

## The Design & Implementation of Healthy Lifestyle Game: Run Dash!

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### Abstract

**Abstract:** *Run Dash!* is a healthy lifestyle game that was developed as a mobile application game. This mobile game is an adventure of a character that known as Ash that traps in an infinite run challenge that focus on healthy eating lifestyle. This game will give a better understanding of how the selection of foods on our daily basis will affect our health from time to time. The objective of the paper is to explain the design and implementation of Healthy Lifestyle Game: Run Dash! that follows the principles and elements of design. This mobile game is focusing on young adult eating lifestyle that are mostly universities' student that are most likely to choose unhealthy foods that contain high calories over healthy foods. This mobile game is created by using multimedia elements such as text, sound, and animation for user to feel enjoy while playing it. The method that has been used to develop this mobile application game is by using ADDIE model that consists of five main stages which are analysis, design, development, implementation, and evaluation. This mobile game has been developed because there is no game on android platform that focused on healthy lifestyle. The three main pillar of game which is have great usability, great functionality, and lastly have great design. The contribution of this mobile game is to give impacts towards the targeted user's decisions when they are buying their foods because it is proven that game can affect the way people think easily when the event happens repetitively that automatically train our brain.

**Keywords:** *Healthy lifestyle, game, education.*

### 1. Introduction

Facilitating learning, or the development of knowledge, skills, attitudes, beliefs, and habits, is the process of education. Teaching, training, and storytelling are examples of educational practices. Although teachers typically supervise learning, students are also able to educate themselves (Ze-Nian et al., 2021).

Compared to non-multimedia applications, applications with multimedia can be easier to use. Additionally, the system or application can be used more easily with the multimedia interface. When combined with the right multimedia components, an application or system can be made more user-friendly and requires less time for the user to use. An application's

multimedia interface needs to be user-friendly to succeed. An intuitive interface makes use of appropriate icons, graphics, audio and visual cues, and user-friendly input. The user doesn't need any training to utilize the application because of its user-friendly interface. Because the presentation includes text, sound, graphics, video, and animation, multimedia is effective. It is easier for the user to understand the content and more fun to play the game (Ze-Nian et al, 2021).

A mobile application is a computer program that is intended to operate on a mobile device such as a smartphone, tablet, or smartwatch. Mobile applications frequently differ from desktop applications that operate on desktop computers, as well as web applications, which run in mobile web browsers rather than directly on the mobile device (Tay Vaughan, 2014). The name "app" is a contraction of the term "software application," and people currently carry their smartphones with them wherever they go, therefore mobile applications are their best companions in dealing with any challenges they may experience (Ze-Nian et al, 2021).

## **2. Problem Statements**

According to Utusan Malaysia's article "1 Daripada 2 Rakyat Malaysia Gemuk - One Out Of Two Malaysians Are Obese," one of the major issues confronting our society is the growing number of people becoming obese. This is due to insufficient public awareness of the situation (Petah Wazzan, 2021). This condition worsens in young adults aged 18 to 30. These young adults will usually continue their education in universities, and most of them will prefer unhealthy foods such as fast food over healthy and well-balanced foods. This occurred because kids are no longer under their parents' advice on which diet is best for their health, and it is up to them to choose. Several movements have been launched, including a Malaysian government-led push against obesity. However, it is insufficient to focus society's attention on this issue. This mobile application game will help kids become aware of the issue.

The second issue is how to create a mobile educational game that will have a beneficial impact on the obesity problem that young adults between the ages of 18 and 30 are experiencing due to their eating habits. According to an article titled "The Impact of Video Games on the Players' Behaviours" published by Science Direct, certain research shows that playing video games can influence how individuals think. The game is usually known for its bad effects rather than its beneficial aspects. However, according to the research, it will influence how people make decisions in the real world based on the game they played (Muhammad Quwaider, 2019).

The third issue is that various health-related instructional games have been developed and published in the Google Play Store without adhering to design standards and aspects. According to Petri Lankoski's research "Game Design Research: An Overview," if the game generated does not adhere to design principles, the game's look and feel will be unappealing to the intended user. To make the mobile game more appealing, numerous factors must be applied, including harmony, balance, proportion, resemblance, and contrast (Petri Lankoski, 2017). Design consists of various elements, including lines, colours, forms, typography, texture, and space. Therefore, it is necessary that the game that has been developed must follow the principles and elements of design.

### 3. Obesity in Malaysia

Statistics available from several Ministries for the last two decades suggest that as the population achieve affluence, their intake of energy, fats, and sugars increase, as reflected in the rising and now substantial size of the food importation bills (Rashid et al, 2019). According to the World Health Organization (WHO) research on Malaysia's obesity showed that Malaysia is located among the top 25 countries with large of obesity (Rashid et al, 2019). According to this research paper supports the hypothesis that the fast expansion of obesity in Malaysia is originated from a few factors and the most factor is caused by high consumption of fast food (with high fat content: fried and oily food) and high consumption of soft drinks (with a high content of sugar) (Rashid et al, 2019).

From this research about obesity, the researchers aim several objectives that is to introduce the effect of consuming fast food among young adults. To develop a mobile educational game for healthy lifestyle and to create a mobile educational game that follows the principles and elements of design.

### 4. Physiological Function of Food

A person's health is determined by the types and quantity of food they consume. Good nutrition is necessary for a person's regular growth and development, as well as their long-term health. When a person does not eat the right foods, the body may not develop properly. There is a potential that some of the body's organs will begin to malfunction, or that there will be sickness. Poor diet may also have a negative impact on one's mental and social health. Food performs three physiological purposes. These include energy production, body construction, body process regulation, and disease prevention (Sharda Gupta et al, 2016). Table 1 provides an explanation of the three physiological functions performed by food.

Table 1: Physiological Functions Performed by Food

NO.	FUNCTIONS	EXPLANATION
1.	<b>Food Provides Energy</b>	Everybody needs energy to do work. Energy is required for walking, studying, eating, working in the house or outside. You get this energy from the food that you eat. Human need energy even when they are resting. The reason for this is, there are Different organs inside our body that are always working, for example, heart is pumping blood, stomach is digesting food, lungs are breathing in air, etc. All these organs need energy for their respective functions and food provides that energy (Sharda Gupta et al, 2016).

- 2. Food Helps in Body Building**

Our body is already made up of thousands of small cells. New cells are added to these to help the body to grow. Food is needed for the formation of new cells. Cells also die or are damaged due to injury. New cells need to be formed and this repair work is done with the help of food. So, foods are so crucial for this type of development (Sharda Gupta et al, 2016).
- 3. Foods Regulates Body Processes**

Regulatory functions refer to the role of food in controlling body processes, for example, our body temperature is maintained at 37 degrees Celsius. Similarly, the heart beats are also maintained at 72 beats per minute. Excretion of waste products from the body is also regular. If not, the body suffers from a disease called constipation which can lead to further complications. All these processes are regulated by the food that been eat. The food that we eat gives us strength to fight against disease germs. (Sharda Gupta et al, 2016).

## **5. Islamic Perspectives on Healthy Eating Lifestyle**

The Quran and Hadith teach many people about healthy eating habits and food nutrition. The instruction provided is meant to sustain not just human physical health but also spiritual health, since human growth must be balanced between the spiritual and physical. As Muslims, we eat to live rather than live to eat, and we must be mindful of the food we consume while adhering to religious and nutritional guidelines. Furthermore, Quranic scriptures and Hadiths state that the amount of food consumed should be reasonable. Muslims have also been encouraged to avoid excessive eating and drinking, and to keep their stomachs at one-third capacity. That is why Islam is a religion that complete the way of life because it provided numerous guidelines on how we interact with food (Ahmed et al, 2017).

### **5.1 The Principles and Elements of Design**

Designers utilize design principles as a set of guidelines to shape their work. When used correctly, these principles provide designers with the ability to develop designs that are both functional and visually beautiful. The combination of good functionality and pleasing appearance results in a better UX for all (Zachery, 2021).

The elements of design are the fundamental, raw building pieces that designers utilize to construct a piece of art. Lines, forms, colors, typography, texture, and space are fundamental design aspects that can be found in practically any prototyping tool. However, design principles are the common standards that designers use to bring their work together.

The principles of design work in unison with the aspects of design, helping designers understand how to produce a well-crafted, user-friendly design. Design principles can also

help designers analyze other works, such as understanding why a designer took decisions during the creative process (Zachery, 2021).

## 6. Methodology

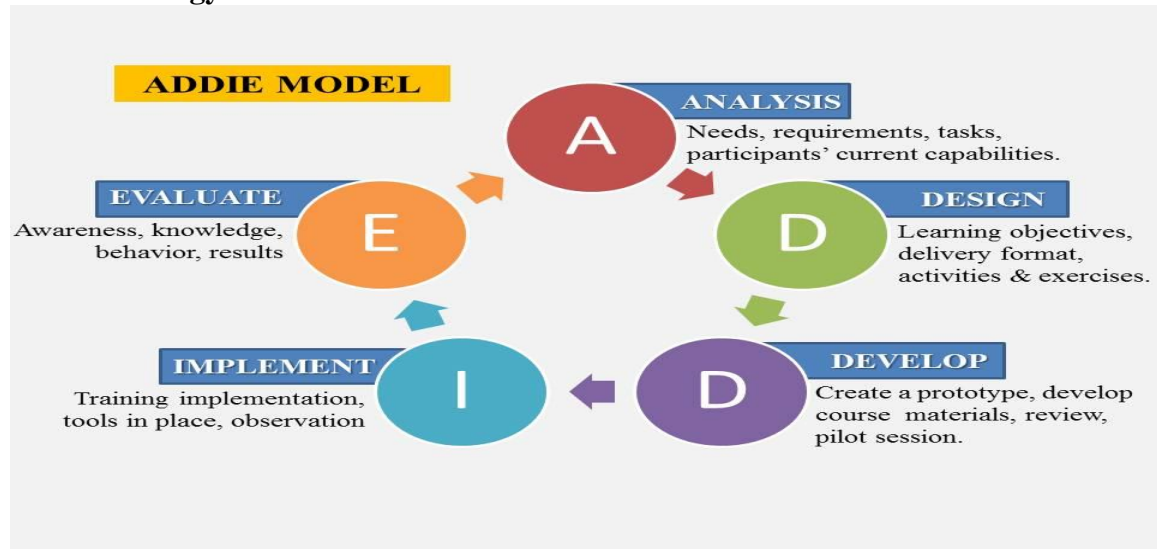


Figure 2: ADDIE Model

Methodology relates to the processes of gathering, organizing, and analyzing data. The nature of the research question determines the methodology used. In research, methodology can refer to the theory of making proper scientific conclusions. Project methodology is also a rigorously defined set of logically related practices, procedures, and processes that establish how to best design, create, control, and deliver a project throughout its continuous implementation phase until successful completion and termination. It is a scientifically validated, systematic, and disciplined method of project planning, execution, and completion (My Management Guide, 2021).

## 6.2 Designing

### 6.2.1 Storyboard

Storyboards are graphic organizers in the form of illustrations or images displayed in sequence for the purpose of pre-visualizing a motion picture, animation, motion graphic or interactive media sequence. According to Christopher Finch in *The Art of Walt Disney*, Disney credited animator Webb Smith with creating the idea of drawing scenes on separate sheets of paper and pinning them up on a bulletin board to tell a story in sequence, thus creating the first ever storyboard. Figure 3 below are storyboards for Run Dash! Game:

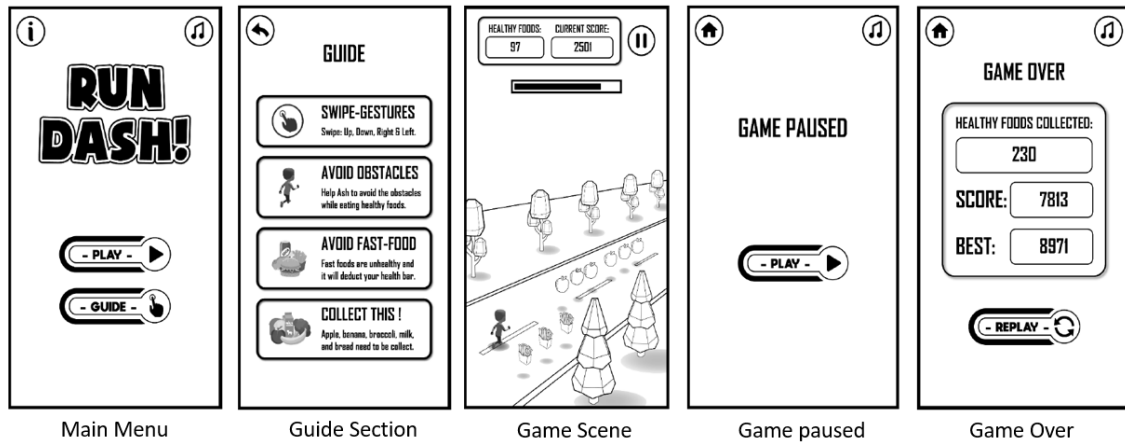


Figure 3: Storyboards for Run Dash

### 6.2.2 Designing the Interface

Run Dash! mobile application game was developed using five major software packages, including Build box, Adobe Photoshop, Adobe Illustrator, and others.

The first step is to design a character for Run Dash! Game and design the background, then begin developing the character and drawing the actual background with Adobe Illustrator CC 2021. In this phase, audio and background music are also included to make the content more appealing to the target audience.

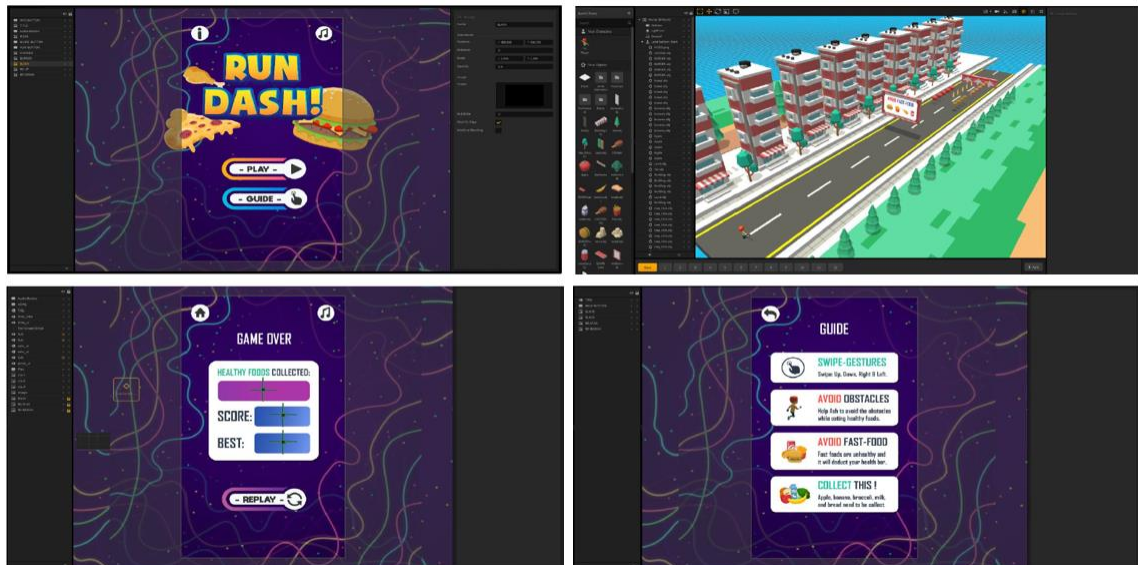


Figure 4: User Interface

Figure 4 shows the user interface setting for the main menu, the game world scene, game over menu and guide menu. Each of the game icons can be changed just by drag and drop to the scene. Each of the graphical elements can be moved and can be set at different layer at the layer settings.



### 6.2.3 Gameplay Design



Figure 5: Game play Scene

Figure 5 shows the gameplay scene for Run Dash Game. There are 12 scenes of game world was developed. The game world shows that all the obstacles are placed accordingly in the game world. The healthy foods and fast foods were placed randomly on the game track. Lastly, the power-ups were placed to give shield and lighting speed power to the game character during the game play.

## 7. Implementation

During the implementation phase, it was discussed in detail how the mobile gaming application was constructed based on the previously created storyboard. It also discusses the game's mind map, the function of the buttons, and how it all works together.

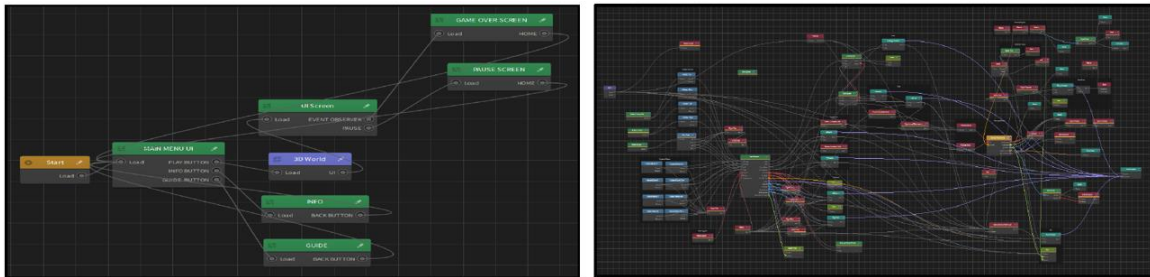


Figure 6: Game Mapping

Figure 6 above shows the foundation of this game development which is the game mind maps itself. This mind map functions as a core of a system to run this game smoothly. There are several functions that can be set such as the number of worlds for this game, the character movement functions, the functioning buttons that this game needs and how the buttons interact to each of the mapped sequences.

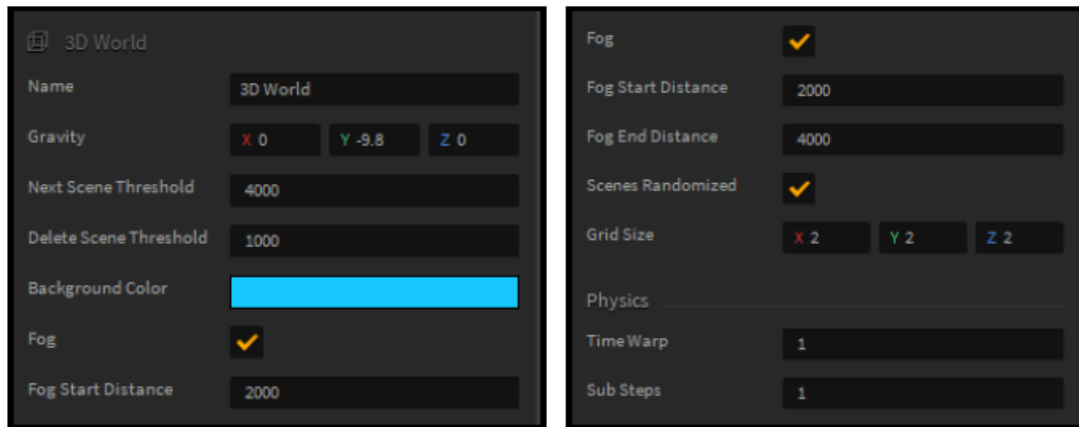


Figure 7: Game World Setting

Figure 7 above shows the game world setting menus. There are several settings that can be set such as gravity setting that will impact towards the movement of the character in each world that been created. The time warp setting will set how fast the world will move during the game session. The camera Smooth will change how smooth the tracking of the camera at the main character of the game.

## 8. Findings

The name of this mobile app game is Run Dash! (Healthy Lifestyle Game). This game follows the adventures of a character named Ash, who is trapped in an infinite run challenge focused on a healthy eating lifestyle. To stay alive, Ash must consume the right kind of food that will provide him with enough energy to continue his run. This game will educate the users on how to have a good life by eating well-balanced and healthy foods. This game will help you understand how our everyday food decisions affect our health from time to time.

This game will have only one mode: an infinite run mode. This mode requires the user to navigate the character through gesture-based control, which alters the character's mobility. To play the game, you can utilize one of three different gesture controls. The initial gesture control is a swipe up gesture, which causes the character to jump. The second gesture control is a swipe down gesture, which causes the character to glide across barriers. The third gesture control is a swipe left and right to dodge obstacles and acquire nutritious meals.



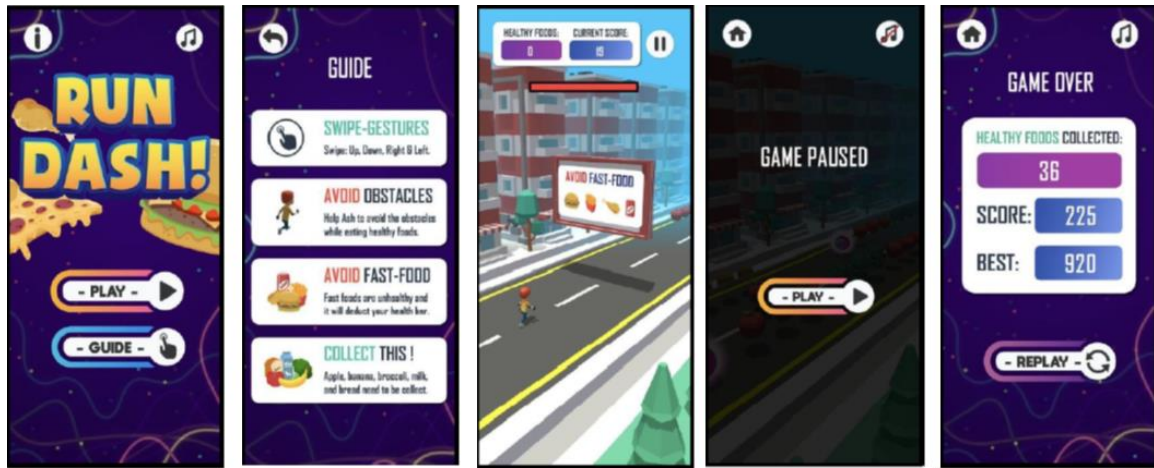


Figure 8: Interface Run Dash Game design.



Figure 9: Gameworld

Figure 8 and 9 shows examples of game design interface and game world. It demonstrates that the games that have already been produced adhere to the elements and principles of design. The design principles that have been employed are unity, balance, repetition, and contrast. The design elements that have been applied include lines, forms, colors, typography, texture, and space. The game that was built became more user-friendly and entertaining to play for the intended users by implementing design concepts and aspects. Game play design above shows the interface of game world. There are 12 scenes of game worlds. All the obstacles are placed accordingly in the game world. The healthy foods and fast foods were placed randomly on the game track. Lastly, the power-ups were placed to give shield and lighting speed power to the game character during the game play.

## 9. Conclusion

This mobile game has a lot of fun and engaging features that make it enjoyable to play. A variety of colors were employed in this project to make it lively and intriguing, which helps to attract the intended demographic of young people. This mobile game application successfully introduces the impacts of consuming unhealthy meals, namely fast foods, among young people. This mobile gaming application also has an impact on the targeted user's food purchasing habits, as certain studies have shown that video games can influence our real-world decision making based on the game that has been played.

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