Exploring destinations with a touch based tablet application

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Abstract

The mobile technology that emerged with the smartphones and tablets has changed the way people travel. This has changed both in how bookings are performed, but also in the way travel destinations are browsed and explored.

This thesis concerns the design and implementation of a prototype for exploring destinations, with the goal of finding out what the most essential factors and parameters are concerning travel browsing. With literature studies, user survey, paper prototyping and Hi-Fi prototypes, an implementation was made, written in Objective C and created as an iPad prototype. The application uses a globe-, map-, image- and list view as the main interfaces for browsing destinations. The prototype uses 14 different APIs, with diverse functionality to be able to take advantage of searching and filtering of destinations, made available by the APIs. By incorporating social platforms, it was made possible to better target the user’s interest, making the experience and exploration more personalized.
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Chapter 1

Introduction

With mobile technology, the way people travel have evolved in the last few years [43]. Prior to the emergence of mobile smartphones and tablets, travel browsing and booking was done, inter alia, through websites, travel agencies and magazines. Today, mobile technology has changed both how the flights are being booked and also how hotels are chosen [43].

In 2012, 12% of the people using a mobile device had downloaded applications related to travel, 17% have researched a trip on a mobile application or mobile website and 3% had booked their trip using a mobile device [43]. In 2013, the number of bookings through a mobile device had increased to 25% [23]. In the U.S market, the increase of bookings is expected to continue, from being 10% in 2013, 16% in 2014 to being 25% in 2015 [9].

By creating efficient software that can personalize the travel experience and by addressing the users needs and offer intelligent suggestions to the user, will prove to be an important factor for the user experience [1]. Personalization had been recognized as a critical element for the added value, efficiency and commercial prosperity in tourism. The technology too, makes it possible for tourists themselves to play an active role in producing dynamic content about destinations and visits, with the use of social networks, blogs and wikis [36].

1.1 Human-Computer-Interaction and Interaction design

Human-Computer-Interaction (HCI) emerged in the 1970’s with the emergence of personal computing, as a special area of research in computer science, which included cognitive science and human factors engineering [10]. HCI's goals are to improve the interactions between users and computer systems by increasing computer usability and also to be receptive to user needs. HCI's major concerns are design, evaluating and implementing interactive systems for human use and the study of events that encompasses them. The two primary terms are functionality and usability, where the first one covers the functions that can be efficiently utilized by the user. The second one is to what extent the system can be used efficiently and how to accomplish certain goals for the user. The effectiveness of the system is the balance between functionality and usability [52].

Interaction design is a small part of the field of HCI, and is about designing digital objects for peoples use [40] and to create user experiences, which enhance the way people work, communicate and interact [61]. Interaction design was created as a new design discipline in the 80’s, with emphasis on behaviors, animations, sound and shapes in a virtual world.
Interaction design was, similar to industrial design, created with the needs and desires of the users as the central point. The goal of the discipline was to make designs with aesthetic pleasure, satisfaction and enjoyment. The term “Interaction Design” was first coined as “soft-face”, being a combination between interface design and software, until later being changed to Interaction Design [42].

1.2 Application Programming Interfaces

An Application Programming Interface (API) is a way where software components can communicate with each other. Web APIs are HTTP request messages with a specified structure of the response, which are in the form of the mark up languages XML or JSON [60]. An API powers applications and websites and makes it possible to retrieve data from different digital channels. With the use of APIs, integrating social context to a product is made possible [35].

There are more than 10 000 APIs available on ProgrammableWeb, where top API mashups being LinkedIn, Facebook, GoogleMaps, Twitter, YouTube and Flickr [49]. More than half of the traffic for big brands is through APIs [35].

1.3 Purpose

By finding out what makes the individual undertake travel, choose travel destinations and what parameters are of importance, the overall travel experience can be improved. By making use of social networking sites, Big Data and APIs, the exploration of destinations can be more personalized and fit the users needs more accurately.

The goal of this paper is to create a tablet prototype, which involves different ways of exploring travel destinations. The focus will be on interaction design as the foundation and by incorporating literature studies, design guidelines and user feedback from a survey, create an exploratory and usable application on top of a booking system for added value.

1.4 The Mobile Life

This thesis was done as an independent research project at The Mobile Life (TML) in Stockholm. The mobile life is a technology company with offices in Stockholm and Singapore, and has been focused on mobile technology since 2005, with mobile applications, mobile web and responsive web in particular. TML has done over 100 mobile projects with clients like Tiger Airways, Asia Tour, Eklund Stockholm New York, Vasaloppet, SAS, Volotea, Betsson, Arla, 7-Eleven, Scania, Swedbank and ICA.

In 2012 they started to develop products and platforms for high performing flight booking applications for the airline industry, optimizing the core booking flow for its end users.

1.5 Paper outline

Here are the chapters in this thesis, briefly describing the content of each chapter.

**Chapter 2 - Objective** This chapter describes in detail what research questions will be dealt with.
Chapter 3 - Methodology  This chapter describes the process of the work, the methods and the resources used.

Chapter 4 - Theoretical framework  A description of the literature study, presenting the travel motivation process, tablet use, the differences between web and native, usability and user experience, social computing and Big Data.

Chapter 5 - Results  A description of the user study results, prototypes and implementation.

Chapter 6 - Discussion  In this chapter, the results are discussed based on the theoretical framework.

Chapter 7 - Conclusion  This chapter deals with the conclusions of the thesis work. It also handles the limitations of the thesis and also the future work that could be done.
Chapter 2

Objective

2.1 Research questions

This thesis is both theoretical and technical. The theoretical aspects of the thesis are to investigate what interaction designs and new mobile technologies can do to make the experience extra fulfilling and meaningful to the user. The technical part of the thesis emphasizes on interaction design and the final prototype will be implemented as an application written in the Objective C language.

As an added layer on top of TML’s booking platforms, this thesis investigates the best ways to display and find destinations before actually booking a flight. This layer could provide an additional value for the users of TML’s products. The call to action to book a flight is not included in this project, the integration is assumed to exist.

To define what type of information that is needed, this thesis will deal with the following research questions:

1. What technologies and capabilities do we have available in smartphones and tablets that makes it different from web?

2. How can the user experience be enriched in a mobile environment, and what are the various methods of browsing and finding destinations?

3. How to make destinations come alive, and what methods and sources are available today to keep this interesting and relevant to users?

4. How can the user tag destinations so that smarter filters can be made and find exactly what the user want?

5. How to make destinations interactive and enable users to give back to this community?
Chapter 3

Methodology

3.1 Information gathering

The collection of information has been done by reading relevant literature regarding usability, user experience and social computing. Additionally, the research evaluated travel applications and investigated big data and application programming interfaces. The literature has been acquired from travel sites, article databases, books and from webinars.

The theoretical framework would come to be essential for the process. This was significant for understanding and evaluating different design choices, to determine which navigation techniques to use and what type of data that could be of importance. The work done here was the foundation of the final design and programmed prototype.

3.2 User study

The user study has been done by creating an internet survey. A survey is an effective way to measure intentions, feelings, opinions and beliefs. It can also be useful to determine if a product can help to solve a problem or meet a need, and finally, to foretell the future success of a product [38].

The participants were asked to answer questions regarding their travel, booking and browsing experiences. Furthermore, the survey featured questions that evaluated already existing applications, and the feedback would later be taken into account in the designing process. The survey focused on quality analysis rather than quantity, to be able to retrieve as diverse information as possible. The choice of using open-ended questions was needed to be able to capture a broad and versatile range of information.

3.3 Prototypes

Based on the literature and results from the user study, paper prototypes were created. These paper prototypes have been both low-cost and was a way of understanding the flow, structure and concepts of a product. Additionally, by using paper prototypes, users are more comfortable giving feedback, and designers can throw bad ideas more easily if they have spent less time working on a prototype [53].

These paper prototypes was later evolved into more refined prototypes made in Photoshop, for a clearer view of what the final implementation, with it’s design elements, might
look like.

3.4 Implementation

The implemented high fidelity prototype was written in Objective C, using Xcode. Graphical elements used in the interface of the implementation were done with Photoshop and Illustrator. The difference between the implemented prototype and a complete iPad application is the absence of a few location-based functions in social API:s and the limited use of API requests.

3.5 Delimitation

Initially the project started off with no specific platform in mind. However, early in the process it was narrowed down to an Apple iOS project due to framework dependencies, more knowledge in the Objective C programming language with it’s development environment and also it being TML’s largest platform.

Furthermore, it was decided that Apples iPad was more suitable than the iPhone, due to the differences between the usage: browsing destinations and on-the-go booking on a tablet is different than on a smartphone. On-the-go booking is used more often on a smartphone than a tablet. Correspondingly, a tablet is preferable when browsing, planning and booking a trip [55].
Chapter 4

Theoretical framework

4.1 Travel motivation and planning

When people are planning travel, they undertake a certain process. First is the emergence of the initial motivation event [27]. Studies regarding travel motivation factors show that the most important ones are novelty, escaping or relaxing, strengthening relationship, autonomy and nature. This is followed by self-development, stimulation, self-actualization, isolation, nostalgia, romance and recognition [17]. Secondly comes the seeking of inspiration and doing the research about destinations. This is a stage of the planning process, where books, magazines, stories from friends, searches, newspapers, maps, atlases and blogs can be sources of inspiration [27]. This could also be explained as the “push and pull factor”, where push factors are socio-psychological motivations for people to travel. Push depictures how the traveller is pushed by motivation factors to make a travel decision. Pull factors are external, situated or cognitive motivations that attracts the traveller to a particular destination. The pull motivation depictures how the traveller is pulled by the attributes of the destination. Push motivations can be the need to escape, rest, relax, prestige, health, adventure, social interaction and where pull motivations are inspired by the desirability of the destination, which can be things like attractions, entertainment, scenery, shopping and beaches [17].

In the last couple of years, tourism induced by watching films, television and digital media [13] has become increasingly popular [34]. This film tourism can be connected to nostalgia and finding an identity with history [34]. Also, it can awake emotion and meaning to a resort [34]. Studies show that 8 our of 10 find their destination based on film they have seen, and 20% planned to travel to their favorite movie’s location [54].

Finally, when destinations have been decided, comes the allocation of dates, durations and activities for each destination, which involves flight times as an important factor, creating a draft itinerary, researching accommodation and activities in more detail, calculate budget, and sharing the itinerary with family, friends and colleagues. This is done in several iterations, with iterations in every step as well [27]. See Figure 4.1 for an illustration of the travel planning process.

4.2 Tablets

In the first quarter of 2013, the shipment of tablets had risen globally with 142% annually, with 49.2 million units shipped in total [32]. In 2013, there were more connected devices
than people in the USA and 31.8 million of these devices are tablets. In 2013, 10.58% of the visits from ecommerce websites come from tablets, compared to 2011, when this number was 2 %, and 5.95% in 2012 [19].

In a study by Henry Harteveldt in June 2013, two out of five American travelers own a tablet and according to Pew Internet and American Life Project; 31% of the people owned a tablet, and one i five planned to buy one in 2013. In the first quarter of 2014, the number of tablet owners had increased to 42% in the USA [62]. Hudson Crossing anticipated that 89% of U.S travelers will own a tablet by 2018 [30].

4.2.1 Tablet use

In a study by Budie et al in 2011, half of the participants carried the iPad with them frequently. The other half used it at home or on long trips, or if they anticipated long waiting periods. However, most iPad users do not use the iPad in truly mobile situations. Users that take their iPad with them use them when they are waiting, between activities, killing time or in relaxed situations. Using the same presentation as on the smartphones is not applicable on the iPad, since the context of use differs [7].

4.2.2 Tablet use in travel

The travel industry had the highest percentage (11.8%) of internet traffic coming from tablets, and is the only industry that has more internet traffic than smartphones [20]. In the travel industry, mobile traffic in general has become increasingly significant, and when it came to tablets, hotel searches was expected to increase by 180% by the end of 2013. In a study made, where 300 million searches to hotels websites were analyzed, one in six came from mobile devices, were tablets stood for 60% of the searches.

Furthermore, the browsing on a tablet is more like the one on PC, differing from smartphone usage, and the studies showed that travelers tended to use the tablet more than customers of other products [20]. From a study by Phocuswright, 7% of the travelers use tablets to plan travel, 8% use smartphones and 86% use desktop computers and 63% of the travelers only use desktop to plan travel [50]. Moreover, mobile travelers are interested in planning and researching their trips, and 40% of tablet users are also interesting in booking.
4.3 Native vs Web

According to a study by Nielsen, using a native application instead of mobile web is a better way to improve the usability. This study showed that users perform better on applications than on mobile websites, and this applies to all platforms. The reason for this is that a native application, compared to a mobile web site, can better target the limitations and abilities of each device. Furthermore, as a business perspective, native applications provide a superior case for content providers due to the micro payment support inside the apps [45].

4.4 Mobile technology and travel

With the technology available in the smartphones and tablets, the user experience can be enhanced. Tablets and smartphones with features like GPS, camera and Wi-Fi can help travelers stay connected with friends through social networking sites, book hotels, find flights, discover destinations and find activities [43] and the technology also makes it possible for the travelers to contribute with content themselves [36].

A study by Amadeus, where 29 experts were interviewed, show that researching the trip provided the biggest opportunity for technology to improve customer experience, both before, during and after a trip. Finding information about prices and cost and other available information also proved to be necessary for the user experience. Additionally, the booking of a trip, choosing hotel and choosing destination was also proven to be significant. Furthermore, the biggest impact technology can have is to make travel options available to the public and also provide the ability for the consumers to share travel related information with others consumers [1]. In the same study, interviews show that improving the user experience proved to be the most important factor to address for raising the brand loyalty. In addition to this, customization and personalization to address personal needs and present intelligent suggestions are important to achieve a good customer experience [1].

4.5 Usability and user experience

User experience is described as users experiences using software, and is not about having beautiful interfaces, but to give the users what would work best for them [6]. User experience
in a mobile software project can be divided into the context and the implementation. The context are elements that cannot be controlled or changed, but must be understood. These are hardware affordances, platform capabilities, user interface (UI) conventions and the environment in which an application is used. The implementations are elements that can be controlled, which are performance, design and platform features such as accelerometer, gyro, data notifications [11]. Mobile devices with these capabilities play an important part in mobile applications. Furthermore, the smaller screens and different interaction styles play a big role in the interaction design. Important qualities of an application for making a good impact are to have good performance, be reliable and have good quality and security. Performance means to be efficient to use, responsive and scalable. Reliability is about being robust, stable and connective. Finally, quality is about having usability [57].

Usability was defined by Nielsen in 1993 as measuring learnability, efficiency, memorability, error tolerance and satisfaction [44]. Many of the usability guidelines have remained very stable throughout the years [48] and in 2007, 90% of the web guidelines defined in the 1990’s were still valid. The reason for this is that most of the guidelines depend on human behavior, which does not alter frequently [47]. Key usability challenges when it comes to mobile are the technology issues with respect to limited screen sizes, limited input methods and navigation difficulties. In addition to that, the mobile user has to shift their attention between their task and their surrounding environment. Also, individual characteristics play a part in how people use mobile devices and many variables beyond the interface can affect usability. There are some key factors to consider when assessing usability of mobile devices. These are who the user is, what environment the user is in, the task the user has to complete and finally the technology used, with its interface design and size [29].

In two studies by Budiu et al, usability was observed on the iPad using both native applications and websites. This was done by testing usability in a lab and by examining reviews from experts. The studies were conducted using the think-aloud-method and a design-review study. The user experience issues found in the first study, were related to target sizes, affordances, inputs and error tolerance, popovers, small modal views, swiping ambiguity, navigation issues and orientation [7]. The findings in the second study revealed some new usability issues concerning swipe ambiguity, space related problems and introductory segments. User might find long introductory segments entertaining the first time but gets them tired after some time. Swipe ambiguity issues occur when multiple items on the same page can be swiped. Finally, space related issues occurs when too much information is squeezed together on too small areas on the screen, making them harder to see and to manipulate. Also, many of the applications featured too much navigation: a user interface should contain only a few navigation techniques. Furthermore regarding the study, some users complained about not being able to access all of the content without signing up and there were a frustration when not getting the same content as on the mobile website version [7].

Target sizes - Target sizes affect the experience. Small targets can be hard to discover, and since it is harder to hit a small target, it makes the users work more. Crowding targets also present a problem: by placing targets too close to each other, the users can accidentally tap the wrong target [7].

Affordances - Affordance means what you can do with an object. In software, these are called the physical metaphors. I should be easy for users to make this mental leap, and the design elements must match the expectations and mental model of the user [6]. The user cannot know that something is touchable, if it does not look touchable. Hence, choosing the right icons and labels for the buttons is important [7]. The interfaces today mimic the psychical action required for it to work. Turning a page, pressing a button is like it is done
4.5. Usability and user experience

in the real world, a required action. There is a psychological reward and good affordance encourages continuous interaction and results in things being fun to use [6].

**Input and registration** - To make a registration process easy and usable for the user, it should compute the information for the users and be tolerant of type errors. Moreover, it should save user history so that the user can select from previously typed information and use default values that makes sense to the user. If the application does not contain sensitive information, the user should be kept logged in, and if it does contain sensitive data, this should be provided as a choice for the user. A logout button should always be available to the user [7].

**Popovers** - Relevant information should not be put in a small popover if the space underneath is unused, but rather be presented in a table view. Also, presenting a popover only with images, much like in a table view, is not beneficial. Also, if there is a lot of information, a table view is better than a popover, but if the user needs to see the information in the background, and the popover does not block it, it can be used. Finally, if the popover has thumbnails that are hard to see or the text inside the popover is small, it is a bad idea to use a popover and using a table view is a better choice [7].

**Small modal views** - Modal views that are smaller than the full screen should be used only if they can display all the needed information. If not, it is better to use a full screen modal view. E-commerce applications used to display product information may be motivated to use a modal view, if it helps to keep the users oriented within the application, but if there is a lot of content, it is better to use separate pages instead [7].

**Swiping** - It is important to give the user a visible clue that he or she needs to use a swipe gesture. One should avoid using “carousels”, if features will interfere with the swiping. However, the carousel is easy to use if the affordance and horizontal swiping is good. Also, using carousels can show most information without being too importunate [7].

**Navigation** - Including a back button is of great significance, by providing a possibility for the users to undo accidental touches. Moreover, carousel-like navigation is not appropriate to use when dealing with long lists, such as search results. Many carousels can overwhelm the user and two-dimensional carousels make it hard to keep track on previously visited items [7]. Additionally, it is crucial to think about the depth so that the user does not get disoriented within the application. Also, giving the users a clear spatial model of the screens is needed to prevent the users from getting lost. To further avoid disorientation, using animations to provide continuity and using transparency with frosted glass views, can help the users stay oriented [2].

**Orientation** - More users prefer using landscape orientation instead of portrait, by a margin. However, users were in general not bothered if there was an orientation constraint. When users switch orientation, they expect the same interaction in landscape- and portrait mode. Thus, inconsistent navigation should be avoided.

One important thing is to have the same content available on both orientations, and not to include more in one orientation. This makes it inconsistent and frustrating for the users. If different content is available in the other orientation, it is important to notify the user. Using different content in different orientations makes the user loose orientation and control, which affects the user experience in a bad way [7].

**Initial experience** - Download time is another problem, if it takes to long time to get the data. It is important to display a progress bar so that the user knows how far a download has progressed and that the application is working. Using a progress bar is better than a spinning gear if the download takes more than 20 seconds. Furthermore, it is preferable if a preview can be shown, with content available up to the present or show instructions on how to use the application. Continuously, start screens can also improve the user experience and
should therefore be considered, but only if it gives an additional value. The start screens should look as close as the first functional screen. Additionally, animations in a start screen should not be used, and noises or videos should neither be used when launched [7].

**Reading instructions** - People who normally do not read instructions may read them during loading time or if the instructions are simple and they can get the core use without actually reading them, such as clear and simple graphical instructions. It is important to focus on *one* feature to get the user started [7].

**Desirability** - Danny Brian talks about *desirability*, which involves how useful, visually appealing and surprising an application or design is. Primarily, if the users do not like an application, they will not use it or even try it. That is why visual elements of an application should avoid cluttered-, inconsistent-, overloaded- and unappealing designs. For example, give the user *one* way of doing something rather than ten ways.

In addition, Brian mentions the significance of the factor of surprise, which is desired by the leading software companies today. It is a designer desirability to create an application that attracts attention and makes it unique.

Furthermore, Brian mentions *Findability* as something that could improve user experience. If the user cannot find the application or the information it holds, users might fail to complete their task. A proper software should not require a manual and users should be guided through out where they are in the workflow, giving them a sense of how much left there is to do. Lastly, Brian talks about *Reliability*, which has to do with consistency, credibility and responsiveness. If people do not trust your application, they will not use it for important things [6].

### 4.5.1 Usability with maps and locations

In an article by Bedford, results show that maps containing business locations were visually appealing to users. However, the users had issues with usability on mobile devices and using list views proved to have better results. Additionally, these results showed that maps and locations on dedicated applications had higher usability than on maps on websites. However, the default view should be a list views for the higher information density. How easily accessible locations are, is a key factor for the success or failure of an application [3].

One major issue was the swipe ambiguity, where panning interfered with scrolling. This had the effect that users in this case preferred a list view rather than a map view. To avoid this, added functionality to hide and collapse the map could be implemented. Also, adding borders or insets to prevent swipe ambiguity can improve the usability [3].

Additionally, there were also usability issues when it came to pins, which were often grouped too closely together due to the zoom level, making it hard to select the correct pin. Aggregating pins to reduce the number of pins also had a few issues, making it confusing for users [3].

### 4.5.2 User interaction with 3D globes

It is important to differentiate between 3D interaction system in which you navigate directly in a 3D spatial context and systems that display virtual 3D space but with indirect manipulation of the space. The latter ones are not 3D user interfaces. But, if the non-3D input can be transferred directly into some action in a 3D space, then it is regarded as a 3D user interface. Smart phones and tablets have, with their gyro, accelerometer, compass and sensors, the possibility to support 3D spatial input. However, there are some difficulties with 3D user interfaces, with common problems being improper mapping between input and
actions. A 3D interface might work better with more general interaction techniques. Travel techniques where the user simply points to a landmark object might be better than using techniques which allows for continuously manipulation of position and orientation [5].

In a report by Wilkening, results showed that users more frequently used 2D interaction capabilities rather than 3D tools, which is the use of tilting and rotating. The experiments, which were done using Google Earth, showed that users would prefer interaction tools such as panning and zooming instead of 3D tools like tilting and rotating [59]. Panning and zooming are fundamental components in any information display and more important than 3D navigation tools. [28] The study did not give any proof of added value for using interactive 3D globe viewers, with or without time pressure [59].

4.5.3 Usability and flat design

In six user studies by Nielsen, it was concluded that the usability has improved since the first tablets came out, however, flat design followed by poor gestures and workflow are the main threat for usability. He suggests a design somewhere in the middle of skeuomorphism and flat design. In the study, Nielsen also saw that searching is used frequently and that users want to return to a search result page, which many applications do not provide. Nielsen also found usability problems with the back button, which revealed problems such as hard-to-find buttons and buttons that did not undo the users actions as expected [46].

Continually, the study pointed to issues related to gestures. Accidental activation, when the user accidentally touched the interface and needs to undo the mistake, was a common issue. Swipe ambiguity problems appeared, when the screen was divided into different frames and when a gesture can achieved different results depending on where the touch occurred. Finally, invisibility issues occurred when a gesture cannot be seen, or have low learnability [46].

With flat design, buttons and interface elements have to be distinguishable from the content or it will be ignored. Users can often find themselves lost and disoriented with flat design. To avoid this, using shadows, 3D, coloring and placement can invite users to act and tap on the interface. Also, some of the interface elements rely of previous knowledge of the system [8].

4.6 Social computing

Social computing can be summarized as digital systems that support online social interaction. This can have a broad meaning, ranging from creating a web page to follow someone on Twitter. What makes this social is that the actions are done with other people in mind. Social computing systems also use its users social activity to provide more value and improve the product. These systems can also provide results that might seem better for people who rather trust information from multiple participants than just one. Further benefits are greater efficiency, quality, legitimacy and the exchange of the interaction [21].

4.6.1 Social networks

Consumers today rely a lot on the information available in social media and content generated by regular people (User-Generated Content), before making a purchase [26]. Social media has a small amount of traffic passing through ecommerce websites, with 1.55% of all traffic. Of this traffic, statistics from 2013 show that Facebook has 55.18%, Pintrest has 24.96%, StumbleUpon has 10.65%, Twitter has 9.06% and LinkedIn has 0.14%. The reason
for the low percentage of social media can be due to that consumers do not want to leave
the social network site, and therefore remember the site and visit it later on. This means
that the visit to a site will be a direct source [19]. Using social login can keep consumers
on a website longer, which gives more time to present right information and also grant the
opportunity to retrieve customer data. Also, presenting insider deals can be an important
factor to improve engagement [19].

Social media plays an important role in planning a travel, since it provides information
about other traveller's experiences. It can also aid at travel decision-making and travel risk
assessment. It also provides a sense of belonging into travel communities [24]. Social media,
when it comes to travel planning, is largely used in the beginning of the trip and not so
much after the trip [14]. Furthermore, social networking sites like Facebook can affect the
destination choice when planning a trip, by displaying travel related photos from Facebook
and thus generating interest to the viewers [58]. Blogs can also be a trustworthy source of
time related information [24].

In contrast to the findings by Cox, conclusion from the study by Fortis et al showed
that social media is predominantly used after a trip (78.3% of the respondents), to share
experiences and photos to friends and other travelers. Research before a trip, to get ideas
as where to go, is common and used by 44.5% of the respondents. Trying to narrowing
down choices, social media is used by 24% of the respondents, and to confirm a destination
choice, 30% of the respondents rely on social media. When people are researching activities
and sights, social media is used by 41.6% of the respondents. Social media during a trip
is not used as much as before and after. 49.1% of the respondents use social media to
stay connected with friends. When it came to trustworthiness of source, friends were most
trustworthy, fellow travelers and social media came second and third [24].

4.6.2 Big Data

In a report published by Gartner, “information is the context for delivering an enhanced
social and mobile experience” and one of the important trends that will affect the experience
is Big Data [25]. Big Data is data that exceeds the processing capacity of conventional
database systems [18] and it refers to the use of huge datasets in data science and predictive
analytics [15]. Predictive analytics is when a predictive model is used together with data to
get a prediction. The prediction is only the start, where action needs to be taken to get an
outcome, which could be increase of sales among others things [51]. In practice, predictive
analysis covers maximizing computational power, increasing accuracy of algorithms and
improving types of analyses to compare data. Also, it promotes the belief that this will lead
to more truthful, objective and accurate results [15]. Examples of predictive models and
Big Data are Facebook and LinkedIn, who inter alia predict which one should be connected
to [51]. Moreover, the global sharing of data has increased significantly from 2005 to 2010,
from 130 Exabytes to 1227 Exabytes. This is predicted to be 7910 Exabytes in 2015 and at
the same time, the cost of storage is predicted to decrease from 18.95 dollars per Gigabyte
to 0.66 dollars per Gigabyte in 2015 [4].

In a study by Amadeus, Big Data has the potential to change how services are delivered
to travelers and make the travel experience more intelligent and responsive. With this, the
focus can be on the needs and preferences of the customers, and thus improving the travel
experience. Travel companies today use Big Data to enhance the travel experience. An
example of this is a travel company called Kayak, who uses big data to present a price
forecasting model over a seven-day period [16].

If more information about a customer and his or hers experience is given, it is possible
to personalize communications and present more appealing services [31]. With Big data, a more complete travel experience can be given to the traveler. It has the possibility to better target the traveler and give better recommendations regarding flights, hotels and food, based on previous purchases [41]. Some travel planning apps use Big Data analytics to observe where the travelers go, eat and drink in terms of price, cuisine or allergies, and what activities they enjoy. Based on that, useful recommendations can be made to the user [33].

4.6.3 Big Data and social networks

Social networks generate huge amounts of data, with billions of users with content, textual information and media information and billions of connections where behaviors, preferences and trends can be found. Social media makes is fairly easy to get access to data, with developer APIs, datasets and through spidering the web [39].

Flickr, which is one of the most popular photo sharing services, has the ability to add photos with latitude and longitude and use a device’s location to tag the photo with destination coordinates, time stamps, tags and other useful information [37]. Photos can be taken using a mobile device and store the location with the build in GPS and use social sites to announce travel locations. Furthermore, by using photos containing coordinates, is it possible to predict users favorite locations, based on his or hers travel behavior in previous cities. In a study by Clemens et al, based on a set of geo-tagged photos made by users, similar users were identified in previously visited cities and used to aggregate those users opinions to obtain a personalized recommendation for a target user. The user’s favorite places can then be predicted in previously unvisited cities, based on similar users travel experiences. Moreover, this information can be used to detect global events and mapping textual tags to geographical locations, and can then predict popular places and activities near the user [12].

However, Big Data is useful only if it can tell a story, and “storytelling is where social media and big data truly intersect” [56]. A good way to tell a story is through visualization. The difference between social media and other data sources is that the users provide all the information themselves: photos, connections and private messages and in return, the information is structured and easily accessed. By accessing the users own social timelines, they can access their own stories [56].
Chapter 5

Results

5.1 User study

The user study was conducted with an internet survey, to retrieve information of what users found interesting and important when it came to browsing for travel destinations and finding flights. In addition to the survey questions, the users were asked to test two iPad travel applications, Kayak and Fly Delta, and answer questions about them. There were 17 people participating in the user survey.

The results from the survey yielded that there was a need for a more accessible and intuitive way for browsing travel destinations than currently existing applications implemented, which could be provided with more effective filtering. Using existing applications on tablets and smartphones was the most common way for browsing destinations. Besides that, users sometimes browsed destinations through travel magazines, travel communities and travel blogs. It was shown that gradations from independent sources were accounted.

14 of the 17 users found it important to be able to filter and search for a destination’s shopping features and culture sights, such as history monuments and other points of interest. Also, finding events was significant when browsing, which included theatrical events, musical events and sport events. Furthermore, food filtering was essential, to be able to find places where food and drink can be found. This was a feature desired by 9 users. In addition, filtering options that were also mentioned in the survey was the ability to find and filter nightlife places, spas, destinations with peace and quite, places close to the beach, price on merchandise, the amount of tourists and finally: filter by weather conditions and temperature. 3 of the 17 participants users wanted to be able to filter between destinations within a certain category, such as charter, all-inclusive travels, sun- and bath travel destinations and child friendly destinations.

When asked about what would make a tablet application more compelling, 13 of the 17 users expressed that a clear user interface that was easy to use was critical. In addition to that, 14 users expressed that focus should be on filtering, where 8 of these users wanted filtering by price. Also, presenting ratings from other travelers, displaying currency and automatically convert to the users own currency, were significant and requested by 11 users. Furthermore, 2 users wanted to be able to specify “no stopovers” and select airline companies, if searching for flights.

The study also showed that 12 of the 17 participants wanted to share positive and negative travel experiences with other users, 3 of these also wanted to share the distance from hotels to points of interest and experiences and activities. The study also conveyed that
finding beaches, shopping districts, attractions and accessing local traffic was important. Additionally, finding good places with food and drink, sights, places to avoid, reviews, ratings, small tips and images were of great value. 1 user said that travel diaries often felt to long, and wanted grading scales instead, when reading about destinations.

5.2 Design and prototypes

5.2.1 Paper prototype

The first prototypes were done using sketches. It was tested on six test users, where feedback was used to improve and expand the basic structure and functionality of the prototype. The reason to test simple sketches is to get better and more honest answers from the test users [53]. The sketches involved a globe as the main interface, in which labels and pins with different points of interest were displayed. The results showed that all test users liked using a globe and experienced that they got a good overview of the world. Furthermore, all users had used Google Earth before, which made them comfortable with the prototype concept. There were also sketches, which displayed a regular map, in which the users also had no trouble understanding and navigating. However, five users felt that using a globe was more explorative. Moreover, the users also found it desirable to have a view where the destinations could be browsed by images.

When a destination is found and selected, an overlay view was added displaying summarized information about the destination. The user can then further explore the destination to display more detailed information. When these paper prototypes had been discussed and evaluated by the test users, the Hi-Fi prototypes were created.

5.2.2 Photoshop prototype

The Hi-Fi prototypes were made using Photoshop, which gave a better view of how the implemented prototype would look like. During the course of work, the Hi-Fi images changed for the final implementation due to user feedback. The feedback was generated through discussions and dialogue, and the major part of the changes were UI element improvements, such as new icons and backgrounds, but there were also changes to the functionality, where some features were added and some removed. Figure 5.1, 5.2 and 5.3 show some of the views from the Hi-Fi prototype.

When the Hi-Fi prototypes were completed and the design decided, the implementation in Xcode could begin.

5.3 Destination Explorer iPad application

5.3.1 Whirlyglobe framework

To build the application, certain requirements were needed. Firstly, it had to be open source, and secondly, it had to have support for map layers, coordinates and drawing on top of a 3D globe, where custom labels could be created. It also had to be written in Objective C to be created as an iPad application. With those criteria, the best solution was to use WhirlyGlobe framework.

The framework titled Whirly Globe Component, provides base imagery, network map tile data sets, labels, vectors, shapes and overlay views. The framework is written in C and Objective C, and it renders a globe using OPENGL ES. WhirlyGlobe is created by Steve
5.3. Destination Explorer iPad application

Figure 5.1: Photoshop prototype showing the main interface containing a globe view. A slide in view has been added as an overlay when a place is selected.

Figure 5.2: Photoshop prototype showing the view where the browsing by images is selected.
Figure 5.3: Photoshop prototype displaying a view where a destination is selected and available destinations and guides are displayed on the globe.

Gifford of Mousebird Consulting. The map tiles are used locally or fetched using different World Map Services (WMS) and these tiles are available from different sources depending of map type. The framework has support for adding coordinates, pins, names and images, and also provides basic animations on the globe. Furthermore, the framework also supports panning, zooming and retrieving more detailed map tiles depending on the zoom level. It also has the ability to add images for different coordinates, making it possible to customize pins and also to add an overlay view on top of the globe, when a pin is selected. The framework included more functions, such as elevation data and additional overlay layers, but these were not used. The version used in this thesis is version 2.2 [?].

5.3.2 APIs used

Below are the requests made, together with their respective API responses.

**Facebook API** is used to be able to acquire information about friends on Facebook, both the profile information but also all of their check-ins. The check-ins are needed to be able to use geo-located information to be displayed on a globe or map. The check-ins are also used to display more detailed information when selecting a city or place. The API also provides search functionality, where it is possible to retrieve geo-located places and events all over the world, based on search term or coordinates.

**Instagram API** retrieves information about friends, with profile information and geo-tagged images with metadata. The API also gives access to public geo-tagged places, based on search parameters.
Twitter API makes it possible to get access to the twitter flow based on coordinates, search term and other search parameters. The API also has the functionality to present the most trending topics that has geo-tagged information about them.

DK Eyewitness Top Ten Travel Guides API is based on *DK Eyewitness Top 10 Travel Guides*, with wide-ranging information about sights, shopping, hotel, restaurant, attractions and nightlife for a limited number of cities. By retrieving data based on one of the 87 available dataset locations, specific categories and guides are available. Not all datasets are pure cities but can be associated categories, such as a group of islands. There is also a search functionality within this API which provides text searching, both of categories of places. Parameters such as latitude, longitude and distance, can be specified to retrieve places within a specific area.

ForecastIO API gives access to weather information based on coordinates or by place name.

OpenWeatherMap API is another weather API used to access weather information.

Flickr API is a photo API that makes it possible to search for photos based on a search term. In this application, the weather images are gathered from a group named Project Weather and contain high quality images of cities, which can be found by making request with a city search parameter. Furthermore, it is possible to specify the bounding box to limit the search results to a specific area.

Geonames API is a geological database, which contains place names and coordinates. These place names are found by specifying the bounding box of which these cities are located. Geonames are also used when the user is selecting a map pin, where a geo-location lookup based on latitude and longitude is made, to retrieve the nearest city. Geonames datasets are also available as local files. Abbreviated Wikipedia information about locations can be retrieved through this web service as well.

Filmaps API contains geo-tagged movie set locations of more than 2000 films. The response of a method call is a movie scene, with the information of where it was recorded together with details about the scene. The movie poster is also retrieved.

BeerMapping API contains information about where beer related places can found, covering bars, pubs and breweries.

Google Places API makes it possible to search for places, by text only or limit the search by providing type arguments in the request. Additional parameters are coordinates, radius or ranking for a more specified search results [?].

Panoramio API is an image service with geo-tagged images. By providing search tag or coordinates, images that matches that input will be returned, together with meta data information of the images.

Yahoo API is used to get the Where On Earth ID (WOEID) to use with the Twitter API, when there is a need to get geographical information about a known place.

WhirlyGlobe connects to map services to get map tiles for every region. This is done by requesting them from the MapQuest API which uses Open Street Map tiles [?].
5.3.3 Functionality

The application features a 3D globe, a map, an image viewer and list as the main views for browsing and finding the destinations. It uses 14 different APIs to represent geological information and social context for the different types of pins. By using the social APIs, the user experience becomes more personalized and social, since the user can retrieve information related to the user.

The navigation techniques used in the application are touching, pinching, swiping, and scrolling. Any 3D navigation techniques, like globe tilting, were not implemented. The touch is used for selecting objects and pressing buttons in the interface and the pinch is used for zooming in and out on the map and on the globe. Swiping is also a part of navigation on both the globe and map, and it is also used in the views that display activities, social data, sights, food and hotels. In case of uncertainty, segmented controllers are implemented to give the user another option for swiping through those views, minimizing any carousel-like problems. The reason for using the views with a segmented control is to avoid going too deep down in the hierarchy of views and instead let the user get a feeling of being on the same page.

The main globe view of the application features OpenStreetMap as the map layer on top of the globe, see Figure 5.4. The same layer is used for displaying the map view as well.

The navigation bar at the top of the display has four design elements with different functionality. The top left view is the button for sliding over to the left side menu, in which the user can select which type of view to display; the globe view, map view, image view or the settings view. At the top right, the user finds the button for displaying pins on the globe, based on different types, which will show in a pop over on top of the main view. This toggles objects on and off, which can be seen in Figure 5.5. By toggling features such
as Geonames datasets, city markers will be loaded on top of the globe. The markers are presented as bars, displayed the population of the city, see Figure 5.4.

To the left of this button is the search filter button, showing what type of pins the user can search for. These options are guide objects, Facebook events, Facebook places, Twitter tagged places and Instagram places. Moreover, there is also a search bar in the main view, giving the user the possibility to easily search places, irrespective of where the user is in the view.

Toggling the Facebook switch enables Facebook friends’ checkins to be displayed on top of the globe and map as pins, with their profile picture inside, see Figure 5.6. This also features the selection of individual friends of choice. When selected, lines are drawn between every individual user’s check-ins. That makes it convenient to see the itinerary of a friend’s visited places, see Figure 5.7. Displaying people that the user is following on Instagram works the same as with Facebook, see Figure 5.8.

When toggling Twitter, the most trending tweets with geo-locations are retrieved and displayed, see Figure 5.9.

To view world cities, local datasets are used since this information is static. The information in the datasets contains of cities with more than 15 000 in population, which is around 20 000 cities. However, to avoid crowding the maps with pins, which will affect performance, it removes cities with less than a specified amount in population.

Weather information is retrieved by getting the forecast for cities available from Geonames dataset and by comparing the weather data with the users presets based on temperature and forecast. When toggling the Filmmaps, movie poster will be shown at the location where the scene of the movie was recorded. Continuously, the Top 10 Guides can be toggled to show available city guides, but to avoid crowding the map with guide pins when turning the guides on, only the first object in every data set is pinned on the map to show which cities have available guides. However, when searching, all the objects that match the search
Figure 5.6: Facebook friends checkins displayed on the globe.

Figure 5.7: Selected friends to follow, which will display checkins and show routes on the globe.
5.3. Destination Explorer iPad application

Figure 5.8: Instagram friends, which display images and location on the globe.

Figure 5.9: The most trending geo tagged twitter topics, showed on the globe.
Figure 5.10: The slide in view that shows location information, weather and Facebook and Instagram friends who also visited the selected destination. Additional object specific information are also displayed.

will be pinned on the globe and map.

5.3.4 Slide in view

When the user selects an object, a semi transparent view will slide in, overlaying half of the screen. Here, the user can save the destination, view images in a slideshow specific to the location, view the current weather conditions and also view additional location information. Moreover, two lists are also available which display Facebook friends and Instagram friends whom have visited the selected destination, see Figure 5.10.

Any additional information is object specific.

- If a Facebook object is selected, the message and the place information will be presented, next to a profile picture. The number of check-ins, likes and how many are talking about the destination are also displayed.

- An Instagram object displays a message for a geo-tagged image, along with the place information, similar to the Facebook object.

- A Filmap object displays the movie poster as additional information, with the title and the information about the scene of the movie.

- The Twitter objects show animated bars and labels, with the area rank and pop rank values.

- *DK Eyewitness Top Ten Guides* objects have more textual information and displays a summary of the place. If this object is selected, another button will be made visible
Figure 5.11: The main view when exploring a city. It shows six objects which gives information about weather, social context, images, sights, activities, food and accommodation.

to the user, which will declare that guides are available for that city. It will take the user to a specific guide page with custom guides depending on the information from the API.

– BeerObjects display information about the bar, pub or brewery.

5.3.5 City view

The city view contains of sub views holding six different categories, displayed as circles with respective icons on top of them, see Figure 5.11. These categories are:

– Detailed weather information
– Sights
– Activities
– Social check-ins and posts
– Image slideshow
– Places to find food - restaurants, pubs and bars. Also, hotels are in this category.

The background for this view is set dynamically. This is done by retrieving images from the Flickr API, specifically Yahoo’s “Project Weather” group, based on the selected location.
5.3.6 Social view

The social view is divided into three pages where each page is accessible by either scrolling horizontally or by using a segmented control to display the pages directly. The Facebook page has check-ins from friends that has visited the selected place, together with posts about the place, see Figure 5.12. The user can also reply on the checkins. The Instagram page displays images from every user that has visited the place, with additional textual information about the place, see Figure 5.13. All the Facebook and Instagram checking are compared to the coordinates of the city to find a match. However to find a match for a city rather then a specific city area, the bounding box is set to cover a larger zone.

Finally, the Twitter page displays tweets, based on the name of the place, see Figure 5.14. The hierarchy of the views can be seen in Figure 5.15, where the slide-in view, city view and social views are displayed.

5.3.7 Weather view

The weather sub view shows a weather forecast, season and recommended time to travel, see Figure 5.16. The background is set dynamically with images from Flickr, based on locality.

5.3.8 Sights view

The sights view uses Google Places API to get nearby places given a set of coordinates, which are given by the selected destination. By passing in certain parameters and query types given by Google, sights are pinned on a map view together with a table containing the sights, see Figure 5.17. Facebook places are, besides the Google places, also integrated.
5.3. Destination Explorer iPad application

Figure 5.13: The Instagram view shows images by the friends which have been to the selected location.

Figure 5.14: The Twitter view displaying tweets about the location.
Figure 5.15: The hierarchy of views displaying the slide-in view, city view and social views.

Figure 5.16: The weather view that presents a weather forecast.
in this sights view, but are displayed on the next page using a segmented control. These places are fetched by search query and coordinates, and are labeled with a certain type. Furthermore, Wikipedia information is available in the sights view, where it is possible to get points of interests, with images and description of the places. The information about the locations is received through the Geonames web service.

5.3.9 Activities view

Regarding activities, the Google Places API provides activities by making the same request as with sights, but with different place types associated with activity.

5.3.10 Hotel and Food view

Places related to food and accommodation is supported by the Google Places API as well, which works similar to the Sights view and the Activities view. The requests are done using tags related to food and accommodation. The views within this category are separated the same way as with the Social-, Sights- and Activities views, where the selection of sub view occurs through the segmented controller or swiping gestures.

5.3.11 Images view

This view displays geo-located images, together with meta data such as date and description, through the Panoramio API. This also gives an indication of how the city transforms throughout the different seasons. The images are presented with an image slide show, showing a page control to clarify to the user that the images can be browsed with a sliding gesture.
Chapter 6

Discussion

The implemented prototype incorporates several fundamental functions and designs from the literature study and the user survey. The prototype uses hardware features, design elements, navigation techniques and gestures used by most applications on the market. The design also follows what is in line with the iOS guidelines and design languages. The content of the prototype included many of the features from the user study, such as activities, sights, events, weather and social context. With the use of social networking, the content gets more personalized and the user can give back to the community by contributing information themselves: sharing places, images or rating places. The personalization is, in conclusion with Kenteris et al, a significant element for the added value of a product.

Furthermore, the user survey featured elements that were significant in the travel motivation study by Dolcinar et al, such as nostalgia and nature. Nostalgia, as a motivation factor, was strongly connected to tourism encouraged by films, which was the reason for implementing a feature related to movies. Moreover, as was shown in the study by Hargreaves, the push and pull factors social interaction, scenery, entertainment and shopping were of great importance which was also featured in the final product. Also, the study by Dolcinar also mentioned stories from friends, maps, atlases and searches as being sources of inspiration, which greatly influenced the design and implementation.

Tablets are a fairly new technology and design changes quickly, which is clear when looking at the previous skeuomorphic design contra the flat design. The reason for the major change from skeuomorphic to flat design could be due to people’s knowledge and usage of tablets and smartphones: they know how to utilize them, with the navigation techniques being essentially the same. However, this major change in design has also come with usability issues, and it demands much from the designer to create a design that follows generally accepted design and design guidelines, and still creates a great user experience. Also, with the rapid and continuous change in designs, there is not always support for all the designs today. As mentioned in the studies by Nielsen, it might be preferred to stay somewhere in between flat UI and skeuomorphic UI.

Also, the usability of 3D globes has limited literature encouraging or discouraging it, aside from when 3D navigation techniques were used which resulted in a negative experience. The implemented prototype did not use any 3D navigation techniques, only the basic pinching and scrolling, which gave it a clear and obvious navigation, satisfying usability and a positive user experience.

Moreover, a recurring navigation issue from the studies made by Nielsen, Budiu and Bedford was the swipe ambiguity, which can affect the usability in a negative way. However,
even though issues were discovered, "carousels" can show a great deal of information, if it is done correctly. The implemented prototype integrated a possibility to scroll vertically in lists, but also to swipe horizontally to switch between, for instance, social views. This does not interfere with the list scrolling and is not either the primary navigation technique for switching views.

Additionally, there is also a difference between smartphones and tablets, both how and when they are used but also regarding the interface, in terms of space. As shown in the study by Budiu et al, the tablet is not as mobile as the smartphone, and is used differently. This influenced the design and implementation, since the tablet user will not be as affected by time pressure or external factors as the smartphone user. In addition, a great amount of the usability studies in the literature are done with focus on smartphones and the smartphone user, which made it necessary to try to filter out the core design choices that were applicable on both systems.

Finally, implementing a high fidelity prototype for the iPad was necessary to understand the technical constraints and to fully understand the functions, navigation techniques and structure. Using real data was significant for visualizing and understanding the concept, and implementing the prototype in Objective C was a given choice compared to creating several Hi-Fi Photoshop prototypes for every function or scenario.
Chapter 7

Conclusions

The result of the thesis is an iPad prototype written in Objective C. The prototype incorporates 14 API services to retrieve the information needed to provide and display destination with their attributes and data. By integrating social network APIs such as Facebook, Instagram, Google, Flickr or Twitter, addressing the user’s needs and providing suggestions can be achieved in a more accurate way. Using the various APIs makes it possible to access immense amounts of data, specific to the user. Also, it is possible for the user to observe and be inspired by a friend’s destinations, find trending places, search with Hashtags, filter places with certain weather conditions or find events close to the user. Furthermore, giving back to the community by posting updates about places, tweeting, writing reviews or posting pictures is also achievable with the use of APIs. Moreover, adding media content APIs, which provides images for backgrounds and slideshows, can provide a more dynamic appearance and user experience.

In regards to design, using flat design should be done with caution given the usability issues found. However, due to the few studies on usability with flat UI, using a design between skeuomorphic and flat design would be preferable. Additionally, by incorporating the parts of the platforms design guidelines that is most suitable for the application made, and by using the core elements in interaction design with the user in the center, the most suitable design can be created for the enjoyment, satisfaction and pleasure of the user.

7.1 Limitations

Finding suitable APIs that would provide sufficient information about places, images and guides was challenging. The most popular travel communities demanded a paid subscription to be able to access their APIs. The APIs used in this thesis were all free, which often involves rate limits which restrict the number of requests daily. Also, by paying for an API and it’s premium webservices, could give the implemented prototype access to several travel communities and city guides with editorial content which would imply more destination-, and user specific content.

7.2 Future work

The application comes to its full potential when it is connected to a flight booking system, to cover the entire process of exploring and finding a destination and finally booking flights...
and hotels. Moreover, integrating a social travel platform, accumulating large amounts of user data and storing user preferences could make more accurate recommendations for the user. This integration and accumulation could include destination recommendations but also cover more specific propositions such as sights, food and accommodation the user might want. These recommendations would also implicate that smart algorithms need to be implemented to operate and interpret huge sets of data.

Additionally, implementing airline related information such as filtering of airports, flight prices and flight times, could further raise the experience by providing the user with more options for customization. With these options, the user can be more in control of the entire booking- and browsing process.

With the use of the Facebook API, activities and events are available. However, the Facebook API covers a wide range of events, which can make it difficult for the user to find events within certain category. Further filtering among events can be improved by using an API that primarily focuses on events. Furthermore, adding support for prices, currency conversion and theme-based travel could further improve the product.

In addition, geographic oriented functions such as Geofencing could be implemented, sending push notifications with interesting points of interest nearby the user’s location. Also implementing methods for providing available events on a geographical location between certain dates, could further enhance the travel experience.
Chapter 8

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Appendix A

User survey questions

– Have you ever browsed travel destinations on a tablet, or made a booking on a tablet?
– If not, why is that?
– Is there something missing in the way you can search, browse or find travel destinations on a tablet?
– If you did not have a tablet available, how would you browse or look for different travel destinations?
– If there was a possibility to filter the browsing among different categories, which categories would these be?
– What one thing would you wish for, to make a travel application on a tablet more compelling and useful?
– What would you want to share to other travelers about the trips you have made?
– If you can use the "Kayak" iPad app available on AppStore, what are the things they do good, and what are the things you are missing in the app?
– If you can use the "Fly Delta for iPad" app, available on AppStore, what are the things they do good, and what are the things you are missing in the app?