



Dunkin Donuts in Foodocalypse

INM375 Game Development Process (PRD1 A 2015/16)

Game Design Document

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1. OVERVIEW

Foodocalypse is an action oriented survival shooter game. The game takes place in a science fiction setting where a strange virus has turn the food into zombies (aka foombies). Dunkin donut products have survived from this virus and live inside the Dunkin Donut store. Foombies are trying to capture the store and eat all the products from the world of the living. Double-D, the main character of the game, is a donut whose mission is to defend the store and the rest of his family, the pure and delicious Dunkin Donut products.

The foombies' target is to capture the donut store. However, they will only do that after they kill you first. So the player's actual objective is to survive. This is a survival game where you can't eventually win, you can only eventually lose.

Foodocalypse is an action oriented survival shooter 3D game. The game is carried out in individual mini games. The player cannot save his progress or load a previous game. The gameplay focuses in fighting with enemies and scoring points. The game also includes the exploration element as the player can explore the map to find and pick up elements to help them fight the enemies. Despite that this is an action game, it will use as little violence as possible in order to attract people from different categories.

An appealing selling point of the game is that however the player cannot eventually win, the game has a steady growth in difficulty. So a player can never become better than the game itself. This will be a mechanism that will raise the audience's interest. Everyone try to beat the game they play. The more people try to achieve this, the more dedicated will become. As the game progresses, the more competent someone becomes, the more difficult to kill the opponents will be. This makes the game repayable and fun. Also, since a player can never beat the game, a ranking table will be incorporated in the game in order to assimilate the competitive element that the audience needs.

The game incorporates a basic scoring system. You can move around in the map, you can kill enemies which allows you to score points, and you pick up upgrades. The game objective is high score oriented. The more foombies you kill in a game the more points you will score. A table will hold the score rankings which will sync online with the account of every player. The game difficulty is increasing gradually by spawning more and more enemies.

The development of this game is part of the Dunkin Donuts advertising campaign. So, its main focus is to promote the brand through the game. The company's approach to the development of the game is that the more dedicating the game will be the more addicted with the brand the players will become. To achieve that, the game contains daily mini quests that reward the players with real life gifts for the donut store. The target group of this game is basically people who play action games with low violence appearance in a mobile device. People who also prefer cartoonist games instead of

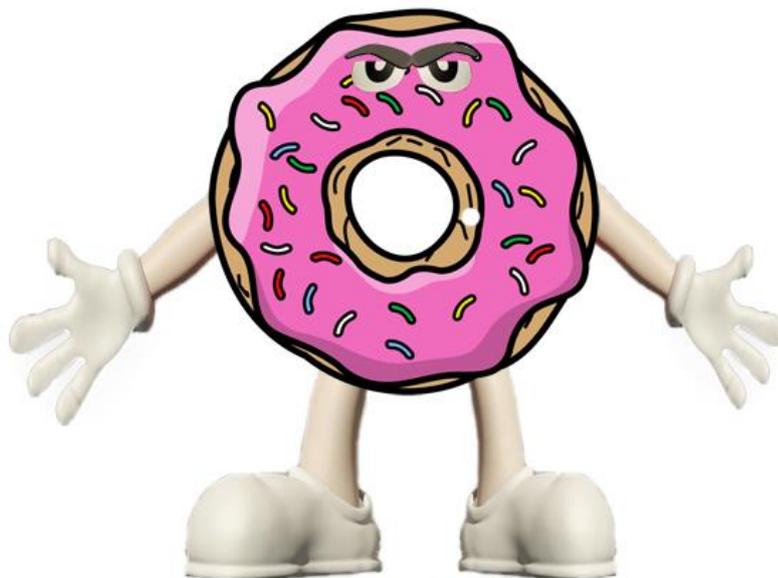
realistic ones, and apparently the company's customers who seek for special gifts and entertainment.

When the game starts, double-D is spawned in front of the Dunkin Donut store and the first wave of enemies start coming him. Double-d can kill the incoming enemies with his weapon, the sweet-gun, explore the map, find upgrades which help double-D survive longer and become stronger, and also pick up special weapons.

2. THE MAIN CHARACTER

Double-D:

The main character of the game is Double-D. Double-D is a humanoid donut, which means that it has the body of a donut but also has legs, arms and a face. The front side of the body is the top size of a regular donut with a pink glaze and colorful sprinkles on it. This is also the side where the face of the character exists and consists of a set of eyes and a mouth. The back side of the donut is the brown part of the donut, and is the side which will face the camera. However, since the camera is in isometric mode, the player will be able to see part of both sides of the 3D character while playing the game. To give an example of the size scale, Double-D and the rest AI elements will have approximately the same size, and will be reasonably proportionate with the game world (same ratio as a human has with a Dunkin Donut building in real life). Double-D holds a weapon which he uses to attack the enemy AI elements. The weapon is some kind of sweet-made weapon, the sweet-gun, which fires sprinkles as bullets.

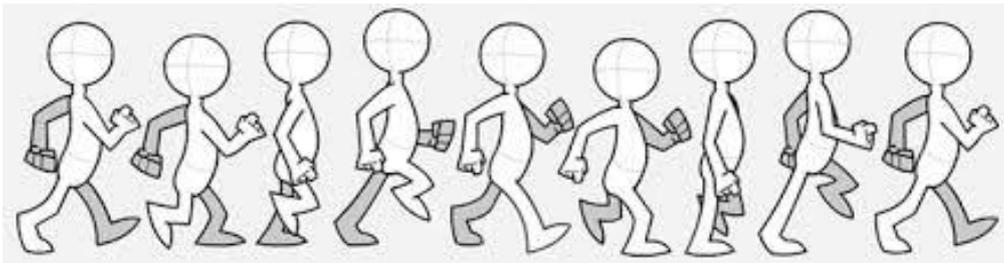


Possible character model

2.1. Animations:

2.1.1. Movement Animation:

Double-D's movement animation is pretty similar to human movement animations. He walks in a jogging pace moving basically his legs.



2.1.2. Death Animation:

When Double-D dies, he falls slowly to the ground and the AI enemies fall on top of him taking bites out of his body.

3. GAME MECHANICS

The first development of the game is tailored for touchscreen-based smart devices. The following mechanics are referring to the mobile version of this game. The game play orientation is horizontal so the mobile device need to be rotated in order for the game to be played properly.

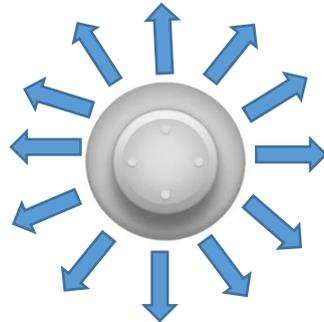
3.1. Controls:

3.1.1. Movement:

The player can control the character's movement around the map. The direction where double-D shoots is a different mechanic from his movement direction which means that double-D can move in a different direction from where he is shooting. Double-D can move in a standard speed and cannot jump, run or stoop.

The player can make the basic moves with the character, move him backward, forward left or right. The character move control is achieved via a virtual analog stick controller which is shown in the bottom right side of the screen. Using the analog stick controller, the player can move the character in different directions. The player can move this stick in a 360° degree angle to direct the character's movement.

In order for the player to move the character, he needs to move and hold the analog stick controller. If the player moves and releases the analog stick, the player will only make a tiny move towards the direction the player moved the stick. When the player won't move the stick, the character stands. The character's reaction to the analog stick is instant and the character control gives the player a smooth feeling.



3.1.2. Shooting direction:

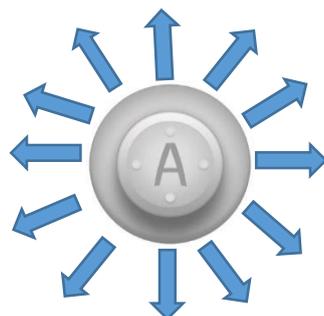
In order to control the shooting direction of the character, the player should use the "A" button. When the player presses this button, double-D starts shooting ceaselessly. The player can move this stick in a 360° degree angle to direct the characters shooting.

3.1.3. Attack:

The player can use two buttons to attack AI enemies. The "A" button which triggers the default shooting event, and the "B" button which triggers the special attack event. These buttons live on the bottom right corner of the screen. Double-D's reactions to the buttons commands are very accurate and gives a physical and smooth feeling when they are used.

3.1.4. A button:

A button, is not only a button but also an analog stick controller. Just like the movement controller, the player can move it in a 360° angle, which makes the player have better control of the character. A button has also a basic button functionality. When "A" button is pressed the shooting event is triggered. The player can use this mechanism to control the character's shooting direction.



3.1.5. B button:



B button is used for the secondary weapon functionality, the mines. The player uses this button in order to place mines on the ground. The player can trigger this action by just tapping the “B” button. Whether tapping or press and holding the button, the same event will occur. The mine will be placed on the point where double-D is standing when the B button is pressed. As long as a mine is placed on the ground, Double-D won’t trigger a mine explosion. So if double-D places a mine and then steps on it, the mine won’t explode. It only interacts with enemy AI elements.

3.2. Weapons:

3.2.1. Candy-gun:



Candy-gun is the primary weapon that double-D uses to attack enemies. Sweet-gun is a ranged rifle which has infinite amount of bullets. The damage it causes is standard, which means there is no scaled damage or damage reduction/amplification. An enemy AI needs to take 3 shots before it dies.

3.2.2. Mines:



Mines are the secondary weapon that double-D can use to attack enemies. The mines explode when an enemy steps on them. The mine damage type is AOE (area of effect). This means that the mines can damage enemies within a specific area around them. There is no limit on how many enemies can die from a mine explosion. So, a player doing appropriate moves can force all the enemies of the spawned wave at that time to step on it and die.

When the game starts, the player has only one mine to use. The mines are also spawning randomly in the map and the player can pick them up by passing over them. When the player picks up a mine, this mine is stored in the player’s armory, and is available for the player to use it whenever he wants. However, there is no other element that can be stored in the character’s armory. Actually the player cannot visit the armory. In fact, there is an icon in the in-game GUI that indicates how many mines the player has acquired.

3.3. Camera and Graphics:

The default camera view is an isometric style top-down camera and this is the only camera style available for the game. In the game the player will only control the main character, Double-D. So, at all times, the camera is focused on Double-D. Double-D is placed in the middle of the screen on the X axis, and little below the 0 point on the Y axis in the way someone can view the screen. The camera is set in a distance that the player is able to view the character and reasonable part of the environment around him, enough to see all the incoming enemies. The player is always having a clear view of Double-D. In the map, there are no elements higher than the position of the camera, so the camera will never deal with any obstacle that blocks the view of the character. The camera will focus on the characters position in the map, not the direction. The camera will follow the Double-D movement and its orientation will not change at all.

3.4. The game world:

The main element in the map is a simulation of a Dunkin donut store. It is lying on the center the map, as you see it form a panoramic view. The rest of the map is a simulation of the outside area of a Dunkin Donut store in a country side. There is a parking lot and some nature elements. However, the character cannot interact with any of the map elements. In fact when the character interacts with a game world element, like a tree or a car, a collision event is happening. A possible view of the map is illustrated in the next picture:



The environment and the units are modelled in 3D. The main lighting is relatively dark, however certain surfaces and the characters appear shiny. This makes everything be

visible. The high shadow quality makes the game feel “scary” but atmospheric at the same time. The environment and characters have a comical graphical style which make the game look more attractive and fun.

3.5. Sound:

The game include a default sound track which starts playing when the game starts. The purpose of the in game sound effect is to add the “zombie apocalypse feeling” into the game while keeping the comic sense of the game alive. The game also includes sound effects for the “die” events as well as for the picking up events. These sound effects make the game feel more realistic and entertaining.

3.6. Difficulty:

The game incorporates an increasing difficulty scheme. The game difficulty increases as the game progresses. Every wave of enemies that is spawned will consist of more foombies than the previous one. However, the more the game progresses, the more upgrades will be generated in the map. So the player can keep Double-D durable as more enemies are coming.

3.7. In-game GUI:

Since this is the mobile version of this game, the in-game GUI should be as tidy as possible so the player will have enough part of the screen left to enjoy the game.

The bottom left and right of the screen is the place where the controls live. The left side illustrates the movement analog stick controller and the right side the two attack buttons. On the top left side of the screen there is a health bar which illustrates the character’s amount of health. Below the health bar, lives the mine icon, which indicates how many mines the player has acquired. Finally, on the top right corner lies the score counter.



3.8. AI Elements:

The AI element that double-D faces in this version of the game, is the enemy AI element, the Foombies. Foombies are the sweets which has turned into zombies and go after Double-D trying to kill him.

3.8.1. Look:

Foombies look like sweets that have been affected by an Apocalypse virus, just like the way zombies are illustrated in a zombie movie or other zombie games, but instead of humans they are sweets. Foombies come in 2 versions. The dead-cookies, and the sausage-crawlers. However, there is no special action that each of them can make. In fact, there is no special action that an enemy AI can make. They can only walk and hit the Double-D with their hands. So in order to attack the Double-D and manage to decrease his health percentage, they need to collide with him.

Dead-cookies:



Sausage-crawlers:



Foombies are spawned in waves. When the game starts the first wave of foombies is spawn. The number of dead-cookies and sausage-crawlers in each wave is random, but the total amount of foombies in every wave is specific. The first wave consists of 5 foombies. In each subsequent wave, an extra foombies will spawn. The new wave of foombies is spawn only when all the living foombies of this wave die. Where the wave of foombies is spawn depends on where the character lies on the map at that moment.

3.8.2. Movement:



Foombies doesn't have a predefined path. When they get spawned they go after the player. They move in a slighter slower speed than the character so the player can run away from them while shooting at them. Foombies don't move in an intelligent manner. They just follow the player's path. Foombies can only attack from melee

range and the damage they can do is also specific. A unique attack of a foombies cuts the 1/5 of characters life bar.

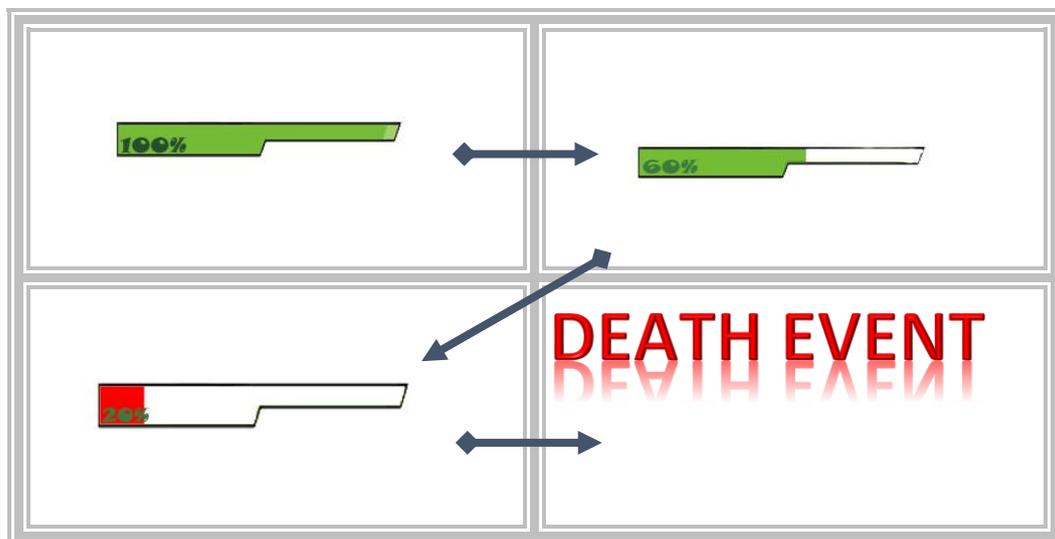
3.8.3. AI Death animation:

When a foombies dies, blood is splattered in the ground. When a foombies gets hit for the 3rd time, the death event is triggered. The foombies get lifted a little bit in the air and then lies in the ground for 2 seconds. After the 2 seconds, the corpse disappears slowly in the ground.

4. GAME ELEMENTS

4.1. Health bar:

Health bar is a green bar that lies on the top left of the screen and illustrates Double-D's amount of health. Health bar is divided in 5 parts that represent the amount of hits needed before Double-D dies. When Double-D gets hit, a part of this bar is cut. When Double-D gets 5 hits, this bar becomes empty and double-d dies.



Possible flowchart of health bar states.

4.2. Upgrades:

During the game flow, multiple upgrades are generated in the game world map. These upgrades are generated in random time and place. There are four different upgrades available in the game and at all times they are useful for the player. Every single

upgrade element is modelled as a Dunkin Donut product. The four upgrades and their possible animation model are illustrated below:

4.2.1. Sprinkles:



Sprinkles is an upgrade for the player's gun. When the player will pick up a sprinkles rune, the character does a multi shot attack. This means, the character fires in 3 directions at the same time. All the 3 attacks point at the side that the character faces. The damage that the bullets does remains the same. This effect last for 15 seconds. When this effect expires, double-D can should with the default style. Can work with every other upgrade. However, if Double-D is under the muffin effect when the player picks up sprinkles, the muffin goes off.

4.2.2. DD Box:



The box represents a shield which affect the damage intake scale of the hero. Whenever the player will pick up a DD box, Double-D will get 3 more hits before he dies. This upgrade doesn't expires, which means that its effect will go off only when the player got hit 3 times. When the player pick up DD box, all other active upgrades get deactivated. However, it doesn't affect sprinkles upgrade.

4.2.3. Milkshake:



The milkshake is a regeneration upgrade. Whenever a player pick up a milkshake upgrade, Double-D's health bar fills up to 100%. If the player has an active DD box, or an active muffin their effect will go off. However, if Double-D is under the sprinkle effect, it will remain active.

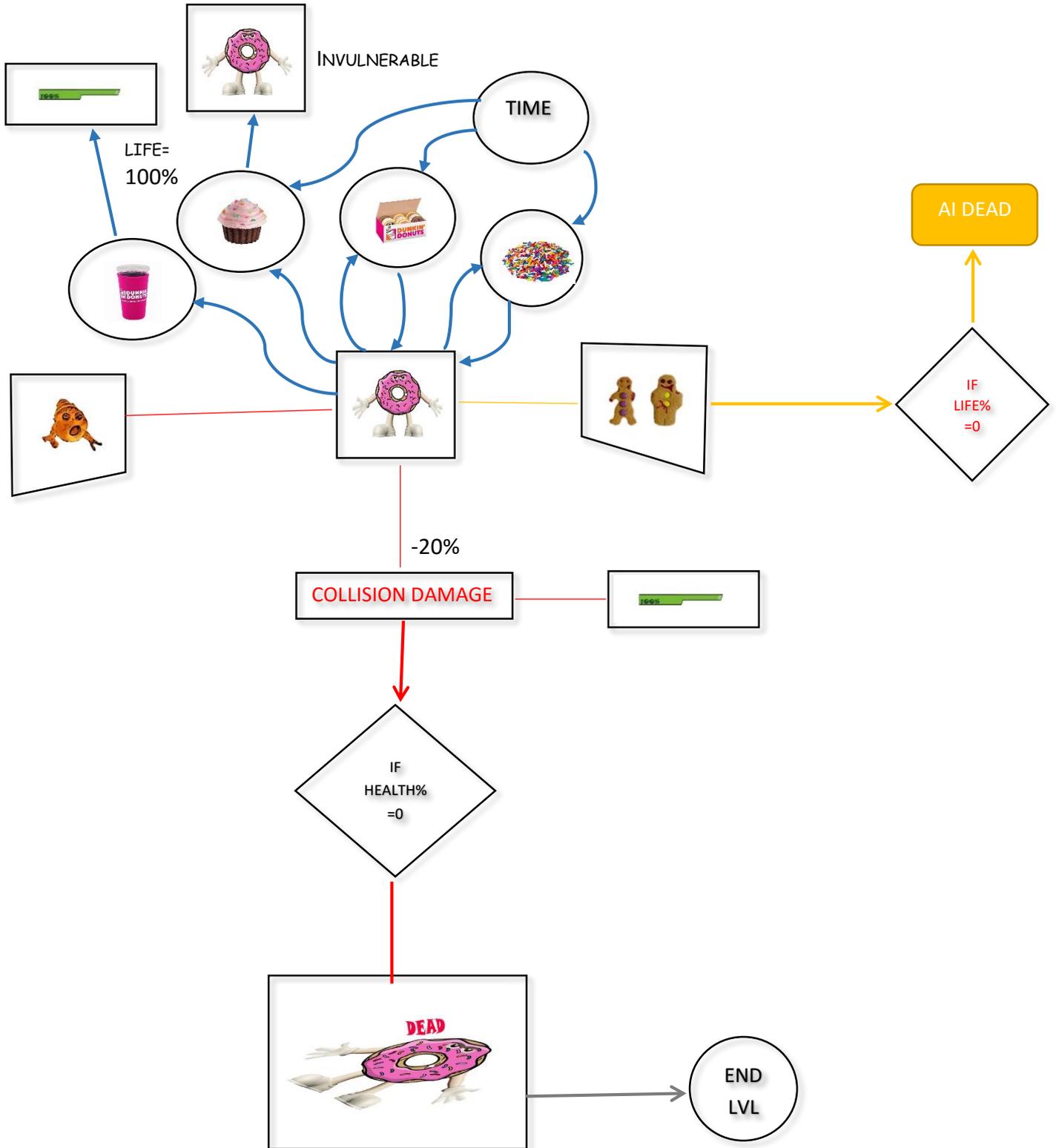
4.2.4. Muffins:



The muffins turn the character invisible for 10 seconds. Whenever a player pick up this upgrade, Double-D turns invisible and the enemies, the foombies, lose their focus on Double-D and start patrolling around randomly. When Double-D becomes visible again, foombies will go after him. When Double-D is under the invisibility effect, his movement speed is decreased 30%. If the player triggers any action during invisibility, like shooting enemies or pick up any other upgrade, the invisibility effect will fade out. Muffin cannot affect Double-D with any other upgrade simultaneously.

4.3. Element finite state machine:

A state machine of the interaction of the game elements is illustrated below:



4.4. Element token diagram:

The following diagram describes how the game elements interact with each other:

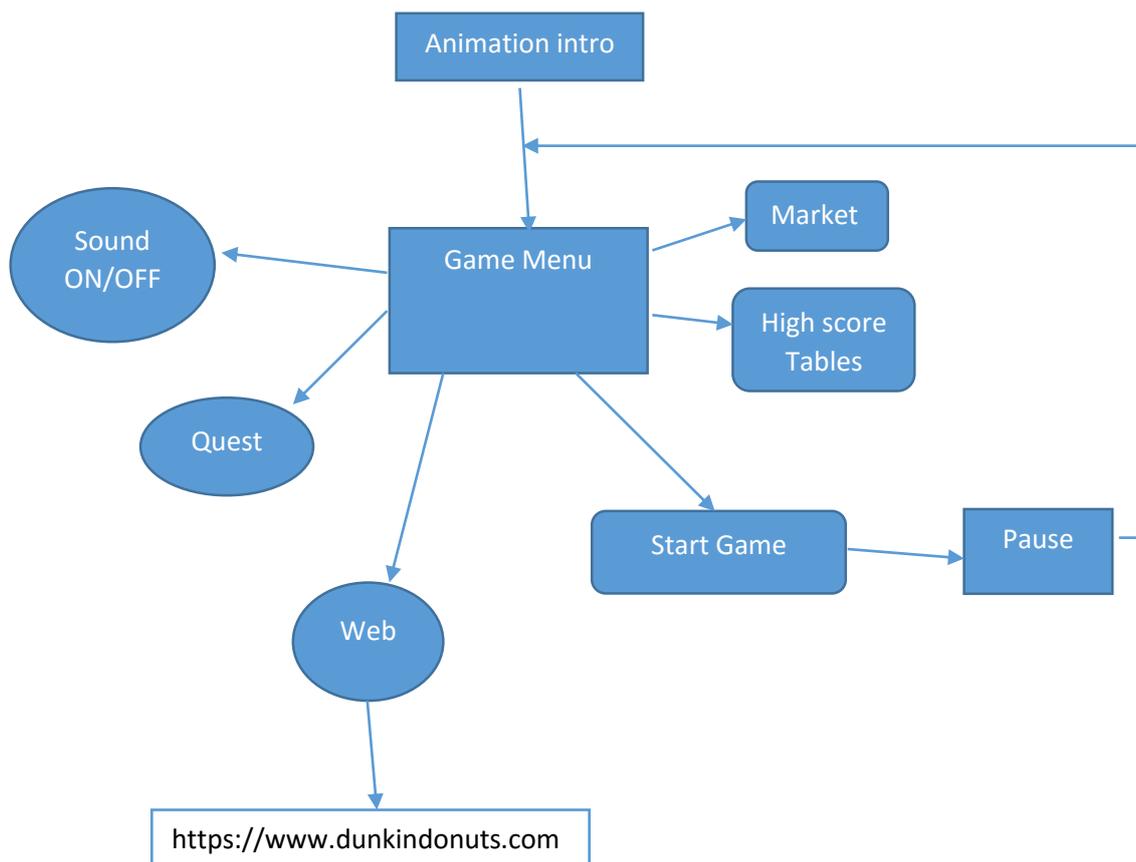
										
	×	0	0	0	P	0	0	0	0	
	-1	×	0	-1	P	0	0	0	0	
	0	0	×	0	P	0	0	0	0	
	-1	-1	-1	×	P	0	0	0	0	
	+1	+1	+1	+1		×	H IF HP =20% K	H IF HP =20% K	0	0
	0	0	0	0	H	IF HIT =3 K	×	0	K	0
	0	0	0	0	H	IF HIT =3 K	0	×	K	0
	0	0	0	0	+1	T	T	×	0	
	0	0	0	0	U	0	0	0	×	

Table: Token diagram symbols description

-1	DEACTIVATE EVENT
0	N/A
+1	ACTIVATE EVENT
P	PICK UP EVENT
H	HIT EVENT
K	KILL EVENT
U	UPDATE EVENT
T	TRIGGER EVENT

5. GAME MENU GUI

When the game starts an animation intro is played and then the game menu appears. In the game menu, there are 3 buttons that lie in the middle of the screen, in a list view. The button on the top of the list, is the “start game” button which starts a new game. Right bellow start game button, lies the market button, which leads you in the game market network area. The third button is the high score button which leads you in the rankings table. On the background you can see the main character and the company’s logo. On the bottom right of the screen there is a button that turns the sound of the game on or off. On the bottom left side of the screen there is a button which when it’s pressed it activates the mobile phone browser and directs you to the company’s website (<https://www.dunkindonuts.com>). Next to the website button, there is another one that notifies the player for available daily quests. The player can press the button to see what the daily quest is. If a player complete the daily quest, the button shows a discount coupon which is the reward for completing the daily quest. The player can use the discount coupon to get discount in a Dunkin Donut store. When a new quest is out, the button shows the quest description again.



Foodocalypse Game Menu structure.

6. REWARDING THE PLAYER:

6.1. The market:

The market is a place where the player can make in app purchases. Different character figures or AI elements will be on sale in the market. The buyable characters and AI elements will have the same skills and powers with the default characters of the game. The player can buy them for aesthetic reasons.

6.2. Daily quests:

Daily quest will be released in random time and will be available to complete for specific period in the day. When a player complete the daily quest, he gets rewarded with a discount coupon which he can use to take discount in any Dunkin Donut store. More daily quests to come later on.

6.2.1. Initial Quest storyline:

A Muffin has escaped from the Dunkin Donut store and is lost and scared. When the foombies locate the little muffin, they start chasing it. Your goal is to protect the muffin and help it get back in the store. However, if Double-D gets close enough to the foombies, he still dies. So the goal in the daily quest is still to survive but also protect the little muffin. The muffin will be moving around in the open world for 1 minute. If the player manages to keep it alive, the daily quest is complete.

6.3. Further development:

Although Foodocalypse is an advertising mobile game, further development is considered to be established. We believe that the fancy graphics along with the fun story line and the appealing giveaway discounts will captivate the crowd. In the near future after the release of the first version of the game, we are planning to build a more complicated game which will be competitive and challenging. In addition to that, development for a different platform is under consideration. As an example, some future embellishments could be:

- Different map theme
- More daily quests
- Different daily quest rewards
- Market expansion
- More available weapons
- More enemies
- More AI elements to interact with

7. References

movement:

<https://www.google.co.uk/search?q=movement+animation&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjs7K6JpsPJAhUGKg4KHcF-D3AQsAQIHA&biw=1920&bih=957#tbm=isch&q=walk+animation&imgdii=lc9YX9OmAKgfnM%3A%3Blc9YX9OmAKgfnM%3A%3BNRB>

zombiecook:

<https://www.google.co.uk/search?q=movement+animation&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjs7K6JpsPJAhUGKg4KHcF-D3AQsAQIHA&biw=1920&bih=957#tbm=isch&q=zombie+death+animation&imgrc=ultrDJAIarEcpM%3A>

stick:

<https://www.google.co.uk/search?q=movement+animation&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjs7K6JpsPJAhUGKg4KHcF-D3AQsAQIHA&biw=1920&bih=957#tbm=isch&q=analog+stick+control+touch&imgrc=jszWvXZMIX4OQM%3A>

Button:

<https://www.google.co.uk/search?q=movement+animation&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjs7K6JpsPJAhUGKg4KHcF-D3AQsAQIHA&biw=1920&bih=957#tbm=isch&q=Button&imgrc=hQPGKTeEg3z20M%3A>

Mines:

https://www.google.co.uk/search?q=dota+2+mines&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiS8_PorcPJAhUB9g4KHwIkCJoQ_AUIBygB&biw=1920&bih=957#tbm=isch&q=dota+2+techies+mine&imgrc=EPJz6tNm1OxlkM%3A

Candygun:

https://www.google.co.uk/search?q=sweet+gun&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi5moiTr8PJAhUEJQ8KHWrBAFYQ_AUIBygB&biw=1920&bih=957#tbm=isch&q=candy+gun&imgrc=eT0ZPFn6KnkSgM%3A

zombie1:

https://www.google.co.uk/search?q=sweet+gun&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi5moiTr8PJAhUEJQ8KHWrBAFYQ_AUIBygB&biw=1920&bih=957#tbm=isch&q=zombie++moving+drawing&imgdii=55oeHFicWQH5BM%3A%3B55oeHFicWQH5BM%3A%3BZ-Do_1gpcY-nuM%3A&imgrc=55oeHFicWQH5BM%3A

zombie2:

https://www.google.co.uk/search?q=sweet+gun&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi5moiTr8PJAhUEJQ8KHWrBAFYQ_AUIBygB&biw=1920&bih=957#tbm=isch&q=zombie++moving+drawing&imgdii=55oeHFicWQH5BM%3A%3B55oeHFicWQH5BM%3A%3Bs0ul_Ta7HE89QM%3A&imgrc=55oeHFicWQH5BM%3A

Sprinkles:

https://www.google.co.uk/search?q=sweet+gun&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi5moiTr8PJAhUEJQ8KHWrBAFYQ_AUIBygB&biw=1920&bih=957#tbm=isch&q=sprinkles&imgrc=L7OKGDCQOGWsXM%3A

Milkshake:

https://www.google.co.uk/search?q=sweet+gun&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi5moiTr8PJAhUEJQ8KHWrBAFYQ_AUIBygB&biw=1920&bih=957#tbm=isch&q=dunkin+donut+cup&imgrc=FINO_jVzi9zI0M%3A

Box:

https://www.google.co.uk/search?q=sweet+gun&source=Inms&tbm=isch&sa=X&ved=0ahUKewi5moiTr8PJAhUEJQ8KHWrBAFYQ_AUIBygB&biw=1920&bih=957#tbm=isch&q=dunkin+donut+box&imgrc=cbSSFrsFqzyiM%3A

Muffin:

https://www.google.co.uk/search?q=sweet+gun&source=Inms&tbm=isch&sa=X&ved=0ahUKewi5moiTr8PJAhUEJQ8KHWrBAFYQ_AUIBygB&biw=1920&bih=957#tbm=isch&q=muffin+3d+&imgrc=skCTxFyUNThJsM%3A

pad:

https://www.google.co.uk/search?q=smartphone&source=Inms&tbm=isch&sa=X&ved=0ahUKEwim19q9hsXJAhUGzxQKHSgWBfkQ_AUIBygB&biw=1920&bih=957#q=smartphone+white+screen&tbm=isch&tbs=isz:l&imgdii=vo3y4eZe_y1UHM%3A%3Bvo3y4eZe_y1UHM%3A%3BFLhMTGdSiRi3vM%3A&imgrc=vo3y4eZe_y1UHM%3A

donut:

https://www.google.co.uk/search?q=donut+comic&source=Inms&tbm=isch&sa=X&ved=0ahUKEwii_-Du1sbJAhVKnRoKHfPyDukQ_AUIBygB&biw=958&bih=578#imgdii=BpXIOUPNbaTMxM%3A%3BBpXIOUPNbaTMxM%3A%3B14gTsKxi7rSH7M%3A&imgrc=BpXIOUPNbaTMxM%3A

Health

bar:

https://www.google.co.uk/search?q=donut+comic&source=Inms&tbm=isch&sa=X&ved=0ahUKEwii_-Du1sbJAhVKnRoKHfPyDukQ_AUIBygB&biw=958&bih=578#tbm=isch&q=health+bar&imgrc=tqHVVhUWim79jM%3A

store:

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