Product vision

Games Context Group 1 (a.k.a. Funky Donkey Studio)

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Abstract

This document gives an clear and stable description of our product by answering the following questions:

1. Who is going to buy the product? Who is the target customer?
2. Which customer needs will the product address?
3. Which product attributes are critical to satisfy the needs selected, and therefore for the success of the product?
4. How does the product compare against existing products, both from competitors and the same company? What are the product's unique selling points?
5. What is the target timeframe and budget to develop and launch the product?

This document also includes a "Literature study and analysis of the existing alternatives" which can be found on page 8.

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Gameplay

Project Wave is a game in which a segment of a queue controls a curve using motions. Objects flow in one direction along the curve and need to reach targets avoiding obstacles along the way.

Our gameplay differs from that of a conventional game in that each player controls different parts of the same object. The players' positions are recorded by a camera, of which the information is used to determine the current height of the players. The camera translates points defined by the player motions into game coordinates which are used to draw a curve. This curve represents a wave along which all objects roll. This wave is the only gameplay element directly controlled by the players.

The screen displaying the game lies parallel to the queue. The game direction, i.e. the direction in which the objects are rolling, is determined by the direction the queue is moving in.

The main gameplay elements are objects that continuously spawn, rolling along the wave in the game direction. They are introduced at the start of the screen and are destroyed when exiting the screen. The players dynamically control the shape of the wave which changes how the object moves along the wave: slopes affect the speed of the object, yet the object cannot be brought to a halt, nor can it roll backwards. Thus, players can form hills and valleys to influence the objects' trajectories.

Other gameplay elements include targets and obstacles. Targets enter the right side of the screen and slowly progress towards the left side of the screen, as do obstacles. The players are meant to shape the slope in such a way that the objects hit the targets and avoid the obstacles.

Another gameplay element is the combo count. When an object hits a target a combo count is either initiated or incremented. Maintaining a combo is the main gameplay goal of the players. A combo is broken (reset to 0) when an object collides with an obstacle or an object misses a target (i.e. if the gameplay direction is from left to right, once the object's horizontal position is more to the right than a target's horizontal position we conclude the object has missed the target). As the combo count increases, the game becomes more difficult. Various gameplay elements will change, like the spawning of power-ups, object spawn time, object general movement speed, amount of targets/obstacles and positioning of spawn areas of targets or obstacles.

Power-ups are what makes reaching higher combos much more exciting.They will appear depending on the combo count and can be hit to activate. As the last gameplay element, power-ups open up a myriad of possibilities. Inverting controls, inverting game movement, various modes like frenzy, with lots of objects spawning at once, or wacky, where the world colors turn psychedelic and obstacles become targets and vice versa. etc, etc.

When the combo count is reset, the game does not enter a 'game over' state, the only loss the players can encounter is the end of a combo. Subsequently, the difficulty is also lowered, and activate power-ups will become inactive.

With respect to queue dynamics, the game does not keep track of the amount of players. This makes moving along the queue without interrupting the game possible. When players move along the queue they also control a different position of the wave. When a new player enters the camera FOV he/she (usually) controls the part of the wave right after where the object enters the screen. Bearing in mind that new players can join at any time and since the goal of the game is to score combos we do not want the presence of a new players to be linked to a high chance that the combo will be interrupted. This is why players near the edges have little effect on the game, and targets or obstacles that can break the combo do not reach this far.

Finally, also with respect to queue dynamics, players can also leave at anytime, so that when the queue moves along and the last player goes forward in the queue and leaves the camera's FOV, the player before him/her will simply move along and replace the player that just left.

The game always plays in the same mode, from which different play states can be reached depending on the players' competency to maintain the combo.

Customer and Target participant analysis

We are making a game for a queue so we are targeting companies that have queues, preferably a queue where people have enough time and are willing to play a game. We were thinking of entertainment parks and airports. These queues usually contain enough people to play our game and have people standing still for a decently long period of time (compared to for example a coffee machine queue) giving people a chance to try out the game for a few minutes. ([2]Henry Corrado, 2015) Our game can be designed in multiple themes so the game could easily be adjusted for attractions with a certain theme.

The software of our game will be freely available for anyone to use. This however, does not mean that the whole game is free to set up for any company. The company implementing our game in its queue will still have to supply the setup, i.e the computer running the game, the camera, and the screen/projector. Then the company can make the game to play for any queue participants.

Our game requires a certain setup to work properly since we will be using a projector and a camera. First of all, we need enough space so the camera can detect enough people and the distance between the projector and the projector screen / wall is large enough. Preferably we would like the game to be displayed on a 1:1 ratio as changing the wave will then feel very natural to the players.

It will be easier to detect the heights of the players when the background behind the players is unicolor and immobile but other backgrounds should work fine as well with background subtraction. ([3]Lijing Zhang & Yingli Liang, 2010)

Other people should not be able to walk between the participant and the screen as they will be walking in front of the camera and this will disrupt the gameplay.

Because we use a projector it might also be preferable (but not obligated) if our setup is indoors since the screen is hard to see with too much sun light on it. ([4]London Audio Visual, 2015)

Thus our *ideal* setup would be with two walls (one to project on and one as a background), indoors and with enough space for the setup. This is the ideal setup where the screen is clearly visible and no disruption of the camera's image is possible. However, the game should be playable on a much more basic setup, as long as there is some screen to display the game on and the background is not constantly moving and changing color (i.e. if the queue were to be 'S' shaped some separator needs to be inserted so that no humans are visible on the background of the camera image). ([3]Lijing Zhang & Yingli Liang, 2010)

The ideal queue setup should be one person wide and straight (at least along the segment where the game takes place). The people will be easiest to detect if they are of equal distance from the camera. The camera could also be placed on a dented queue, meaning people will not have the same distance to the camera, as long as from the camera's

perspective no people will be standing behind one another. This setup will pose a small extra difficulty on the players because people closer to the camera will be taller in game as they are in real life. There are no constraints on the speed of the queue nor total length of the queue (as the camera will only detect a segment of the queue).

The target players of our game are people queueing up for a service, as mentioned for example a theme park, as lines there will be very fitting. Since our game is using players' heights as controls. Our game does not strictly enforce a minimum height: a child or small person would still be able to participate, yet their experience of how the game plays could highly differ. Most rides in a themepark require a minimum height, which would automatically ease the height issues that may appear on our game. For our game either a suggested minimum height should be applied, or accompanying players should be told to lower their position, as to lower the playing field. Age of participants can vary all the way from a child to an elder member of society. Regarding maturity, the game is meant for all ages as it is simple fun and easy to understand and control. The theme of the game can be changed to accommodate a certain setting, for example a certain theme of a theme park ride.

Customer needs analysis

The main reason why we are making a game for a queue is because a lot of people are extremely bored while they are waiting in a queue. There are queues that only take a minute but there are also queues that can take half an hour or even up to multiple hours, at theme parks for example. In total a person even spends about a year in a queue in its lifetime on average! () Everyone knows that time passes quicker when you are occupied.([1]David Maister, 1985) So we try to make our game as entertaining and engaging as possible, by involving cooperative team play and addictive gameplay.

Another thing that we want to address with our game is the need for social interaction. We think that most people would rather interact than stand silently in the queue.([1]David Maister, 1985) Usually people stand alone in the queue, awkwardly checking their cell phone every few seconds, often texting with friends that are miles away. Imagine if they could socially interact with everyone around them, without feeling uncomfortable or awkward. Since a lot of people will not randomly start talking to strangers ([7]Jonathan O'callaghan, 2014, july 21) we decided to make a game that encourages interaction above all else. This way, people standing in a queue will have fun playing a cooperative game together.

Our game is a multiplayer game and always needs to be played with at least two players. Shaping the wave becomes a much arduous task with too few people. To achieve the goals of the game the participants need to work together. Should someone in the queue not participate then this would pose a problem. The other participants will definitely try to convince this odd game-disturbing queue member to play. Thus instead of standing alone in the queue, the participants are now interacting, coordinating the necessary movements of their fellow queue members to shape the wave at the best of their abilities, to reach ever-higher combos.

Crucial product attributes

Since camera detection is a big part of our game, and the small disturbances inherent in all camera detection algorithms could trigger errors/gameplay disturbances we need to make sure the game is playable: the player's must be able to control gameplay elements using camera detection without having the feeling the detection itself is their main obstacle in the game

In order to promote social interaction in a queue, we need to change the structure of the queue from a handful of individuals to a group of socially connected people working together in a team. The game should be this link. It will encourage individuals to collaborate, and as a structure represent the wave on screen. Of this entity, the weakest link should never be the game itself. Were this the case, then people will lose interest, and their interaction will diminish.

To achieve this fidelity, the game cannot be too cluttered or have a steep learning curve. It should be a simple yet fun game that is easy for any new player to jump into and drop out of at any time without negatively affecting the gameplay. However it shouldn't be too easy, otherwise people will lose interest and stop playing, ruining it for the rest of the queue. ([9]Kevin Oxland, 2004)
Every player should feel like he/she can control the game sufficiently to make a difference for the team. A player should not feel like his/her actions do not matter.

Because new people will be joining the game and current players will exit the game as the queue advances, the game should be continuous and never-ending. It should not be bound by time or higher-order progression like levels nor should there be any character progression or need to save of any kind.

Queues can have a lot of different sizes, i.e different amounts of people standing in the queue. Our game will not be able to handle any amount of players, but it should be flexible in the amount of supported players. There are two estimated maxima we can provide now:

1. max 6 people per camera.
    - Naturally, the camera can be moved backwards to encompass more people. Right now, we feel 6 should provide a doable challenge to perform motion detection on.
2. max 3 cameras (18 people) per game.
    - With more cameras, there is a longer wave on screen, which means the virtual camera needs to zoom out a bit. With our current prototypes, 3 camera widths seems like a solid amount, based on clarity and visibility for the player.

Literature study and analysis of the existing alternatives

Queue entertainment

There are not a lot of games designed to make waiting in line more fun. Theme parks often decorate the waiting area to fit the theme of the attraction people are waiting for (e.g. the queue by the vogelrok from the efteling). A lot of clinics use magazines or other reading material to make the time pass more quickly in a waiting room, or have physical games for children. Computer games on the other hand, are not something you see very often if at all in a queue setting. This means that in the specific area of digital games designed to amuse or distract people waiting in line there isn't a lot of competition.

Camera controls

However there are games that incorporate the same kind of controls as we allow in our game. Both the eyetoy games for the playstation 2 as the kinect for xbox require participants to move their body to control the game. These games generally use a more complicated way of image recognition than we plan to implement in our game. Since we only need one coordinate per participant we can make do with a more simple camera than the kinect and a more simple detection algorithm than the eyetoy. Background subtraction to detect the foreground is a common concept widely used in motion detection. It works best when the reference frame (i.e. background) is of a static background and does not contain any foreground elements[6].

Similar gameplay

Analysing gameplay elements from popular games can help make our game more interesting. Unfortunately there aren't a lot of big game companies that make physics based slope manipulation games. But we can look at a wide range of internet games available such as "solipskier"([10]Mikengreg, 2010) that do have these kind of mechanics.

Glossary

- Game Direction: the ‘main direction’ of the gameplay. If the screen is positioned on the left side of the queue the direction is from left to right and if the screen is positioned on the right side of the queue the game direction is from right to left. Basically the game direction is in the same direction as in which the queue progresses.

- FOV: field of view.

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