Department of Computer Science & Engineering
The University of Texas at Arlington

Project Charter
CSE 4316: Senior Design I
Fall 2019

oVRworked
Cookums

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Revision History

Revision	Date	Author(s)	Description
0.1	09.27.2019	JL	Document creation
0.2	10.6.2019	KT	Transition from Spookums to Cookums
1.0	10.15.2019	KC, GK, JL, QT, KT	Initial Release of Charter

CONTENTS

List of Figures

1 Vision

Cookums is a Virtual Reality video game that will essentially provide the user an escape from reality and into a virtual world, where he/she will become a chef in charge of cooking up and delivering food orders to customers from a food truck. The gain of producing this video game is nothing more than pure entertainment for it's user.

2 Mission

In order to achieve our vision, we will have to balance the concepts of challenging the user interacting with the video game, as well as not challenging the user too much to where it's no longer enjoyable. To accomplish this we shall:

- Reduce the amount of time it takes to cook a food object drastically
- Make food objects such as lettuce, tomato, hamburger buns, and etc, readily available to be grabbed
- Allow Food objects that need assembling to easily snap into place if placed on top of each other

3 Success Criteria

Upon completion of the prototype system, we expect the following success indicators to be observed when demoing the game:

- 70% of visitors express desire to try gameplay
- 75% of visitors expressing positive interest after trying gameplay

Within 1 month after the release to Steam, we expect the following success indicators to be observed:

- At least 100 game downloads
- A positive or better review rating for the game

Within 12 months after the release to Steam, we expect the following success indicators to be observed:

- At least 500 game downloads
- The maintenance of a positive or better review rating for the game

4 BACKGROUND

We are to develop a virtual reality food truck simulator that is considered fun to play by a majority of users. There is a need for improved virtual reality video games as the technology and industry are still developing. There are currently several virtual reality videogames that revolve around the idea of cooking and prepping food for customers. These other video games have had limited success, and we hope our project will analyze these competitors and their mistakes and create a more competitive version that can succeed where other attempts have failed. We have found that other attempts have had one or more of the following issues in design.

- Creepy or unsettling character design.
- Unrealistic capabilities. i.e. pulling fries out of a fryer with your bare hand.
- Repetitive nature of gameplay that causes boredeom after novelty has worn off.
- Poorly implemented, or lack of, gameplay progression.

5 RELATED WORK

There are several other cooking-based VR games, including:

- *Food Truck VR* by *Gambit Games Studio, LLC* [1]
- *ChefU* by *Lockem Reality* [2]
- *Job Simulator* by *Owlchemy Labs* [3]
- *The Cooking Game VR* by *Play Spirit Limited* [4]
- *Dead Hungry* by *Q-Games Ltd.* [5]

The reason why we decided to pursue our own VR food truck game in spite of *Food Truck VR* [1] is because *Food Truck VR* [1] falls short in being a fun experience. Much of the content progession does not add any new interesting mechanics to the gameplay, and there is a lack of urgency. As a minor issue, *Food Truck VR*'s [1] graphics are weird.
ChefU's [2] appearance is excellent, but it comes with performance issues and bugs that prohibit actual gameplay. It is also expensive.
Job Simulator [3] is notable for having a cooking portion, but it is not a cooking focused game.
For all of these games (aside from *ChefU* [2]), there were gameplay constraints that we felt did not capture the spirit of cooking in a VR environment.
The Cooking Game VR [4] suffers from strange graphics, although the gameplay is ok. It is focused on being competitive, while our project aims to be more arcade-like.
Dead Hungry [5] is somewhat closer to what we are attempting, but has a strange premise and appearance that does not attract interest.

6 SYSTEM OVERVIEW

The system we will create will have three major components. The components are the video game application, the computer executing the video game application, and lastly the virtual reality equipment.

- The video game application will consist of all software managing the game logic. It will also contain all assets included in the video game.

- The computer is the machine that the video game application will be executed on and will handle all hardware connections between the application and the virtual reality equipment.
- The virtual reality equipment will include the headset and controllers which will give input for the players actions and will give responses back to the player in the form of images and vibrations.

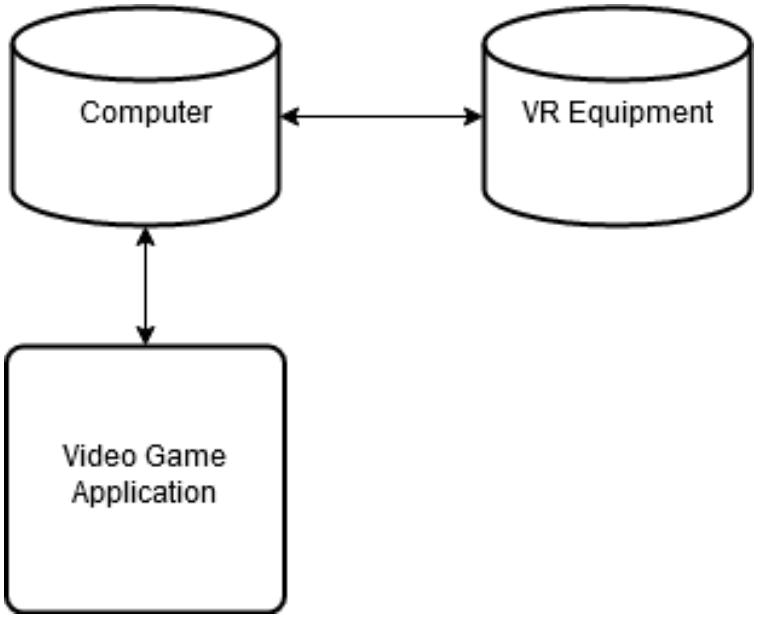

Figure 1: High-level System Architecture

7 Roles & Responsibilities

Stakeholders of this project include the development team, virtual reality game enthusiasts, and Christopher Conly, Ph.D.

The point of contact for all sides will be Kevin Tung.

The full team, alphabetized by last name:

- Zachary Cross
- Geetesh Kalakoti
- John Livesay
- Quinton Tompkins
- Kevin Tung

No concrete roles or responsibilities have been designated on the team at this time. Instead, each member is encouraged to step up and take responsibility as needed. It is possible that in a future sprint retrospective, the team decides to have roles.

8 Cost Proposal

Our biggest spending would have been on a PC that can run VR games for testing and the HTC Vive VR headset. This is not the case however, as these have been lended to us by the department. Because of

this we do not expect to make a large dent into our funding. At most we predict we will use a quarter of the funding on quality of life and development improvements such as foam headrests and further power banks for the wireless adapter addon.

8.1 Preliminary Budget

Name	Estimated Cost	Reasoning
Game Assets	$200	Rather than creating our own assets from scratch we deemed it best to purchase premade assets from the Unity Asset Store.
Foam Headrests	$50	Despite the provided headrest functioning personally well, it would be best for each member to have their own headrest for the sake of hygiene.
Extra Power Banks for Vive Wireless Adapter	$60	The stock power bank for the Vive wireless adapter has a very long charging time and a very short usage time. Due to this development will be heavily restricted unless we have backup banks which we switch between charging and usage to prevent interruptions.
Domain	$20	A domain to host the project website.

8.2 Current & Pending Support

We will, both presently and for the forseeable future, only be depending on the default $800 of funding provided by the University of Texas at Arlington's CSE department.

9 Facilities & Equipment

The project requires that we have the VR headset and accompanying equipment and a PC that is able to run the project for testing. This equipment will be provided by the university so that we may use it in our work. The accompanying equipment includes 2 controllers, tripods, and various cables and parts. We will also acquire a VR wireless adapter extension from the university to increase ease of development. Finally, we will need to purchase, with our budget, a total of 5 foam facerests for each team member and 2 spare power banks for the wireless adapter to improve development efficiency. The VR headset, additional equipment, wireless adapter, PC, and purchased items will be returned once development has been completed at the end of Senior Design II.

In order to meet our needs for development and testing of the project we are using multiple facilities. The primary facility for development and testing will be our assigned lab space in Room 208 of the Engineering Research Building. The lab space will have a desk area to setup the PC and an area of 64-100 square feet to test the project in VR. Our secondary workspaces will be each individual team member's homes. It is not possible to fit 5 computers in the provided lab space so a portion of the development must be done on our personal computers. Despite development being done at homes and in the lab, we can only fully test the project while in the lab space. We also have a Jira Server hosted by Kevin Tung in his household, used to track sprints and development progress.

Finally, to keep our lab space and equipment safe we will have a lock box which will store the VR headset, wireless adapter and various other parts. The PC provided will have locks so that it cannot be

opened up. The 2 lighthouses which are situated on the tripods positioned at opposite corners in the lab will be unplugged after being used. This will allow us to monitor any tampering.

10 Assumptions

The following list contains critical assumptions related to the implementation and testing of the project.

- The lab space is always available for the team to use and develop in VR
- There will be sufficient space and power to demo the project on the demo date
- Artistic assets will be available for all elements in the game
- Each team member will contribute a reasonable share of development
- The issue tracking software being used does not suffer from outages

11 Constraints

The following list contains key constraints related to the implementation and testing of the project.

- Final prototype demonstration must be completed by May 8, 2020
- Team members schedules are not constant, and may prohibit team members from meeting up
- Research is needed to understand the concepts and limitations of virtual reality
- Total development costs must not exceed $800
- Team must learn how to utilize Unity

12 Risks

The following high-level risk census contains identified project risks with the highest exposure. Mitigation strategies will be discussed in future planning sessions.

Risk description	Probability	Loss (days)	Exposure (days)
Team has outside responsibilites that detract from project	0.90	30	27
Requirement changes waste development time	0.50	30	15
Access to only one set of VR equipment bottlenecks development	0.95	10	9.5
Team inexperience with tools and project domain makes start slow	0.70	5	3.5
VR equipment is damaged, malfunctions, or stolen	0.20	3	0.6

Table 1: Overview of highest exposure project risks

13 Documentation & Reporting

13.1 Major Documentation Deliverables

13.1.1 Project Charter

The Project Charter document will be updated and verified on Papeeria at the end of each sprint starting after the initial due date to make sure that nothing has changed. Any major changes to the original plan, and as due dates change. This project charter is initially due October 15th, 2019 and the final version is due before May 3rd 2020.

13.1.2 System Requirements Specification

The System Requirements Specification document will be verified at the end of every sprint to ensure it is accurate after the initial sprint where it is produced with the product charter. The initial due date of the System Requirements Specification is November 5th 2019, and the final version is due before May 3rd, 2019.

13.1.3 Architectural Design Specification

The Architectural Design Specification is gonna be updated after any major changes, and every other sprit revisited to ensure the information is accurate. We don't anticipate our architectural plan to change too much within the lifetime of this product during the class. The initial document will be completed by December 2nd, 2019 and the final will be finished before May 3rd, 2020.

13.1.4 Detailed Design Specification

This document will be maintained after any major changes to the project happens. Like other documents, this will be verified at the end of each sprint. The initial draft will be delivered February 27th 2020, and the final will be delivered before May 3rd, 2020

13.2 Recurring Sprint Items

13.2.1 Product Backlog

As ideas come up, we'll add them to the sprint backlog. After we're done brain storming the stories will be sorted into epics to keep things organized. The recurring sprint items are typically the title of our epics. The stories of our epics are then sorted through at the beginning of each sprint to know what part of the project to focus on. All stories will be prioritized by how far into game development we are. Greybox objects are prioritized higher than getting the textures on them so we can figure out the logic of the object and making sure that works. Decisions are then made by the group as much as possible. We are both the customer and the developer. All of this is going to be managed within Jira.

13.2.2 Sprint Planning

Sprint planning will be organized after sprint retrospective on Jira. There will be 12 total sprints over two college semesters. Our sprints will be two weeks long.

13.2.3 Sprint Goal

As a group we will decide the Sprint Goal after making velocity estimates from previous sprints.

13.2.4 Sprint Backlog

We decide how items move along the sprint board as a group. Everything will be kept track of within Jira.

13.2.5 Task Breakdown

Individual tasks will be assigned based on a voluntarily basis for as long as possible.

13.2.6 Sprint Burn Down Charts

Jira automatically generates burndown charts for each sprint at the end of the sprint. The burndown chart is an attempt to measure the team as a whole, and not any individual.

13.2.7 Sprint Retrospective

Sprint retrospectives will take place on Fridays during the regularly scheduled lab time, at the end of the sprint. Each team member will state something unique for both what the team did well and what

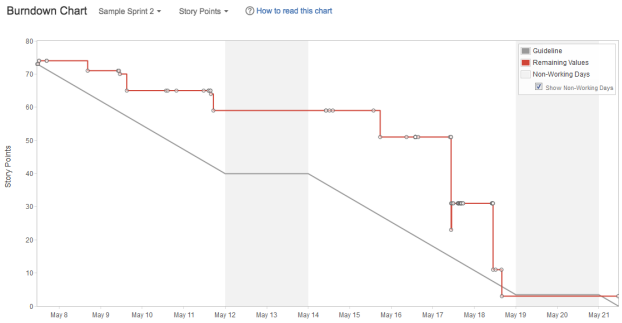

Figure 2: Example sprint burndown chart in Jira

the team did not do well. At the end of the retrospective, the team will produce actionable items which will be taken into account for future sprints to improve.

13.2.8 Individual Status Reports

There will be no status reports. Instead, we will have scrum each time we meet for a status report substitute.

13.2.9 Engineering Notebooks

At least once a sprint, each team member will make an entry in the notebook.

13.3 Closeout Materials

13.3.1 System Prototype

The system prototype will be a video game executable for Windows 10.

13.3.2 Project Poster

The project poster will include details about our team, our development process, and some design challenges we encountered.

13.3.3 Web Page

The web page will have a trailer for the game and a link to download, and all the details on the project poster.

13.3.4 Demo Video

The demo video will be a short video featuring choice moments gameplay.

13.3.5 Source Code

The license has not been determined, but is currently closed source. We will use bitbucket and git to manage our version control.

13.3.6 Source Code Documentation

Unity has some kind of built in documentation we will consider using. We will also maintain some level of documentation.

13.3.7 Installation Scripts

Unity will produce game executables for platforms and will not require installation scripts.

13.3.8 User Manual

We will hope to include a small tutorial in gameplay, but at this time there are no plans for a user manual.

REFERENCES

[1] Gambit Games Studio, LLC. Food Truck VR. Video Game, 2018.

[2] Lockem Reality. ChefU. Video Game, 2017.

[3] Owlchemy Labs. Job Simulator. Video Game, 2016.

[4] Play Spirit Limited. The Cooking Game VR. Video Game, 2018.

[5] Q-Games Ltd. Dead Hungry. Video Game, 2016.