.



User Experience Questions

The users gave resounding feedback (100%) regarding how they liked the appearance of the app, which now had a consistency in style throughout. This made it easier for users to recognize a note whether it was on the home screen, view note or list view.

88% of users also felt that it was easy to communicate with other festivalgoers. People clearly understood the function of the thumbs up button to approve or like good advice and knew how to start a discussion or thread on a map.

It was great that the app met the majority of the users expectations. We believe viewing the introductory video before participating in the trial helped with this by giving a greater understanding of our concept and the app's functionality.

A major aim for us was to heighten people's festival experiences and 94% agreed this was indeed the case. This was also reflected in number of users who would use the app at a future event (82%).

'It was good to see pictures of the stalls and see everyone's comments'

'Uncomplicated.... Very user friendly. This would encourage me to use it'

'Easy to use. Very quick.'

'....raining so it was good to be able to see things people recommended before spending time standing at stalls in the rain.'

53% of users said they would pay for the app.

Analysis

The results showed major improvements in contrast to early formal testing. This also proved that even at a small event the concept of the app was viable.

Users exhibited two major trends of using the app, one prior to entering the event at the entrance, where they could see notes of interest for advice, and during their time at the event, where they posted their own notes and commented on other users' notes.

6.9 Conclusion

User testing was a major part of the production of Festie. It allowed us to gain valuable insight into the users' needs and wants. It also provided us with a lot of useful feedback throughout the process.

Paper Prototyping initially got the app concept up and running, mock prototyping got the concept on devices where initial layouts and iteration of design was tested with users. Social media allowed for much feedback and helped decision-making, on visual elements, development testing allowed us to find bugs and usability issues throughout implementation. Finally mock trials allowed us to improve usability and find all possible issues with the application.

Our final tests through Testflight allowed us to quickly get a large amount of user feedback, while our final user trials with organisers and attendees saw very positive feedback on our app.

Chapter 7 Evaluation

7.1 Introduction

After analysing the results from tests conducted through prototyping, social media, on-site feedback and formal tests in Chapter 6 Testing and Analysis, we will commence Chapter 7 Evaluation by giving a full evaluation of the project. This section will review the overall project objectives, both functional and content requirements, risks taken and finally how we found working and collaborating as a team and our marketing strategy.

Following this we will briefly outline Future Work for the app, firstly with regard to Unfinished Features and Additional Features that we would like to implement, then looking at the application in general and discussing commercial opportunities.

Finally, we will conclude by reverting back to our very firsts concepts, which we drafted in the beginning of this process highlighting particularly how the app could be utilised in other domains.

7.2 Project Evaluation

In early December, after the end of the implementation stage, which was marked by the staging of a final user trial at the St. Stephen's Green Christmas market (6.8.3) we began the month-long process of documenting and evaluating the entire project.

Before attempting to evaluate our work, we created a mind map (Figure 7-1) to help us determine which areas of the process needed to be analysed in order to measure the overall success of the project, as well as to remind us of all the individual targets that we had set for ourselves to be met by the project's end.

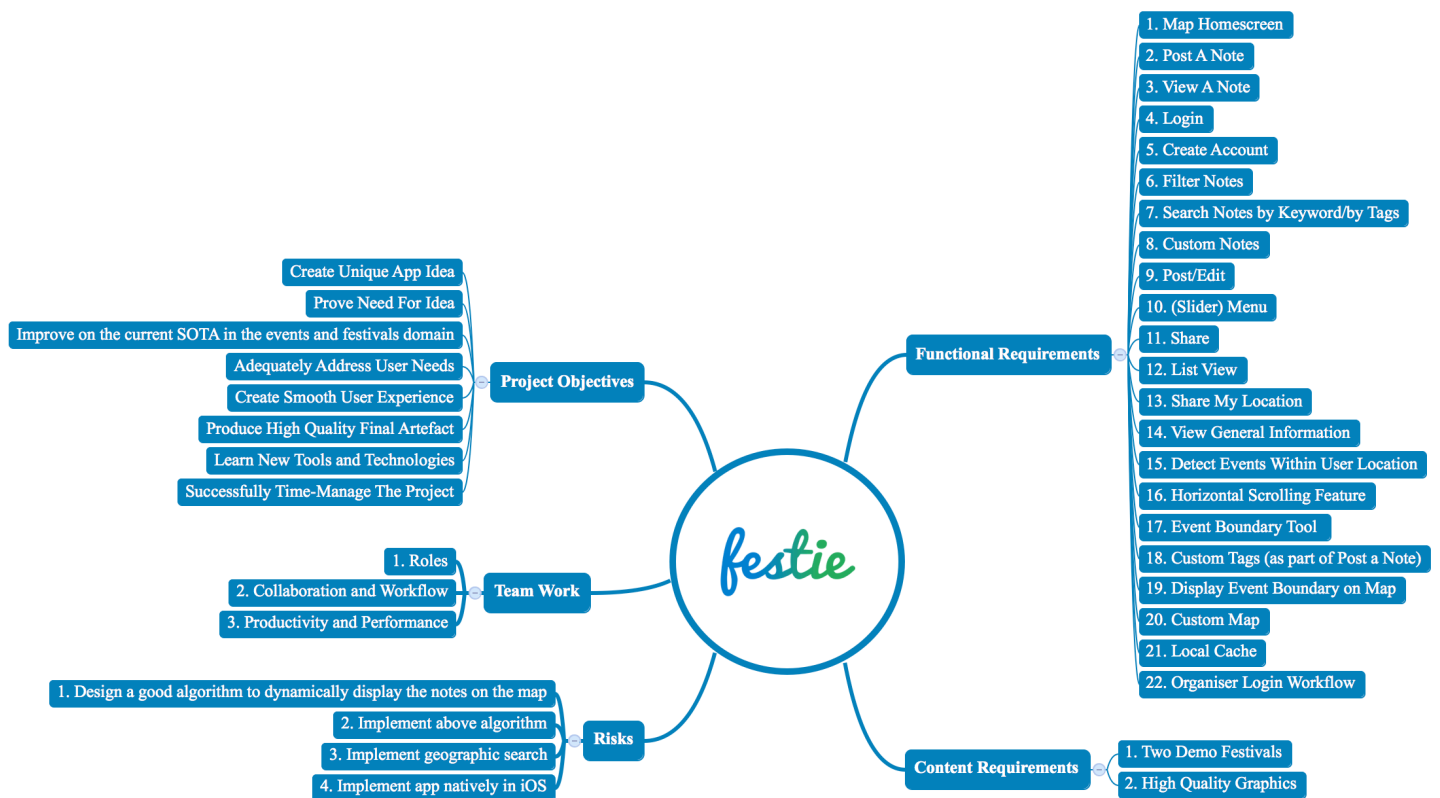


Figure 7-1 Mind Map of project

In the following four sub-sections we will examine each of these five areas of the project in detail and try to determine whether their individual targets have been successfully met.

7.2.1 Project Objectives

- 1) **Create Unique Idea**—We believe we succeeded in finding a unique app idea, as proven by the lack of true direct competitors in the current events app domain (See Section 4.3.1 Direct Competitors). Interestingly, this situation did not change over the course of the project.
- 2) **Prove Need for App**—We believe that the combination of an evident gap in the app market, as proven by the lack of direct competitors (discussed in point 1 above) together with the favourable results from user research (3.4.1) is a strong indicator for the need of on an app like Festie.

- 3) **Improve on the Current State-Of-The-Art in the targeted ‘events and festivals’ app domain**—As discussed in Section 4.3.1 *Direct Competitors* and Section 4.3.2 *Current State-Of-The-Art*, we are aware of only one app that is both a competitor (indirect) and state-of-the-art—Circle. We believe Festie improves upon Circle by offering to users a map interface, which we consider more suitable for a location-based networking app, because it gives the users the opportunity to see where notes are posted from. Other improvements include the ability for organisers to set event boundaries and indicate locations of key facilities (exits, toilets etc.), as well as better filtering capabilities for attendees, including the use of custom tags, and finally the possibility to send your location to a friend.
- 4) **Adequately Address User Needs**—We believe the user needs (3.4) were adequately addressed as indicated by our test data: 100% of outdoor event organisers said they would use the app and 50% of all organisers said they would pay for the app (6.8.2), while 83% of event attendees said they would use the app and 55% would pay for it (6.8.3).
- 5) **Create Smooth User Experience**—We believe Festie delivers a smooth user experience for the attendee user, as indicated by our final user testing results—94% of testers found the app easy to use, 88% found it easy to find the information they wanted and 88% found it easy to communicate with other event goers.
- 6) **Produce High Quality Final Artefact**—While this target will be easier for us to measure after our artefact has been officially assessed by the CDM team, we believe our app to be of high quality in terms of the following four major aspects: Functionality and Deployment, Design and Content, Usability, and Complexity and Completeness. On a personal level we are very proud and gratified (delighted, satisfied) with the quality of our final product, which have been praised by both users (6.8) and industry experts^{31, 32}. We also believe

³¹ “The concept is good... it looks very polished and put together—nice job”—Shane McAllister, founder, Mobanode.

that what we have built can form a base for future work, since we endeavoured to build Festie in a manner that allows future scaling, in terms of number of users, supported use cases and features.

- 7) **Learn New Tools and Technologies**—Almost all of the tools and technologies³³ we used for the research, design and execution of the project were completely new to us and learning them thoroughly (yet quickly) was a sought-after outcome of having to produce a complex product within a limited timeframe with a set deadline. We believe that the breadth of new technologies learned was really wide both in terms of the sheer number, but also the *types* of technology learned.
- 8) **Successfully Time-Manage the Project**—Even though we were ‘behind schedule’ more often than not, we successfully managed the situation by revising our schedule and re-evaluating our prioritised list of tasks every four–five weeks. We believe this is a natural part of the agile development process and that it has led to successfully meeting all our major deadlines so far.

7.2.2 Requirements

Functional Requirements

1) Map/Home Screen

- a. View Notes (and Event Boundary)
- b. View Markers
- c. Show User Location

³² “Woot! Congrats... It really looks like a professional job... Definitely deserves an A.”—Denis Hennessy, co-founder, Peer Assembly.

³³ **Tools and technologies learned**—Prototyping: Flinto, inVision; Design and Content Production: Photoshop, Illustrator; Code Development: iOS, Node.js, MongoDB.

The *Map* feature works well, as well as the *Show User Location*. 90% of testers reported that they didn't have any problems viewing and browsing the notes on the map.

2) Post a Note

This feature works as intended. 100% of testers reported they didn't have any issues posting a note to the map.

3) View a Note

- a. Vote on a Note
- b. Reply to a Note

95% of the testers reported that there were no issues when viewing a note in detail. The *Vote on a Note* and *Reply to a Note* features both function correctly.

4) Login

The *Login* feature functions correctly for both an attendee user, and an organiser user. However, as described in the Coding Section and in Testing there is a usability issue regarding the **organiser workflow** -

5) Create Account

The Create Account works as expected.

6) Filter Notes (segmented control)

The segmented control button correctly filters the notes by popular, recent, and displays the event markers correctly.

7) Search Notes by Keyword/by Tags

The *Search Notes by Keyword/by Tags* finds the correct notes and tags and works without issues when the user chooses to view a note in further detail from the drop-down search table. The feature performs well when the user chooses to see notes with the corresponding tag displaying on the map the most popular such notes.

8) Custom Notes

- a. Display the note title (and maybe a thumbnail) on every note
- b. Display notes on the map without overlapping

The notes are customised as per our requirement – every note displays a title and notes don't overlap. Due to the fact that the shape of the note is not a perfect square or a circle, completely preventing notes from overlapping, while probably not impossible, won't add much to the user experience but will be complex to calculate. Our notes sometimes slightly overlap but no usability issue has been noted by testers and we don't consider this a concern.

9) Post/Edit (organiser)

- a. Post a Note (organiser)
- b. Post General Information (organiser)
- c. Post a Marker (organiser)

Posting a note and general information about an event work without issue. Adding and saving markers on the map (including custom markers) works correctly. However, as discussed in Coding and Testing, we ran out of time before submission and we never implemented the *Clear* button, which would allow users to clear all the markers on the screen and start adding them afresh. The lack of a clear button was noted by 38% of the testers at the final trial.

10) (Slider) Menu

The user can slide the home screen to the right to reveal a menu screen underneath in one of two ways - either tap on the 'hamburger' button to trigger the slider or to drag the home screen with their finger (as long as their finger is not on the map). However, due to an oversight on our part when implementing the slide-out functionality for the rest of the menu screens – login, create account, share my location, currently means users can't drag with their finger from these screens (only tap on the 'hamburger' icon). This is a very minor 'consistency' issue, which will be easily rectified with the addition of two lines of code for each screen.

11) Share

The share functionality, which is part of the *Post a Note* feature works correctly. It lets users share their note content via SMS, email, as well as on social media (Facebook, Twitter etc.)

12) List View

List View displays all the notes correctly on the screen. However, as discussed in Coding and Testing, we ran out of time towards the end of the implementation stage and never implemented a connection between *List View* and *View a Note* to let the user view notes in further detail. As a result currently users can only scroll up and down to view the notes. 40% of testers noted this issue during our final trial.

13) Share My Location

The *Share My Location* feature performs well. However, due to concerns about bandwidth limitations and not enough time to test for the optimal size of the image to be sent, we significantly reduced the quality of the screenshot to ensure a quick upload, which makes it currently slightly pixelated. We were comfortable with this decision since we already know how to address the issue properly: by converting the PNG image to JPEG our testing indicates that a large byte-size saving will be made.

14) View General Information

This screen displays all of the information correctly, however in the future we will make sure not to display the grey buttons on the bottom if the organiser hasn't supplied links to their website or tickets info site. Right now there is a minor issue—the grey buttons remain on the screen even if there are no web link displayed on them.

15) Detect Events Within User Location

This feature performs correctly. Only 3% of testers reported issues during detection of events.

16) Horizontal Scrolling Feature

The *Horizontal Scrolling Feature* performs correctly. Final user trial revealed

that 94% of testers were aware that clicking on it will let them see further detail about the note.

17) Event Boundary Selection Tool

As confirmed by user testing, this feature performed well at our final trial—in general users responded very positively to the idea and how it worked.

We will note however, that 25% of the users had to clear their first boundary and make a second attempt (mostly due to not reading the instructions carefully).

Nevertheless, we are satisfied with this result as the boundary tool does not use a common design pattern and it is a relatively complex feature. That's why we took care to provide the users with means to recover from their mistakes—a *Clear* button.

We also think that creating a boundary is not a task organisers will have to perform very often anyway and a bit of a learning curve would cause no harm.

18) Custom Tags (as part of Post a Note)

Adding a custom tag to your note functions correctly with no issues reported from testers.

19) Display Event Boundary on Map

Event boundary is correctly displayed on the map.

20) Custom Map

As explained in Coding, we abandoned our attempts to debug our custom map due to time pressure and the need to prioritise more important features. This was not an original requirement in any case and the default Apple Maps performs very well. Hence we do not consider this a failing.

21) Local Cache

Caching data locally on the device is really a must for any app that gets data from a server—otherwise the user might be left staring at a blank screen with nothing on it whenever the network is slow.

Even though this feature was planned from the beginning, it was repeatedly pushed further down our priority list for the entire duration of the development process, as more urgent tasks needed our attention. As a result local caching was never implemented.

We believe the main reason for this was the fact that the app was functioning well even without local cache as we were connected to a stable WiFi connection while developing and the fast 4G connection in Dublin and Wexford (3.5G outside of city centre) never failed us during testing with users.

However, in the real world, whenever the network is slow or non-existent this will become a major issue, thus we plan on implementing this feature in our next build before submission for release in the App Store. We have already thought through this implementation and believe that we have a workable design.

22) Organiser Login Workflow

This workflow was not an official original requirement but the issues with it will need to be rectified if we are to submit the app to the App Store.

While still minor, this is the biggest issue in Festie at the moment and we received poor feedback from our testers—75% reported dissatisfaction with the number of alert screens that are used to take you through the process.

The two alert screens we incorporated in this workflow were really a compromise we were forced to make as we were running out of time before the final deadline and the initial way we were thinking of implementing this feature was not working.

Here is a brief explanation of the issue:

Organiser users can access the login screen in one of two ways:

- 1) Through the menu—this option works without a problem;
- 2) They are prompted to sign in after having opted to press the ‘*I am an organiser*’ button at launch. However, this happens after first being prompted to press the ‘+’ button to add content for their event³⁴. This results in a poor user experience.

We are not yet sure whether this issue should be rectified by changing our design for the workflow or by just dealing with the programmatic difficulties that forced us to use the two alerts.

While the path for logging-in is currently workable, and in mobile apps users usually need to sign-in only once, we are unhappy with how we implemented this feature.

In our opinion the issue here is purely programmatic, as we were satisfied with how we designed this workflow on paper and in the digital mock-ups.

Our failing was due to two factors, we think: one, we ran out of time before the submission deadline; and two, we feel we are missing a some aspect of how background threads work in iOS. We feel that in order to address this issue we need to consult with iOS developers to understand how such issues are addressed.

Content Requirements

We are delighted with the visuals we produced for Festie. This opinion was also shared by our testers, both 100% of organisers and 100% of attendees said they liked (or strongly liked) the visuals and appearance of the app (6.8).

7.2.3 Risks

We are happy to report that all the risks we took at design stage (5.3.3) led to success.

³⁴ This prompt would not be displayed once local cache is implemented and if this is not the organiser’s first time to open the app. This is because mobile app users usually need to sign-in only once into apps installed on their devices, as there is no privacy issue.

- 1) **Design a good algorithm to dynamically display the notes on the map—**
We are happy with the algorithm we came up with in the end. It was exactly what we were hoping for in the beginning.
- 2) **Implement above algorithm—**The implementation of said algorithm was also a huge success (See *Prevent Overlapping of Notes* in Sub-section 5.4.2(ii))
- 3) **Implement geographic search—**Implementing geographical search in order to detect events and their boundaries was also successful (See *Detect Events Within User's Location* in Sub-section 5.4.2(ii)).
- 4) **Implement app natively in iOS—**This was the biggest risk we took and we are thrilled that it worked out perfectly in the end, achieving both our goals to learn the technology and produce a polished quality app.

7.2.4 Team Work

Having read comments about teamwork issues by teams from last year in their blogs, we thought it was best to assign strict roles for each team member at every stage so that each of us managed their time independently while still collaborating together on important design decisions. We are very satisfied how this approach worked for us.

1) Roles

During the research and design stages we collaborated on all aspects while still maintaining our assigned roles. Ciaran was in charge of getting user feedback—surveys, interviews, hosting the focus group, as well as researching competitor apps and making the digital mock-up prototypes, and Vanya was in charge of paper prototyping, interpreting the results from user research by extracting user needs, as well as analysing competitor research and drawing up the initial list of requirements, which we then finalised together.

During the implementation stage Ciaran produced all the graphic content, conducted all of the user testing and was in charge of social media engagement, while Vanya wrote all the code.

2) Collaboration and Workflow

We collaborated on important decisions through email, Trello and inVision (a prototyping, collaboration and workflow platform), as well as through weekly meetings.

During the design stage inVision proved to be an excellent tool for collaboration on design and prototypes as it allowed us to attach comments and sketches to our screen layouts and discuss our ideas both in a chat-like form or live through the LiveShare tool. The use of inVision helped speeding up design decision-making, which otherwise would have been difficult given that each of us worked from home, only meeting in person once every week.

During the implementation stage we took advantage of Xcode's storyboards feature, which has a user-friendly Photoshop-like interface. This allowed Ciaran, when it was time to integrate a new feature, to first build the new screens for each feature and add to them all design elements, adjusting their sizes, fonts and colours to perfectly match his mock-up designs to the last pixel. After this Vanya connected all the screens and elements to the written code.

It took us many weeks however before we managed to establish a truly efficient and productive workflow. Xcode is a complex tool and we were both beginners, which in the beginning caused many setbacks. Even after creating a good workflow one issue remained—that we couldn't work on the Xcode file at the same time, forcing a quite inconvenient daily schedule for Ciaran who had to add design elements to the file at night, so that Vanya could write code for them during the day.

During testing and debugging we collaborated in the following manner, in keeping with agile principles: after Vanya was done incorporating a new feature, Ciaran would extensively test that particular feature, as well as all the other functionality of the app to make sure no new bugs were introduced without our knowledge. Every four to five weeks Ciaran would test all new features with users and, based on the results, create action points for Vanya to

address in the next build.

Again, it took us a while to establish this workflow (towards mid-November), which really came as a reaction to issues with undetected bugs (which were hard to trace back to establish when they were introduced) rather than being planned in advance by us.

3) Productivity and Performance

As already mentioned earlier, our productivity and performance were poor in the very beginning of implementation. However, this changed gradually with time, while getting familiar with the tools and technologies we were using, leading to a good workflow towards the end, which yielded satisfactory results.

7.2.5 Marketing

Marketing was an important element to our project, regular updates were posted to different social media networks.

Twitter: @Festie_Bestie

Twitter was used as a base to make contact with festival attendees. Events we attended, such as Open House and Speigeltent festival retweeted us to raise awareness of our presence amongst potential users at these venues.



Facebook: <https://www.facebook.com/eventfulDIT>

Our Facebook account was the earliest form of marketing used while developing our app. This social medium allowed us to reach out to potential users giving them a voice and letting them contribute in decision-making on elements of design, functionality among other things. When unable to make a definitive decision as a team (such as for the app name and app logo) we sought user opinions.

Instagram: Username '[Festie_](#)'

We also used Instagram to promote Festie. One of our favourite weekly contributions to this social network was #throwbacktuesdays displaying images from past festivals to encourage people to reminisce about events and festivals gone by.

Youtube: https://www.youtube.com/watch?v=noO90xAfC_o

Our trailer can be witnessed on our channel, we hope to make use of this medium going forward by gathering footage from festivals for promotional videos regarding the app.

Website: <http://www.festie.eu/>

Our website was used to sign up potential users for testing sessions. We hope to use this web address in the future to provide links to the app in the App Store, as well as provide information about future plans and updates.

Promotional Events: We showcased our app at the DIT Showcase Event on 11 Dec and received a lot of positive feedback, including valuable advice from Tapadoo's CEO Dermot Daly.



Figure 7-2 Festie team and Dermot Daly at the DIT Showcase Event

7.3 Future Work

Our work on Festie is not yet finished. We have had many ideas in the past months about what our next steps for Festie should be. Here we will discuss only some of them:

7.3.1 Unfinished Features

First, we would like to release Festie in the App Store. But before doing this, in order to make sure our offering is of the highest standard, we plan on completing all our unfinished features first. By our estimation all these will be mostly minor tweaks and additions mainly to do with improving the user experience:

- 1) **Organiser Login Workflow**—The organiser login workflow is the biggest issue in Festie at the moment and will need to be resolved first. We can think of two possible ways to resolve this issue. One—by redesigning the workflow altogether to avoid having to deal with background threads at launch; and two—by finding a programmatic solution to the background thread issue

while keeping the current workflow design. It is difficult to give an estimate of how much time will be required to fix this issue—maybe about a week.

- 2) **Organiser Edit functionality**—We are considering improving the overall editing functionality for all the organiser features. We think this will require one-two days of additional work.
- 3) **Add *Clear* button to *Add Markers* feature**—This will require just copying and pasting the *Clear* button code for the boundary tool and adapting it for the markers. We think it will take half a day at most.
- 4) **Implement Local Cache**—We were planning on using SQLite to implement this. We envisage this might require a day or two to implement.
- 5) **Connect *List View* to *View Note***—We think this will take half a day.
- 6) **Event Boundary Selection Tool**—We have already written a function to prevent the user from creating boundary lines that cross each other (as crossed boundary lines won't be interpreted well by the geo search). It only remains for us to incorporate this function into the rest of the code. We estimate one day of work.
- 7) **General Info Screen, Share My Location, Slider Menu**—We only need to fix some minor issues for these, as discussed above. To fix them we estimate one-two days in total.
- 8) **Custom Map**—We don't consider unfinished feature but are curious to see whether we will be able to fix the problem that was causing the pins to disappear, now that we are not under time pressure.

Overall, we think we will require about two more weeks to make this app fully ready for the market.

7.3.2 Additional Features

Support all screen sizes (iPhone 4s, 5, 6 and 6 plus)—We investigated doing this even during development, however, because the brief required us to choose one device only, due to time pressure we decided to make this an additional feature

instead. With the introduction of the iPhone 6 series and Xcode 6 Apple has also introduced a more powerful Auto Layout tool to help developers create an adaptive interface for their apps to respond appropriately to changes in screen size. We went through few Auto Layout tutorials already.

Option for attendees to create events— We played around with this idea during research but opted not to pursue it due to the extra layer of complexity it would have introduced making the app unsuitable for a master’s project. At some point we would like for Festie to be a truly crowd-sourced app and this means that attendees should be able to create events as well, as there could be events where the organisers are not willing to participate but attendees will be enthusiastic to exchange information. The dramatic rise in ad-hoc, collaboratively organised “unconferences” such as BarCamp, and Pub Standards suggests that this is true. We think this could be achieved by simply prompting the first 10–20 attendees who opt to post a note within close proximity to each other (within certain time frame) to enter the name of the event they are at. Based on their median location then the software could automatically create an event and keep on adjusting the boundary as more people join in. The locations of facilities will also be crowd-sourced rather than entered by an organiser.

7.3.3 Commercial Opportunities

From talking to Irish apps development companies, who had been commissioned to develop festival apps in the past (Tapadoo and Mobanode) we learned that the majority of festival and event apps in Ireland get funding from the Arts Council to finance the commissioning of their apps. However, due to government cuts in funding in recent years many festivals could not afford these companies’ services any more. As a result these festivals have either not released an app (Oxygen) or compromised their app’s quality by paying for a substandard product (Electric Picnic).

We believe there might be a commercial opportunity here. Given that a generic app like Festie could be used for many festivals, it might be of interest to the Arts Council to fund just one app rather than funding a number of apps every year. We were also in conversation with AOIFE in this regard, who have invited us to their next annual conference in May 2015.

7.3.4 Re-use the App in Other Domains

We think our app could easily be adapted for use in other domains. During our brainstorming sessions for ‘more focused’ concepts at the beginning of the summer we made a list of possibilities. At the time the idea about events was undoubtedly the strongest candidate for a master’s project. Now, looking back at these ideas we think that it will be feasible to quickly ‘make copies’ of the app’s infrastructure to use for our other ideas:

- 1) **Accessibility App**—An accessibility app for disabled users to indicate which buildings are accessible, which particular entrance of a building is accessible, which establishments and public buildings have accessible toilets and their ratings. We actually came across an app (Access Earth) for accessible hotels produced by four students from NUI Maynooth, which has won a competition in the US for their app (Irish Times, 2014).
- 2) **Baby-friendly Establishments App**—Similar in concept to the accessibility app but for baby-friendly establishments.

7.3.5 Festie—Part of a Bigger Concept

Digital Maps as a Platform—Festie was inspired from the bigger concept that we had in the beginning about *Digital Maps as a Platform*. This idea was not suitable for the scale of a master’s project at the time but we are still strongly of the opinion that maps are an underutilised resource in the era of ubiquitous connectivity and smartphones.

Countless areas of modern life can be improved through an easy-to-use map annotation platform that enables people to create and consume geographically-targeted information that is relevant to where you are, when you are there.

With Festie we took one baby step into this future, deliberately narrowing the scope of our artefact to ensure it was realisable in the time allocated, but we believe that some of the concepts that we explored can be taken much further.

7.4 Conclusion

In Chapter 7 we started our evaluation by assessing each of the following: project objectives, requirements, outcomes of risks taken, how we performed as a team and our marketing strategy.

Following this we looked at *Future Work* and how we planned to achieve completing unfinished features, as well as add further functionality to the application. We also looked at possible commercial opportunities for Festie going forward, before concluding with a look at how the app could be utilised elsewhere other than in the festivals and events domain.

Chapter 8 Report

Conclusion

Final Conclusion

We have written and structured a detailed document, which follows the User-Centred Design (UCD) and Agile Development (AD) methodologies through each chapter. This approach reflects the development cycle of our app Festie most accurately.

In chapter 2 *Idea*, we concentrated on our final idea regarding festivals and events and then briefly referred to our previous ideas. We researched this domain and following positive analysis progressed our idea to the next phase of the project.

In Chapter 3 *User Needs Analysis*, this progression was in the form of analysing the potential user needs, where we first outlined our strategy for project execution and as a result we interpreted our project aims and objectives, which we believe we have met and achieved. We then looked at analysing the user needs in greater detail through surveys, interviews and a focus group, resulting in the creation of three key personas.

Chapter 4 *Background Research*, began by outlining our project scope, following this we conducted in-depth research of competitors and looked for inspiration by reviewing current state-of-the-art apps in other domains. We also discussed technologies that could be integrated into our app. Following these reviews we defined the functional and content requirements for the app. We fulfilled these requirements—evident from the successful final trials for both attendees and organisers.

In Chapter 5, we took a detailed look at *Methodology and Approach* used throughout the development process. We concisely discussed the design, production and development of the artefact, which took place over a three-month period.

In Chapter 6 *Testing and Analysis*, we outlined how we had made informed decisions throughout the project process. From early stages we involved potential users and tested through many different methods. We attended festivals to receive feedback from users in the environment the app would be used. In addition, we gathered feedback through formal test, social media, surveys and interviews. All this data was analysed and greatly helped the progression of our app towards a final build.

In the final chapter, Chapter 7 ***Evaluation***, we assessed and analysed whether we had met our targets and aims set out in the beginning. We used data from our final tests to support these outcomes. We examined the features that need improvement and also outlined features we could implement in the near future before release of the app in the App Store.

Overall, we are incredibly proud of the application we have created. The hard work that we put in throughout this project has been greatly rewarding.

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Appendix A Events and Festivals Research

Overseas Attendance at Festivals/Events in Ireland 2009-2013 ('000s)

Source: Fáilte Ireland's Survey of Overseas Travellers

FESTIVALS & EVENTS					
Overseas Visitors	2009	2010	2011	2012	2013
Britain	117	143	167	220	208
M Europe	167	176	181	220	261
N America	69	98	105	85	165
Other Overseas	16	27	49	33	40
Total Overseas	369	443	502	557	673

Types of Events attended					
MUSIC EVENT / FESTIVAL					
Overseas Visitors	2009	2010	2011	2012	2013
Britain	68	93	59	92	98
M Europe	82	88	70	88	109
N America	40	48	32	24	51
Other Overseas	9	10	20	9	8
Total Overseas	199	238	181	212	266
ARTS FESTIVAL					
Overseas Visitors	2009	2010	2011	2012	2013
Britain	18	31	25	17	25
M Europe	53	46	26	25	27
N America	23	31	20	9	15
Other Overseas	2	9	13	5	7
Total Overseas	96	116	84	55	75
FOOD & DRINK EVENT / FESTIVAL					
Overseas Visitors	2009	2010	2011	2012	2013

Britain	4	7	2	6	15
M Europe	3	4	3	21	20
N America	3	3	-	-	15
Other Overseas	-	2	-	10	2
Total Overseas	9	16	4	38	52

Sample taken of ten festivals to analyse variables of festivals

Festival	Contact	Size of Festival Boundary *	Genre	Month	No of Days	Attendance*	Facebook likes	Most engaging users Facebook	Wifi connectivity available	Event App
St. Patricks Day	info@stpatricksfestival.ie	84,481km ²	Cultural	Mar	3	1.6million	21,870	25-34(Dublin)	Depending on town/city	Yes
Dublin Horse Show	Victoria McArdle	.14km ²	Equestrian - (Arts & Crafts)	Aug	5	Over 100,000	39,977	18-34(Dublin)	Yes - Full coverage	No
Wexford Festival Opera	Seamus Redmond	27.391 km ²	Arts	Oct	10	No Stats	8,807	25-44 (Wexford)	Yes - In Opera House	No
Spiegel tent Festival	Brian Byrne	0.003 km ²	Music/Comedy	Oct	10	8,000	6,233	25-34(Wexford)	No	No
Electric Picnic	jroberts@festiv alrepublic.com	2.072 km ²	Music	Sept	3	Over 40,000	151,258	25-34(Dublin)	No	Yes - webapp
Guinness Amplify - Leinster	info@guinnessamplify.com.	19,800km ²	Music	Oct	20	No Stats	4,886,360 Guinness page	25-34(Dublin)	Depending on Pub	No
Rose of Tralee	Rebecca Kemp	.601km ²	Carnival	Aug	5	200,000	1,065	18-34(Dublin)	Yes - In main Hotel	No
Lisdoonvarna Matchmaking festival	Julie Carr	0.36km ²	Entertainment	Aug	7	60,000	2,182	25-34(Limerick)	Yes – In hotel Hq	No
Castlepalooza	Cillian Stewart	.141km ²	Music	Aug	3	4,750	26,195	25-34(Dublin)	Yes - Full coverage	Yes
Samhain	info@samhainfestival.com	.034km ²	Music	Oct	1	5,000	16,818	18-24(Dublin)	No	No

* Indicates stats calculated through educated calculations or unverified sources.

Appendix B User Research

What information would you like displayed about your nearby surroundings in an app like this?

Answered: 53 Skipped: 0

people who are there/ things happening
3/12/2014 10:23 PM View respondent's answers
Buskers, free stuff
3/12/2014 9:51 PM View respondent's answers
Traffic problems, utility interruptions, promotions and events. Live feedback about what's happening
3/12/2014 9:50 PM View respondent's answers
One off events like pop up shops, markets and gigs would be cool. Anti mainstream events would give the app an edge on other apps/sites I've seen.
3/12/2014 9:24 PM View respondent's answers
One-off events (such as gigs, exhibitions, screenings, talks)
3/12/2014 9:23 PM View respondent's answers
eg. pointing out what the place excels at etc comprehensive list of events and happenings around you
3/12/2014 9:16 PM View respondent's answers
Maybe atmosphere in a pub if there is a crowd there and worth going. Taxi availability at ranks
Restaurants bars etc
3/12/2014 10:43 PM View respondent's answers
Whats happening and where in the local area would be a great help as such as the introduction of pop shops as shown on the map above would be really beneficial. The ability to learn of local roadworks would also be of great use.
3/12/2014 10:43 PM View respondent's answers
Good pubs, good barbers maybe! Healthy Eating Restaurants (for the athlete)
3/12/2014 10:33 PM View respondent's answers
Nothing additional
3/12/2014 10:32 PM View respondent's answers
Ratings
3/12/2014 10:29 PM View respondent's answers
Reviews by the app
3/12/2014 10:28 PM View respondent's answers
new restaurants and bars, and food markets
3/12/2014 11:26 PM View respondent's answers
All of the ones you've displayed are interesting
3/12/2014 11:16 PM View respondent's answers
Maybe one you click into a post you could learn more about the place itself like menus prices events etc
3/12/2014 11:13 PM View respondent's answers
Popularity
3/12/2014 11:13 PM View respondent's answers
Offers for food in restaurants. Updates on how full/empty venues are.
3/12/2014 11:06 PM View respondent's answers
accurate directions would be most important.
3/12/2014 11:03 PM View respondent's answers
Events, traffic information
3/12/2014 10:57 PM View respondent's answers

Gigs food cheap boos

Good bars events search bar to search what you are looking for and then to be able to see where this type of thing is on

3/13/2014 5:28 PM [View respondent's answers](#)

Short precise descriptions

3/13/2014 3:03 PM [View respondent's answers](#)

Menu / Special Offers / Availability

3/13/2014 2:35 PM [View respondent's answers](#)

Depends on the context, if I am a tourist, what I would like to see may be different than if I was living here for a year...

3/13/2014 2:18 PM [View respondent's answers](#)

Reviews, Ratings, Street events / gigs.

3/13/2014 11:14 AM [View respondent's answers](#)

people meeting to play football , random 5 a sides ect, college house parties or student houses :)

3/13/2014 10:22 AM [View respondent's answers](#)

GIGS, EVENTS, GOOD GRUB ETC.

3/13/2014 6:58 PM [View respondent's answers](#)

Nearby Public Houses

3/13/2014 6:16 PM [View respondent's answers](#)

brief descriptions and ratings of restuarants, bars, updates on local surroundings etc!

3/13/2014 6:14 PM [View respondent's answers](#)

Gigs, cheap and cheerful events, this weeks *best* event (voted by app users)

3/13/2014 5:39 PM [View respondent's answers](#)

Food

3/13/2014 5:37 PM [View respondent's answers](#)

the popularity of the place/ landmark

3/13/2014 5:32 PM [View respondent's answers](#)

Traffic jam, street closed, shops, buses stops, bars

3/13/2014 5:32 PM [View respondent's answers](#)

Sports facilities. Lotto agents. Roadworks

3/14/2014 11:11 AM [View respondent's answers](#)

Events (gigs, markets, talks, public speakers etc.)

3/14/2014 5:24 AM [View respondent's answers](#)

Pubs, nice restaurants, sites to see,

3/14/2014 12:09 AM [View respondent's answers](#)

events happening with clear access to more information about it...

3/13/2014 9:49 PM [View respondent's answers](#)

Sports info. Local matches etc

3/13/2014 9:22 PM [View respondent's answers](#)

Good food & drink. Sports and music events. Hidden treasures...

3/13/2014 8:52 PM [View respondent's answers](#)

special offers/deals on in shops, pubs,restaurants. Traffic diversions/ street closures.. great idea about notifying where road works are.

Events, tourist attractions. Amazing how many people havnt seen local attractions and don't even know about them

3/24/2014 11:00 AM [View respondent's answers](#)

Interesting stuff

3/21/2014 2:49 PM [View respondent's answers](#)

events, gigs, traffic works, traffic delays

3/16/2014 10:04 PM [View respondent's answers](#)

Public events. pub events etc

3/16/2014 8:22 PM [View respondent's answers](#)

Taxi. Bus. Shops places of interest. Roads.

3/14/2014 9:04 PM [View respondent's answers](#)

Reviews from people who have experienced the places, also for restaurants maybe a online menu with the app rather than just a link to their website.

3/14/2014 3:35 PM [View respondent's answers](#)

What do you think of our idea to have the notes displayed on the map?

Answered: 53 Skipped: 0

Great make sure and colour code to what people might be looking for to find it quick

3/24/2014 11:00 AM [View respondent's answers](#)

Clutters up the display if there are too many locations displayed - drill down is better

3/21/2014 2:49 PM [View respondent's answers](#)

good idea, saves an extra click

3/16/2014 10:04 PM [View respondent's answers](#)

Great idea

3/16/2014 8:22 PM [View respondent's answers](#)

Good

3/14/2014 9:04 PM [View respondent's answers](#)

Good very innovative

3/14/2014 3:35 PM [View respondent's answers](#)

Good idea so long as it is not too cluttered. Maybe use a colour scheme. Blue for sport. Green for entertainment etc

I think you run the risk of the screen becoming very cluttered. It may be better suited to tablets than smartphones.

3/14/2014 5:24 AM [View respondent's answers](#)

Great idea

3/14/2014 12:09 AM [View respondent's answers](#)

good idea once its not taking over the map..

3/13/2014 9:49 PM [View respondent's answers](#)

Looks good

3/13/2014 9:22 PM [View respondent's answers](#)

Great but would need to be short & sweet

3/13/2014 8:52 PM [View respondent's answers](#)

good idea if the notes are short. Would need a character limit on them, and they would have to be verified before they are allowed to appear on the map by a moderator to make sure people were not abusing the app... eg teenagers might post rude things etc. Good idea overall though, because you might not think to click on a pin at a certain location if you had never been there but if you saw the note and were drawn in by what it said it could entice users to go there, be happy that the app lead them there... so they'd recommend the app

3/13/2014 7:27 PM [View respondent's answers](#)

GREAT - IF I CAN SEE THEM

3/13/2014 6:58 PM [View respondent's answers](#)

It's not a bad idea provided it is updated on a regular basis and costumer feedback is taken seriously.

3/13/2014 6:16 PM [View respondent's answers](#)

Very good! Prefer it to pins

3/13/2014 6:14 PM [View respondent's answers](#)

Good idea. Think that you could make an app better by letting people "rate" each event, or categorise events and link each persons interests to that of their friends phone or phones near by.

3/13/2014 5:39 PM [View respondent's answers](#)

Might be hard read on a phone compared to a tablet or laptop

3/13/2014 5:37 PM [View respondent's answers](#)

very good idea

3/13/2014 5:32 PM [View respondent's answers](#)

User Interviews (Sample)– Attendees

Alan

Male/Female:

Male

Age:

25

Ethnicity:

Irish

Occupation:

Teacher

Background:

Attended St.Pats college to study primary school teaching. Loves to travel and keen sports player particularly hurling.

Family:

In a relationship (no children)

Social Situation:

Is coach to local teams and organises summer camps for students. Likes going out at weekends to local pub and attends irish festivals during his summer break. Also involved with organising small scale local community events and activities. Is active on Facebook, Twitter and Instagram.

What are your favourite festivals/events to attend?

Longitude / Strawberry festival / Galway Festival / Sea Sessions / Fleadh Cheoil / Cats For Laughs

How many times a year would you attend events/festivals?

Twice a year

What did you enjoy about the events in particular?

The atmosphere

Have you ever found yourself frustrated at an event/festival? why?

Yes.

Strawberry festival - Didn't know where anything was driving around looking facilities.

As a result crowd dispersed all over the place, no central or focal point.

No information office or point.

Oxegen - information centre too crowded and not going to waste time queuing.

Maps of the event had been vandalised.

Have you ever used an app for an event?

No

Do you know of any apps that are event related.

No

So you have been to the fleadh. Tell me about your festival experiences good or bad.

Enjoyable experience spent listening to music, socialising, at stalls. Mingled with other event goers who weren't direct friends. Unsure of what pubs were good to go too, live music on street very good.

Parking frustrating, it would good to see where parking areas or spaces are on near arrival to an event/festival. Ate at fast food vans as didn't know where the best places for food were.

Have you ever found yourself looking for event/festival staff to ask them a question?

Yes.

What were you looking them for?

Directions and information about times.

Is it easy to navigate around at these events/festivals?

It can be and it can't. With a big crowd its hard to manoeuvre around as a group and people missing from the group becomes a problem.

Would an app that highlights key locations such as toilets/exits etc. help your experience?

Yes provided it is presented well. Some paper maps are cluttered and is more confusing than anything.

Did you use a map to help you find your way round at any festivals?

Yes.

How did you find these?

Maps were good and detailed but some were over crowded and actually made it difficult to read.

Would you interact with other event goers and if so why?

To be sociable and to ask directions if know one in our group knew where they were going.

Would you interact with other event/festival goers through a social app?

Yes. To get advise is something good im missing out on, where the best atmosphere is, to be in the thick of the event.

Have you shared experiences from an event/festival on social networks through videos, photos, text?

Yes - FB, Twitter, Instagram, Snapchat

How would you keep updated with the latest news/announcements while attending an event/festival?
(Radio, Word of mouth, Speakers Announcements)

Dont know. Word Of Mouth or some kind of notice board.

Claudia

Male/Female:

Female

Age:

27

Ethnicity:

Irish

Occupation:

Pensions Administrator

Background:

Studied in Sligo IT, Spent a year traveling as a airhostess with Etihad airways. Loves to travel & discovering new places aswell as meeting new people and eating out .

Family:

3 brothers

Social Situation:

Currently working as a pensions administrator since Jan. I am studying for QFA exams at the moment. Have a keen interest in world cinema movies. I love socializing and having spontaneous plans. Currently active on Facebook and linkedin.

What are your favourite festivals/events to attend?

Sea sessions / Electric Picnic

How many times a year would you attend events/festivals?

Once a year to a major festival but it really depends whats on.

If one of events for example a concert in marley park would interest me I would go.

What did you enjoy about the event in particular?

Sea Sessions: Line up - small bands particularly Irish such as the Coronas and Corner Boy

The destination: Set in Donegal it is an unusual venue for a big event. Love touring Ireland so being able to enjoy the irish countryside and good music is always a plus.

Have you ever found yourself frustrated at an event/festival? why?

There is always an element of frustration queuing for different things. In particular queuing for drinks can be quite annoying. The fact that its usually one type of drink being served, you would think the process would be quicker.

Have you ever used an app for an event?

No

Tell me about your festival experiences good or bad.

Festival experiences are all good, the rain has been the only major problem on a couple of occasions. I suppose from that point of view it would be nice to know what you could do when its raining or if there are any activities indoors rather than just sit in a tent for the festival.

Do you ever find any issues with these events?

The only issue i really encounter at events is parking and its a problem that never seems to be resolved.

Have you ever found yourself looking for event/festival staff to ask them a question?

No

Is it easy to navigate around at these events/festivals?

Yes most of the time maps can be a little confusing now and again.

Would an app that highlights key locations such as toilets/exits etc. heighten your festival/event experience?

Yes great idea, would be much better than a cumbersome map that you have to open out everytime your looking for something.

Did you use a map or app to help you find your way round?

Google Maps is the only app for events that are based on streets.

Would you interact with other event goers?

Yes. Simply looking tips on the places to go, so you wouldn't miss out on something.

What would you converse over?

Would you interact with other event/festival goers through a social app?

Probably not, I would be for more communicating with people face to face as people tend to be in good spirit and helpful at events.

Did you share these experiences on social networks through videos, photos, text?

Yes mainly photos.

How would you keep updated with the latest news/announcements while attending an event/festival?

(Radio, Word of mouth, Speakers Announcements)

Facebook and then other people at the event.

Michelle

Male/Female:

Female

Age:

31

Ethnicity:

Irish

Occupation:

Office Admin

Background:

BBS Degree in WIT

Family:

In a relationship (no children)

Social Situation:

Enjoy coffee w/ends with Friends and dinner at an open mic restaurant where acts just come in off st.
Enjoy bootcamp which also has social events linked in. Is active on Facebook, Twitter and Instagram.

What are your favourite festivals/events to attend?

Previously Oxygen, Taste of Dublin – food festival, German beer fest,

How many times a year would you attend events/festivals?

Twice a year

What did you enjoy about the events in particular?

The atmosphere: being around a busy fun environment a lot different to a work environment. Just having the craic and socializing with friends and others with similar interests.

Drinking and Eating: Its kinda a typical Irish answer but I enjoy drinking and just letting loose. Also love for food and trying different foods ie Taste Of Dublin.

Have you ever found yourself frustrated at an event/festival? why?

Yes.

Taste of Dublin – you have to use currency that is specific for that event which is very frustrating and you cant cash in. Queues for facilities such as toilets, which is common at peak times at most events but when your at an event the last thing you want to be doing is queuing for the toilet for an hour.

Have you ever used an app for an event?

No

Do you know of any apps that are event related.

No

Tell me about your festival experiences good or bad.

Good exp: German beer festival was probably the most enjoyable. The ease of access to the event there was no hassle queuing and it was just a fun experience. Everyone seemed to be up beat and friendly which makes a big difference at an event. You don't feel pressurised into trying to socialise it just happens naturally.

Bad exp: Probably the fear at campsites when you rumours that someone has been stabbed or that a tent was set on fire.

Have you ever found yourself looking for event/festival staff to ask them a question? Yes

What were you looking them for?

First Aid – a friend of mine cut there finger on glass, we ended up getting bandages of another festival goer.

Sale of ponchos – when it rains the last thing I wanted to be doing is looking for people who sell ponchos.

Is it easy to navigate around at these events/festivals?

Usually provided there is a map.

Would an app that highlights key locations such as toilets/exits etc. help your experience?
Yes provided facilities labeled are easily recognizable.

Did you use a map to help you find your way round at any festivals?

Yes

How did you find these?

Good would like to see specific meeting points on map. People could meet easier then. I found people were meeting at general points such as toilets etc.

Would you interact with other event goers and if so why?

Yes for fun its heightens your experience at a concert if you share funny moments with people you have never even met before.

Would you interact with other event/festival goers through a social app?

Yes maybe they might tell you food bad/good or where particular stalls are.

Have you shared experiences from an event/festival on social networks through videos, photos, text?

Yes - Facebook, Twitter, Snapchat

How would you keep updated with the latest news/announcements while attending an event/festival?
(Radio, Word of mouth, Speakers Announcements)

Dublin free event guide is pretty good for events, I don't think it gives you updates while at the event however.

Megan

Male/Female:

Female

Age:

24

Ethnicity:

Irish

Occupation:

Payroll Administrator

Background:

Attended NUIM studying French and geography. Working background in payroll and retail.

Family:

In a relationship (no children)

Social Situation:

Loves to socialise at large events attending with small and large groups. Active on Facebook, Twitter and Instagram.

What are your favourite festivals/events to attend?

Electric picnic, Taste of dublin, The fleadh, local events

How many times a year would you attend events/festivals?

Twice a year

What did you enjoy about the events in particular?

The atmosphere and trying new things.

Have you ever found yourself frustrated at an event/festival? why?

Hard to find friends, where to meet them can be confusing as both people will usually have to use the map to pick a destination. Also queues for toilets and showers can be very annoying and something you don't want to be wasting your time doing.

Have you ever used an app for an event?

No

Do you know of any apps that are event related.

No

Tell me about your festival experiences good or bad.

The fleadh:

Good – Private premium paying campsites. Comfort is important to me when camping at events. The idea of tents being on top of each other like glastonbury is not one that appeals to me even though the acts playing would.

Bad – huge queues for everything and time spent waiting. No proper wifi, difficulty contacting friends.

Have you ever found yourself looking for event/festival staff to ask them a question?

Yes

What were you looking them for?

Stage times would be the main reason but this down to preparation. Most people would not know what time acts are playing for festivals that are 4 days long.

Is it easy to navigate around at these events/festivals?

Yes

Would an app that highlights key locations such as toilets/exits etc. help your experience?

Yes provided it is presented well!! It would be cool if it was updated in real time regarding how long the queue is.

Did you use a map to help you find your way round at any festivals?

Yes but by the end of the weekend it was soggy and hard to read. The laminated ones are too expensive

for what they are

How did you find these?

Grand – but not long lasting

Would you interact with other event goers and if so why?

Yes! Everyone is there to have a good time – getting to know people you're camping beside is part of the experience!

Would you interact with other event/festival goers through a social app?

Yes. It's hard to follow everything going on. If there was a tagging system so you could search for specific bands/artists at music festival that would be brilliant.

Have you shared experiences from an event/festival on social networks through videos, photos, text?

Yes – Facebook, twitter, viber, snapchat, instagram, youtube

How would you keep updated with the latest news/announcements while attending an event/festival?

(Radio, Word of mouth, Speakers Announcements)

Online for the first day before my battery dies, word of mouth otherwise!

David

Male/Female:

Male

Age:

40

Ethnicity:

Irish

Occupation:

Bank Manager

Background:

Primary degree from UL. Masters degree from DCU. Many, many years work experience. Speaks French, German and Spanish. Interests include traveling, cooking, history, politics, art, film, music and football.

Family:

Single, no children

Social Situation:

Active on Facebook and Twitter. Plays football at weekends. Socialises regularly with friends. Often does evening language and other courses.

What are your favourite festivals/events to attend?

Would generally go to one off events such as concerts

How many times a year would you attend events/festivals?

A couple of times a year to events.

What did you enjoy about the event in particular?

The atmosphere and the entertainment.

Have you ever found yourself frustrated at an event/festival? why?

Yes. At Blur last year the bar was rubbish. Took an hour to get a drink. And getting to the toilet was chaotic.

Have you ever used an app for an event?

No

What did you like or dislike about them?

N/A

Tell me about your festival experiences good or bad.

Apart from the entertainment on offer itself, good and bad event experiences usually depend on how easy it is to get in and out of the place, to how amenable the facilities are, to what drinks/food etc are available, to how annoying/attractive the people around you are.

Have you ever found yourself looking for event/festival staff to ask them a question?

Yes

What were you looking them for?

Directions to exits, toilets, etc.

Is it easy to navigate around at these events/festivals?

Depends on the size of the event and the crowd and where you end up standing. The bigger the crowd, the less mobile you are, so the harder it is to move around, assuming to begin with you know where you're going.

Would an app that highlights key locations such as toilets/exits etc. heighten your festival/event experience?

Probably yes.

Did you use a map or app to help you find your way round?

No

Would you interact with other event goers?
Probably yes

What would you converse over?

A variety of things. It could be anything from wanting to chat them up to remonstrating with them after they knock into you and spill your drink.

Would you interact with other event/festival goers through a social app?
Possibly yes.

Did you share these experiences on social networks through videos, photos, text?
Yes, on Facebook for example.

How would you keep updated with the latest news/announcements while attending an event/festival?
(Radio, Word of mouth, Speakers Announcements)

Generally I wouldn't stay updated, I'd tend to wander about in an uninformed daze until someone tells me what to do or where to go.

Focus Group - Event Attendees (Sample)

Focus Group profile

Name	Age	M/F	Occupation	Event/Festival Goer	No. of Events/festivals attended in last 12 months
Sean O'Corcora	24	M	Teacher	Yes	5
Aisling Healy	22	F	Office Worker	Yes	2
Gareth Wallace	21	M	Car Sales	Yes	2
Grace Stapley	21	F	Student	Yes	3
Rory O'Connor	23	M	Barman	Yes	2
Darren Murphy	25	M	Marketing	Yes	2
Stephen Gannon	23	M	Student - Law	Yes	1

What words come to mind when you think positively about an event/festival?

Fun, Relaxed, Hassle - free, Exciting, Carefree, Thrilling, Tasty food, Drink, Merry, Clean Camping, Sing songs, Entertainment, Banter, Craic, Unity, Invigorating, New friends, Socialising, Sessions, Games, Calm, Amusing, Lively, Just for laughs, Welcoming

What words come to mind when you think negatively about an event/festival?

Queues, Security issues, Puking, Cold, Rain, Muck, Fighting, Stabbings, Drugs, Alcohol, Unsatisfactory food, Poor choice of food/drink, Stealing, Loosing friends, No wifi, Annoying people, Dirty facilities, Out of Order facilities, Journey home, Lack of Sleep, Hangover

Tell me about bad experiences you had at an event/festival?

Trying to find an entrance to the campsite where our friends were staying. Signs with an arrow no specific directions or people to help. - Oxegen

Finding out when a band/singer was performing, like most people not coming prepared, having no schedule and just asking people around you of stage times. - Electric Picnic

Not knowing where the best food is so just going to the nearest place that sells food usually a dirty chip van. - Indpendency

Lost phone at festival, wasn't able to contact friends for the rest of time there and didn't retrieve phone or know who to talk to about lost/found items. - Fleadh

The cost of items at an event are usually raised. When at Oxegen you could pay 6 euro for a pint when you could get alcohol in local town a lot cheaper.

Security completely throwing a blind eye to people causing major disturbances such as slashing tents, fights etc. - Oxegen

Not being able to find your friend and taking ages to try and explain your location. - Electric Picnic

Toilet facilities being absolutely dreadful and nothing being done about it, these toilets left in the same condition for full weekend of festival.

Queues leaving Slane, so many people in such a confined spaces was a scary experience

Tell me about good experiences you had at an event?

One of my greatest experiences is making new friends, people are so friendly. I made friends with people in the tent beside me and it makes you feel more settled and calmer.

Enjoying the music and seeing the bands you want to see in the flesh. Nothing beats being there and the atmosphere of a live festival.

Just letting loose - being able to get away from the day to day job and relax or have fun in an environment you want to be in.

Being able to socialise with like mind people sharing experiences and stories.

At electric picnic when event staff brought around bottles of water around to people in tents, clearly a marketing ploy but a nice gesture none the less.

Experiencing new things - Never been camping before was a great experience, learning from mistakes like what to bring and not to bring to a festival.

The bus/car journey with the anticipation and excitement before the event has actually started.

What events/festivals have you attended? Rate them.

Oxygen - 5

Electric Picnic - 9

Slane - 7

Marley Park Concerts - 7

Benicassim - 8

Sea Sessions - 7

The fleadh - 7

Rose Of Tralee - 8

Galway Races - 8

Glastonbury - 9

Independency - 7

Longitude - 7

Wexford Food Festival - 6

Wexford Strawberry festival - 5

Bannow/Rathangan Show - 4

Tullow Agriculture Show - 6

Galway Food Festival - 7

Maritime festival - 5

Opera Festival - 8

Gold Wing Festival -6

“Electric Picnic” was the best rated. why?

The range of activities and the diversity of people.

The laid back atmosphere was calming and stress free.

People just chilled out enjoying each others company without conflict

Easy to make new friends and interact with other festival goers.

Food very good with great choice and variety

Camp sites were positioned well with adequate space for campers.

The general feel of the event is funky with a lot of attention to detail, such as the pirate ship stage.

The lay out of the event is good making it easy for people to move around and find what they want.

There is something for everyone.

All ages welcome even kids. Family friendly.

Entertainment range - Comedy/ Music/ Poetry etc.

Mature attitude - sensible adults

Big acts mixed amongst with some of Irelands smallest bands.

Venue built around the environment

Facilities looked after

Sense of a security presence, feeling of safety.

Helpful nature of other attendees and staff.

Map and stage times

Updates on social networks: constant updates.

“Bannow/Rathangan Agriculture show” (Local) was the worst. why?

Finding the venue - Signs are painted

Getting to the venue - no public transport

No Map - just sign posts to key facilities

Time wasted wandering around looking for certain facilities.

No safe paths to walk on, just path ways made from people walking on ground.

Car parking unorganised.

Difficulty moving about at event when raining or ground wet.

Queues everywhere for each tent and particularly actually getting into the event.

No organisation on stalls, first come first serve on best spots for setting up your stall.

Toilet facilities only cleaned at end of the day.

One entrance and one exit - traffic frustrations

Health and safety issues of with livestock being transported along same pathways as attendees.

No wifi

Poor phone service

**Have you ever used an event app? Such as ‘Glastonbury’ app?
If so, tell me about it rate it?**

None of the group had downloaded any event apps. One had downloaded the arthurs day app but it was just for stage times and was very basic with little features.

Why do think you have never used an app at an event?

For long events over 4 days apps only waste battery life. As a result would tend to bring paper copies of event/festival information.

Didn’t know about the app before the event.

Would rely on own instinct than use an event map app.

Did you ever use a map or app to help you find your way round at an event?

Yes all did.

Had to screenshot event map to use at event.

Used paper map which had to be laminated and was annoying to bring about particularly in the rain.

Had to pay for event programme with all details of the event.

Would an app that highlights key locations such as toilets/exits etc. help your festival/event experience?

All agreed it would be very beneficial.

“very beneficial”

“Something simple thats easy to follow would be great”

“so useful, nothing worse than wasting time at an event”

How would you keep updated with the latest news/announcements while attending an event/festival? (Radio, Word of mouth, Speakers Announcements)

Word Of Mouth - all agreed this was the number one means of getting to know the most important urgent information

Twitter - through a specific event hashtag
- through the official page.

Facebook
(Screenshots)

Would you like an app that keeps you up to date with the latest information and announcements through other event goers and event organisers?

Yes. Great Idea.

Out of 10 how would you rate a concept where users place notes (issues, information etc.) on a map for other attendee goers to see and discuss? (Present Screenshots)

Sean - 8

Aisling - 9

Grace - 9

Gareth - 7

Stephen - 8

Darren - 8

Rory - 9.5

What concerns would you have using an app like this?

Battery life is an issue for weekend events that people are camping at.

Been to festivals before why use an app now. How would you get people on board.

People putting up fake posts trying to mislead other users.

Would like reviews and ratings of food stalls or restaurants, nothing like this for events but may be hard to do.

People like to be spontaneous and search and communicate with people face to face.

Marketing - how to get people initially using use it.

Event Organisers

Event Manager (David Redmond)

1. What is your occupation? Please explain in 1-2 sentences what are your duties/responsibilities?
I work for a Music Booking agency. I broker deals for our artists and liase with Promoters over the logistical requirements for their travels. I also run a Festival, a monthly club and DJ.

2. Is your job in the realm of hosting/organising of festivals/events/concerts?
Yes, I have ran Nightflight for 9 years a now monthly, once weekly club that promotes quality electronic music. I run an annual Festival in London every Easter thats called Airbound. I DJ at most major Irish Festivals.

3. Currently, what means of communication do you use to keep event attendees informed:

a. about real-time issues (such as cancellations, last-minute changes in schedule)?

Facebook and Email

b. about useful information about the event (such as the provision/availability/locations of utilities and services etc.)?

Facebook and Email

4. Are you happy with how these means of communication are working out for you? How could they be improved? Is there anything that is missing?

I am for the most part, I suppose it is a challenge as Facebook has become so over crowded with stuff to make sure your voice is heard, you also cant guarantee people will read the mails you send them thoroughly.

5. Can you think of recent examples (1-2 years) where something went wrong during an event and you needed to quickly communicate this to the attendees? What happened? Did you have quick and easy way of communicating the issue? What would be the best/most convenient way for you to communicate issues like that?

Nothing ever goes wrong at my events.....

6. (Screenshots of our app). Our app (Eventful) would help event attendees connect with people around them to exchange useful information about what's happening at an event right now, these attendees would also quickly get first-hand 'verified' information from the event's hosts/organisers regarding important announcements, issues and locations of facilities such as exits/toilets/first aid etc.

Attendees or Organisers can add notes to a map where the event is currently happening. These notes can be viewed by others who may add comments thus starting a discussion. As well as this users can see the location of certain facilities such as entrances/exits/first aid/toilets etc.

Organisers can see what people are saying about their event and in particular can answer or help with any issues attendees may have.

a. Would you find this app beneficial in your work when it comes to communicating information to the attendees to your events?

Most definitely, its a great idea and something I would defo look at using for my events.

b. Is there anything the app could have address but it's missing at the moment? Can you think of any features that it lacks but which could improve the app?

Looks pretty thorough to me. Maybe some sort of incentive to download the app. If you brokered a deal with several events, users could get a small discount on certain events.

c. In your opinion, would such an app be useful to event organisers? 1....9

10

d. In your opinion, would such an app be useful to event attendees? 1....9

10

7. We would appreciate any insights you may offer regarding event apps/websites based on your

professional experiences? Is our idea worth pursuing? Do you have any comments (positive and negative) about the idea or the execution of the idea?

Yeah I think this is a quality idea, one piece of advice I would say from my time running events is that you have to make things as clear as possible for punters. Not to sound patronising but people for the most part are incredibly stupid when taking in information about events so they have to be spoon fed!! Thats something worth keeping in mind when developing the look and feel of the app.

Event Manager (Danielle Tilliotson)

1. What is your occupation? Please explain in 1-2 sentences what are your duties/responsibilities?

I'm an event manager, so I look after the organising and the running of the overall event.

2. Is your job in the realm of hosting/organising of festivals/events/concerts?

I tend to work mainly within sport, for example Rugby, Rowing, Polo, Tennis, events. As well as gala dinners and charity events.

3. Currently, what means of communication do you use to keep event attendees informed:

a. about real-time issues (such as cancellations, last-minute changes in schedule)?

Twitter, Facebook, emails, voice overs

b. about useful information about the event (such as the provision/availability/locations of utilities and services etc.)?

It would be through the same means Twitter, Facebook, emails, voice overs.

4. Are you happy with how these means of communication are working out for you? How could they be improved? Is there anything that is missing?

For what we are looking for they do just fine.

5. Can you think of recent examples (1-2 years) where something went wrong during an event and you needed to quickly communicate this to the attendees? What happened? Did you have quick and easy way of communicating the issue? What would be the best/most convenient way for you to communicate issues like that?

Not really.

6. (Screenshots of our app). Our app (Eventful) would help event attendees connect with people around them to exchange useful information about what's happening at an event right now, these attendees would also quickly get first-hand 'verified' information from the event's hosts/organisers regarding important announcements, issues and locations of facilities such as exits/toilets/first aid etc.

Attendees or Organisers can add notes to a map where the event is currently happening. These notes can be viewed by others who may add comments thus starting a discussion. As well as this users can see the location of certain facilities such as entrances/exits/first aid/toilets etc.

Organisers can see what people are saying about their event and in particular can answer or help with any issues attendees may have.

a. Would you find this app beneficial in your work when it comes to communicating information to the attendees to your events?

Yes would be useful, but would have to try it out to be able to have a better idea.

b. Is there anything the app could have address but it's missing at the moment? Can you think of any features that it lacks but which could improve the app?

No don't think so.

c. In your opinion, would such an app be useful to event organisers? 1....9

4

d. In your opinion, would such an app be useful to event attendees? 1....9

4

7. We would appreciate any insights you may offer regarding event apps/websites based on your

professional experiences? Is our idea worth pursuing? Do you have any comments (positive and negative) about the idea or the execution of the idea?

I would buy it, however people going to an event would need to be made aware that the event organiser were using this app. Maybe if it could be linked into the entry bands by printing the app name on the bands.

Event Manager/Promoter (Feargal Hynes)

1. What is your occupation? Please explain in 1-2 sentences what are your duties/responsibilities?
Promoter and event manager for music, comedy, and musical events.

2. Is your job in the realm of hosting/organising of festivals/events/concerts?
Yes for example, Des Bishop at Wexford Opera House, Passenger at The O2, Duke Dumont in UCD.

3. Currently, what means of communication do you use to keep event attendees informed:
a. about real-time issues (such as cancellations, last-minute changes in schedule)?
Facebook and Twitter mainly. Not through venue mediums. (Facebook, Twitter, Ezine email and website)

b. about useful information about the event (such as the provision/availability/locations of utilities and services etc.)?
Same as above.

4. Are you happy with how these means of communication are working out for you? How could they be improved? Is there anything that is missing?
Could be more reliable. But usually work well.

5. Can you think of recent examples (1-2 years) where something went wrong during an event and you needed to quickly communicate this to the attendees? What happened? Did you have quick and easy way of communicating the issue? What would be the best/most convenient way for you to communicate issues like that?
Yes. Act didn't turn up as part of the bill. Couldn't contact attendees but there wasn't any real major disruption.

6. (Screenshots of our app). Our app (Eventful) would help event attendees connect with people around them to exchange useful information about what's happening at an event right now, these attendees would also quickly get first-hand 'verified' information from the event's hosts/organisers regarding important announcements, issues and locations of facilities such as exits/toilets/first aid etc.

Attendees or Organisers can add notes to a map where the event is currently happening. These notes can be viewed by others who may add comments thus starting a discussion. As well as this users can see the location of certain facilities such as entrances/exits/first aid/toilets etc.

Organisers can see what people are saying about their event and in particular can answer or help with any issues attendees may have.

a. Would you find this app beneficial in your work when it comes to communicating information to the attendees to your events?
Yes for sure. Looks good.

b. Is there anything the app could have address but it's missing at the moment? Can you think of any features that it lacks but which could improve the app?
Not sure. Cant think of anything of hand.

c. In your opinion, would such an app be useful to event organisers? 1....9
4

d. In your opinion, would such an app be useful to event attendees? 1....9
4

7. We would appreciate any insights you may offer regarding event apps/websites based on your

professional experiences? Is our idea worth pursuing? Do you have any comments (positive and negative) about the idea or the execution of the idea?

Always hard to get off the ground, but once people start using it, you could see a domino effect!

Collecting Raw Data

"Verbatim" comments of users from user interviews and questionnaires:

Alan

1. "Didn't know where anything was driving around looking for facilities."
2. "No information."
3. "Information centre too crowded - not going to waste time queuing."
4. "Maps of event had been vandalised."
5. "Unsure what pubs were good to go to."
6. "Parking frustrating - it would be good to see where parking areas or spaces are on near arrival to an event."
7. "Ate at fast food vans as didn't know where the best places for food were."
8. "Asked staff directions and information about times."
9. "Hard to manoeuvre around events with a big group and people missing from the group become a problem."
10. "Key locations such as toilets/exits would help if presented well. When maps are cluttered it's even more confusing."
11. "I interact with other event goers to be sociable and to ask for directions."
12. "I would interact with other event goers through a social app to get advice if there is something good I'm missing out on, where the best atmosphere is, to be in the thick of the event."
13. "I have shared experiences from an event on FB, Twitter, Instagram, Snapchat."
14. "I (would) keep updated with the latest news/announcements while attending an event through word of mouth or some kind of notice boards."

Claudia

1. "There is always an element of frustration queuing for different things. Queuing for drinks could be quite annoying. You would think the process would be quicker (given one type of drink is being served)."
2. "It would be nice to know what you could do if it's raining if there are any activities indoors rather than just sit in your tent."
3. "The only issue I really encounter is parking."
4. "Most of the time it's easy to navigate around events though maps can be a bit confusing now and again."
5. "An app highlighting key locations such as toilets/exits would be a great idea - that way you don't have to use the paper map if you are looking for something."
6. "I interact with other event goers when looking for tips on the places to go so I wouldn't miss out on something."
7. "I would rather communicate with people face to face at an event rather than use a social app."
8. "I share my experiences at events mostly through photos."
9. "I (would) keep updated with the latest news/announcements while attending an event through Facebook and other people at the event."

Michelle

1. "At taste of Dublin you have to use currency that is specific for the event which is very frustrating and you can't cash it in. Queues for facilities such as toilets also - the last thing you want to be doing is queuing for the toilet for an hour."
2. "I had good experience at the German beer festival - ease of access to the event, there was no hassle queuing, just having fun and socialising."
3. "Bad experiences - probably the fear at campsites when you hear rumours that someone has been stabbed or that a tent was set on fire."
4. "I have asked event staff about first aid - a friend of mine cut their finger on glass, we ended up getting bandages of another festival goer. And also about sale of ponchos - when raining the last thing I wanted to be doing is looking for people who sell ponchos."
5. "Usually it's easy to navigate around events, provided there is a map."
6. "An app that highlights key locations such as toilets/exits would be helpful provided facilities labeled are easily recognisable."
7. "I do use a map to help me find my way around festivals. What I would like to see is specific meeting points on maps - people could meet easier then. I found people were meeting at general points such as toilets."

8. "I would interact with other event goers at events - it heightens your experience if you share funny moments with people you don't know."
9. "I would interact with other event goers through a social app - they might tell me about food (bad/good) or where particular stalls are."
10. "I have shared experiences at events through Facebook, Twitter, Snapchat."

Megan

1. "At events it's hard to find your friends. Where to meet them can be confusing both people will usually have to use the map to pick a destination. Also queues for toilets and showers could be very annoying and it's something you don't want to be wasting your time doing."
2. "Good festival experiences - comfort is important to me when camping at events. The idea of tents being on top of each other like Glastonbury is not one that appeals to me even though the acts playing do. I like the idea of private premium paying campsites."
3. "Bad festival experiences - huge queues for everything and time spent waiting. No proper wifi, difficulty contacting friends."
4. "I have asked event staff about stage times (but this is down to preparation). Most people would not know what time acts are playing for festivals that are 4 days long."
5. "An app that highlights key locations such as toilets/exits would be useful provided it is presented well. It would be cool if it was updated in real time regarding how long the queue is."
6. "I did use a map to help me find my way around events/festivals but by the end of the weekend it was soggy and hard to read. The laminated ones are too expensive for what they are."
7. "Yes, I would interact with other event goers - getting to know people you are camping beside is part of the experience!"
8. "Yes, I would interact with other event goers through a social app. It's hard to follow everything going on. If there was a tagging system so you could search for specific bands/artists at music festivals that would be brilliant."
9. "I have shared my experiences from events on Social networks such as Facebook, Twitter, Viber, Snapchat, Instagram, YouTube."
10. "I (would) keep updated with the latest news/announcements while attending an event online for the first day before my battery dies, word of mouth otherwise."

David

1. "At Blur last year the bar was rubbish. Took an hour to get a drink. And getting to the toilet was chaotic."
2. "(Apart from the entertainment on offer) good and bad event experiences usually depends on how easy it is to get in and out of the place, to how amenable the facilities are, to what food/drinks are available, to how annoying/attractive the people around you are."
3. "I have asked event staff about directions to exits, toilets etc."
4. "I converse with other events goers for a variety of reasons - could be anything from wanting to chat them up to remonstrating with them after they knock into you and spill your drink."
5. "I possibly would interact with other event goers through a social app."
6. "I have shared event experiences on Facebook."
7. "I wouldn't generally stay updated with the latest news/announcements at events. I tend to wander about in an uninformed daze until someone tells me what to do or where to go."

Focus Group

Good/Bad Experiences:

1. "Trying to find an entrance to the campsite where our friends were staying. Signs with an arrow no specific directions or people to help."
2. "Finding out when a band/singer was performing, like most people not coming prepared, having no schedule and just asking people around you of stage times."
3. "Not knowing where the best food is so just going to the nearest place that sells food usually a dirty chip van."
4. "Lost phone at festival, wasn't able to contact friends for the rest of time there and didn't retrieve phone or know who to talk to about lost/found items."
5. "The cost of items at an event are usually raised. When at Oxegen you could pay 6 euro for a pint when you could get alcohol in local town a lot cheaper."
6. "Security completely throwing a blind eye to people causing major disturbances such as slashing tents, fights etc."
7. "Not being able to find your friend and taking ages to try and explain your location."
8. "Toilet facilities being absolutely dreadful and nothing being done about it, these toilets left in the same condition for full weekend of festival."
9. "Queues leaving Slane, so many people in such a confined spaces was a scary experience."
10. "One of my greatest experiences is making new friends, people are so friendly. I made friends with people in the tent beside me and it makes you feel more settled and calmer."
11. "Enjoying the music and seeing the bands you want to see in the flesh. Nothing beats being there and the atmosphere of a live festival."
12. "Just letting loose - being able to get away from the day to day job and relax or have fun in an environment you want to be in."
13. "Being able to socialise with like mind people sharing experiences and stories."
14. "At electric picnic when event staff brought around bottles of water around to people in tents, clearly a marketing ploy but a nice gesture none the less."
15. "Experiencing new things - Never been camping before was a great experience, learning from mistakes like what to bring and not to bring to a festival."
16. "The bus/car journey with the anticipation and excitement before the event has actually started."
17. "Facilities looked after."
18. "Sense of a security presence, feeling of safety."
19. "Helpful nature of other attendees and staff."
20. "Map and stage times."
21. "Updates on social networks: constant updates."
22. "Finding the venue - Signs are painted."
23. "Getting to the venue - no public transport."
24. "No Map - just sign posts to key facilities."
25. "Time wasted wandering around looking for certain facilities."
26. "No safe paths to walk on, just path ways made from people walking on ground."
27. "Car parking unorganised."
28. "Difficulty moving about at event when raining or ground wet."
29. "Queues everywhere for each tent and particularly actually getting into the event."
30. "No organisation on stalls, first come first serve on best spots for setting up your stall."
31. "Toilet facilities only cleaned at end of the day."
32. "One entrance and one exit - traffic frustrations."
33. "Health and safety issues of with livestock being transported along same pathways as attendees."
34. "No wifi."
35. "Poor phone service."

Did you ever use a map or app to help you find your way round at an event? Yes all did.

1. "Had to screenshot event map to use at event."
2. "Used paper map which had to be laminated and was annoying to bring about particularly in the rain."
3. "Had to pay for event programme with all details of the event."

What concerns would you have using an app like this?

1. "Battery life is an issue for weekend events that people are camping at."

2. "Been to festivals before why use an app now. How would you get people on board."
3. "People putting up fake posts trying to mislead other users."
4. "Would like reviews and ratings of food stalls or restaurants, nothing like this for events but may be hard to do."
5. "People like to be spontaneous and search and communicate with people face to face."
6. "Marketing - how to get people initially using use it."

Event Managers

Possible user needs are highlighted in red:

What is your occupation?	I work for a Music Booking agency. I broker deals for our artists and liaise with Promoters over the logistical requirements for their travels. I also run a Festival, a monthly club and DJ.	I'm an event manager, so I look after the organising and the running of the overall event.	Promoter and event manager for music, comedy, and musical events.
Is your job in the realm of organising of festivals/events/concerts?	Yes, I have ran Nightflight for 9 years a now monthly, once weekly club that promotes quality electronic music. I run an annual Festival in London every Easter thats called Airbound. I DJ at most major Irish Festivals.	I tend to work mainly within sport, for example Rugby, Rowing, Polo, Tennis, events. As well as gala dinners and charity events.	Yes for example, Des Bishop at Wexford Opera House, Passenger at The O2, Duke Dumont in UCD.
Current means of communication with attendees?	facebook, email	twitter, facebook, email, voiceover	facebook, twitter, Ezine email, website. not through venue mediums.
Are you happy with these means of communication? any issues?	I am for the most part, I suppose it is a challenge as Facebook has become so over crowded with stuff to make sure your voice is heard, you also cant guarantee people will read the mails you send them thoroughly.	For what we are looking for they do just fine.	Could be more reliable. But usually work well.
Recent examples of things going wrong at an event. how did you inform the attendees?	Nothing ever goes wrong at my events.....	Not really.	Yes. Act didn't turn up as part of the bill. Couldn't contact attendees but there wasn't any real major disruption.
Do you think our app could be useful in your work? (based on description and looking at prototype screenshots)	Most definitely, its a great idea and something I would defo look at using for my events.	Yes would be useful, but would have to try it out to be able to have a better idea.	Yes for sure. Looks good.
Is it missing anything? (based on description and looking at prototype screenshots)	Looks pretty thorough to me. Maybe some sort of incentive to download the app. If you brokered a deal with several events, users could get a small discount on certain events.	No don't think so.	Not sure. Cant think of anything of hand.
Rate the usefulness of the app on a scale 1-9 (based on description and looking at prototype screenshots)?	10	4	4
Any further advice/ Insights based on your professional experience? Is our idea worth pursuing?	Yeah I think this is a quality idea, one piece of advice I would say from my time running events is that you have to make things as clear as possible for punters. Not to sound patronising but people for the most part are incredibly stupid when taking in information about events so they have to be spoon fed!! Thats something worth keeping in mind when developing the look and feel of the app.	I would buy it, however people going to an event would need to be made aware that the event organiser were using this app. Maybe if it could be linked into the entry bands by printing the app name on the bands.	Always hard to get off the ground, but once people start using it, you could see a domino effect!

User Needs Statements

Coding the raw data into user needs statements:

Alan

Original Statement by User	User Need
<i>"Didn't know where anything was driving around looking for facilities."</i>	Alan needs a way to find where facilities are. He wants to avoid having to drive around looking for them.
<i>"No information."</i>	Alan needs a way to find information.
<i>"Information centre too crowded - not going to waste time queuing."</i>	Alan needs to be able to find information without wasting his time queuing at information centre.
<i>"Maps of event had been vandalised."</i>	Alan needs to be able to reliably find a map of the event.
<i>"Unsure what pubs were good to go to."</i>	Alan needs a way to find out what pubs were good to go to.
<i>"Parking was frustrating - it would be good to see where parking areas or spaces are on near arrival to an event."</i>	Alan needs a way to find out where parking areas or spaces are.
<i>"Ate at fast food vans as didn't know where the best places for food were."</i>	Alan needs to be able to find where the best places for food were.
<i>"Asked staff directions and information about times."</i>	Alan needs a way to find information about times.
<i>"Hard to manoeuvre around events with a big group and people missing from the group become a problem."</i>	Alan needs to be able to manoeuvre around events with a big group without people missing turning into a problem.
<i>"Key locations such as toilets/exits would help if presented well. When maps are cluttered it's even more confusing."</i>	Alan needs to be able to find key locations (toilets/exits) without the map getting cluttered or confusing.
<i>"I interact with other event goers to be sociable and to ask for directions."</i>	Alan needs to be able to interact with other event goers to be sociable and to ask for directions.
<i>"I would interact with other event goers through a social app to get advice if there is something good I'm missing out on, where the best atmosphere is, to be in the thick of the event."</i>	Alan needs to be able to interact with other event goers to find what he's missing out on, where the best atmosphere is, and to be in the thick of the event.
<i>"I have shared experiences from an event on FB, Twitter, Instagram, Snapchat."</i>	Alan needs to be able to share his experiences from an event on social networking sites like Facebook, Twitter, Instagram, Snapchat.
<i>"I (would) keep updated with the latest news/announcements while attending an event through word of mouth or some kind of notice boards."</i>	Alan needs a way to keep updated with latest news/announcements, i.e. word of mouth, notice board.

Claudia

Original Statement by User	User Need
<i>"There is always an element of frustration queuing for different things. Queuing for drinks could be quite annoying. You would think the process would be quicker (given one type of drink is being served)."</i>	Claudia needs a way to avoid spending too much time queuing for things.
<i>"It would be nice to know what you could do if it's raining if there are any activities indoors rather than just sit in your tent."</i>	Claudia needs a way to know what she could do if it's raining, rather than just sit in her tent.
<i>"The only issue I really encounter is parking."</i>	Claudia needs a better parking experience.
<i>"Most of the time it's easy to navigate around events though maps can be a bit confusing now and again."</i>	Claudia needs to be able to navigate events easier.
<i>"An app highlighting key locations such as toilets/exits would be a great idea - that way you don't have to use the paper map if you are looking for something."</i>	Claudia needs to be able to find key locations (toilets/exits) without having to use a paper map.
<i>"I interact with other event goers when looking for tips on the places to go so I wouldn't miss out on something."</i>	Claudia needs to be able to interact with other event goers when looking for tips on places to go so she wouldn't miss out on something.
<i>"I would rather communicate with people face to face at an event rather than use a social app."</i>	Claudia needs to be able to communicate with people face to face rather than through an app.
<i>"I share my experiences at events mostly through photos."</i>	Claudia needs to be able to share her experiences at events through photos.
<i>"I (would) keep updated with the latest news/ announcements while attending an event through Facebook and other people at the event."</i>	Claudia needs a way to keep updated with latest news/announcements at events through social networking sites like Facebook and through the other people at the event.

Michelle

Original Statement by User	User Need
<i>"Queues for facilities such as toilets are frustrating - the last thing you want to be doing is queuing for the toilet for an hour."</i>	Michelle needs a way to avoid spending too much time queuing for facilities such as toilets.
<i>"At taste of Dublin you have to use currency that is specific for the event which is very frustrating and you can't cash it in."</i>	Michelle needs a way to express her frustration at the organisers about having to use an event-specific currency.
<i>"I had good experience at the German beer festival - ease of access to the event, there was no hassle queuing, just having fun and socialising."</i>	Michelle needs to be able to have easy access to events, no hassle queuing.
<i>"Bad experiences - probably the fear at campsites when you hear rumours that someone has been stabbed or that a tent was set on fire."</i>	Michelle needs to be able to reassure herself that rumours of someone being stabbed or that a tent was set on fire are just that - rumours.
<i>"I asked event staff about first aid - a friend of mine cut their finger on glass, we ended up getting bandages off another festival goer."</i>	Michelle needs a way to quickly find first aid or borrow things like bandages from other festival goers.
<i>"And also about sale of ponchos - when raining the last thing I wanted to be doing is looking for people who sell ponchos."</i>	Michelle needs to be able to quickly find sellers of ponchos when raining without having to go out looking for them in the rain.
<i>"Usually it's easy to navigate around events, provided there is a map."</i>	Michelle needs a map to be able to navigate around events.
<i>"An app that highlights key locations such as toilets/exits would be helpful provided facilities labeled are easily recognisable."</i>	Michelle needs to be able to easily recognise facilities labeled in an app.
<i>"I do use a map to help me find my way around festivals. What I would like to see is specific meeting points on maps - people could meet easier then. I found people were meeting at general points such as toilets."</i>	Michelle needs to be able to see specific meeting points on maps so it will be easier to meet with people.
<i>"I would interact with other event goers at events - it heightens your experience if you share funny moments with people you don't know."</i>	Michelle needs a way to interact with other event goers at events.
<i>"I would interact with other event goers through a social app - they might tell me about food (bad/good) or where particular stalls are."</i>	Michelle needs a way to interact with other event goers through a social app in order to find out about food (good/bad) and where particular stalls are.
<i>"I have shared experiences at events through Facebook, Twitter, Snapchat."</i>	Michelle needs to be able to share her experiences at events through social networking sites like Facebook, Twitter, Snapchat.

Megan

Original Statement by User	User Need
<i>"At events it's hard to find your friends. Where to meet them can be confusing both people will usually have to use the map to pick a destination."</i>	Megan needs a way to easily find her friends at events.
<i>"Also queues for toilets and showers could be very annoying and it's something you don't want to be wasting your time doing."</i>	Megan needs to be able to avoid wasting her time queuing for toilets and showers at festivals.
<i>"Good festival experiences - comfort is important to me when camping at events. The idea of tents being on top of each other like Glastonbury is not one that appeals to me even though the acts playing do. I like the idea of private premium paying campsites."</i>	Megan needs a way to find comfortable accommodation while camping at events.
<i>"No proper wifi, difficulty contacting friends."</i>	Megan needs to be able to reliably stay in touch with her friends at festivals.
<i>"I have asked event staff about stage times (but this is down to preparation). Most people would not know what time acts are playing for festivals that are 4 days long."</i>	Megan needs a way to find out about stage times.
<i>"An app that highlights key locations such as toilets/exits would be useful provided it is presented well. It would be cool if it was updated in real time regarding how long the queue is."</i>	Megan needs to be able to see real-time updates about length of queues, locations of facilities like toilets/exits.
<i>"I did use a map to help me find my way around events/festivals but by the end of the weekend it was soggy and hard to read. The laminated ones are too expensive for what they are."</i>	Megan needs a way to use a map at festivals that won't become too damaged to use by the last day of the festival.
<i>"Yes, I would interact with other event goers through a social app. It's hard to follow everything going on. If there was a tagging system so you could search for specific bands/artists at music festivals that would be brilliant."</i>	Megan needs a way to interact with other event goers at events because it's hard to follow everything going on. She needs to be able to search for specific bands/artists at music festivals.
<i>"I have shared my experiences from events on Social networks such as Facebook, Twitter, Viber, Snapchat, Instagram, YouTube."</i>	Megan needs to be able to share her experiences at events through social networking sites like Facebook, Twitter, Viber, Snapchat, Instagram, YouTube.
<i>"I (would) keep updated with the latest news/announcements while attending an event online for the first day before my battery dies, word of mouth otherwise."</i>	Megan needs a way to keep updated with latest news/announcements at events i.e. online and word of mouth.

David

Original Statement by User	User Need
<i>"At Blur last year the bar was rubbish. Took an hour to get a drink."</i>	David needs to be able to reduce the time waiting at the bar.
<i>"And getting to the toilet was chaotic."</i>	David needs a way to get to the toilets that is less chaotic.
<i>"(Apart from the entertainment on offer) good and bad event experiences usually depends on how easy it is to get in and out of the place, to how amenable the facilities are, to what food/ drinks are available, to how annoying/attractive the people around you are."</i>	David needs to be able to get in and out of events easily. David needs to be able to easily use the facilities of the event. David needs to be able to enjoy high quality food/ drinks. David needs the people around him to not be annoying.
<i>"I have asked event staff about directions to exits, toilets etc."</i>	David needs a way to ask about directions to exits, toilets etc.
<i>"I converse with other events goers for a variety of reasons - could be anything from wanting to chat them up to remonstrating with them after they knock into you and spill your drink."</i>	David needs to be able to flirt with other event goers at events.
<i>"I possibly would interact with other event goers through a social app."</i>	David needs a way to interact with other event goers through a social app.
<i>"I have shared event experiences on Facebook."</i>	David needs to be able to share his experiences at events through social networking sites like Facebook.
<i>"I wouldn't generally stay updated with the latest news/announcements at events. I tend to wander about in an uninformed daze until someone tells me what to do or where to go."</i>	David needs a way for others to update him about the latest news/ announcements at an event.

Event Managers

Original Statement by User	User Need
<i>"I suppose it is a challenge as Facebook has become so over crowded with stuff to make sure your voice is heard, you also cant guarantee people will read the mails you send them thoroughly."</i>	Event manager needs a way to make sure they will have their voice heard. Event manager needs a way to make sure people will read event updates/announcements.
<i>"Current means of communication (facebook, twitter, email) could be more reliable."</i>	Event manager needs a more reliable means of communication with attendees.
<i>"Act didn't turn up as part of the bill. Couldn't contact attendees."</i>	Event manager needs a way to contact attendees when an act doesn't turn up.
<i>"You have to make things as clear as possible. People for the most part are incredibly stupid when taking in information about events so they have to be spoon fed!!"</i>	Event manager needs a way to spoon feed the information to the attendees and make things as clear as possible.
<i>"I would buy it, however people going to an event would need to be made aware that the event organiser were using this app."</i>	Event manager needs a way to make people aware that the event organiser are using this app.

Clustering user needs by similarity and arranging by priority

Event attendee needs to be able to easily find various information about the event such as stage times, artists, accommodation.

Event attendee needs to be able to find information.

Event attendee needs a way to find information about times.

Event attendee needs a way to find out about stage times.

Event attendee needs a way to find information about comfortable accommodation while camping at events.

Event attendee needs to be able to search for specific bands/artists at music festivals.

Event attendee needs a way to interact with other event goers at events in order to be able to follow what's going on, ask for directions, be sociable, look for help from people at the event.

Event attendee needs a way to interact with other event goers through a social app.

Event attendee needs to be able to flirt with other event goers at events.

Event attendee needs a way to interact with other event goers at events because it's hard to follow everything going on.

Event attendee needs to be able to interact with other event goers to be sociable and to ask for directions.

Event attendee needs a way to quickly find first aid or borrow things like bandages from other festival goers.

Event attendee needs to be able to interact with other event goers to find what he's missing out on, where the best atmosphere is, and to be in the thick of the event.

Event attendee needs to be able to interact with other event goers when looking for tips on places to go so she wouldn't miss out on something.

Event attendee needs a way to interact with other event goers through a social app in order to find out about food (good/bad) and where particular stalls are.

Event attendee needs to be able to reassure herself that rumours of someone being stabbed or that a tent was set on fire are just that - rumours.

Event attendee needs a way to see real-time updates about length of queues to help reduce queuing times at events (at info centre, entrances, exits, toilets, showers, at the bar).

Event attendee needs to be able to find information without wasting his time queuing at information centre.

Event attendee needs a way to avoid spending too much time queuing for things.

Event attendee needs a way to avoid spending too much time queuing for facilities such as toilets.

Event attendee needs to be able to avoid wasting her time queuing for toilets and showers at festivals.

Event attendee needs to be able to have easy access to events, no hassle queuing.

Event attendee needs to be able to get in and out of events easily.

Event attendee needs to be able to see real-time updates about length of queues.

Event attendee needs to be able to reduce the time waiting at the bar.

Event attendee needs a map to be able to navigate around events.

Event attendee needs to be able to reliably find a map of the event.

Event attendee needs to be able to navigate events easier.

Event attendee needs to be able to easily find key locations (toilets, parking, exits, first aid) on a map.

Event attendee needs a way to use a map at festivals that won't become too damaged to use by the last day of the festival.

Event attendee needs to be able to easily recognise facilities labeled in an app.

Event attendee needs a way to find out where parking areas or spaces are.

Event attendee needs a better parking experience.

Event attendee needs a way to find where facilities are.

Event attendee needs to be able to easily use the facilities of the event.

Event attendee need to be able to find key locations (toilets/exits) without the map getting cluttered or confusing.

Event attendee needs to be able to find key locations (toilets/exits) without having to use a paper map.

Event attendee needs to be able to see real-time updates locations of facilities like toilets/exits.

Event attendee needs a way to quickly find first aid.
Event attendee needs a way of getting to the toilets that is less chaotic.
Event attendee needs a way to ask about directions to exits, toilets etc

Event attendee needs to be able to easily find out about the best places to go/ best things to do at an event.

Event attendee needs a way to find out what pubs were good to go to.
Event attendee needs to be able to find where the best places for food were.
Event attendee needs a way to know what she could do if it's raining, rather than just sit in her tent.
Event attendee needs to be able to quickly find sellers of ponchos when raining without having to go out looking for them in the rain.
Event attendee needs to be able to enjoy high quality food/drinks.

Event attendee needs a way to easily find their friends at events.

Event attendee needs to be able to manoeuvre around events with a big group without people missing turning into a problem.
Event attendee needs to be able to see specific meeting points on maps so it will be easier to meet with people.
Event attendee needs to be able to reliably stay in touch with her friends at festivals.

Event attendee needs a way to interact with the organisers at an event.

Event attendee needs a way to express her frustration at the organisers about having to use an event-specific currency.
Event attendee needs to be able to reassure herself that rumours of someone being stabbed or that a tent was set on fire are just that - rumours.

Event attendee needs to be able to share his experiences at an event on social networking sites such as Facebook, Twitter, Instagram, Snapchat.

Event attendee needs to be able to share her experiences at events through social networking sites like Facebook, Twitter, Snapchat.
Event attendee needs to be able to share her experiences at events through social networking sites like Facebook, Twitter, Viber, Snapchat, Instagram, YouTube.
Event attendee needs to be able to share his experiences at events through social networking sites like Facebook.
Event attendee needs to be able to share her experiences at events through sharing photos.

Event attendee needs a way to keep updated with latest news/announcements.

Event attendee needs a way to keep updated with latest news/announcements, i.e. word of mouth, notice board.
Event attendee needs a way to keep updated with latest news/announcements at events through social networking sites like Facebook and through the other people at the event.
Event attendee needs a way to keep updated with latest news/announcements at events i.e. online and word of mouth.
Event attendee needs a way for others to update him about the latest news/ announcements at an event.

Event manager needs a way to make sure people will read event updates/announcements.

Event manager needs a way to make sure they will have their voice heard.

Event manager needs a more reliable means of communication with attendees.

Event manager needs a way to contact attendees when an act doesn't turn up.

Event manager needs a way to spoon feed the information to the attendees and make things as clear as possible.

Event manager needs a way to make people aware that they are using this app for real-time updates.

Appendix C Use Cases & Data Model

Use Case 1

2.1 Use case 1 - View home screen/ Info Button/ Sign Up/ Log In/ Post a Note/ Social Media Connectivity		
Act	User	Software
1	launch app	
2		display "Home" screen with Map view
3	click the "i" button	
4		display "General Info" screen
5	click the "Back" button	
6		
7	click on the "+" button	
8		check if user is logged-in
9		if not logged-in display "Log In" screen
10	click on the "Create my account"	
11		display "Create an account" screen
12	fill in the "email", "password" and "username" text fields	
13	click on the "Create my account"	
14		display "Sign Up" screen
15	resume app	
16		display "Home" screen with Map view & notes
17	click on the "menu" button	
18		display "Menu" drop-down menu
19	click on the "Log In" option	
20		display "Log In" screen
21	fill in the "username" and "password" fields	
22	click on the "Log In" button	
23		display "Home" screen with Map view & notes
24	click on the "+" button	
25		display "Adding Note" screen
26	zoom and pan to adjust the location	
27		refresh map
28	click on the "Next" button	
29		display the "Adding Note Details"
30	fill in the "Note Title" and "Add Description" text fields	
31	click on the "Add image/ video"	

32		display options: “Take Photo or Video”, “Choose Existing Photo”, “Choose Existing Video”, “Cancel”
33	click on the “Take Photo or Video”	
34		launch phone camera app
35	press camera round button	
36		(phone camera app takes photo)
37		display photo (in phone camera app)
38	press ‘Use photo’ button	
39		display photo
40	adjust the “Display note for” slider	
41	click on the “Twitter” and “Facebook” buttons	
42	adjust the note location	
43	click on the “Save” button	
44		update records in database and upload photo to the server
45		display new note on ‘Map’ screen

2. Data Model (Use Case 1)

3.1. Data Model for Use Case 1

	User	Software		Data
1	launch app			
		calculate current location of user	process	userPosition.latitude userPosition.longitude userCurrentPosition
		create a marker for user’s current location on the map	process	userCurrentPosition userMarker
		query server for events in that vicinity		events eventID
		decide which event it is		eventID

		query server and fetch Notes for that event and General Info data	process	eventID notes generalInfo
2		display "Home" screen with Map view, notes, info button and marker for user's current location	output	iOS
3	click the "i" button		input	
4		display "General Info"	output	iOS
5	click the "Back"		input	
6		display "Home" screen	output	iOS
7	click on the "+"		input	
8		check if user is logged-in	process	isAuthenticated
9		if not logged-in display "Log In" screen	output	iOS
10	click on the "Create my account" button		input	
11		display "Create an account" screen	output	iOS
12	fill in the "email", "password" and "username" text fields		input	email password username
13	click on the "Create my account" button		input	
		add email, password and username to database and check if not there already	process	email password username SignUpResult
14		display "Sign Up" screen	output	iOS
15	resume app			

		calculate current location of user	process	userPosition.latitude userPosition.longitude userCurrentPosition
		create a marker for user's current location on the map	process	userCurrentPosition userMarker
		query server for events in that vicinity		events eventID
16		decide which event it is		eventID
		query server and fetch Notes for that event and General Info data	process	eventID notes generalInfo
		display "Home" screen with Map view, notes, info button and marker for user's current location	output	iOS
17	click on the "menu" button		input	
18		display "Menu" drop-down menu	output	iOS
19	click on the "Log		input	
20		display "Log In" screen	output	iOS
21	fill in the "username" and "password" fields		input	username password
22	click on the "Log In" button		input	
		check username and password	process	username password
		give access to user's account info	process	isAuthenticated

23		display “Home” screen with Map view & notes	output	iOS
		check for updates of notes homescreen if screen is on	process	pollFrequency
24	click on the “+”		input	
		fetch user’s location	process	userPosition.latitude userPosition.longitude userCurrentPosition
		create a marker for note’s current location on the map	process	userCurrentPosition noteLocation
25		display “Adding Note” screen with map and marker of user’s current	output	iOS
26	zoom and pan to adjust the location		input	
27		refresh map	output	iOS
28	click on the “Next” button		input	
29		display the “Adding Note Details” screen	output	noteLocation iOS
30	fill in the “Note Title” and “Add Description” text fields		input	noteTitle noteDescription
31	click on the “Add image/ video”		input	
32		display options: “Take Photo or Video”, “Choose Existing Photo”, “Choose Existing Video”, “Cancel”	output	iOS
33	click on the “Take Photo or Video”		input	
34		launch phone camera app	process (by another	n/a (data by another app)
35	press camera round button		input (in another	
36		(phone camera app takes photo)	process (by another	n/a (data by another app)
37		display photo (in phone camera app)	process (by another	n/a (data by another app)
38	press ‘Use photo’ button		input (in another	n/a (data by another app)

39		display photo in the “Add image/ video” field	output	notePhoto
40	adjust the “Display note for” slider		input	noteLongevity
41	click on the “Twitter” and “Facebook” buttons		input	userFacebookCredentials userTwitterCredentials noteFacebookPost
42	adjust the note		input	
43	click on the “Save” button		input	
44		update records in database and upload photo to the server	process	noteLocation noteTitle noteDescription noteLongevity noteFacebookPost noteTwitterPost
45		display ‘Map’ screen with new note highlighted in the middle	output	iOS

Appendix D Content Inventory

(Sample)

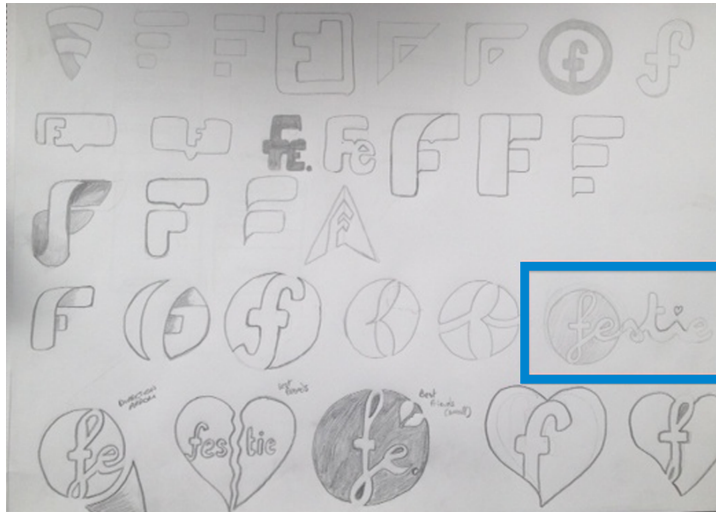
Screen	UI Control
General (Common aspects used throughout a number of not all screens)	Navigation Bar Status Bar Keyboard Control Centre Loading Spinner Alert Boxes Icon Notifications
Homescreen	Navigation Bar Menu Icon Search Bar Add Note Icon List View Icon Map Map Marker Icon Current Location Icon Current Location Marker Filter Button Segmented Filter Button Information Icon Note Element
Post A Note	Crosshairs Save Icon Cancel Icon Current Location Icon Header Input Box Description Input Box Add Photo – Library Icon Add Photo – Take photo icon Set Longevity Slider Twitter Icon Facebook Icon
Add Category	Categories Icons Add Button Cancel Button Preset Categories Icons
View A Note	Add Button Menu Button Reply to Note Button Report Note Button Voting Up Voting Down Voting Counter Image Box
Login	Facebook Log In Icon Twitter Login Icon Email Input Box

	Password Input Box
Create Account	Create Account button Sign Up Button
Search Notes	Search Bar Note Image Note Text
Menu	Map View / Home Button Notifications Button Profile Image Profile Button Settings Button Login Button Logout Button
Share Location	Current location beacon Message Box Send by email Send by text Send button
List View	Menu Button Map Button Add Button Image Box Date and Time of Note Voting Up Voting Down Voting Counter Filter Button
General Information	Back Button Visit Website Button
Add Event Boundary (Organiser)	Boundary Tool Cancel Button Next Button Current Location Icon Clear Button Search Location
Add Event Details	Event Title Title Input Box Add Logo Button Event Date from Input box Event Date too Input box URL Event website input Box Save Button Cancel Button
Add Markers (Organiser)	Add Marker Button Marker Icons

	Add one more button Cancel Button Next Button Search Location Input Box Save Button Edit Button
Add Note Organiser	Crosshairs Save Icon Cancel Icon Current Location Icon Header Input Box Description Input Box Add Photo – Library Icon Add Photo – Take photo icon Set Longevity Slider Twitter Icon Facebook Icon

Appendix E Design

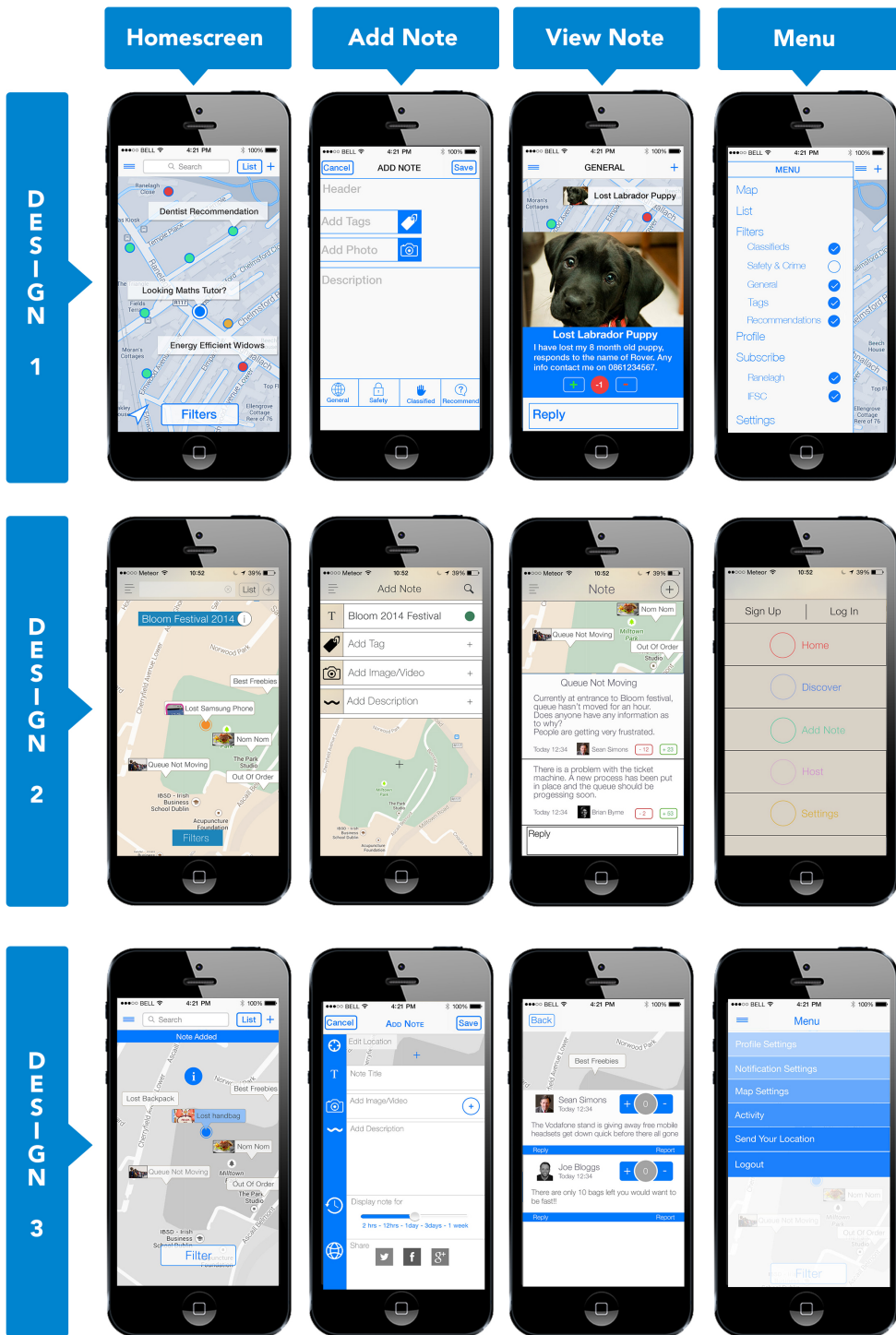
Logo Design



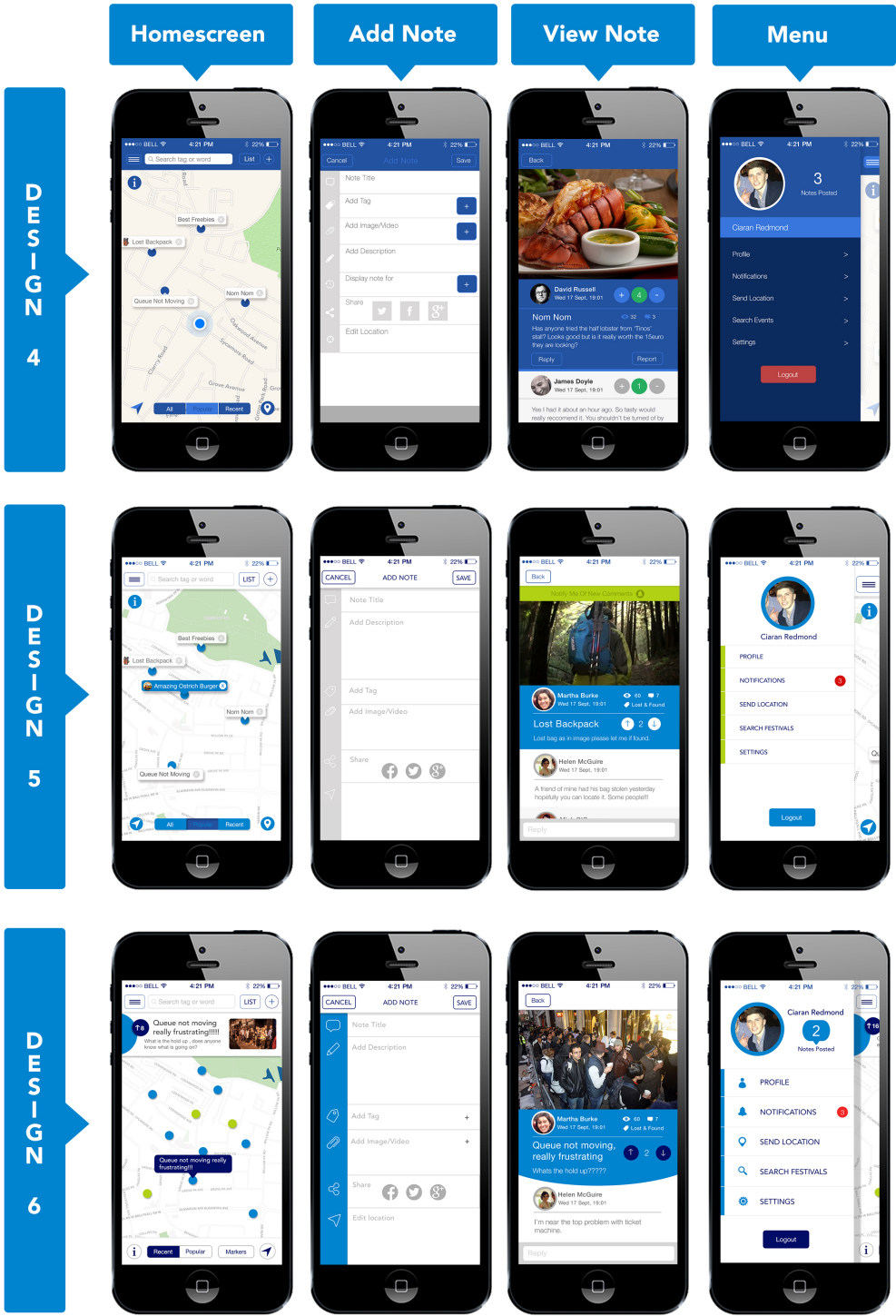
festie

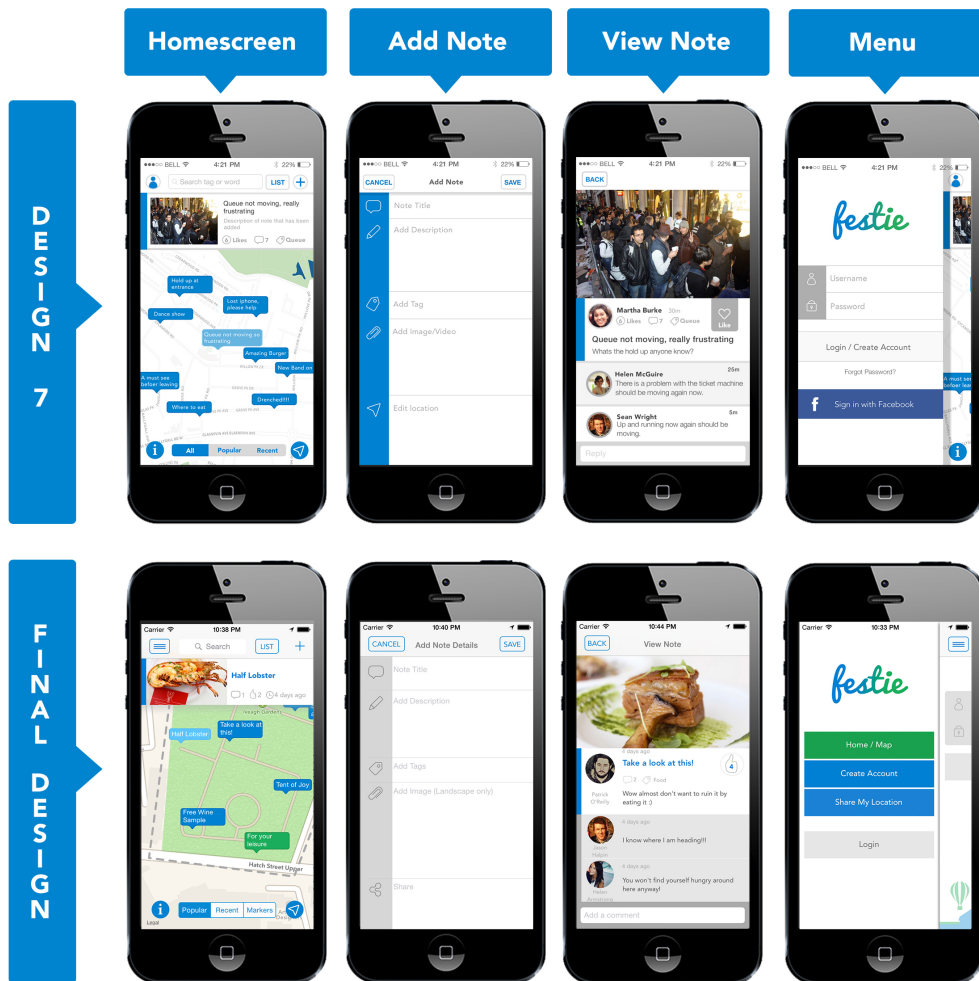
Sketching/Testing graphics through Facebook/Final design

Design Iteration (Sample)



Design Iteration (continued)





Appendix F Code

```

- (void)import
{
    NSURL* url = [NSURL URLWithString:[kBaseURL
stringByAppendingPathComponent:kLocations]];

    NSMutableURLRequest* request = [NSMutableURLRequest requestWithURL:url];
    request.HTTPMethod = @"GET";
    [request addValue:@"application/json" forHTTPHeaderField:@"Accept"];

    NSURLSessionConfiguration* config = [NSURLSessionConfiguration
defaultSessionConfiguration];
    NSURLSession* session = [NSURLSession sessionWithConfiguration:config];

    NSURLSessionDataTask* dataTask = [session dataTaskWithRequest:request
completionHandler:^(NSData *data, NSURLResponse *response, NSError *error) {
        if (error == nil) {
            NSArray* responseArray = [NSJSONSerialization JSONObjectWithData:data
options:0 error:NULL];
            [self parseAndAddNotes:responseArray toArray:self.notes];
        }
    }];
    [dataTask resume];
}

```

```

- (void) persist:(Note *)note
{
    if (!note || note.name == nil || note.name.length == 0) {
        return;
    }
    if (note.image != nil && note.imageId == nil) {
        [self saveNewNoteImageFirst:note];
        return;
    }
    NSString* locations = [kBaseURL stringByAppendingPathComponent:kLocations];

    BOOL isExistingNote = note._id != nil;
    NSURL* url = isExistingNote ? [NSURL URLWithString:[locations
stringByAppendingPathComponent:note._id]] :
[NSURL URLWithString:locations];

    NSMutableURLRequest* request = [NSMutableURLRequest requestWithURL:url];
    request.HTTPMethod = isExistingNote ? @"PUT" : @"POST";

    NSData* data = [NSJSONSerialization dataWithJSONObject:[note toDictionary]
options:0 error:NULL];
    request.HTTPBody = data;

    [request addValue:@"application/json" forHTTPHeaderField:@"Content-Type"];

    NSURLSessionConfiguration* config = [NSURLSessionConfiguration
defaultSessionConfiguration];
    NSURLSession* session = [NSURLSession sessionWithConfiguration:config];

    NSURLSessionDataTask* dataTask = [session dataTaskWithRequest:request
completionHandler:^(NSData *data, NSURLResponse *response, NSError *error) {
        if (!error) {
            NSArray* responseArray = @[[NSJSONSerialization JSONObjectWithData:data
options:0 error:NULL]];
            [self parseAndAddNotes:responseArray toArray:self.notes];
        }
    }];
    [dataTask resume];
}

```