

HEALTHY VEGEFRUIT : 2D EDUTAINMENT GAME

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HEALTHY VEGEFRUIT : 2D EDUTAINMENT GAME

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This report is submitted in partial fulfilment of the requirements for the
Bachelor of Computer Science (Media Interactive)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2014

DECLARATION

I hereby declare that this project report entitled

HEALTHY VEGEFRUIT – 2D EDUTAINMENT GAME

is written by me and is my own effort and that no part has been plagiarized without citations.

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DEDICATION

To my beloved family, a million thanks for making me to come to this far in my life.
The support from you all makes me to stay still until now especially in my study.

To my supervisor, En Shahril Bin Parumo, and my evaluator, En Wan Sazli
Nasaruddin Bin Saifuddin, thank you for guiding me to make this project into
completeness.

To all my friends who lend their hand to me for all the time whenever helps is
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ABSTRACT

Healthy Vegefruit Game is a game that educate young people about the health of vegetables and fruits. This game is design for young people aged 18 years old to 25 years old. Recently, there are a lot of computer games available in the internet. But there is no about the health of vegetables and fruits drink game. Most of the games that available in the internet are mostly about the fruits drink. There is no vegetables and fruits drink available yet in the internet. This is a good opportunities to expand the knowledge of the health of the vegetable and fruit to the worldwide by playing games. This game will help young people to learn about how to make a healthy drink. This can attract young people to learn healthy drink with more depth. By using graphics, animation and sound effects, interest in young people are more likely than from reading a recipe book available in book stores. A comprehensive testing were done to evaluate the effectiveness of the game to enhance the user's knowledge on the healthy vegetables and fruits.

ABSTRAK

Healthy Vegefruit Game ialah sejenis permainan yang mendidik remaja tentang pemakanan sayur-sayuran dan buah-buahan yang sihat. Permainan ini adalah dicipta untuk remaja yang berumur 18 tahun hingga 25 tahun. Baru-baru ini, terdapat banyak permainan komputer yang terdapat di internet. Tetapi tidak ada permainan yang berkaitan dengan minuman kesihatan daripada sayur-sayuran dan buah-buahan. Kebanyakan permainan yang boleh didapati di internet adalah mengenai tentang minuman buah-buahan sahaja. Belum ada lagi minuman kesihatan daripada campuran sayur-sayuran dan buah-buahan di internet. Ini merupakan salah satu cara terbaik untuk mengetengahkan pengetahuan tentang pemakanan sayur-sayuran dan buah-buahan secara sihat melalui permainan. Permainan ini akan membantu remaja untuk belajar tentang bagaimana untuk membuat minuman yang sihat. Ini boleh menarik remaja untuk belajar tentang minuman sihat dengan lebih mendalam. Dengan menggunakan grafik, animasi dan kesan bunyi, pengguna akan lebih berminat daripada membaca sebuah buku resipi yang boleh didapati di kedai-kedai buku. Pengujian secara komprehensif telah dijalankan untuk menilai keberkesanan permainan ini dalam meningkatkan pengetahuan pengguna.

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LIST OF ABBREVIATION

PSM	Projek Sarjana Muda
UTeM	Universiti Teknikal Malaysia Melaka
PC	Personal Computer
2D	Two Dimensional
CS5	Creative Suite 5
ADDIE	Analysis, Design, Development, Implementation, Evaluation
ISD	Instructional System Design
UI	User Interface
DVD-R	Digital Versatile Disc - Recordable

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CHAPTER I

INTRODUCTION

1.1 Introduction

For this chapter, it will discuss about the introduction of the project. The introduction include project background, problem statement, objective, scope, expected output and conclusion.

1.2 Project Background

This product is a 2D Healthy Vegefruit Game for young people. Nowadays, young people working hard in the workplace has brought unprecedented pressure for them. This pressure make them facing a lot of health problem. For example, insomnia, hypertension, fatigued, and anxious. By playing this game, user will know the knowledge of the function of fruits and vegetables. Most people are leaking on the knowledge about the advantages of fruits and vegetables in term of healthy diet. This project will use 2D edutainment game as a platform to deliver the output. While 2D edutainment is the creation of picture in a two dimensional environment.

1.3 Problem Statement

According to Wikimedia, game is a structured playing, usually undertaken for the enjoyment and sometimes used as an educational tool. In this project, a 2D edutainment game will be developed. The target user of this game is for young people. Nowadays, social competitiveness is too strong. Young people working hard in the workplace has brought unprecedented pressure for them. Vegefruit drinks can make the blood become alkaline, the accumulation of toxins in the cell dissolve and excretes.

This game activity are making drink based on customer's request. Customer will appear with their health problem. Then user must open the menu and search what drink can solve the problem, after that follow the steps in the menu to make a drink for customers. By this way user will easily to remember the function of the fruits and vegetables. Besides that they also remember the steps of making the drink.

According to Brain Matrix, memory improvement is part of the memory game, the process can be done with few steps that can be easy and performed effortlessly [5].

1.4 Objective

The aims of the project are:

1. To study the game that educate users on healthy fruits and vegetables.
2. To develop a 2D edutainment game on healthy fruits and vegetables.
3. To evaluate the effectiveness of the 2D edutainment game.

1.5 Scope

This project is made especially for young people. Which is between 15 year-old to 24 year-old. Within this age they are facing a lot of health problem. With playing this game, young people will easily remember about the steps of making Vegefruit drink and it functions to overcome the health problem.

1.6 Expected Output

1. To enable user to get the general knowledge of making drink by themself.
2. This project will show how the reaction of player due to reaction through out the game.

1.7 Conclusion

This chapter is about the introduction for whole project. It include all the concept of the project. The implication in this 2D edutainment game will give benefits to young people who play this game and learn about the function of the fruits and vegetables.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This section will discuss about the facts and finding and methodology that will be practically used in this project. This chapter concentrate on the research related to the topic of the project that will be developed by determined the related topic, searching and collecting the information, and analysing the related information about game based learning on health. The topic of research for this project will be based on the game based learning on health for the young people and related topics.

The project methodology is process of an approach that used to develop a project to achieve its objectives. There are so many kinds or types of project methodology. Each methodology that chosen is based on what kind of project will be developed. For this game based learning on health, methodology that will be using is ADDIE Model. Briefing of this methodology will be explained in later. This section will explain about project methodology of the whole process of game development.

2.2 Facts and Findings

2.2.1 What is Vegefruit drink?

Vegefruit drink is made from vegetables and fruits with physical method such as squeezing. Vegefruit drink can relieve the accumulated of toxins and waste from the body, when Vegefruit drink into the human digestive system, it will make the blood alkaline, the accumulation of toxins in the cells dissolve and excretes.

Affected by the modern busy life, environmental changes and dietary behavior change, it is easy to ignore the importance of diet, resulting in nutritional imbalance, the body immunity, physical decline, premature aging and other phenomena. Due to the ever-accelerating pace of life, people in order to cope with the busy work, often take in a lot of vitamin supplements, or in the supermarket to buy a variety of juices to meet the body's needs. But part of the juices drink that available in the market are already added chemical coloring or artificial fragrances to enhance the taste, these additives are detrimental to human health, so do the vegefruit by yourself, not only hygiene, healthy, can also be used in accordance with your own constitution, in order to reduce fatigue, enhance physical purposes.

Fruit and vegetables should be an important part of your daily diet. Fruit and vegetables rich in cellulose contained, can effectively promote gastrointestinal motility, constipation, reduce the incidence of cardiovascular disease and cancer, fruit and vegetables contain vitamins and minerals, that can help to keep your healthy. They can also help protect against some disease and can promote the body's metabolism, also can play the role of beauty.

Most Australians are benefit from eating more fruit and vegetables as part of a well-balanced, regular diet and a healthy, active lifestyle. There are many varieties of fruit and vegetables available and many way to prepare, cook and serve them [6].

Fruit and vegetables are low in fat, salt and sugar. They are good source of dietary fibre. Fruits and vegetables are as part of a healthy diet, it may help to

- control your weight
- lower risk of stroke, heart disease, and high blood pressure
- reduce risk of diabetes
- lower risk of some type of cancer
- boost energy level
- look and feel great.

2.2.2 Existing System

In order to develop new product or a system, research need to be done on the previous or existing system. It is use to make an enhancement for new project. Existing system is the current system or manual that has similar importance or approach to the new system that going to be developed. Well, the research is done to get the pros and cons features for the existing system and to be applied and produce the best result on the new system.

2.2.2.1 Beverage Game

This is an online casual game. This game is only have 3 minutes to play. Player are need to follow the order of the guests and prepare the drink for the guests. The customers will not leave no matter how long the wait. They only leave when they receive the drink that they order.



Figure 2.1: Beverage Game

2.2.2.2 Sushi Bar

This is an Android fun time management game. Player can build their own Sushi restaurants over the worldwide, and manage the shops to be the best. Player need to keep their customers happy and serve them the right dishes. They really have to rely on their memory skills, each level has different cash and reputation target.

Player start open their own Sushi Chain Store in Japan, then they can expand their business through the worldwide, different menus according to different places. Every next level more sushi ingredients will be added and the more complex they sushi making will be.



Figure 2.2: Sushi Bar

2.2.3 Comparison of Existing System

Table 2.1 below shows the comparison of two existing system.

Table 2.1: Comparison between Beverage Game and Sushi Bar.

	Beverage game	Sushi Bar
Technique or Domain	2D Game Online	Android game
Advantage	-Easy to follow the instruction. -Various of drink can be made.	-Various of sushi can be made.
Disadvantage	-Need connection to internet to play the game. -This game is in Chinese. -Only have 3 minutes to play this game.	-Only focus on making sushi. - Need connection to internet to play the game.
Approaches	-Provide the instruction followed by the practical phase.	-Using brain to memorize the sushi ingredient even though the recipe is provided.

This Healthy Vegefruit Game is different from those existing game. In this game it apply the advantages of those existing game and add on some attractive things to attract young people to play it. The recipe in Sushi Bar is only teach the player how to make sushi. While in Healthy Vegefruit Game the recipe is not only teach the player how to make the drinks, it also have the information of health for the drinks. In Beverage Game there is only a 3 minutes to play and no level for the game. In Healthy Vegefruit Game it have 3 level to show the difficulty of the game.

2.3 Project Methodology

The project methodology that's going be used as a guideline of this project is ADDIE model. The ADDIE model is the generic process traditionally used by instructional designers and training developers. There are consist five stages which are analysis, design, development, implementation, and evaluation. They are representing a dynamic, flexible guideline for building effective training and performance support tools. Instructional theories also play an important role in the design of instructional materials.

Theories such as behaviourism, constructivism, and social learning cognitive help shape and define the outcome of instructional materials. This methodology are used because for its simplicity, ease of application, and cyclic nature. It is an Instructional System Design (ISD) model. Most of the current instructional design models are spin-offs or variations of the ADDIE model [7].

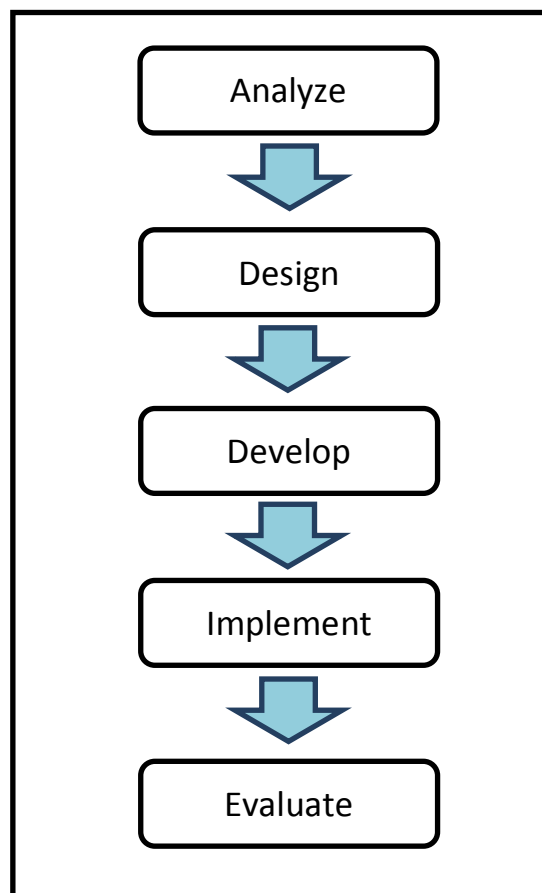


Figure 2.3: ADDIE Model

Each step has an outcome that feeds into the next step in the sequence. There are probably over 100 different variations of the generic ADDIE model. The five phases of ADDIE are as follows:

2.3.1 Analysis

During analysis process, the developer should analyzes and the requirement of the target user and the scope of the game based learning that already listed in early development process also the user expectation for this game development at the end of the development process. The developer identifies the learning problem, the goals and objectives, the audience's needs, existing knowledge, and any other relevant characteristics. Analysis also considers the learning environment, any constraints, the delivery option, and the timeline for the project. Any difficulties that come up on the existing game will be inspect in this phase and it will come with the solution for that problem.

2.3.2 Design

After done with the analysis process, design process will come up next. The design process of the game will be based on the outcome from the analysis process. After getting the user requirement and the user expectation, then the design architecture and game will be develop. This process include the sketching the storyboarding and the flow of the game. The interface of the game will be designed at this phase. Interface design should require the developer to see the metaphor and look and feel during developing the game. Detailed storyboards and prototypes are often made, and the look and feel, graphic design, user-interface and content are determined here.

2.3.3 Development

After designing the storyboard and familiar with the flow game, process developing is up to. This phsase includes, develop the characters, ingredients, background, sound, animation. At this point the character, button, movie clip and background of the game project will be created and edited by using the drawing tools in platform. Sound will be embedded into game project after edit. Link the each interface. After developed and link each interface according to the storyboard, function and button must be added using the action script to navigate the game accordingly.

2.3.4 Implementation

During implementation, the plan is put into action and a procedure for training the learner is developed. Materials are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is eveluated.

2.3.5 Evaluation

This phase consists of formative and summative evaluation. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation consists of tests designed for criterion-related referenced items and providing opportunitied for feedback from the users. Revisions are made as necessary.

2.4 Project Requirement

To develop the project, several hardware and software are required. Amongst the software required are:

2.4.1 Software Requirement

- i. Adobe Flash CS5
- ii. Adobe Photoshop CS5
- iii. Adobe Illustrator CS5
- iv. Microsoft Office Project 2010
- v. Microsoft Office Word 2010
- vi. Microsoft Office Visio 2010
- vii. GameSalad Creator

2.4.2 Hardware Requirement

Beside the software, hardware also required to develop the project. The hardware required is:

- i. Personal Computer
- ii. Printer and scanner

2.5 Conclusion

This chapter is consists of the literature review which included introduction, facts and findings, project methodology, project management, project schedule and milestones. This project will be develop based on these finding.

CHAPTER III

ANALYSIS

3.1 Introduction

Analysis is an activity performed during the requirements phase. The activities of analysis are focused on the problem domain and concerned with assuring the correctness and completeness of the requirements. This phase is the critical phase. The purpose of the analysis phase is to understand the user's requirements and the problem domain. This phase will determine the details of project requirement and how this requirement be accomplished.

Several approaches have been chosen which are addressing questions on what are the requirements of 2D animation elements that can attract children interest, seeking information regarding what are the strategies a reader is using and identifying areas that need attention for reading to develop.

The methods that will be used in this analysis phase are research observation and research on existed system. Things that will be analyzed are the result of the observation that will be used as reference for this project. The purpose of the observation is to understand the multimedia approach use in the current application. To get the user requirements to develop the project, we use finding and searching method via the internet to get the information about courtesy and polite. The result will be analysis to make a design for the project.

To develop the project, we need to identify the software, hardware and user requirements. The software requirements that we need to develop the project are Microsoft Office Word 2010, Adobe Photoshop CS5, Adobe Illustrator CS5, Adobe Soundbooth CS5, GameSalad Creator. The hardware requirements which are we need to develop the project are a set of personal computer, printer, scanner and digital versatile discs recordable (DVD-R).

3.2 Requirement Analysis

In order to collect requirements as regards to this project, survey will be hand out to the young people. This is to get the information about their knowledge and skill of making beverage that they have heard or knowing about this issue. Requirements and analysis phases are both focused in getting more understanding about the problem better and the software and hardware requirement also being discussed in this project.

3.2.1 Project Requirement

For project requirement in games, developers should determine and discuss on the requirement gathering such as the game genre, game storyline and analyzing the existing system. There is also a technical analysis such as what kind of device technologies that will be used in the project.

3.2.1.1 Requirement Gathering

Requirement is a declaration of what should the new system must gather the information in order to develop the product or what the characteristics it needed. This game is entitles with Healthy Vegefruit. This game will start with a menu screen. It requires the player to choose which button they want to click. Such as play button, how to play button and instruction button. These game have three levels. User must hit the target just can go to the next level. Moreover this project requirement consists of the need analysis, user analysis, technical analysis and resource analysis. In term of requirement gathering, there were be a topic that must be determined first such as the genre of the game, and game flow.

i. Game Genre

The genre of this “Healthy Vegefruit” game is Educational games. It content skill toteach the children. According to Marc Prensky, role play game includes coaching, feedback and continuous practice of learning activities. This game is using GameSalad as platform that mean it will be develop in 2D animation. This game is developing special for young people. This beverage game will encourage young people to learn how to make a healthy beverage. It helps the young people to know more about fruits and vegetables.

This action game includes level which is in this “Healthy Vegefruit” game have three level. User must to finish first level before they can go to the next level. It also has score at the end of the game.

ii. Game Flowchart

The summary of the functionalities of this game can be viewed in the form of a flowchart as shown below:

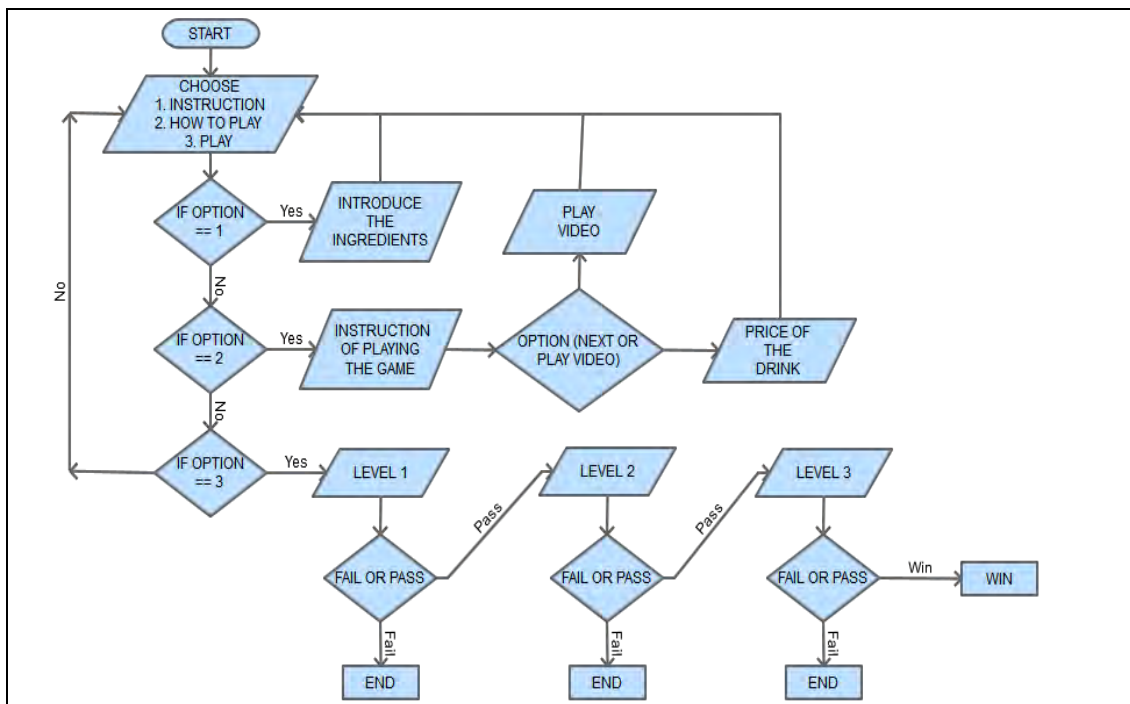


Figure3.1 : Flowchart for Healthy Vegefruit Game

In Healthy Vegefruit game the task is to learn the skill on how to making a healthy beverage. By refer to the flowchart, player will have three levels to play. For the first level, player will be given a menu and inside the menu will be five type of drinks. Player will follow the menu and click the suitable ingredient in making the drink based on the customer request. Then for the second level, the menu will add a new type of drink. The player also must follow the customer request to make a drink that the customer want to order.

3.2.1.2 Technical Analysis

Technical element can be analyzed based on the technology devices that being use in developing the game. For this project, mouse is used for game controller to ru the game. The point of technical analysis is to set up baseline technical capability and approximation progress cost, effort and implications in future. So mouse will be the main device to control the whole game. A game controller is an input device used to control a video game. A controller is typically connected to a personal computer. The mouse is often used with a mousepad to achieve greater

speed, comfort and accuracy for the gamer. Some video game consoles also have the ability to function with a keyboard and a mouse.

3.2.1.3 Need Analysis

Need analysis describe the functional of each level of this game and the deliverable information to target user.

a. Main Menu

This Main Menu will appear in the first. In this interface, there have three buttons, which is Instruction, How To Play and Play.

b. Level 1

This level is the most easy level. User need to earn at least RM15 to pass to the next level. There are 3 types of different drink in this level which is orange banana yogurt, grapefruit apple juice and honey pear juice. There is 3 minutes to given in this level.

c. Level 2

For this level, user need to earn at least RM20 to pass the level. There is 4 minutes given to complete this level. Therefore, user have extra 2 types of different drink in this level.

d. Level 3

This is a most difficult level. User need to earn at least RM25 to win the game. There are 7 types of different drink in this level. User need to hit the target which is RM25 within 5 minutes.

3.2.2 Software Requirement

To develop the project, suitable software must be chosen to make sure that the game supported successfully. There are two types of software requirements:

3.2.2.1 Technical Requirement

a. Adobe Illustrator CS4

This software helps to draw the characters, environment and background image. All drawing use in an animation in Adobe Flash.

b. Adobe SoundBooth CS4

Adobe SoundBooth CS4 is a digital audio software application that is used for sound editing. The function of Adobe SoundBooth CS4 is it can get rid of the unwanted noise from animators, editing and adding or change the speed of music.

c. GameSalad Creator

GameSalad Creator is an authoring tool for composing games in a drag-and-drop fashion, using visual editors and a behavior-based logic system. It is used by consumers and creative professionals for rapidly prototyping, building and self-publishing cross-platform games and interactive media.

3.2.2.2 Management Requirement

a. Microsoft Office Word 2010

Helps produce professional-looking documents by providing a comprehensive set of tools for creating and formatting your document such as proposal. This tools help to represent the documentation such as analysis, design, testing report and etc.

b. Microsoft Project 2010

This software is a tool to create the project schedule and milestone. It is used to develop Gantt chart signify game development schedule for PSM I and PSM II.

c. Microsoft Office Power Point 2010

Microsoft Power Point is document standard for presentation and discussion authoring tools. It is using in final presentation for PSM I and PSM II.

3.2.3 Hardware Requirement

For the development of this project, the hardware needed is selected wisely. Suitable hardware is needed to support the software for developing the game. Compatible hardware also determines the success aspect of project development.

Table 3.1: Hardware Requirement

Hardware	Specification	Description
Processor	Intel (R) Core™ i7-2620M CPU @ 2.70 GHz	Needs a high speed processor to support this project game.
RAM	8.00 GB	The development of this project needs to be supported by a powerful RAM.
Hard Disk	2 GB HDD	The development of this project involve storage of various multimedia elements that needs a large disk capacity.
Monitor	14.0" HD LED LCD Screen Resolution: 1366x768 Pixels.	Provide for high quality viewing of graphics as well as adequate resolution for the standard 1021x768 pixel resolution.
Graphic card	ATI Radeon TM HD 4200 Graphics up to 869MB Hypermemory TM	Provides quality graphic and video.
Sound card, microphone and speakers	Realtek Semiconductor Corp.	Provides quality audio and microphone is used for music.
Mouse	Logitech M185 Port: USB	Provides comfortable pointing device for small and medium sized hands.
Printer and Scanner	Canon MP 250 (scan, copy, print)	Printing project documents.

Modem	TM Streamyx	Provides high speed wireless connection to the Internet.
External Storage	Western Digital Passport 320 GB	Provide storage for backups of project files.

3.3 Conclusion

This chapter is all about the analysis for developing this project and all of the information from the analysis will help develop a better project to overcome weakness for an existing system. This also consists of the research on all requirements about latest software and hardware that will be in this project to help the development process efficiently. The result from this chapter will assist the designing phase and other phase as well.

CHAPTER IV

DESIGN

4.1 Introduction

In this chapter, the game design explains the features and function of the products. It continues the process of fleshing out the vision expresses in the pitch paper and game proposal. The designer should try to encompass as much of the design as possible in game design document so that the tasks needed to complete the project can be decided upon and put into a reasonable schedule on developing the game. Sometimes it is better to overdesign the product up front, knowing that materials will be cut as shipping time approaches. It is far easier to cut the materials than to ass them later because adding new materials tends to have a cascading effect where one change forces another to be made, and another, and so on. Adding extra gameplay elements are called feature creep and it should be avoiding it at all cost.

Before starting the first draft of game design, we need to make in account about the target user. Knowing the target user will help the designer in designing a better interface and gameplay of the game. Some types of game design involve integration of may varying disciplines. Video game design, for example, requires the co-ordination of game mechanics, visual arts, programming, production process, audio and narrative.

Many games have been developed primarily through iterative prototyping which, depending on the type of game, can be a more appropriate way of discovering new designs than theorizing on paper. This was particularly true of early video

games where the programmer was often also the designer and designs were much more constrained by technology, while at the same time new and original programming techniques were being devised in matching with the game itself. In practice, some combination of forward planning and iterative design is used in the development of a game.

Iterative design tends to be more suitable for core game (or gameplay) where the growing properties of the design can be very hard to predict. On the other hand, game elements such as story, setting, logical flow and level designs often lend themselves to being designed on paper, although almost invariably some unexpected issues will arise that will need to be dealt with through a modification of the paper design. Thus, even a design document can and usually does undergo some kind of iterative process during the development of a game, either formally or informally.

4.2 System Architecture

System architecture is the conceptual design that defines the structure and behaviour of a system. Some goes to game architecture. It helps to define all the component that the games need and also use to identify the functionality of the component.

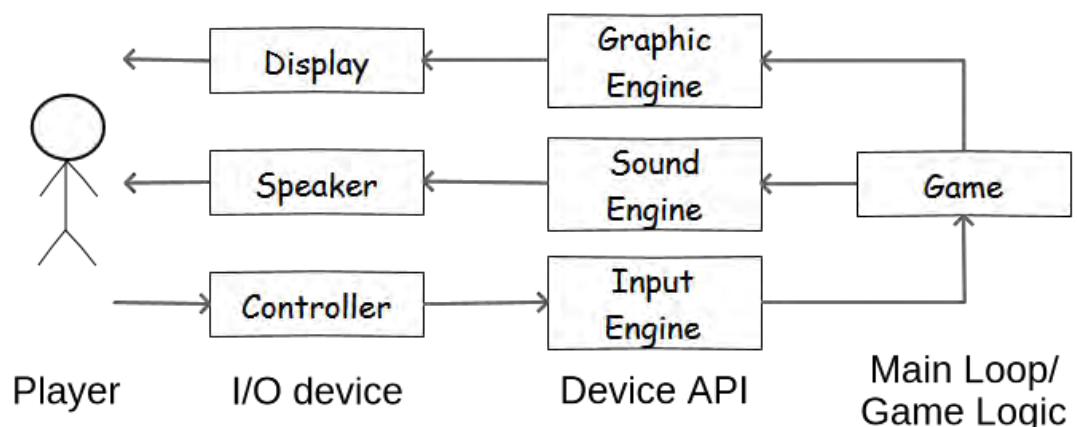


Figure 4.1: Game Architecture

4.3 Preliminary Design

Preliminary design is the design phase between schematics and construction documents. Also known as the design development phases in the architectural and engineering industry. It also the basic structure design that will guide the developer and designer to do the final design. Basically preliminary design defines the core content for the project, navigational and features and effect of the project. Preliminary design based on the analysis from the current project that has been analyzed which is from chapter 3. The analysis from the current define that certain factor that can be used and guide for design the roughly the project. It includes all the elements such as text, audio, animation, video and graphics. The storyboard design shows how the elements have been organized.

4.3.1 Storyboarding Design

Storyboards are graphic organizers such as a series of illustrations or images displayed in sequence for the purpose of previsualizing a motion picture, animation, motion graphic or interactive media sequence, including website interactivity. For this project, the storyboard was prepared according to each scene that will be developed in the game.

SUBJECT	Game Menu	DISIGNER	Low Mooi Fang
PROJECT	Healthy VegeFruit	PAGE	1
			<p>Description :</p> <p>1. Main menu of the game There will be new game button, and instruction button.</p>

Figure 4.2: The Healthy Vegefruit Design Scene 1


SUBJECT	Game Menu	DESIGNER	Low Mooi Fang
PROJECT	Healthy VegeFruit	PAGE	2
			<p>Description :</p> <ol style="list-style-type: none"> 1. Interface of instruction video <p>There will be a play button when press it will play the instruction video.</p>

Figure 4.3: The Healthy Vegefruit Design Scene 2

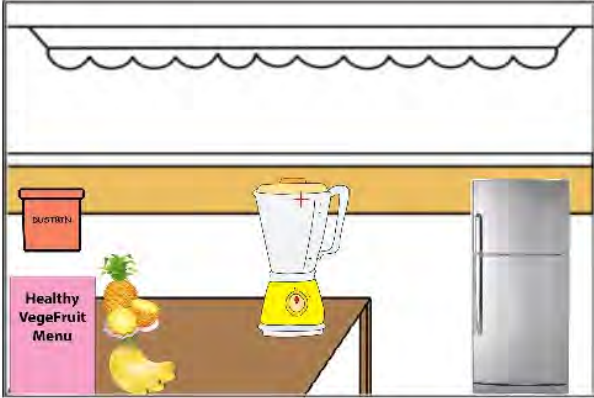
SUBJECT	Game Menu	DESIGNER	Low Mooi Fang
PROJECT	Healthy VegeFruit	PAGE	3
			<p>Description :</p> <ol style="list-style-type: none"> 1. Interface of the game <p>There are dusbin, Healthy VegeFruit menu, banana, pineapple, blender and refrigerator in the kitchen.</p>

Figure 4.4: The Healthy Vegefruit Design Scene 3


SUBJECT	Game Menu	DISIGNER	Low Mooi Fang
PROJECT	Healthy VegeFruit	PAGE	4
			<p>Description :</p> <p>1. Interface of open refrigerator</p> <p>There is a opened refrigerator and inside have fruits, milk vegetables, water and ice in the refrigerator.</p>

Figure 4.5: The Healthy Vegefruit Design Scene 4


SUBJECT	Game Menu	DISIGNER	Low Mooi Fang
PROJECT	Healthy VegeFruit	PAGE	5
			<p>Description :</p> <p>1. Interface of Healthy VegeFruit menu</p> <p>There have button in the menu which is next button, home button and back button.</p>

Figure 4.6: The Healthy Vegefruit Design Scene 5

4.4 User Interface Design

User interface design is the design of computers, appliances, machines, mobile communication devices, software applications and websites with the focus on the user's experience and interaction as simple and efficient as possible, in terms of accomplishing user goals.

The design process of an interface must balance the meaning of its visual elements. However the usage of these elements must be done sparingly, and therefore the interfaces must be carefully designed and structured so as not to confuse the user, and let the user have a fast and easy understanding of the system's overall flow. All of these projects involve much of the same basic human interaction yet also require some unique skills and knowledge. As a result, user interface designers tend to specialize in certain types of projects and have skills centered on their expertise such as game design. This section will first cover the navigation flow of this project. It then will cover the input and output design.

4.4.1 Navigation Flow

Navigation flow used in this project to explain a non-linear storyline of the game. Using navigation flow, it will be a best way to give a picture of the gameplay and game flow to the player. The overview of this project can be viewed as below.

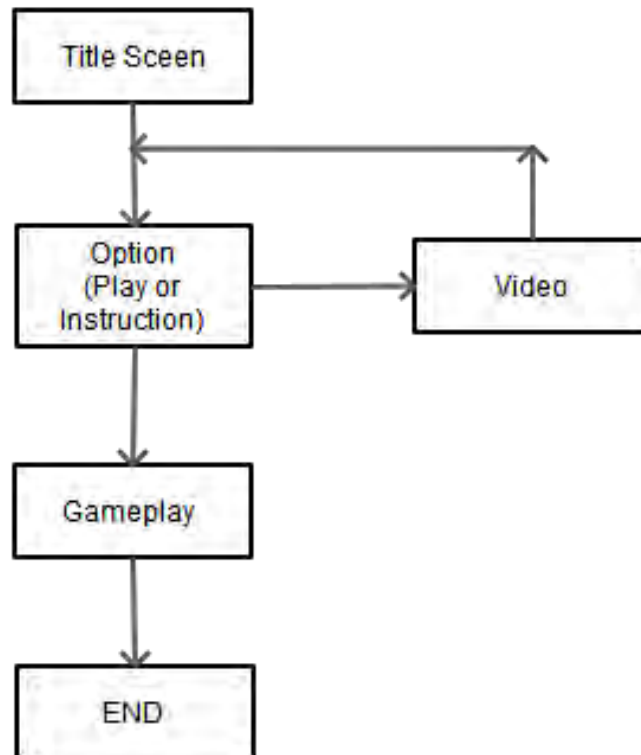


Figure 4.7: Healthy Vegefruit Game Navigation Flow

4.4.2 Metaphor

The theme of the user interface (UI) are the most important parts of the learning environment. The UI and teach elements such as buttons, graphics and controls support the rest of the media in this application. The theme is for learn how to making drinks and UI design work kitchen to form an interesting platform place to teach making drink that attracts the learners' attention and helps them learn and memorized.

4.4.3 Input Design and Output Design

For this project, mouse will be use as an input key to interact with the game. The output is the drink that finished make by the user and the drink will give to the customer.

4.4.4 Media Creation and Integration

The purpose of this project is tried to develop a 2D web based game. Hence, other multimedia elements such as, visual, interactive and audio must be taken in account. The audio carried an important role in the products. For the interactive element, mouse will be used as the main component as input device.

4.5 Conclusion

As the conclusion for this chapter, it covered explanation about design phase for the project and it covering the details of design such as navigation flow, storyboard user interface design and metaphor. The design phase is not only about concept, but an action, which is the interaction set by the designer or developer to the game. This chapter has covered the overall flow of the system which its architecture, the preliminary, the storyboard and user interface design section which includes the input and output specifications. This chapter helps to identify what will be design and put in the game such as background, environment and also theme. The next section will focus on implementation for this game.

CHAPTER V

IMPLEMENTATION

5.1 Introduction

In this implementation chapter, it covered all entire activity that involved in the implementation phase. The detail of the project development of Healthy Vegefruit mission based game such as media creation, media integration, product configuration management and implementation status will be discuss in this chapter. To make a game operate, it need to be take in account to handle many functions including graphic, sound, user interface and so on. All of this activity must be referring the time management to keep the project development on time. By implementing all the design such as storyboard, interface design and the navigation flow, this Healthy Vegefruit will be a good product referring all the case studies and all the observation information for helping to convert all these information to an application. By referring all the data of the case studies and implement it in this phase, this game might be archive the goal or the objective of this project developing 2D educational game.

5.2 Media Creation

Multimedia contains of several elements including text, graphics, sound, video and animation. Media creation will describe in details about the production of text, graphics, sound, video and animation that is used in implementing this project. The following subtopics are brief explanation of each multimedia element.

5.2.1 Production of Text

Production of text is important to make a better experience and understanding for user or player of this Healthy Vegefruit Game. If the user cannot read all the instruction in the game, user cannot play it well because lack of understanding for the game instruction. Choosing the appropriate font style is essential to illustrate what the type of animation is produced, for example funny, kids and adventure cartoon. A suitable text is also taking considerable of the target user or player. The size of text are depends on the space of the frame. This design used to balance out the space of text and other thing in one frame. Most all of the text is static text and anti-alias for readability.

5.2.2 Production of Graphic

In the production of graphic, Adobe Photoshop and Adobe Illustrator was only software that was used in editing the entire graphic in this project. Graphic production considered of format for graphic that being used in the animation production are PNG and JPEG. Because of this project were using Adobe Photoshop in the production of graphic, all the image that created is in bitmap and not a vector image. In computer graphics, a bitmap or pixmap is a type of memory organization or image file format used to store digital images.

The term bitmap comes from the computer programming terminology, meaning just a map of bits, a spatially mapped array of bits. Now, along with pixmap, it commonly referred to the similar concept of a spatially mapped array of pixels. Raster images in general may be referred to as bitmaps or pixmaps, whether

synthetic or photographic, in files or in memory. In some contexts, the term bitmap implies one bit per pixel, while pixmap is used for images with multiple bits per pixel. In this project, some of the pictures are edited in Adobe Photoshop CS5 to make the picture clearer, to cropping the unused object in the picture and to make some of graphic effect. All the characters in Healthy Vegefruit Game are created using Adobe Illustrate CS5. Started with hand sketches on paper, and the draw it again at Adobe Illustrate to digitalize it. Next step is to color the image and last step is exporting the image. Some goes to other images in the animation. All the process worked at the same ways.

5.2.3 Production of Audio

Audio is another flexible and important medium in multimedia element that helps to produce better multimedia content including producing a game. By adding a good sound effect and background music for game, it will provide a realistic environment and also give a good game experience for player. Production of audio is divided to three category of audio such as voice over, background music and sound effect. There was minimum usage of audio for this in developing Healthy Vegefruit Game. There were voice over for dialogue and storytelling were need it this game besides editing a background music and some of sound effect for the game.

In this project, productions of audio are using Adobe Audition 1.5 as editing software for audio editing. For this project, the audio file format that use is in wav and mp3. Wav format has been used for final editing sound because it give a very good quality but gives a large size to embedded in the GameSalad but it is a best format of sound for GamaSalad. There is not much audio is used in this project as it is limited because this is an educational game. Audio is used as the button click, animation and in quiz.

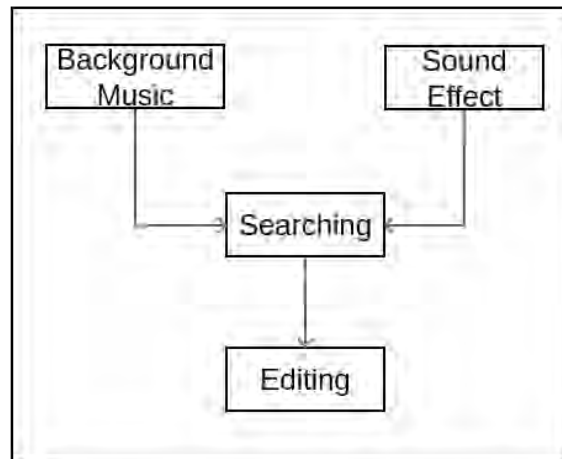


Figure 5.1: The audio production of the background music and sound effect

5.2.4 Production of Animation

The animation in this project was created using Adobe Flash CS5. Create an animation in a Flash document by adding content to a timeline, such as the main timeline, or a timeline inside a movie clip. When the playhead move across the timeline, those individual frames play. Timeline effects such as blur, expand, and explode, make it easy to animate an object. When create a frame-by-frame animation, every frame is a keyframe. Each new keyframe initially contains the same contents as the keyframe preceding it, so able to modify the frames in the animation incrementally.

5.3 Media Integration

Every project must be delivered in certain format for the final product. Media integration is whole material will need a few list of software that can arrange and integrate with all material. Integration process is the process to integrate the entire element that was used before to produce a final product.

5.3.1 Graphic Integration

Creating graphics and image is the first step in graphics integration. The image designed will be applied in GameSalad, Photoshop and Illustrator will be used to design the image or icon with the suitable image of format; size and color are chosen in order to create the graphics. The symbol in GameSalad will be converting to be a graphic to use in Healthy Vegefruit whether some of the image will be edited in Adobe Photoshop or created using Adobe Illustrator. Then it will be export into .png or .jpg format. Afterward those images will be imported to GameSalad Creator to be used.

5.3.2 Sound Integration

This step is to adding and applies suitable audio/ sound to the project. Adobe Audition 1.5 will be used to editing and compile the sound.

5.3.3 GameSalad Integration

The process of integration will all put in and combine using GameSalad Creator. The entire multimedia element like text, graphic, animation and sound are integrated in GameSalad Creator. GameSalad provides a graphical user interface for describing the rules and the behavior of game objects, called Actors. Behaviors are components of an actor that can either instantaneously or persistently affect the actor depending on rules that compose them. The application comes with a library of behaviors (for movement, changing attribute states, affecting collision, and saving) that can be inserted into rules and other behavior groups to create new behavior.

5.4 Conclusion

As a conclusion, this chapter has described in details about the implementation of the project. The process started with development of media elements involved, which are production of texts, graphics, audio, animation and process of integration all the elements. It also explained the media integration as the elements multimedia and configuration management such as software tools used to support configuration control and version control procedure.

This chapter also explains all the techniques used in developing this project such as editing image, editing audio and motion tween technique. This phase is the implementation of the project according to storyboard and design that have been made in the previous chapter.

CHAPTER VI

TESTING AND EVALUATION

6.1 Introduction

The last phase involved is testing phase. The testing is conducted after the implementation is completed. Testing phase is done to determine whether the project has succeeded in fulfilling its objectives or not. This includes, but is not limited to, the process of executing a game application with the intent of finding errors.

Testing is the process of questioning a product in order to evaluate it, where the questions are operations the tester attempts to execute with the product, and the product answers with its behavior in reaction to the probing of the tester.

The testing chapter contains test plan, test implementation, test results and analysis. Test plan consists of test user, test environment, and test schedule. Test strategy will use alpha, beta and acceptance testing. Whether test implementation involved test description and test data. Lastly test results and analysis, can include graph or chart for analysis testing part.

6.2 Test Plan

In developing this game, test plan is important to make sure that whole system flow can run smoothly without any interruption and run according to flow. Test plan indicate process and arrangement of the application such as target user and questionnaire. In this section the target user for the testing will be first discussed. It is important to select group of specific users to test the product of this project. All the feed back and the result from user testing will be valuable information to improve and upgrade the project.

6.2.1 Test User

For test user, its will be describe the target user which is the number of participant involved to be tested. For this Healthy Vegefruit Game, the testing phase involved young people who are familiar with the multimedia environment.

a. Young people with aged between 18 years old and 25 years old.

This age of young people is the target users that will be use for Healthy Vegefruit Game. The test will be performed by the young people. This tester was tested mostly on their understanding and the effectiveness of the game. The developer has to do the observation of their attitude during the prototype. The purpose to do the kind of testing is to test their understanding.

6.2.2 Test Environment

In this test environment, hardware and software that involve are need to be develop. Below is the hardware and software as required for testing Healthy Vegefruit Game.

Table 6.1: Hardware and Software Requirement for Testing

No.	Hardware and Software	Description
1	Laptop	Toshiba Satellite P745 Operating System: Windows 7 Home Premium 8 GB RAM 320 GB HDD 14.0" HD LED LCD Screen resolution: 1366 x 768 pixels Color Depth: 32 Bits
2	Mouse	Optical Mouse Brand: Logitech
3	GameSalad Creator	Open source

6.2.3 Test Schedule

Time must be managed correctly in order to obtain the accurate data from the tester. In performing the task, a task schedule has been made to ensure testing phase will run successfully. Hence, test schedule is planned to fulfill this purpose. The following table show that the details of the testing schedule for Healthy Vegefruit Game.

Table 6.2: Testing Schedule for Healthy Vegefruit Game

Testing Type	User Acceptance Testing
Tester	Young people (18-25 years old)
Number of Tester	15
Duration	15-20 minutes
Venue	FTMK lobby
Date	19 August 2014

Time	9.00 am – 2.00 pm
-------------	-------------------

6.3 Test Strategy

Before testing is carried out, need to develop a Test Strategy. The Test Strategy will detail what is to be tested and how it should be tested. The objective of a Test Strategy is to enable the developer and end users to carry out testing a systematic and through manner. The Test Strategy will cover all the requirements as stipulated in the Requirement Specification Document in User Acceptance Testing (UAT).

User Acceptance Testing commonly known as Alpha and Beta testing, the completed system (or a major portion of it) will be released to a select group of users for testing under real-world conditions.

Alpha testing is simulated or actual operational testing by potential users/ customers or an independent test team at the developer's site. Alpha testing is often employed for off-the-shelf software as a form of internal acceptance testing, before the software goes to beta testing.

Beta testing comes after alpha testing. Versions of the software, known as beta versions, are released to a limited audience outside of the company. The software is released to groups of people so that further testing can ensure the product has few faults or bugs. Sometimes, beta versions are made available to the open public to increase the feedback field to a maximal number of future users. After alpha and beta testing, the product will be delivered to the users for acceptance testing. The result from the questionnaire will be collected as a reference for future enhancement.

6.4 Test Design

This section included test description and test data that is done and obtained for the testing phase of this project.

6.4.1 Test Description

For test description, every test case is identified and is implemented to obtain the results.

6.4.2 Test Data

Data testing is done base on the functionality of the game. During alpha testing, the gameplay, the suitability of audio, animation and usage of proper design are tested. While for beta testing, it will be done by selected range of young people who are in between 18 years old to 25 years old will test play the game. Hence, there will have two kind of result for respective testing.

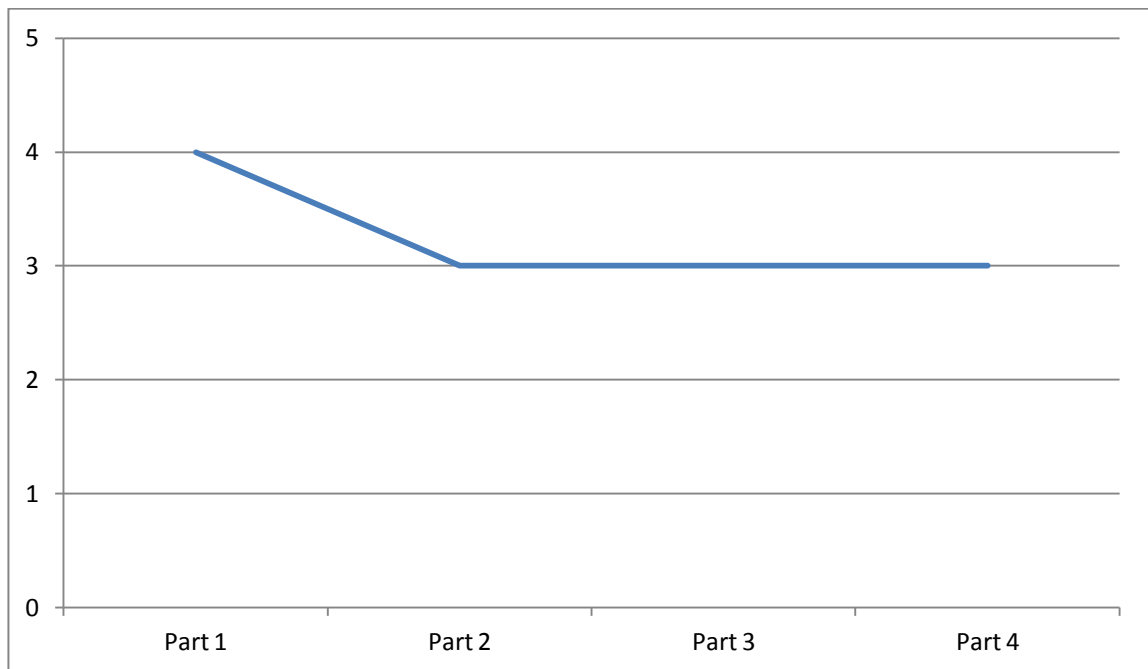
6.5 Test Results and Analysis

All test results are gathered after both tests and to be analyzed. The result from the questionnaire was analyzed and is displayed in pie chart form.

6.5.1 Analysis on Alpha Testing

In this section, the game is tested and should achieve the expected result. This result is based on 15 respondents. The result for the alpha testing is as shown below:

Table 6.3: Expected Result for Each Testing



6.5.2 Analysis on Beta Testing

The beta testing tested the acceptance of the users towards the game. The tester for this beta testing is done by 15 young peoples. There are four parts of the testing which are Educate People Testing (objective), Interface Design Testing (scaling), Interactive Testing (scaling) and Level Testing. The testers are required to test play the game and answer the questionnaire base on their opinion by giving different scaling from 1 (Not Agree) to 5 (Agree) for each question asked.

Table 6.4: Level of Evaluation / Rate

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The results for the beta test are as shown in the pie charts:

Part 1 - Evaluate user knowledge

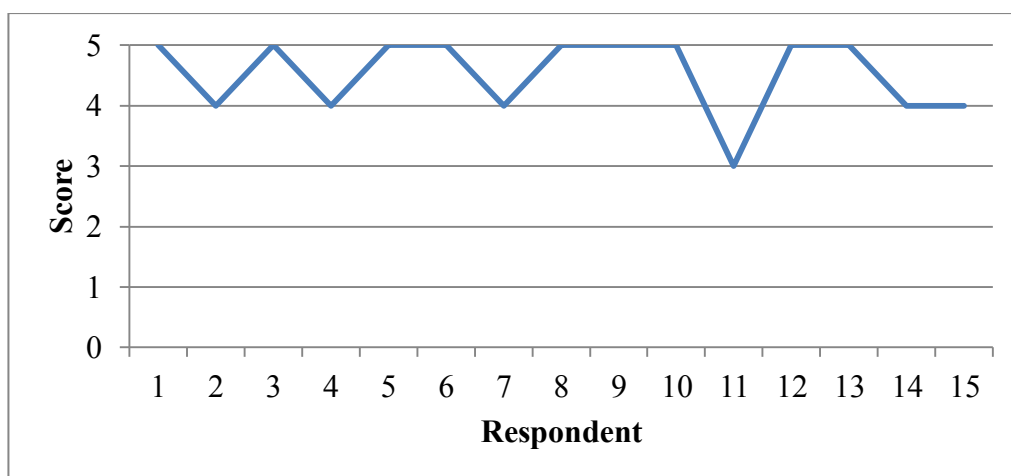


Figure 6.1: Result for Questionnaire Part 1

This graph is show the result that evaluate user knowledge. From the graph most of the respondents are able to get a high score. This is meaning that the game is able to educate people about the health of vegetables and fruits.

Part 2 – Evaluate the interface design

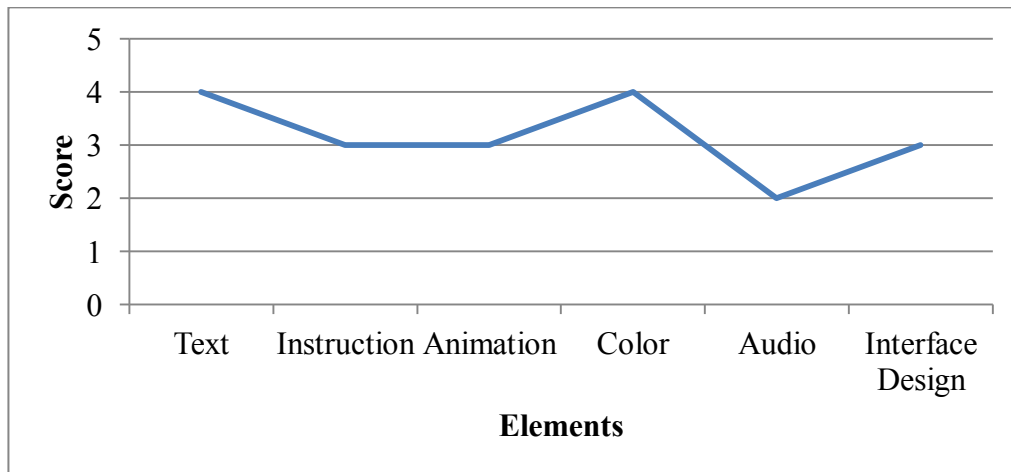


Figure 6.2: Result for Questionnaire Part 2

This graph is show the result that evaluate the interface design of the game. From the graph text and color used in the game is satisfied by the respondents. Most of the respondents are not satisfied with the audio. This is because the audio in the game is play smooth. When the game is change to the other screen the music will stop.

Part 3 – Evaluate the interactive

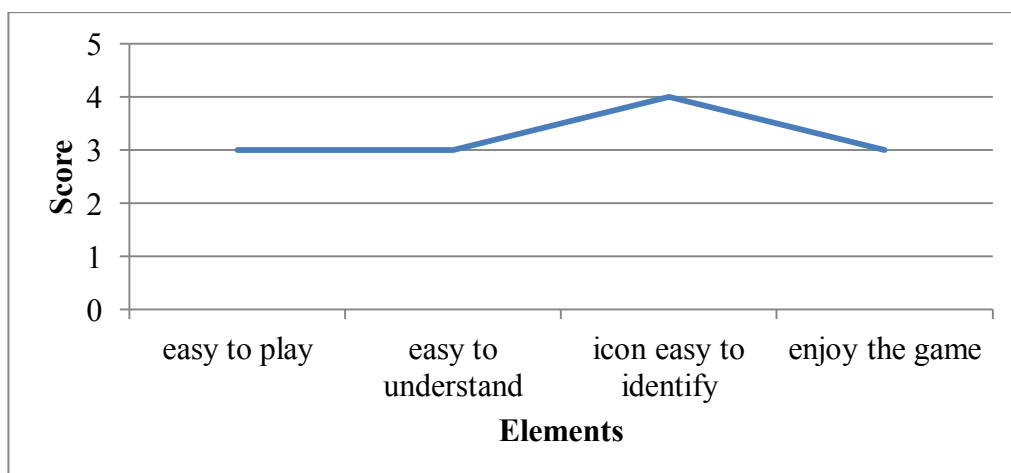


Figure 6.3: Result for Questionnaire Part 3

This graph is show the result that evaluate the interactive of the game. Most of the respondents are agree with the icon that is easy to identify. This game is easy to play and understanding. User also enjoyed the game.

Part 4 – Difficulty of the game

From the result, most of the young people are able to finish the game which is level 3. Some of the respondent are think that the time given to hit the score is not enough. Some suggestion are given by the respondents which is the drag and drop is not smooth and lead the game difficult to play.

6.6 Conclusion

This chapter has explained on the testing process for this project. They are different kinds of feedback which are positive and negative from the target user on the game. But the test result from the alpha testing and beta testing is very important to show the successfulness of the creation and the acceptance of the game except for the acceptance test. The upcoming chapter will discuss about the conclusion of this project.

CHAPTER VII

CONCLUSION

7.1 Introduction

This chapter is discussed about the achievement that contains the strength and weakness in developing game project. In this project, we analyze the problem that occur during or after the project deliverable and suggest the suitable method to improve the weakness to make it success and more interesting. In order to solve those problems, from the previous phase, testing will be done to find any suitable solution or method to enhance the weakness of the project.

7.2 Observation on Weaknesses and Strengths

In general, the weakness of this project is the game could not perfectly present as there are some part where still need to be improved. However, there are some weakness in this project because in order to be perfect, need a mistake to realize. This game is not perfect as known that the developer also as human being unless needs some adjustment on it. The weaknesses and strength identified in order to achieve the projects succeed. We also make the conclusion of the project whether it achieves the objectives of the project and meet the user requirements.

7.2.1 Strengths

The final product of this 2D game carries both strength and weakness. Some of the strength are:

a. Convenient

This 2D game based learning can be used easily and it is fun and entertaining.

b. Use graphics and bright colors to attract user.

The 2D game prototype represents the rights graphics and colors for the user and motivates them play the game and learn through it.

c. Less of the game developer outside prepares the vegetable and fruits drink.

Most of the developer create beverage game based on fruits only. But not yet develop a game based on vegetable and fruit. This is the strength for this game.

7.2.2 Weaknesses

The final product of this 2D game carries both strength and weakness. The weaknesses of the project are:

a. Less animation for attractiveness.

Less animation and it will not make the game much attractive.

b. Use more variety of type of the drinks.

Instead of the seven drinks in this game, should add more recipe to show the user variety of the drinks.

7.3 Proposition for Improvement

The game could be improved by applying better animation, the storytelling method and also result scene to make the game better and more interesting.

The game could be improved by adding more drinks and level to attract more young people to play the game.

7.4 Contribution

This is the first known as a game based on healthy fruits and vegetables diet. To make this game more attractive and understandable, multimedia elements such as audio, graphics, animation and text will be added into the game. By applying more interactive animation, teaching and studying techniques, it can motivate children to study smart. Young people are more attracted to the bright color instead of fully text to deliver the content.

7.5 Conclusion

Lastly for the conclusion, the interactive 2D game based learning gives a variety for young people in learning meets its objectives conclusively. Young people should be able to differentiate and memorize what are the ingredients needed for making each drink in the game. As a conclusion, the 2D game based learning that we developed was achieving the objectives and the scope of the project. Even though this product may lack in form of animation and interaction, but this is the first step to improve the product to enhance it in the future. This product was developed especially for young people. The product is entertaining, gives the knowledge about the health of vegetables and fruits.

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APPENDIX A

GANTT CHART

Task Name	Duration	Start	Finish
Start	0 days		
Planning	6 days	Mon 2/17/14	Mon 2/24/14
Preparation of proposal	5 days	Mon 2/17/14	Fri 2/21/14
Submit proposal	1 day	Mon 2/24/14	Mon 2/24/14
Analysis	12 days	Tue 2/25/14	Wed 3/12/14
Gather user requirements	5 days	Tue 2/25/14	Mon 3/3/14
Investigate existing system through internet	5 days	Tue 3/4/14	Mon 3/10/14
Summarize and conclude findings	5 days	Tue 3/11/14	Mon 3/17/14
Design	28 days	Tue 3/18/14	Thu 4/24/14
Design storyboard	4 days	Tue 3/18/14	Fri 3/21/14
Design screen	4 days	Mon 3/24/14	Thu 3/27/14
Design characters	3 days	Fri 3/28/14	Tue 4/1/14
Design Objects	3 days	Wed 4/2/14	Fri 4/4/14
Design interactive features	3 days	Mon 4/7/14	Wed 4/9/14
Summarize all the designs	4 days	Thu 4/10/14	Tue 4/15/14
Implementation	49 days	Wed 4/16/14	Mon 6/23/14
Develop screen	11 days	Wed 4/16/14	Wed 4/30/14
Develop Characters	9 days	Thu 5/1/14	Tue 5/13/14
Develop Objects	9 days	Wed 5/14/14	Mon 5/26/14
Develop interactive features	9 days	Tue 5/27/14	Fri 6/6/14
Compile the game	11 days	Mon 6/9/14	Mon 6/23/14
Testing	7 days	Tue 6/24/14	Wed 7/2/14
Demo the game	4 days	Tue 6/24/14	Fri 6/27/14
Questionnaire	3 days	Mon 6/30/14	Wed 7/2/14
END			

APPENDIX B

QUESTIONNAIRE

Gender : _____

Age : _____

Introduction :

This is a 2DEdutainment Game which is Healthy Vegefruit. By playing this game, you will know the knowledge of the function of fruits and vegetables.

Objective :

- To study the game that educate users on healthy fruits and vegetables.
- To develop a 2D edutainment game on healthy fruits and vegetables.
- To evaluate the effectiveness of the 2D edutainment game.

QUESTIONNAIRE FOR TESTING

Part 1 – Educate People (objective)

Objective : The purpose of this part is to evaluate the knowledge game by the user from the game.

***Please circle the correct answer.**

1. What are the ingredients to cure insomnia?
 - A. Grapefruit, Apple, Honey and Water
 - B. Strawberry, Yogurt and Milk
 - C. Pear, Honey and Milk
 - D. Lemon, Honey, Yogurt and Ice
2. What are the ingredients to cure poor immunity?
 - A. Orange, Banana, Yogurt and Honey

- B. Lemon, Honey, Yogurt and Ice
 - C. Grapefruits and Orange
 - D. Pear, Honey and Milk
3. What are the ingredients to cure pressure?
- A. Kiwi, Cabbage, Cucumber, Honey, Lemon and Water
 - B. Orange, Banana, Yogurt and Honey
 - C. Strawberry, Yogurt and Milk
 - D. Grapefruits and Orange
4. Pear, Honey and Milk are the ingredients to cure_____.
- A. Depression
 - B. Insomnia
 - C. Poor Immunity
 - D. Fatigued
5. Orange, Banana, Yogurt and Honey are the ingredients to cure_____.
- A. Pressure
 - B. Common Cold
 - C. Constipation
 - D. Fatigued

Part 2 – Interface Design

Objective : The purpose of this part is to evaluate the interface design of the game.

**Answer the following questions with the rate given.*

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

1. This game using suitable font/text that clear thus readable.	1	2	3	4	5
2. The instruction provide a good guideline.	1	2	3	4	5
3. This game using attractive animation.	1	2	3	4	5
4. This game using suitable color.	1	2	3	4	5
5. User enjoy the sound and music in this game.	1	2	3	4	5
6. The interface design suitable for the target user.	1	2	3	4	5

Part 3 – Interactive

Objective : The purpose of this part is to evaluate the interactive of the game.

**Answer the following questions with the rate given.*

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

1. This game is easy to play.	1	2	3	4	5
2. The instruction is easy to understand.	1	2	3	4	5
3. The icons and buttons easy to be identify.	1	2	3	4	5
4. I enjoy learning and play with this 2D game.	1	2	3	4	5

Part 4 – Level

Objective : The purpose of this part is to evaluate the level of the game.

*Answer the following questions with the rate given.

1. What is your highest level you ever get in this game?

Level 1

Level 2

Level 3

2. The timer that given is enough for each level to hit the target? If not, please suggest a proper time.

Yes

No

—

3. Do you think the target given is too hard to achieve (RM15 for level 1, RM20 for level 2 and RM25 for level 3)? If yes, please suggest a proper target for the level.

Yes

No

—

4. Which level is the most difficult to hit the target? Why?

Level 1

Level 2

Level 3

—

5. Any suggestion to improve the game?

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