

INF5261 Midterm Report

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A status update on the progress of our project, as well as a more detailed overview of our motivation and target user group.

Get Gamers
Going

Introduction

Gaming today lets you explore new worlds, participate in interactive stories and immerse yourself in virtual realities, but to experience these games you must play from a fixed position. Of course you can take your laptop outside to play your favorite game in the local park, but for most people this is not an option or something you would even consider.

Many modern games include some kind of system using virtual commodities or currencies. These let you enhance your avatar through buying or unlocking powerful in-game items.

What if you could use your mobile phone to get 'paid to exercise'? Augment your local neighborhood and introduce the option of acquiring virtual commodities and currencies by taking your mobile phone out to 'gather materials' or 'collect treasures' and then have these shipped to your avatar within your favorite game. So why not take a 15 minute walk or spend a day hiking and get 'paid' virtually?

The most basic form of gathering commodities in many games today is to wander around while keeping an eye on your mini-map to see if there are any commodities nearby. When discovered you move your avatar to the location and pick it up. The basic idea for this mobile application is to allow these virtual commodities to present themselves to you through an augmented reality on your mobile phone. All you have to do is take your mobile phone and go outside and pick them up!

We are going to explore different aspects of this broad concept. Some of us see this as an opportunity to learn how to make an app and learn the basics of mobile information systems development, while others want to explore how this concept can work in a larger context, such as game addiction and virtual economies. We also think that in erasing the lines between real and virtual we can activate people to exercise, travel and explore new parts of the world.

Who are we?

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We are a mixed group of people with different background and different motivations for doing this project. But we are all agreed upon that the concept of making a computer game mobile and take down the barriers between the virtual world and the real world is an exciting topic.

Who's our target group?

Our chosen target group is MMO-players who on a regular basis spend several hours playing video games. We assume that these players as a consequence of their frequent playing do not have time and/or motivation to do physical activities in addition. The question that naturally arose while we were specifying the user group was how to create something that could contribute to changing this

behavior? More specifically, how could we help users incorporate physical activities in their daily lives?

What became the aim of our group was not to create something that could hopefully make the users abstain from playing, but to help them vary their everyday activities. We wanted our solution to provide a somewhat “familiar” and non-detering introduction to doing activities in the outdoors. We will describe later what exactly we mean by “familiar”.

The idea

A game is captivating to the player because it is a virtual world in which the player can experience fun, excitement, get a sense of accomplishment, and also interact with other people. One of the reasons why players are often active in this world is because it is so easily accessible to them - the playing can happen in the comfort of the player’s home.

It became clear in our group that the main challenge would be to create something that could be equally satisfying for the player. We figured that instead of focusing on something completely new and different that would serve as a substitute, it would be smarter for us to focus on creating something that was somehow related to the games. We wanted to turn the physical world into a place where players also can get positive experiences similar to the ones they get in the virtual world.

Harrison and Dourish¹ argued that a *space* can be imagined as a three-dimensional environment that can “transform” into a *place* once we add meaning to it. This meaning that is added can be understandings of what is socially and culturally appropriate behavior within the space. In other words, what makes a place is how we *use* the space.

To give a simplified explanation, imagine place as a layer that exists on top of a space.

All of this is relevant to our project because Harrison and Dourish also explain in their article how many have attempted to carry over behavioral patterns from the real world to a virtual world. What we want to achieve with our solution is something that is the other way around - we wish to make it easy for the player to carry over his behavior in the virtual space to the physical world. The outdoors will be the space with the potential to become a place. Why do we wish for the player to continue his playing outside? Because by using something that is already familiar to the player, the transition from being inside to being outside will hopefully not be perceived as too sudden and different.

User analysis

Introduction

Most computer games today are played at home on a game console or on a computer. One of the mobile applications intentions is to expand on such a gaming experience and give gamers the option of taking their gaming experience outside. To create such an application we needed data regarding gamers present gaming habits and what motivates their gaming activity.

¹ Harrison S and Dourish P: *Re-Place-ing Space: The Roles of Place and Space in Collaborative Systems*, 1996. CSCW/ACM

Our hypothesis is that it is possible to create an application that will 'pay' the user in 'virtual' valuables if they play the game. The game itself will take the gamer outside for a set period of time and require him/her to move around in their neighborhood or other outdoor location.

To learn more about this group of users we are conducting one set of quantitative interviews to establish a basic understanding of these users and a set of 5 in-depth interviews to explore these users and their possible needs and goals for such an application.

The quantitative interview was created based on the hypothesis that a core motivator for gaming is the presence of virtual currencies in the form of in-game monetary systems, virtual commodities or status among other players. We also believed that certain parts of a game are considered routine activities to be able to play the parts of the game they gamers really want to.

The qualitative interviews were created based partly on the findings from the quantitative interviews and partly based on the need to identify a set of requirements for the mobile application. These requirements would be created as the result of an evaluation of the in-depth interviews and the creation of user stories based on the same interviews.

Data collection

Each subject participated in a verbal interview (online or mobile communication) of pre-defined questions. In order to obtain uniformity of data, only two project members conducted the interviews.

Research method

Quantitative interviews

The quantitative interview consisted of a fixed number of structured questions. The full interview questions are listed in Appendix ##. The questions examined the subject's basic information, their primary gaming habits and motivations for playing as well as their relation to virtual currencies. The questions were asked in a fixed order and conducted within a 10-minute time frame to ensure the subjects most immediate responses.

Qualitative interviews

The qualitative interview consisted of a set of structured questions and then casual conversation connected to a set of predefined topics. The full interview set-up is listed in Appendix ##.

Data analysis

All interviews were digitally recorded and transcribed. The quantitative interview responses were entered into a spreadsheet, which was used to generate some simple graphical presentations.

Key findings

In general it seems natural to differ between 3 different approaches to gaming often identified by the type of game the player was playing. These are presently categorized as quick games (often classic arcade, simple strategy games and social games found on for example Facebook), our general category of games and MMOs.

In general your casual gamers were usually loyal to a single game and the average time invested in this game varied based on what kind of game was being played. A basic social game on Facebook could consume blocks of 15 minutes on a regular basis, whereas story telling games would easily be played in blocks of 1+ hrs. In comparison your average MMO gamer primarily tend to play a single MMO game at any given time, but often also play other types of games. The general feedback suggests that to be able to play the game a substantial amount of time is required on a weekly basis. For the gamers questioned the average time was identified at 4+ hrs. pr. day for them to be able to play the game at a level they found rewarding, add to this time spent on other games we see a pattern of very large blocks of time spent gaming on a regular basis.

Virtual currencies and commodities, where present in the game, are an important aspect of the game and for most gamers they are critical to their game play. Most of the MMO gamers are aware of the fact that they do not spend enough time outside and would welcome an option that would replace their time in front of a console/computer inside with an alternative that would take them outdoors.

The qualitative interviews also confirmed the requirements and all elements in our predefined user story, but also opened the door for expanding on the game mechanics to introduce both more variation and complex games.

Key numbers

We will be adding a spreadsheet containing the transcribed interview data and simple graphical presentations of the findings.

Requirements

To be able to actually develop an testable mobile application a set of requirements were created from a simple user story combining classic elements from established Geo-caching games and basic concepts involving 'farming' or gathering virtual materials in an MMORPG-setting.

Basic user story

The gamer logs into his mobile application and selects which gaming profile he wants to use when playing. He then activates the game and uses the map shown on the screen to find 'nodes' of virtual materials. When moving close enough to a node he interacts with the 'node' through the mobile interface and is rewarded with materials that are native to his game. When done playing he exits the map and sends the materials he has gathered to his game avatar. When next he logs on to his game he will be able to pick up these materials through his game interface.

Application use case

1. activate the game through the mobile application interface
2. see a map of surrounding area
3. identify 'nodes' spread out over the map
4. navigate close to a 'node'
5. interact with the 'node' through the application interface
6. the application registers the 'node' has be acquired
7. continue to navigate and interact with 'nodes'
8. exit the game
9. view acquired 'nodes'

Alternative game mechanics

Both user interviews and several digital references found suggested the expanding on these mechanics and a multitude of ideas have been identified over the course of the project. Our in-depth interviews also confirm the importance of 'new content', which in this context refers to the introduction of new variations of the 'game'. To reflect this we will be including the most promising and interesting variations uncovered during the semester.

Technical considerations and decisions

Mobile application development is based on the same principles and has the same challenges as development of other embedded applications. This includes among others storage limitations, integration with device hardware, security, performance and reliability. But in addition to these challenges, mobile applications have some special requirements that need to be considered. Wasserman² has made a list over these requirements:

- Potential interaction with other applications
- Sensor handling
- Native, hybrid or and web-applications
- Hardware and software platforms
- Security
- User Interfaces
- Complexity of testing
- Power consumption

In our project we need to address all of these requirements, but not all will be relevant to our implementation.

The GGG-app could benefit from interaction with other applications on the device, but this is not something we will implement. A possibility could be that the GGG-app is made social with connectivity to social platform apps as Facebook or Twitter. The GGG-app will be connected to the web-version of the game, but this is another type of integration.

Our app is based on the advantages of using a mobile device; this includes different types of sensors such as microphone, camera, GPS, accelerator and the touch screen. This raises development challenges, but also great possibilities in the context of user experience. Our prototype will use the GPS, but our vision of the GGG-app exceeds this and it will incorporate many of the features mentioned above. We have discussed different ways of using camera or the accelerator, but this will be discussed later in this paper.

Because of our focus on using the smartphone's features it will be better to make the app as a native app, instead of a web-application. The major downside to this is that it is more difficult to make the app working on the many different platforms and operating systems. In most cases you need to make

² Tony Wasserman: *Software Engineering Issues for Mobile Application Development*. FoSER 2010 . Available at: http://works.bepress.com/tony_wasserman/4

one version to each platform, and with Android being used in so many different models and versions the task of making an app that looks good on all devices would be a real challenge.

The security issues are something we should not take lightly, but in the scope of this project we will not go deep into the technical aspects of this.

The development of user interface on mobile devices differs from custom-built embedded applications, when designing for mobile devices the easiest way is to use the modules provided in the SDK of the development kit. More information about our design-process can be found in the Design-chapter of this document.

To test a mobile application is far from easy. There are several issues to consider when testing an app. First of all, you often need to implement a big part of the application before you can test it. Also it can be challenging to test it on an emulator, because it will not be a realistic testing environment.

One of the most challenging tasks with mobile development is the power consumption. A mobile runs on battery and has not yet a large capacity. Users of apps are quick to evaluate the power surge an app makes to decide if the app is worth having on their phone.

As explained mobile application development has many requirements and there are several additional things to consider than the list of Wasserman² to make a successful mobile application. Examples of this is the question of online vs. offline, what parts of the application needs to be online and what can be done in an offline mode. Will there be differences between types of network and the uploading/downloading speed, and how will the application deal with this?

Choice of Platform

- The two leading operating systems for smartphones are Android and iOS. We considered the strength and weaknesses of both, and decided to develop for Android, based on the following considerations:
- Android is the most widespread and fastest growing mobile operating system today³. According to market research done by Gartner, Android's share has risen from 43.4 to 64.1 % the last year, while iOS' share has remained steady at about 18%⁴.
- Google's Android offers development tools for all the major PC operating systems while Apple only offers the iOS SDK for their Macintosh computers. If we were to develop for iOS, members of the group who doesn't own a Mac would be excluded from taking part in the development.
- Android is an open development platform, and allows third-party tools to be used. Apple's developer guidelines is more restrictive ([can't find specific info to document this right now])

³ IDC Press release: *Android and iOS Surge to New Smartphone OS Record in Second Quarter, According to IDC*. 2012. Available at: <http://www.idc.com/getdoc.jsp?containerId=prUS23638712>

⁴ Gartner Press release: *Gartner Says Worldwide Sales of Mobile Phones Declined 2.3 Percent in Second Quarter of 2012*. 2012. Available at: <http://www.gartner.com/it/page.jsp?id=2120015>

- Development cost is another factor for our no-budget-project. Android's SDK is free⁵, while being an iOS developer costs 99\$ per year⁶. This fee has to be paid before you can test your prototype on an iPhone
- Android is based on Java, a programming language most of the team has experience with. If we were to develop for iOS we would have to learn a new programming language, a process that is time consuming. This is an important consideration, since our project goes over a short time frame.
- iOS' major advantage lies in higher revenues for developers⁷. Our project is not intended as a commercial product, so this is not a decisive factor for us.

Scope of prototype development

For our high fidelity prototype we have chosen to do a vertical compromise. The goal of the software implementation is only to show that the core concepts of our project can work. Our design team will cover different use scenarios for the core concept in the low fidelity prototypes.

Prototype development status

At the moment we are in the early stages of development. We have looked into the Android API for location and map services, and have a simple app up and running on the Android emulator. We have successfully fed the emulator coordinates, and the location data updates like it should. Our next step is to implement Google Maps and test the prototype on an actual phone.

Existing solutions

There are other apps and games out there with the same functionality as us, but implemented in a different context. Examples of such apps are "Zombies, Run!" and the official "Geocaching" app. We will cover more about those in our final report.

Design Process

As we known, the interface of an Android mobile phone game is completely different from PC game. According to the smaller mobile screen the information we can offer to the users is very limited.

In conclusion, for any user interface design of mobile phone app we should insist on 3 principles:

1) Clarity 2) Ease of use 3) Simplicity

⁵ Android Developer Tools. Available at: <http://developer.android.com/tools/index.html>

⁶ iOS Development Program <https://developer.apple.com/programs/ios/>

⁷ App Developers Bet on iOS over Android this Holiday Season <http://blog.flurry.com/bid/79061/App-Developers-Bet-on-iOS-over-Android-this-Holiday-Season>

To be effective using an interface you've designed, people must be able to recognize what it is, care about why they would use it, and understand what the interface is helping them interact with (Joshua Porter).⁸

Below is what we have in mind for a design for our game – Get Gamers Going.

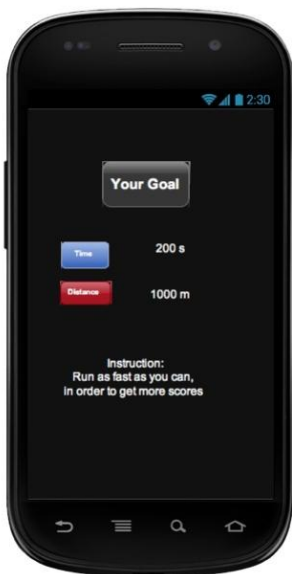
1) **Start page.** “Enter Game” and “Contact Us” is the main design.

In order to enter the game directly we must offer the user a compact and obvious entrance. Beyond that, the user should not have too many choices. All of the information which is not related to enter game is distracting information. Attention is precious, that’s why we should avoid littering the application with distracting material. Let them enter the game as soon as possible, that’s the only thing to reduce the User Attrition Rate (UAR)



2) **Goal page.** When users view the same items in the same order, good visual hierarchies should give strong clue about where to end up feeling cluttered and confusing. Highlight and color are the means often used to fix it.

Hence, we use two colors to let the users know that they have two ways to achieve their goal, one is about “Time”, and the other is about “Distance”



3) **Play page.** Since one of the most important technology we use in our game is about GPS, it is possible to show the game map which is based on the real world map of Google. Where the green arrow shows is the user’s location right now, he/she should run as fast as they can to reach their destination the red pin denotes.

On the top of the page we can find 4 functional signs:



Shows how many coins you have won in this game.



Shows how many lives you have so far in this game (the default is 3 lives each round).



⁸ Joshua Porter: *Principles of User Interface Design*, 2012. Available at: <http://bokardo.com/principles-of-user-interface-design/>



Indicates how much time you have spent so far this session.

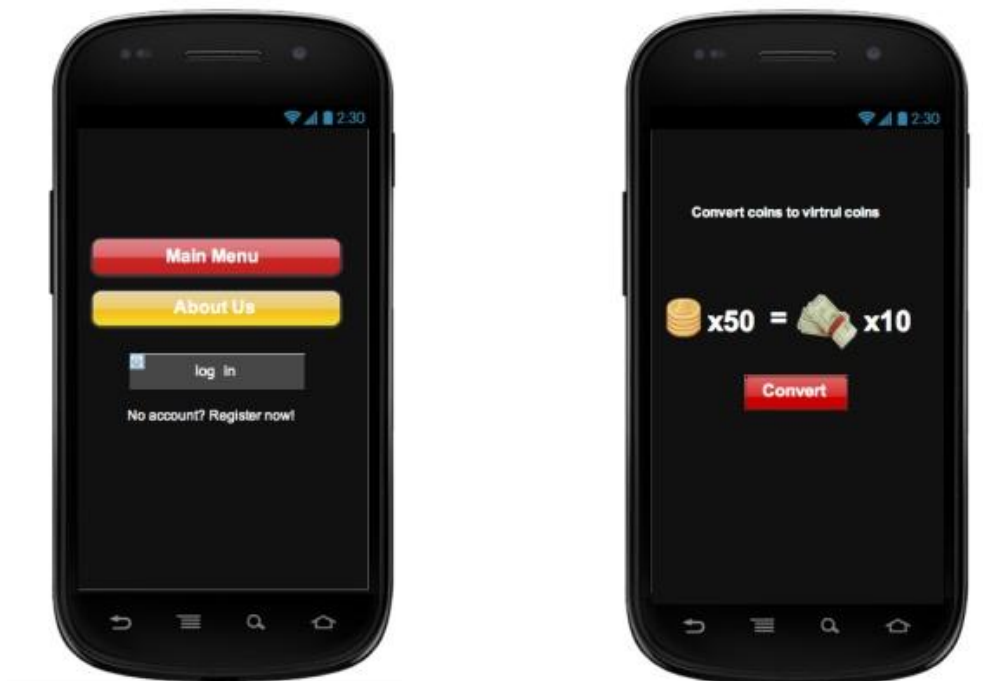


Is a functional part for the user's convenience. The users can choose to toggle the sounds on or off when they play the game.

4) Log in and convert coins page.

According to our research, gamers often play more than one game. Based on this knowledge our game will function as an extension of several MMO games, allowing the users to log into their own accounts for all supported games.

We will offer the ability to convert coins in our game into virtual currency in these games.



Conclusion (so far)

Preliminary research and development so far indicates that our target user group is both interested and motivated to use the kind of game we're proposing. We still need to gather more data through qualitative and quantitative interviews – as well as further our research on similar apps and games. Development is still in the early stages and we're still a little while away from having a working prototype of our game – as well as finalizing the design of our user experience. We also need to decide on how we're going to skin the app based on which MMO it's logged into at any given time.