

Community Scrabble

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Midterm Report

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Contents

- **Introduction**
- **Inspiration and Literature**
 - *Reference Articles*
- **Problem Space**
 - *Assumptions*
 - *Project Goals*
- **Conceptual Model**
- **Our users**
 - *Stakeholders in our Project*
- **Design Approach**
- **The Process**
 - *Meetings*
 - *Workshop 1*
 - *Workshop 2*
 - *First Interview*
 - *Second Interview*
 - *Third Interview*
 - *What did we learn*
 - *Workshop 3*
 - *Initial reaction*
 - *Testing the Timers*
 - *Demo Clip and Star Power*
 - *Moving Tiles*
 - *Free Areas*
 - *Rotating the first Tile*
 - *New Ideas*
- **Future Work**
- **References**

Introduction

Multi-touch tables is today a exotic piece of technology that you seldom encounter and few is experienced with using such technology. With the opening of the new IFI2 building there are plans of placing a multi-touch table in the library open for public use. With this in mind we wanted to design an application based on a familiar and motivating concept that invites people to experience the new technology in a positive way. The application should be intuitive and self explained, offer motivation and purpose for repeated use and give positive experiences. We thought that making a game would be ideal for this purpose.

Inspired by the well known Scrabble board game we wanted to design a game based on placing of letter tiles. We imagine that the familiar concept will make it easier for new users to approach and try the game, but we have no intention to re-create Scrabble for touch based interfaces since this has been done before [1] [2]. A multi-touch table introduce new requirements and possibilities and we want to develop a complete new game based on this aspects.

Our project name reflect the idea of a game based on cooperation. Multi-touch tables invites and accommodates simultaneous participation of multiple users [3]. This introduce challenges in the design process that we find very interesting. As Pelton et al. [3] states: "we are still in the infancy (...) of the whole application area of designing applications for such group usages."

Inspiration and Literature

Our inspiration for creating a game on the multi touch table is simply that we wanted to create a new and fresh game that would take advantage of the multi touch table while using inspiration from a traditional board game called Scrabble.

With this new game we wanted to create something that is more fast paced and where several players can play at once by then working together to get a good high score. It would also be possible to play alone if preferred. As seen for both in [1] for scrabble for iPad you would say that the game is slightly slow-paced with waiting time for the other player to finish their turn, this would apply for [2] iPhone as well.

Our game will be very different from Scrabble. It was never intended to be either apart from the fact that you combine letters to make words and score points with the given points assigned to each letter. Another inspiration we got from Scrabble was to have some sort of bonuses in one or more of the squares on the board. In Scrabble these bonuses are double word points, double points for a letter and so on. We decided to add something similar which is of the form of a «star» that will increase their score by a great amount. By doing so we hope to increase the difficulty, for those that wish to play for a good score, a little by randomly spawning the star which acts as a multiplier bonus that would encourage the players to rethink their strategy and possibly change the direction they intended to make words to get hold on multipliers. This will also make the game more dynamic so you can't just plan where you should make words, like say if a couple of stars appeared soon as the game started most players would already have a plan for where to make

words, but with this they will have to think faster not to mention being able to find the letters you want to make the word that would benefit the most.

Apart from the inspiration Scrabble provided we have come up different ideas on how to make the game more exciting, like unused lettered tiles moving around the game board and a free «area» to have tiles so that they stop moving. These free areas are of course limited to just a few lettered tiles at once. This is more specified in the conceptual model.

Reference Articles

Quality & Innovation Shine in Scrabble for iPad. Game Review

This review [1] is an introduction to the Scrabble game for Apple iPad and an example of how the traditional Scrabble game may be adapted to multi-touch interfaces. We include this not scientific article only as a reference to other approaches to the same game concept

It's Mine, Don't Touch!: interactions at a large multi-touch display in a city centre

A study [3] on the introduction of multi-touch surfaces in open spaces. Do people interact with the technology as a group or single users? The writers state that the size and availability of surface tables in public spaces invites to simultaneous participation of multiple users. Our second goal in this project reflect this property.

Territoriality in collaborative tabletop workspaces.

An article [4] on how different areas on an interactive table can have different territorial properties. Related to our game idea, this article provides arguments for introducing “free areas” on the gameboard as a “personal territory” separated from the grid that works as a “group territory” in collaborative play. The article also discuss the need for individual orientation for users, which we have discussed a lot in groupsessions but not found a good practical solution for yet in the grid area.

The cuetable: cooperative and competitive multi-touch interaction on a tabletop

A short article [5] that looks at cooperation, competition and use experience with games on a multi-touch tables.

Multi-user Multi-touch Games on DiamondTouch with the DTFlash Toolkit

This article [6] presents a technology for multi-touch development, but talk about a lot of interesting topics related to multi-touch interaction in game settings.

Theories of Learning: A Computer Game Perspective

Siang and Rao [8] talk about how users of games learn by interacting rather than by traditional knowledge transfer. The paper relies on psychological theories and is very relevant in our goal of intuitive game rules learning.

Problem space

The original Scrabble game has a lot of strict rules that control the game play. You have to be two to four to play and these players need to compete since the goal is to win over each other. This

makes the game suitable in some situations, but fail to support single players or players that want to contribute towards a shared goal. We call the original Scrabble game strict in this sense.

Most board games are presented with the rules of the game in textual form. To understand what to do, you first have to read the manual, or be told what to do by more experienced players. This makes it mandatory to invest time and effort to understand the game before you may experience it. Not all possible users are motivated to invest this effort, and may leave the game before it even starts. As Siang and Rao state [8]: “It must be remembered that if players fail to understand the rules of game in the first few minutes, they would simply walk away.”.

Most games we have seen made for multi-touch tables are simple, intuitive and do not rely on the need for reading manuals. The concept of the game is often rooted in the multi-touch experience in itself, where the motivating aspects often is the experience of the technology. This makes it interesting and fun for first time users, but fail to motivate users in the long run. In some of the games you can not even win, something that can be described as one of the needs for game players [8]. The games are often not challenging enough in their own way to encourage repeated use, and the technology stays as something you have tried but not something you are familiar with from repeated sessions.

Our goal is to adapt to these problems and make a more flexible, intuitive and motivating game which people can enjoy for either a short or a long time span. Multi-touch technology will give us a natural way to encourage and reward cooperation, where the users decide if they want to play alone or together. We want to provide an easy entrance to become familiar with multi-touch technology. By playing the game users would get more familiar with touch table technology and get a positive experience.

Assumptions:

- Users enjoy word games such as scrabble.
- Users who are used to the original Scrabble will find the game intuitive and would be able to play immediately.
- Users like to exercise their brain with challenges
- Users find High scores motivating
- Users are not negative to cooperation in gameplay

Project Goals:

1. The core rules in the game should be so intuitive that all is understood in the end of the first game
2. The game should support single as well as multiple players at once
3. All rules shall be communicated without the use of written statements
4. The interface should be as minimalistic as possible without sacrificing usability
5. High game value and replay value: It should be fun to play the first time, and challenging enough to satisfy experienced users
6. The users should be left with a positive attitude towards multi-touch technology

7. Give mental exercise on applied knowledge like word recall.

Conceptual model

We call the application we want to develop a game since it is a structured activity that involves enjoyment and a common goal based on competition or achievement. The game is based on multi-touch table technology as a technical requirement, where the table is thought of being stationary placed in a public place such as the IFI2 library and running our application as default.

The table is always ready for a game, inviting users to play. When a player touches the table the game starts immediately. In this way we hope to encourage new users to experience our game.

The game should have a grid area where letter tiles may be placed, and an area where collections of letter tiles is presented. At the time our prototypes have the grid in the middle and the letter tiles presented in random fashion distributed around the grid. The letter tiles is interactive by touch and may be placed in the grid. A count down timer is visible in the interface during play.

The goal of the game is to construct as many valid words with the letter tiles as possible in a connected crossword-like structure on the grid. With valid words we mean words you normally would find in a dictionary. From the moment you touch the surface the game starts and the game ends when the timer reach its end. We have used two minutes deadline in workshops, but plan to test this further later in the process.

When the game ends you are shown a visualization of how the points are being counted and presented with your score. It should be possible to write your name on a high score that is visible for later users. In this way it will be possible to compete in short time frames by comparing scores, or compete in longer time frames by getting your name further up the high score.

The game should be able to be used in different ways. You can play alone, or in a group collaborating to a shared score. The motivating part is the high score where people can take turns and compete, or play alone and compete with their self. Its up to the users to decide how they want to play. The single high score encourage collaboration since we believe multiple users would reach the highest scores.

Since the game has no logical up or down, and it is imaginable that the table could be placed in the middle of a room, orientation is an issue. We want the players to be able to adapt the orientation of the game to their liking.

We can expand on this concept with additional functions to make the game more flexible, challenging and long lasting. This includes bonus tiles that appeared throughout the game and give extra points or extra time if the players manage to build a valid word over it. We also plan to give circular motion to the tiles around the table to raise the challenge and the stress level in the game.

Our users

There is essentially no age limit to play Community Scrabble, but since it is a word game that requires basic knowledge of languages it is not suitable for children under the age of 8. Other than that, the game can be played by everyone with a normal vision, knowledge of language and a free hand. However we want to elaborate in more detail who the users will be we shall have to take into consideration the most likely place that the touch table will be placed.

Assuming that multi-touch table will be placed in the new IFI2 building we can look a little closer on who the primary, secondary and tertiary user groups are[7], as well as who the stakeholders will be for our project. Unless the table is placed in an area where students don't have access, the primary users will be the students who are attending lectures, lab sessions, or for some other reason find themselves walking into IFI2. The majority will be students who are taking a degree in informatics and this is also why most of the people we interviewed were students at the institute for Informatics.

Having such a mature group as primary users will allow us to make some of the user interface aspects a lot more sleek and less "in your face" compared to what we would have to do if our primary users were mainly children. Some of our initial ideas were based on this very fact that students, being mature and smart people, would be able to understand the game mechanics fairly quickly and as a result we had thought up an initial design that we ourselves thought would be very intuitive to understand, but this proved not to be the case as we'll discuss later with regards to the interviews.

Secondary users are those who will be occasionally using the multi-touch table and in our case that would be employees at the university, visitors (such as kids from high schools), guest lecturers and even civilians who come to check out the brand new building. This introduces new types of users who have vastly different backgrounds and with varying knowledge of computers and who probably have never experienced a touch table.

Our tertiary users are those who are either affected by the introduction of our finished product or will influence its deployment. For example if the touch-table that our program is running on is placed in the library in IFI2 then the librarian would be a tertiary user since that person will be affected by it. Other tertiary users could be the people who are tasked with the maintenance of the touch table and making sure it functions properly, the institute for informatics or the course leader for INF4260 who will have influence where the table is placed, and even professors who may be affected by students who come a couple of minutes late to their lectures because they were busy interacting with the touch table and lost track of time.

Stakeholders in our project:

- The University of Oslo administration
- The development team(us)
- Developers of the multi-touch table
- The course leader
- Users
- Visitors at IFI2
- University professors

We believe that our stakeholders will mainly be the university in some way and also people associated with it, like the users, who will mostly be students and university employees.

Design Approach

We have started to use a user-centered design approach in this project. As the main book in this subject clearly describes: “the real users and their goals, not just technology, should be the driving force behind development of a product” (s425). Gould and Lewis states three principles that today is accepted as the basis for user-centered approach.

1. *Early focus on understanding the users and the tasks in depth*
2. *Empirical measurement of users reactions, use and thoughts on the product in development.*
3. *Iterative design where each development go through several cycles of design, test and evaluation.*

In the early days of software development these principles where often accepted as obvious important issues that should be included in every design process. But it is not until the last decade that these principles is given the weight and focus Gould and Lewis intended.

When designing a game that is based on intuitive understanding of game rules and ways of interaction, a user-centered approach becomes crucial. We can't expect that the users will be motivated enough the read a manual to figure out how to play. The game has to meet the users where *they* are, not the other way around. To challenge this we involved users early in the process and plan to continue to do this out the project. We try to meet users with an open mind and encourage and elaborate on their thoughts and ideas. With this we borrow some ideas and techniques from Participatory design, where the users as stakeholders are more actively involved in the design process as designers in their own way. Since a game has no clearly described task that it shall full fill, larger user involvement could have made the project harder to complete. We decided on user-centered design as the best design approach for our project, since it gives more power to us as designers to guide the process and keeps the strong focus on the users.

The Process

Our initial idea was to develop a drawing application for children to be used on a multi-touch table. A few weeks into the planning of our project we had to abandon this idea due to technical restrictions. After trying multi-touch table hands on, we discovered that it wasn't responsive enough to be used as a drawing surface in the way we wanted. In addition, the application we planned would be very time consuming to develop a prototype of. We still wanted to develop something for the multi-touch and after a brainstorming session we agreed on making a game based on forming av words, inspired by the famous Scrabble board game.

Meetings

Our group consists of people with quite different schedules. We figured that Thursday afternoons from around 12.00 to whenever we felt we were done for the day was the best solution for

everyone. Having a fixed time to meet is very helpful when planning for the future and it also helps the project progress consistently. During our meetings we discussed ideas and approaches, planned and held workshops with unrelated people. We also evaluated the results and reflected on what we had learned.

We call our meetings workshops from here since we think this best describes what it is. We interview users, but lets them also interact with prototypes and let them try out each concept. In this way the users also direct the meetings in an active way, and new ideas emerge and may be elaborated upon. In that way it becomes something more than semi-structured interviews or usability tests.

Workshop 1

Our first workshop had only ourselves as participants. The goal for the meeting was to test our initial ideas and broaden the picture a little. Since our user group are students as ourselves, we started the design process by describing and discussing what the main focus and aspects of the game should be, based on our own preferences and ideas. Even in a small group of four people it took av while to reach common ground on some aspects of our game in mind and identify several aspects we disagreed on. Benjamin brought a Scrabble board game so we had tangible pieces to interact with and try out the game concepts.



After discussing and trying different ideas we made a list of functionality that needed to be tested on our users.

- Grid in the middle of the touch table with lettered tiles scattered around it.
- The lettered tiles moves slowly around the table in a circle.

- “Starpower” -> a multiplier that randomly appears in a square on the grid. It disappears after a short time. If the users manage to build a word over it, their total score is multiplied by 2.
- We could not agree on grid size. Normal Scrabble is 15x15, but we want our grid to be a rectangle. This can easily be tested when we have a digital prototype and is not important to figure out now. We would like to know what our users think of a rectangle vs a square though.
- Each game is quite short. We are thinking 2 or 3 minutes.
- Points only awarded at the end of the game because we want to make the game dynamic. This means that once on the grid, the lettered tiles can still be used to form other words (at the expense of the already created word of course).
- We need some visual feedback during the game and we will ask our users what they like during the interview.
- Do we want the users to start wherever they want on the grid, or do we dictate it i.e. first word must be created in the middle
- Since it is possible to move all the way around the touch table, do we want the players to create words in any direction they want or do we follow the scrabble rules i.e. can only create words towards the right and downwards.
- Do we want the users to choose which direction they play in and if so how do we determine in which direction the game is played?
- Since the game is time based we need a timer. It can be a “cake timer” such as an analog clock, a digital timer, a timer bar or something else entirely. We will have to ask our users what they prefer.
- The Scrabble lettered tiles have a numbered value on them that gives the value of that tile. We want something similar, but easier. Our idea is to have all the letters in three categories. Assigning a numbered value is the most obvious, but we want to experiment with other ways of visualizing the value of a letter such as “dots” etc. We will ask our users what they prefer.

Workshop 2

During our second workshop we conducted our first interviews. We only had time for three talks, but we learned a lot from speaking to and discussing our concept with users.

Setting for the interviews

In addition to our group being present we held interviews with subjects of either one or two. We had a relaxing environment for the interviewees where they sat on a sofa while our group sat in chairs on the opposite side. Our “prototype” for these interviews were letter pieces taken from a Scrabble board game that were distributed on a white table

First interview

Our first interviewee had played Scrabble before and therefore understood the concept quite quickly. However, he was missing some sort of help menu so that he would be able to read the rules before playing the game for the first time. Since we want to make our game as intuitive as possible and have a very minimalistic user interface, we didn’t really like the idea of having a big

red “help” button on our screen. We realized we needed to come up with a solution that would show the users how to play the game, but without having to spend a lot of time reading the rules. We think that an elegant solution to this problem is to play a prerecorded animation whenever the board is idle. This makes it possible for entirely new players to see how the game is played without having to read any rules.



We initially toyed with an idea that the users could build words in any direction they wanted. When asked about this, the interviewee did not like the idea very much, because words become hard to read and it looks very messy when the board fills up with many words. In addition, it creates unnecessary trouble for the players as it takes longer to read words that are upside-down. This is especially true when the game is timer based.

After showing several ideas for timers, our interviewee really like the concept of a bomb with a fuse that became shorter and shorter as time went on.

Second interview

In our second interview we wanted to try out our idea on two people at the same time. Obviously, the reason for this is that our game is above all multi-player based and we wanted to see how they interacted with each other.

One very interesting thing about the second interview was that one of the interviewees had never played Scrabble before and was not familiar with the concept. When he tried to play a game and created a word on the board he expected some sort of feedback. The interviewee expressed some frustration with the lack of feedback from the game and would have given up quite quickly. We had not really thought about this beforehand, but realized that the users obviously would need some sort of feedback during the game not just after.

When we showed them a demo of how the game was supposed to be played both interviewees understood how the game was supposed to be played. This was important, because we now knew that having an animation was a good idea and that people would have a visual guide to how to play the game.

Both interviewees complained about the current game time which was 3 minutes. They proposed 1 minute, but we felt that it was too short. Sixty seconds would not be enough to properly build an array of words, especially when you had played the game a few times. We reached a compromise with 2 minutes, but this would require further testing. As for the visual timers the interviewees could not decide between the cake timer and digital timer. They both have drawbacks. The cake timer is more visual appealing, but it only gives a vague sense of how much time is left, while the digital timer is boring, but gives an exact idea of how much time is left.

The “starpower” functionality was intuitive for both our users. They would have tried to build a word over it as they understood it gave some sort of bonus. However, they thought the “starpower” was only valid for the lettered tile that was situated directly over it, but our idea is that the entire score is multiplied. We will need to have some visual feedback to communicate this.

The free area was a good idea, but the interviewees would not necessarily use them because of the limited time. They thought it was more important to build as many words on the board as possible.

Two good ideas emerged during this interview. The first was the fact that our two users wanted a reset functionality. They would not have the patience to wait until the timer was finished to start a new game. We thought about this for a while and we felt that 2 minutes was a sufficiently short time to wait. If nothing else, it is still possible to play the entire round until the time is up. Our opinion was that a reset functionality was not very important at this stage, but it would be implemented later if there was a demand for it.

The second idea was that words that had a meaning read both forwards and backwards would give double points. We really liked this idea and it could be implemented as an advanced function that users could explore as they gained experience with the game.

All in all the second interview was very nice and we got a lot of good ideas and feedback.

Third interview

Our third interviewee did not see the Scrabble connection initially. He tried to create different words on the board and waited for feedback. When we explained how the animation would work he understood the concept and started to create words in the Scrabble vein. He also immediately understood how the “starpower” worked. It seems like this functionality is intuitive and interesting.

To this user we introduced two new functionalities. The first was the high score list. He thought this functionality was very important as it gave incentive to play several times. The “must reach the top” mentality is very powerful in games. The second functionality was the rotating lettered tiles concept where the unused tiles moved around the board. Our user really liked the idea and

said that the game would be much more interesting and fun with it. It also causes more stress which he liked. However, he would like to have an option where he could save tiles so that they did not escape. This fit well with out “free area” concept.

When asked about what kind of timers he preferred, our interviewee did not really care. Both the digital timer and the cake timer would work. He dismissed the bomb and fuse though.

In summary, we did not gain any new knowledge from this user, but our belief in our concept was strengthened by the fact that he understood the game quickly and really liked it.

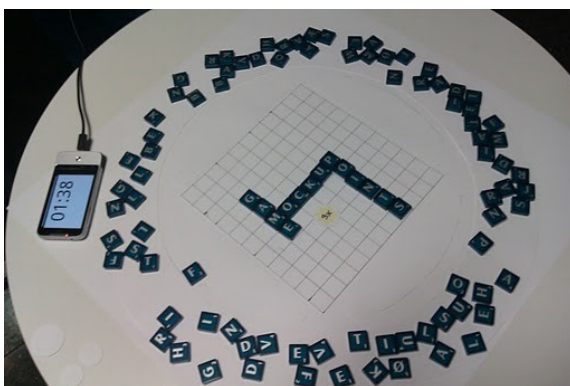
What did we learn

- The game is not intuitive enough on its own. We thought that the connection to Scrabble would be enough to understand it, but were proven wrong
- We need written rules or a animation that visualizes the game.
- Three minutes per game is too long, however this is easier to test when we have a digital prototype.
- The users need feedback from the game during the game and not just after.
- The “starpower” functionality was intuitive, but it was unclear exactly what the bonus did.
- A free area where tiles could be saved was important if the unused tiles rotated around the board. A positive attitude in general towards this.
- Restart functionality might be needed
- A High score list was extremely important. Must be able to see how good others have played.
- Being able to build words in any direction was a bad idea. Felt cluttered and confusing for the users. Too hard to read when under pressure.

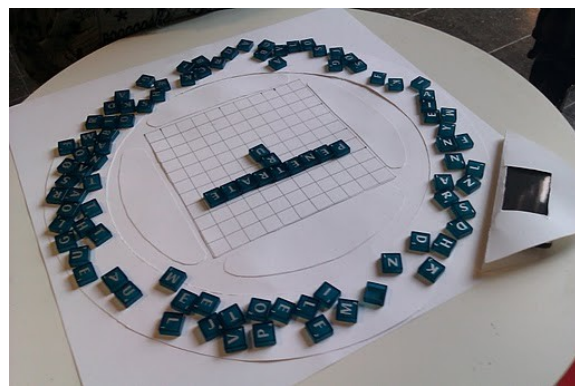
Workshop 3

Before this workshop we created two low fidelity prototypes using plain paper. The first was a clean design using a 10x10 grid with the lettered tiles scattered around it. In this prototype we did not include movement of the tiles. The other prototype was as the first but included the free area functionality and movement of the lettered tiles. Both are seen in the pictures below.

Prototype 1:



Prototype 2:



We held this workshop at Vilhelm Bjerknes' Hus in the lunch hour where we asked groups of people passing by if they wanted to participate in our project and give us constructive feedback. There were about 6 sessions that we completed, varying from 1 to 2 persons at a time. In each session we wanted to test both prototypes and ask the users questions that were related to different functionality in each prototype. We wanted to know if the users understood our concept intuitively and what they thought about the different functionalities in general.

Initial Reaction



We started the interviews by simply explaining to them that what they saw was a prototype of a multi touch table standing somewhere in the new IFI building, and asked them what they would do when they approached the table and saw our application running on it. For this purpose we showed them our first prototype. We observed that most users would try to make words with the tiles that were scattered around the board grid. However, just like during our first interview session in workshop 2, the users did not intuitively understand the point of creating the words on the grid. The most interesting behaviour was that one person thought that the application was some sort of search engine. Only one of the interviewees took the Scrabble connection and started creating words, while all the others made words on the grid that was separate from each other. Everyone we talked to wanted some indication on how the application was supposed to work. These findings told us that it is appropriate to add a little animation that is playing while table is idle to show how the game is supposed to be played.

Testing the Timers

The next thing we wanted to get feedback on was which type of timer the user felt was the easiest and most comfortable to keep track of. At this stage we had narrowed it down to two types of timers, the standard digital timer and the cake timer. The digital timer was well received and just about everyone one we asked felt that it was easy to see how much time they had left compared

to the cake timer and also less disturbing. The cake timer on the other hand was less successful. It was not instantly perceived as a countdown timer, one person thought that it was some sort of indicator that was telling the user how many tiles were occupied. Those who understood that it was a timer felt it was not very informative and that they had to guesstimate how much time they really had left and as a result of this they got stressed and could not enjoy the game. This leads us to believe that a digital timer would work best and be well received by users.

Demo Clip and Star Power

After we had let the participants test the prototype without any sort of assistance or knowing what the application would be, we showed them a little demo animation which was just a clip of us playing the game. The clip was supposed to illustrate how the game was supposed to be played. By showing this clip the basic game rule became quite obvious to the users and those who did not think of the resemblance to Scrabble could certainly see it now. When they now understood how to play the “star power” concept was introduced. We visualized this functionality by putting a piece of paper shaped as a star with the text “2x” inside it on one of the squares in the board grid. The most common reaction was that they would try to make words over the “star power” to claim it, whether it gave double points for the letter or word was unclear to all of them. One case where one thought that the “star power” symbolized that you had build the same word twice. When we mentioned that the “star power” would increase the grand total by the amount indicated by the number it was more tempting to try go for the “star power” for everyone.

Moving Tiles

At this point we showed our users the second prototype which is more advanced than the first one. We simulated lettered tile movement by having a “paper donut” that we moved around the board grid slowly during the game. Our participants were a bit split on this concept. About half of our interviewees thought it would be challenging and very exciting, since you might lose track of tiles and have to look harder to find what you’re looking for. On the other hand, some thought it was slightly annoying and unnecessary and would have liked to have the option to turn movement on/off as they please. We really like the idea of having the unused lettered tiles move around so we are unlikely to remove the functionality from our plans. It also serves a purpose where tiles on the other side of the touch table eventually reaches the user. However, when we have implemented the game digitally we will have a new test round to see if the concept is viable or not.

Free Areas

When we introduced the moving tiles we already had in mind that some users would find it slightly annoying that they can’t “save” any tiles for later use, so we introduced another feature, free areas that are placed between the grid and the letter tiles. Tiles that are moved in to a free area would cease to move and thus they can be used for storing tiles that the user would like to work with. The use of the area seemed to vary a lot from just saving most common used letters to not saving any letters at all because the users felt that they had too little time. Making whole words in the free areas before putting them on the grid was mentioned a couple of times as well. Another interesting thing was that after seeing the free areas on each sides as shown above(PIC above), one interviewee found it natural to try to get friends to come and join. We also asked people if they would have liked the free areas to be placed somewhere else but the consensus was that if free areas were to be used, this was the most logical place to have them.

Rotating the First Tile

The last thing that we wanted to find out was what people would do if they placed the first tile onto the grid and it appeared upside down. The common reaction was that they thought they would be standing on the wrong side of the table and would therefore have moved around to the other side of it to play. There was however some people who reacted differently, one interviewee just rotated the tile so it was facing the same way they were standing without thinking too much about it, which is just what we wanted to see. To help out, we placed a small piece of paper showing an image of two arrows forming a circle underneath the first tile, this led to some people rotating it while others still didn't understand that it was possible to do so.

New Ideas

During our sessions in this workshop our users came up with a few new ideas that we had not previously thought of. For example one user mentioned that it would be fun to have other bonuses such as extra time for completing long words or use letters that are not often used. Building a word over the "star power" could also give extra time instead of bonus points. It is also possible to have several types of "star power" to make the game even more interesting and challenging. One user mentioned that he would like to rotate the circle of unused tiles himself instead of it moving automatically. However, this serves a problem when several players are cooperating because when a player rotates the circle he sabotages for his teammates.

Nothing is yet set in stone and we might or might not include these ideas. We will definitely have a look at them and discuss whether to include some of them in our high fidelity prototype.

Future Work

We have now hopefully finished most of the preparations needed to proceed to the next phase of our project, which will be to create a digital prototype of the game. We started off by coming up with the main idea, then we went on to refine it and included things we thought would make it interesting and worthwhile. Then came the interviews, providing us with feedback on our ideas and also giving us a lot of pointers on which parts we would need to improve on. Now we will have to process all of this and come up with a solution that will make both us and the end users happy.

The next couple of weeks will mainly include coding the application and a lot of testing. The core functionality will have to be programmed first to give us an idea of what it would look like on a multi-touch table and this would also provide us with a testing platform early on. By continuous testing with users we hope to develop the game functionality further and produce an application that fulfills our goals and may be a possible contribution to the library at IF12 next year.

References

1. Craig Willis. Quality and Innovation Shine in Scrabble for iPad. Game review. (April 15, 2010) <http://touchreviews.net/scrabble-ipad-review-word-game/>

2. Tracy Erickson. Scrabble (iPhone). (no date)
<http://www.pocketgamer.co.uk/r/iPhone/Scrabble+%28iPhone/Scrabble+%28iPhone%29/review.asp?c=7682>
3. Peltonen, P., Kurvinen, E., Salovaara, A., Jacucci, G., Ilmonen, T., Evans, J., Oulasvirta, A., and Saarikko, P. 2008. It's Mine, Don't Touch!: interactions at a large multi-touch display in a city centre. In Proceeding of the Twenty-Sixth Annual SIGCHI Conference on Human Factors in Computing Systems (Florence, Italy, April 05 - 10, 2008). CHI '08. <http://portal.acm.org/citation.cfm?id=1357255>
4. Scott, S., Carpendale, M.S.T., and Inkpen, K. (2004). Territoriality in collaborative tabletop workspaces. Proceedings of the ACM CSCW Conference on Computer Supported Cooperative Work. pp. 294-303. <http://portal.acm.org/citation.cfm?id=1031655&dl=GUIDE&coll=GUIDE&CFID=110763460&CFTOKEN=51267882>
5. Gross, T., Fetter, M., and Liebsch, S. 2008. The cuetable: cooperative and competitive multi-touch interaction on a tabletop. In CHI '08 Ext. Abstracts on Human Factors in Computing Systems, ACM Press (2008), 3465-3470. <http://portal.acm.org/citation.cfm?id=1358875>
6. Esenther, Alan & Wittenburg, Kent (2005). Multi-user Multi-touch Games on DiamondTouch with the DTFlash Toolkit. Lecture Notes in Computer Science, 2005, Volume 3814/2005, 315-319
<http://www.springerlink.com/content/y38t21862l5uw30q/>
7. [Rogers, Yvonne](#) - [Sharp, Helen](#) - [Helen Sharp](#) - [Yvonne Rogers](#) - [Jenny Preece](#) - [Preece, Jenny](#). [Interaction Design: Beyond Human-Computer Interaction](#) (paperback - 2007)
8. Ang Chee Siang, Radha Krishna Rao, Theories of Learning: A Computer Game Perspective, *ismse*, pp.239, IEEE Fifth International Symposium on Multimedia Software Engineering (ISMSE'03), 2003
[Http://www.computer.org/portal/web/csdl/doi/10.1109/MMSE.2003.1254447](http://www.computer.org/portal/web/csdl/doi/10.1109/MMSE.2003.1254447)