

EDIBLE WATER ORB ACCEPTANCE AMONGST GENERATION Y

ELI NAZWAN BIN M NADZRI

A project paper submitted

In fulfilment of the requirements for the Bachelor of Degree in Technology  
Management (Technology Innovation) with Honours (BTMI)

Faculty of Technology Management and Technopreneurship  
(Bachelor Degree in Technology Management (Technology Innovation) with Honours)  
Universiti Teknikal Malaysia Melaka

June 2017

## SUPERVISOR'S APPROVAL

'I hereby declared that I have read this thesis and this research is sufficient in terms of scope and quality. This project is submitted to University Teknikal Malaysia Melaka as a requirement for completion and reward Bachelor Degree in Technology Management (Technology Innovation) with Honours (BTMI).'

Signature : .....  
Name of supervisor : Prof Madya Dr. Juhaini binti Jabar  
Date : June 2018

Signature : .....  
Name of panel : Cik Atikah Saadah binti Selamat  
Date : June 2018

## DECLARATION

“I hereby declare that this project paper is the result of my own and independent work except the summary and experts that have been specifically acknowledgement”

Signature :

Name : ELI NAZWAN BIN M NADZRI

Date : June 2018

## **DEDICATION**

This paper is dedicated to both of my parents, who are always support and motivate me in completing this research. They are always gave me support and advice to me in order to fulfil the requirement of the research. Without their support and motivation, it is impossible to complete the research.

## ACKNOWLEDGEMENT

First and foremost, I am grateful to Allah S.W.T for giving me a chance completing the project. Then, I would gladly thank the Faculty of Management of Technology and Technopreneuership (FPTT) UTeM in providing the subject in my coursework. The research has provide me an opportunity to gain more knowledge of the topic which I chosen. Without the subject, I would not know if I am able to complete the research as an undergraduate project.

Moreover, I would like to use this opportunity to express my gratitude to my supervisor in charge, Prof Madya Dr. Juhaini binti Jabar, who had been illuminate me throughout my completion of the research. Without her guidance, the project would not have been completed successfully. I would like to take this opportunity to express my gratitude to other lecturers and my colleagues who are always coped with me in doing the project and sharing useful information for the research to me.

Last but not least, I also would like to express tokens of appreciation to my family and friends who lend me help during progress of the project. Their morale support and love has always given me strength to complete this final year project.

## ABSTRACT

The technology of edible water orb is a technology where the sphere of ice was treated with liquid form of the seaweed-derived membrane for the outer skin. As the skin solidified and the ice melting, a portable and eco-friendly water orb packaging was ready to be consumed. Technology acceptance is a process which refers to a series of mental and behavioural states where a person passing through that leads to the adoption or rejection of an innovation. It also referring to the willingness of a party to received a proposed idea of technology to be used in their life. For a technology of edible water orb to be accepted by Generation Y, there are several factors need to be analyzed. The factors of acceptance of technology of edible water orb were constructed using theories; Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA) and Diffusion of Innovation (DoI). For the collection and analysis of data, researcher use quantitative data analysis. Method of distributing the questionnaire was chosen as the primary data collection to Generation Y as the respondents. The result of the data collection will be analyzed using SPSS to test the relationship of the variables.

Keywords: Technology Acceptance, Edible Water Orb, Generation Y

## ABSTRAK

Teknologi ‘edible water orb’ adalah sebuah teknologi dimana sfera ais dirawat menggunakan membran yang diperolehi daripada rumpai laut sebagai kulit. Sesudah kulit mengeras dan ais cair, sebuah bungkusan bebola air yang mudah alih dan mesra alam tersedia untuk digunakan. Penerimaan teknologi ialah sebuah proses dimana seseorang melalui sebuah siri keadaan mental dan sikap yang mendorong kepada penerimaan atau penolakan sebuah inovasi. Ianya juga merujuk kepada kesanggupan sesebuah pihak menerima idea teknologi yang dicadangkan untuk digunakan dalam kehidupan. Untuk penerimaan teknologi ‘edible water orb’ dalam kalangan Generasi Y, beberapa faktor perlu dianalisis. Faktor-faktor penerimaan teknologi ‘edible water orb’ dibina berdasarkan teori; Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA) dan Diffusion of Innovation (DoI). Untuk pengumpulan dan menganalisis data, penyelidik menggunakan analisis data kuantitatif. Kaedah mengagihkan borang soal selidik kepada Generasi Y sebagai responden telah dipilih sebagai cara koleksi data primer. Hasil pengumpulan data akan dianalisis menggunakan SPSS untuk menguji hubungan antara pembolehubah-pembolehubah.

Kata kunci: Penerimaan teknologi, ‘Edible Water Orb’, Generasi Y

## TABLE OF CONTENT

<b>CHAPTER</b>	<b>CONTENT</b>	<b>PAGES</b>
	DECLARATION	i
	DEDICATION	ii
	ACKNOWLEDGEMENT	iii
	ABSTRACT	iv
	ABSTRAK	v
	TABLES OF CONTENTS	vi
	LIST OF TABLES	ix
	LIST OF FIGURES	xi
	LIST OF ABBREVIATIONS	xii
	LIST OF APPENDICES	xiii
<b>CHAPTER 1</b>	<b>INTRODUCTION</b>	
	1.1 Background of Study	1
	1.2 Problem Statement	2
	1.3 Research Question	3
	1.4 Research Objective	3
	1.5 Scope and Limitation	3
	1.5.1 Scope	3
	1.5.2 Limitation and Key Assumption	4
	1.6 Summary	4



<b>CHAPTER 2</b>	<b>LITERATURE REVIEW</b>	
2.1	Introduction	5
2.2	Edible Water Orb	5
2.2.1	Waste Issues	7
2.2.2	Green Innovation	7
2.3	Theories	8
2.3.1	Technology Acceptance Model (TAM)	8
2.3.2	Theory of Reasoned Action (TRA)	10
2.3.3	Diffusion of Innovation (DOI)	11
2.3.4	Theory Selection	12
2.4	Theoretical Framework	14
2.4.1	Schematic Diagram	14
2.4.2	Compatibility Factor	14
2.4.3	Waste Factor	15
2.4.4	Green Factor	15
2.4.5	Health Factor	15
<b>CHAPTER 3</b>	<b>RESEARCH METHOD</b>	
3.1	Introduction	18
3.2	Research Design	18
3.3	Methodology Choice	20
3.4	Primary Data & Secondary Data	20
3.5	Location of The Study	20
3.6	Research Strategy	21
3.7	Population	24
3.8	Time Horizon	24
3.9	Data Analysis	25
3.9.1	Descriptive Analysis	25
3.9.2	Pearson Correlation Coefficient	26
3.9.3	Multiple Regression	26

3.10 Pilot Testing	26
3.10.1 Validity	28
3.10.2 Reliability	28
3.11 Summary	29
<b>CHAPTER 4 RESULT AND DISCUSSION</b>	
4.1 Introduction	30
4.2 Sample Size	31
4.3 Reliability Analysis	31
4.4 Descriptive Analysis	32
4.4.1 Respondent Background	33
4.4.2 Independent and Dependent Variables	41
4.5 Pearson Correlation Coefficient	46
4.6 Multiple Regression Analysis	51
4.7 Hypothesis Verification	53
4.8 Summary	55
<b>CHAPTER 5 CONCLUSSION AND RECOMMENDATION</b>	
5.1 Introduction	56
5.2 Findings	57
5.3 Limitation	58
5.4 Recommendation	59
5.5 Conclusion	60
<b>REFERENCES</b>	
<b>APPENDICES</b>	

## LIST OF TABLES

<b>TABLES</b>	<b>TITLE</b>	<b>PAGE</b>
<b>Table 2.33</b>	Diffusion of Innovation	12
<b>Table 3.8</b>	Cronbach's            Alpha Consistency	27
<b>Table 3.8.1</b>	Pilot Testing	28
<b>Table 4.3</b>	Reliability Statistic	32
<b>Table 4.4.1.1</b>	Gender	33
<b>Table 4.4.1.2</b>	Educational Institution	34
<b>Table 4.4.1.3</b>	Age	35
<b>Table 4.4.1.4</b>	Level of Study	36
<b>Table 4.4.1.5</b>	Field of Study	37
<b>Table 4.4.1.6</b>	Edible    Water    Orb Packaging Knowledge	39
<b>Table 4.4.1.7</b>	Platform    Information Gained	40
<b>Table 4.4.2.1</b>	Compatibility Factor	41
<b>Table 4.4.2.2</b>	Waste Factor	42
<b>Table 4.4.2.3</b>	Green Factor	43
<b>Table 4.4.2.4</b>	Health Factor	44
<b>Table 4.4.2.5</b>	Technology Acceptance	45
<b>Table 4.5.1</b>	Values    of    Correlation Coefficient	47

<b>Table 4.5.2</b>	Correlations between Variables	48
<b>Table 4.6.1</b>	Multiple Regression Analysis	51
<b>Table 4.6.2</b>	ANOVA	51
<b>Table 4.6.3</b>	Coefficients	52

## LIST OF FIGURES

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
<b>Figure 2.1</b>	Technology Acceptance Model (TAM)	9
<b>Figure 2.2</b>	Theory of Reasoned Action (TRA)	10
<b>Figure 2.3</b>	Diffusion of Innovation (DOI)	12
<b>Figure 2.4</b>	Framework of Research: Independent and Dependent Variables	14
<b>Figure 2.5</b>	Ooho! The Water Orb	16
<b>Figure 2.6</b>	Ooho! Booth at Clapham 10k Run	16
<b>Figure 2.7</b>	User trying Ooho!	17
<b>Figure 3.1</b>	Research Onion	19
<b>Figure 3.2</b>	Research Strategy	22
<b>Figure 4.4.1.1</b>	Gender	33
<b>Figure 4.4.1.2</b>	Educational Institution	34
<b>Figure 4.4.1.3</b>	Age	35
<b>Figure 4.4.1.4</b>	Level of Study	36
<b>Figure 4.4.1.5</b>	Field of Study	38
<b>Figure 4.4.1.6</b>	Edible Water Orb Packaging Knowledge	39
<b>Figure 4.4.1.7</b>	Platform Information Gained	40

## LIST OF ABBREVIATIONS

IV	=	Independent Variable
DV	=	Dependent Variable
CF	=	Compatibility Factor
WF	=	Waste Factor
GF	=	Green Factor
HF	=	Health Factor
TA	=	Technology Acceptance
SPSS	=	Statistical Package for the Social Science
TAM	=	Technology Acceptance Model
TRA	=	Theory of Reasoned Action
DOI	=	Diffusion of Innovation

**LIST OF APPENDICES**

<b>APPENDIX</b>	<b>TITLE</b>	<b>PAGE</b>
1	Questionnaire	64
2	Gantt Chart PSM 1	68
3	Gantt Chart PSM 2	69

## **CHAPTER 1**

### **INTRODUCTION**

In Chapter 1, the acceptance factor of the technology of edible water orb will be introduced briefly. Besides, the chapter also will be stated the problem statement of the research, research questions and research objective that will be used in the research.

#### **1.1 BACKGROUND OF STUDY**

Plastic is one of the technologies which make our life easier. This polymer is widely used in various industries such as food and beverage packaging, furniture and insulators. But, plastic has many side effects. In food and beverage packaging, water bottles are usually made of plastic, especially in this modern, industrial world. Michael (2010) stated that the nightmare scenario is that one day we find out that many disorders like infertility and cancer may be due to toxins leaching from plastics e.g. Bisphenol A, and it may be too late to reverse the side effects.

In addition to, detrimental of environment also had caused by water bottle. According to Clemens (2015), Americans alone use approximately 50 billion plastic water bottles each year, only 23% of which are recycled. Thus, an additional 38 billion plastic bottles begin a centuries-long decomposition journey annually. The huge



amounts of not recycled plastic water bottles are becoming factors led to various health problems caused by plastic.

In this chapter, researcher will provide the background of the research to determine the acceptance of edible water orb technology among students as the substitution of plastic water bottle.

## **1.2 PROBLEM STATEMENT**

This study will show that the acceptance of technology of edible water orb among Generation Y can reduce the risk of disease caused by plastic, decrease the amount of waste plastic water bottle, an initiative towards green innovation and as a healthy lifestyle. By using edible water orb, plastic water bottles can be eliminated from the manufacturing of beverages thus reducing the negative impact of plastic on health and environment.

In the research, researcher will like to focus on the factors affecting the acceptance of the technology of edible water orb among the Generation Y. Attitude and belief are among the factors in making decision. Based on the Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980) described how users' beliefs and attitudes are related to individuals' intentions to perform.

The related factors that will be considered in the research to figure out the technology of edible water orb are compatibility factor, waste factor, green factor and health factor. Further analysis of these factors will be analyzed in the research to figure out the relationships between the factors.

### **1.3 RESEARCH QUESTION**

- 1) What are the factors affecting Generation Y acceptance towards using water orb?
- 2) What are the relationship between the factors and the acceptance of technology of edible water orb among Generation Y?
- 3) What is the most influencing factor towards the acceptance of technology of water orb among Generation Y?

### **1.4 RESEARCH OBJECTIVE**

- 1) To investigate what are the factors affecting Generation Y acceptance towards using water orb.
- 2) To determine the relationship between the factors and the acceptance of technology of edible water orb among Generation Y.
- 3) To identify the most influencing factor towards the acceptance of technology of water orb among Generation Y.

### **1.5 SCOPE, LIMITATION AND KEY ASSUMPTION**

#### **1.5.1 SCOPE**

For the research, researcher would like to emphasize on the factors which affecting the acceptance of technology of edible water orb as the independent variables and the technology acceptance itself as the dependent variable. The factors will be investigated among the Generation Y whether the factors could be used in the research. The

questionnaire later will be distributed to 300 people of Generation Y. The relationships of the technology acceptance with the factors will be focused in later in the result. The questionnaire will be distributed to 300 of Generation Y in Melaka educational institutions.

### **1.5.2 LIMITATION & KEY ASSUMPTION**

The limitation of the research to determine the acceptance factors of technology of edible water orb is the respondents answered the questionnaires within their knowledge and with honesty. In researcher mind, the respondents took count every question seriously and give a thought before submitting the answer. The researcher also thought that the answers provided by the respondents are based on their knowledge, thinking and experience. Somehow if the respondents failed to do both of the matters, inconsistency could be found in the results. Moreover, the researcher thought that the questionnaire might sound interesting to the first timer respondents who gained knowledge from this research. This is to ensure that the research could give a ‘wow’ factor about the technology where they will more cooperate in answering the questionnaires to show their interest in the matter.

### **1.6 SUMMARY**

The whole chapter is discussing the brief introduction of the content of the research that will be referred later in upcoming chapters. The chapter include of background of study, problem statements, research questions, research objectives, scope, limitation and key assumption. For the next chapter, the contents of the this chapter are elaborated into literature review and the proposed theory for the research.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

Literature review presenting the perspective of the researcher of previous research and regarding the topic of acceptance of technology of edible water orb among the Generation Y. This chapter consists of definition of technology acceptance, the details of water orb and theoretical frameworks of the research. Details of the information in this chapter are accumulated from secondary data collection, from books, journals and internet.

#### **2.2 EDIBLE WATER ORB**

Edible water orb (Ooho!) is a technology developed by Skipping Rocks Lab, based in London which using the sphere of ice that treated with liquid form of the seaweed-derived membrane for the outer skin. When the 'skin' solidified, and the ice melts, an orb, which is portable and eco-friendly water packaging is ready to be served. In order to construct each water orb, it only took 2 cents. So far, Ooho! has been sold to events such as in London, San Francisco and Boston. The recent event which edible water orb used was Clapham Common 10k run. In the context of our beloved country, Malaysia, the

application of edible water orb can be applied in athletic event such as recent event, South East Asia sport games (Sukan SEA), marching events like the Celebration of Prophet Muhammad (SAW) Birthday, or musical events such as Rock The World (RTW). Those events are available throughout the year which means after the events were finished, abundance of plastic bottles and other trash were piling up the streets.

What are the benefits of this water orb? First and foremost, Ooho! is totally made of plants and seaweed. This will nullify the harmful chemical substances such as Bisphenol A (BPA) which can be found in conventional plastic bottle packaging. Water orb skin can be biodegradable from four to six weeks which is like a piece of fruit. The time taken for degradable of plastic bottle is at least for 450 years. Some of the plastic bottle even took longer which up to 1000 years to biodegrade. In the worse scenario, Polyethylene Terephthalate (PET) bottle cannot biodegrade. This problem will cause abundance of plastic bottle at the disposal site. According to the plastic study in 2011 by National Solid Waste Management Department Ministry of Housing and Local Government of Malaysia (JPSPN), the export of waste which consists of sacks and bags, boxes, casings, bottles & containers in 2010 is 457,001 tons which is almost six folds the import weight.

Here is a good thing for those who love to drink flavoured water. Edible water orb also can be flavoured and coloured. This mean the product could be consists of any flavoured juice and coloured to make the product more interesting. Another interesting fact about water orb is the cost for making the skin is cheaper than plastic. Ooho! is not only more eco friendly, safely to consume, but also cheaper compared to conventional plastic bottle.

## **a) Utilization of Water Orb**

### **i) Waste Issues**

Waste issue is not a new issue. According to a study conducted by National Solid Waste Management Department Ministry of Housing and Local Government of Malaysia (2011), plastic wastes ranked at the third place, after domestic waste and paper. According to a report provided by National Association for PET Container Resources (NAPCOR) in 2015, it is about 30.1% of the PET bottles (1,797 million pounds) were recycled from the approximately 5,971 million pounds of sold PET bottles in marketplace in the United States. Although plastic waste also one of the most common wastes that recycled the increasing numbers in using plastic in the industry of packaging food and beverage is still a major issue. Application of water orb can reduce the amount of plastic bottle disposal, which replaced the packaging of using bottle with seaweed derived membrane.

### **ii) Green Innovation**

Concerning about the environment is a positive attitude towards achieving green technology city. In a major city like Melaka, where the population is high, we could easily see that used, empty water bottle on the streets. This issue is related with attitude problems where the consumers easily littering the streets after finished up the drinks. By proposing water orb ideas to the beverage manufacturers, the littering streets issues can be reduced. A mutual benefit between the manufacturing company and the cleanliness of the city can be achieved in applying water orbs in the production of their beverages. Replacing the commercial water bottle with water orb can greatly reduced the disposal of water bottle by the roadside while on the manufacturer perspective, it can reduced

their cost for packaging since the cost for manufacturing beverage using water orb is cheaper compared to using conventional water bottles. Design is one of the common practices that motivate sustainable development and green innovation (Sila, 2007; Molina-Azorin et al., 2015).

## **2.3 THEORIES**

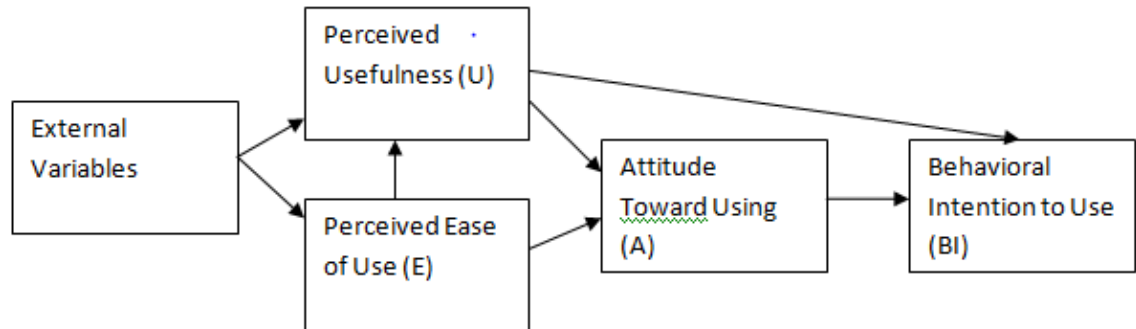
In order to carry out the research, researcher decided to use three theories which are related to the topic. The theories are Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA) and Theory of Diffusion of Innovation (DoI). Using the three theories, the researcher will analyze the model and come up with a new model where it is based on the theories where the model is using variables related to the topic.

### **2.3.1 Technology Acceptance**

Sepasgozaar et. al, (2016) states that the technology acceptance process refers to a series of mental and behavioural states that a person passes through leading to the adoption or rejection of an innovation. Technology acceptance refers to the willingness of a party to receive a proposed idea, technology to be used in their life. This research conducted to determine the acceptance of the edible water orb among the students in their daily life.

The research conducted using Technology Acceptance Model (TAM) to determine the acceptance of Water Orb technology among the target audience. TAM originally developed by David, Bagozzi, and Warshaw (1985). TAM model was constructed based on the Theory of Reasoned Action by Ajzen & Fishbein (1980) that express on how users' beliefs and attitudes which are linked on the intentions of individuals to perform.

Attitude towards behaviour determined on beliefs of behavioural on the consequences of the behaviour and evaluation of the consequences on the individual.



**Figure 2.1: TAM Model**

**a) Perceived Usefulness**

Perceived Usefulness as the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989). In easier words, the technology can be used or apply by a party to bring better outcome of his or her work. This was applied to Ooho!, where the water orb was used in few events such as marathon where the participants did not have to carry around the water bottle in the run.

**b) Perceived Ease of Use**

The degree to which a person believes that using a particular system would be free from effort (Davis, 1989). It means that the technology can be applied by any party to make work easier. In Ooho! case, this can be applied in terms of the ease of