Fast Food Wars

A Computer Game Developed for Melange Computing Services

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Project Description

Project Overview

Fast Food Wars is a turn-based strategy board game for 2 to 6 players which is played on a computer. Age recommendation for this game is ages 11 and up. This game places fast food franchise owners against each other in a war to conquer the city and its suburbs. Each player owns a certain franchise and battles their opponents to become the last one standing. This is a fast paced strategy game requires luck as well as intelligence to become the winner who will be named the most successful businessman.

Each player starts their board piece on their respective end of the hexagonal board and is given a certain amount of seed money. The board is a hexagonal game board which is modeled after the layout of a city. The center of the board represents high-priced, downtown locations and the area near the boundaries represent the suburbs where land is cheaper. Board pieces are designed to model a popular type of fast food restaurant chains, for example a burger and fries or a couple tacos. The player advances their piece one board block at a time. Along the way the player may choose to purchase the board spaces they land on or decline to buy them. Purchasing a board space represents the opening of a franchise. At the beginning of each turn, the player is given a "payout" (i.e. given game money) proportional to the number of franchises owned and the location of those franchises. Properties in the center of the city have higher payouts, but come at a higher initial cost and suffer from more competition from other players. This simulates the real world competition between franchise owners.

Players can either move to a empty space and purchase it for face value or try to conquer an opponent's space. When facing off with an opponent's franchise, it is both luck and monetization which determines the players fate. The storyline is as follows. The player who is attempting to conquer a board space sets up a franchise in that area. The more money invested in this particular franchise the more chance that this franchise will succeed. This is modeled by the player laying down a dollar amount which is comparable to the price of real estate in that area. The player may add to this dollar amount up to 6 times a required investment amount specified on the space to be given an extra advantage. The fate is decided by the roll of the die, depending on how many times the required investment the player has paid. For each payment of the specified investment amount, the player gets an extra side on the die. For example, if the player pays 3 times the investment amount specified on the board space and then rolls a one, two, or three, they will win the board space being battled over. In real terms, this represents the player's franchise outperforming the other player's franchise, causing the defending player's franchise to shut down. If the player rolls a four, five, or a six then the offensive attacking player loses the investment money he or she put down for the property and then the franchise closes, leaving the defending player's franchise in place.

Gameplay continues until one player has completely vanquished all of their opposing players franchises.

This game will be implemented using the Java programming language and will be initially developed for the Android operating system, with the intention that versions for other operating systems will be available in the future. The game can be played as a single player versus one or several AI players, as well as multiplayer versus up to 5 other players over the Internet.

The Purpose of the Project

The main focus of the project is to attempt to capture some of the gaming market that has been identified as being underserved. Melange must be able to develop a product that engages its users with competitive and lively gameplay and provides hours of entertainment to its end users. This game models the competitive edge that exists in the fast food franchise world. There is a constant struggle in this world to be the most popular restaurant, open more and more businesses, and make the most money. This board game takes all the competitive edge of this aforementioned franchise world, boxes it up, and brings it to the user.

The User Business or Background of the Project Effort

This project is to create a strategy board game with the fast food franchise world as its model. The user will be provided with hours of entertainment and fun gameplay.

The situation of the fast food franchise world today is of great ubiquity and importance. The competition is fierce and only a few great restaurants can survive. This competition is the backbone of Capitalism and the central motivation in this game. Our proposed client, Funskool, Inc. believes that this type of competitive gameplay will draw their customers to purchase this computer game.

Considering the ubiquity of the computer-based game industry, this project will strive to gain great profits for our client. It is our clients understanding that a game of this type will hit the market with a heavy momentum and will achieve great sales. It is our prerogative then to make this product as user friendly as possible so that our client can achieve this goal.

Goals of the Project

The product being developed is a computer-based video game based on a fast food franchise competitive board game. The client knows that this game is unique and will accommodate their customers desire to play fun and strategic board games on their computers.

The business being described in this game is that of the fast food industry. Fast food chains have turned to franchising to gain greater profit margins and expand territory. This game

takes this principle and creates a fun strategy game based on it. The motivation behind this game is for the end user to be interested in this type of competitive game play in a knowledge domain each one of them has some familiarity with.

People want to be able to play fun games with their friends and families and would be interested to play as fun characters like tacos or a burger and fries.

Measurement

We expect to develop a product that is above a 90% satisfaction rate from end users, as measured by an independent third party.

We expect to develop a product that is relatively bug-free. A product will be considered relatively bug-free if a maximum of 1 high-priority bug fix is submitted in the month after the initial development phase.

We expect to develop a product that meets or exceeds all client expectations and eventually purchased.

The Scope of the Work

The initial release will consist of an Android client and a HTTP-based back end.

The Current Situation

For the past 15 years, Melange Computing Services has focused entirely on developed 3d Games. While successful, development costs are high and the market is both limited and saturated. There are currently no products that the company has developed that are playable on mobile devices or are developed with networked play as a primary objective. The development of Fast Food Wars would signal an initial foray into the market of cross-platform games. As such, while the company has a wealth of traditional software development resources, the company has few web resources available. It will be critical that the company devote some resources to developing this area.

The Context of the Work

The development of Fast Food Wars will require knowledge in two specific areas, fast-food restaurant industry and computer systems. The fast-food industry should be understood at a high level to be able to simulate what makes a fast-food chain successful and at the micro-scale to be able to simulate a particular location. In terms of computer systems, it is necessary to investigate the development of hardware and software that will be required to run the back end web services. This might include web servers, database server, load balancers, and routing hardware. Mobile and some desktop clients (most notably Mac OS X) clients will have to interface with push notification systems. Experts with experience interfacing with these systems should be consulted. Additionally, since a goal of this project is to develop cross-platform services, a development framework must

be investigated to minimize development duplication.

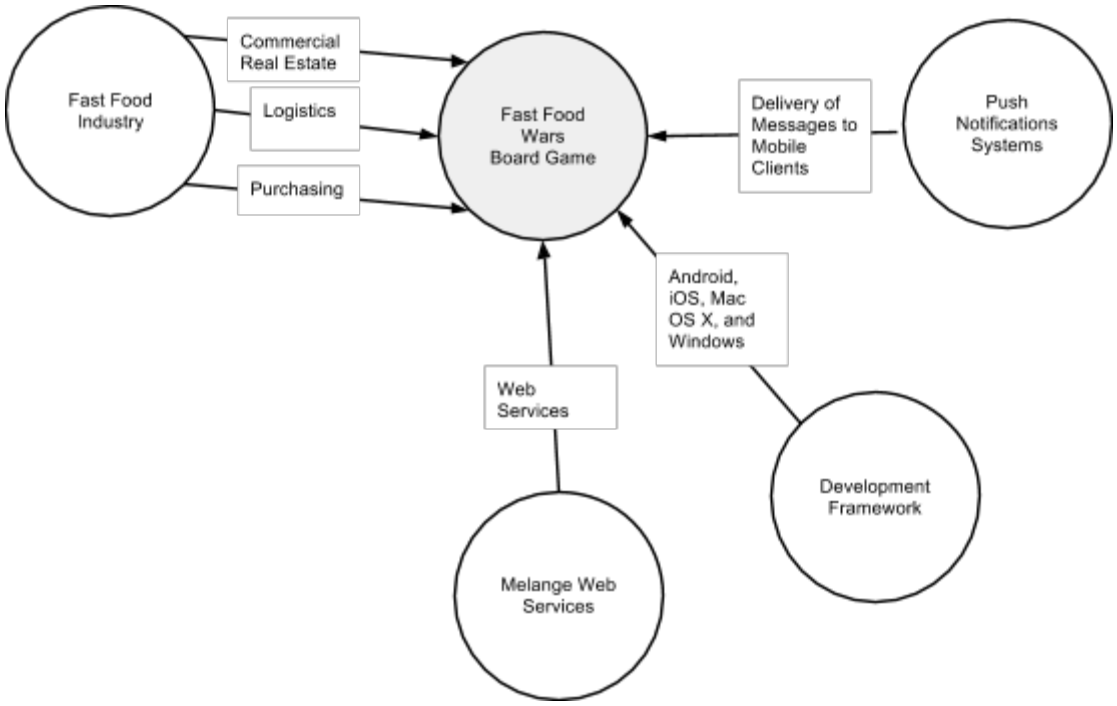

Figure 1 - Work Context

Work Partitioning

Event Name	Input and Output	Summary
Player Starts Game	User Event (In)	Displays splash screen.
Player Chooses Single Player Game	Game Selection (In)	A new game is started.
Player Chooses Multiple Player Game	Game Selection (In)	The web services are queried and user is added to active game or to new game.
Player moves in Single Playe Game	User Move (In)	The player moves and the A moves for computer players.
Player moves in Multiple Playe Game	User More (In)	The player move and sends the move to the web services.
Player Wins Game in Singl Player Mode or Multiple Playe Mode	Scoreboard (Out)	The scores are displayed after each game.

Table 1 - Business Event List

Competing Products

There are many examples of competing products. In the realm of traditional board games, there are such games as Monopoly© and Stratego© offer similar elements to Fast Food Wars. There are web versions of board games as well (i.e. Words With Friends© is a web version of Scrabble©). There is a smaller niche for this game, as it uses the paradigm of a board game, but is solely computer based.

The Scope of the Product

Product Boundary

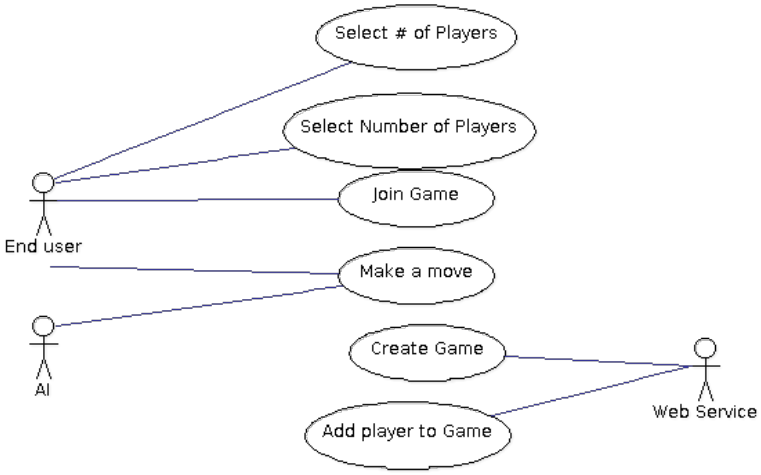

Figure 2 - Product Boundary

Stakeholders

The Client

Initially, the client will be developed in-house, for Melange, but the goal is to develop a relationship with an outside entity so that Melange can shift its focus to the development of software, rather than marketing and distribution.

The Customer

We have identified an interested party for the project, Funskool, Inc. Funskool is a joint venture between Indian tire giant, MRF, and Hasbro, Inc., the worldwide leader in children's and family leisure time products. After more than thirty years effort, Funskool has emerged as the largest toy company in India. This project will be successful only if we meet the needs of Funskool or similar company. The rapid rise of mobile devices has piqued the interest of Funskool.

Domain Expert

Fast food industry Experts

As this game is based on the theme of fast food industry, fast food industry experts are invited to participate the whole process of game design competition strategies design. Experts are expected to ensure the correctness and rationality from general ideas to specific implementations. All items present in this game should originate from real life and the design should consistent with customers' daily experience. Furthermore, in-depth knowledge of fast food industry should also be provided to customers in terms of game guides and helps.

To this end, we have identified George Forrest, who owns five McDonald's franchises in Charlotte, North Carolina. He can be contacted via LinkedIn at http://www.linkedin.com/pub/george-forrest/8/6b8/454 .

Software Interface Specialists

As this game is designed to interact with other softwares on mobile devices, software interface specialists are invited to join this game to smooth interaction between different software interfaces. For example, when customers want to solve problems by phone calls, this game need to interact with low level interfaces of mobile devices. Interaction with browser's interfaces is needed when customers prefer online solutions. And this game also needs to interact with network interfaces when customers are playing online games.

Network Experts

As one of goals of this game is to provide interaction between customers, network experts are invited to participate in this game. They provide optimized solutions adapting to different network infrastructures which ensure best user experience. They are also responsible to provide optimized server side network solutions.

3D Engine Experts

Although this game is a tabletop game, strategies are main features other than fancy 3D effects. 3D effects allow this game to take advantage of the latest displaying technologies such as the overall quality and performance of the game.

Artificial Intelligence Experts

This game has player vs. player model and player vs. AI model. The AI system is designed to learn and estimate players' behavior with empirical learning algorithm. AI experts are invited to provide statistic based learning algorithm which enables the AI system can learn from experience as human do.

Hands-On Users of the Product

First Time User

First time user would be prompted with guides and helps in term of multiple questions. Helps would be provided at key steps of all procedures. User will be asked if the guides and helps should be turned on or off at the first time of running this game. User might choose to turn it off and and turn it on later in the game settings. An extra link pointing to Funskool online customer helping center is also available. If user guide and help information fails to provide customers helpful answer, customers can click this link for extra help online. Once customers click this link, the game will be temporarily suspended and customers will be asked to choose if they want to solve their problems with phone call or online. If customers prefer phone call and their devices are cell phones, phone calls will be made automatically. If customers play this game on tablets or touch screen computers, only the phone number would be provided to customers and no attempt of phone calls would be made. If customers prefer solve their problems online, they would be redirected to online helping center with default Internet browser on devices. Non-first time user could find help and guid information also in Q&A sections of this game or refer to online discussion forum or game masters supported by Funskool.

Multi-Language Support

In order to fully exploit international game market, Funskool decide to provide different language versions of this game. Once installed, this game will automatically detect the language packages installed on devices (Language Packages for Operating System of that device), and prompts customers with options to download languages for this game according to installed language packages list. Customers could also download language packages not in that list. If there is no language package available for some customers, they are encouraged to ask Funskool for language packages. If some customers want to create their own language packages, they are encouraged to ask for language package creating tutor materials.

Maintenance Users

The maintenance users will be broken down into three categories. Facing the customer will be a Customer Support Representative (CSR). The CSR will be responsible for front line technical and user support through email, Twitter©, and chat rooms. Issues in either the web platform or the client software that cannot be resolved will be escalated to a Web Support Technician (WST) or a Client Support Technician (CST). Issues that cannot be resolved will be turned over to Support Developers.

Mandated Constraints

There are certain constraints that must be satisfied, although we intend to leave as much to the developers as possible.

Solution Constraints

Description: The product should run on any Android device version that runs version 4.0 (Ice Cream Sandwich) or later.

Rationale: While prior versions are prevalent, devices with version 4.0 or greater make up 65% of the Android marketplace and is rapidly becoming the baseline for devices.

Fit criterion: The application successfully runs on an Android device 4.0.x, 4.1.x, and 4.2.x.

Implementation Environment of the Current System

As this is a new application, there is no system in place. Melange does host servers in two location in the United States, in Salt Lake City, Utah and in Alexandria, Virginia. It is expected that these facilities will host the web portion of the solution. These services have redundant power systems with battery and off-grid, diesel backup with fuel to supply the facility for 7 days in the event of a disaster. The facilities also have redundant backup Internet access from Tier-1 providers. Security, cooling, and cable management are state of the art.

End users will obtain the application through the Google Play Store, accessible through all Android devices. Guidelines can be found in the bibliography.

Partner or Collaborative Applications

The system will interact with the Google Cloud Messaging system (GCM). The GCM service allows messages to be sent to the application when the application is in the background or not running. In the future, iOS and Mac OS X clients will use the Apple Push Notifications Service, while Windows clients will use Windows Azure.

Off-the-Shelf Software

For the development of the Android client, it is suggested that a framework that is capable of generating code for multiple operating systems. It is recommended that QT and Processing be considered, although this is by no means an exhaustive list of frameworks that could be useful.

For the web API, it is suggested that a combination of Apache web server and the mySQL database be used, with a suitable open-sourced framework for the HTTP connections.

Possible frameworks include Rails-API (Ruby), Node.js, or Slim (PHP) be considered. Since Web technologies change so fast, it is imperative that the skillset of the team that is tasked with building this product be taken into consideration.

In both instances, Git should be used for source control management. Melange currently has a Gitolite server for hosting Git repositories. It is anticipated that this can be used with little to no configuration.

Redundant, commodity servers should be sufficient for the initial release. Additionally, sufficient workstations or laptops should be provided to the entire development and support team.

Anticipated Environment

This product will be used on a wide variety of devices so the user interface must be fairly high contrast.

Mobile devices can lose and regain Internet connectivity often. To this end, any loss of Internet connectivity should not change the state of the game.

Push notifications should not be considered reliable. The system should provide a mechanism to sync game state.

Schedule Constraints

The initial phase of this project should be completed within 14 weeks, as it is anticipated that the window of student developers is a single semester. If the project is not finished within this time period, the project should be a complete loss as it is unlikely that future students will take on the project.

From a business standpoint, the market is already crowded, and Melange is late to the game. Thus a marketing campaign has been linked to the successful release of the project. Melange has committed to investing significant resources to this campaign. Certain parts of the campaign are not time critical, but the loss from other parts can be significant. To this end, it is imperative that a customer release be ready within 20 weeks of project start.

Budget Constraints

There is currently no budget for the development of the project, as student knowledge and labor will be utilized throughout the project. However, hosting and supporting the web services has be estimated as follows:

Description	One Time Price	Monthly Price	First Year Total
Hardware	$5,000.00		$5,000.00
Connectivity		$100.00	$100.00
Technical Support		$1,000.00	$12,000.00
		Total	$17,000.00

Table 2 - Initial Budget

Naming Conventions and Definitions

Definitions of Key Terms

This section is in progress. Further definitions will be included once object models are identified.

player - A user of the software.

computer player - A player controlled by the computer AI.

human player - A player controlled by an end-user.

board - The hexagonal board where all play takes place.

MWS - Melange Web Services - refers to any web services hosted by Melange.

MWS team - The web team responsible for development, deployment, troubleshooting, and maintenance of MWS.

mobile device - Any mobile device that is running the Fast Food Wars software. For the first release, this will specifically be Android devices.

push notification - Any message sent through a third-party server that can be delivered to the device when the software is either running or not running.

UML and Other Notation Used in This Document

This document uses the ISO standard UML version 2.4.1. A link to this specification is listed in the bibliography. Any departure from this specification will be listed here.

Data Dictionary for Any Included Models

As models have not been developed, this section is a work in progress.

Relevant Facts and Assumptions

Facts

85% of Americans play videos games.

The average age of the most frequent video game buyer is 35 years old.

36% of gamers play on their smartphones.

Purchases of mobile games represented 40% of the market in 2012.

Assumptions

Mobile games will become an increasingly important area for game development.

Tabletop games are a natural fit for mobile devices.

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