FACULTY OF TECHNOLOGY MANAGEMENT AND TECHNOPRENEURSHIP

THE AWARENESS OF INNOVATION TECHNOLOGY IN FOOD PACKAGING FOR SUPPLIER IN MALAYSIA

A project report submitted in partial fulfillment of the requirement for the award of the degree of Bachelor (Hons.) of Technology Management (Innovation)

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2022

VERIFICATION

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STUDENT DECLARATION

I hereby declared that this thesis entitled

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is the result of my own research except as cited in the references. I also declare that it has not previously or concurrently

been submitted for any degree or award at University Technical Malaysia Melaka or any other institutions.

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DEDICATION

This humble work is dedicated to:

My supportive family, for the infinity love and sacrifices;

My dearest supervisor, for the never end words of encouragement;

My greatest friends, for being who they are;

And above all

To Allah SWT, the Almighty and;

Muhammad SAW, the best teacher and messenger.

ACKNOWLEDGEMENT

First of all, I would like to praise and thank Allah S.W.T for His Greatness and permission-giving me the time, healthy life, and opportunity to complete my first final year project titled “The Awareness Of Innovation Technology In Food Packaging For Supplier In Malaysia’’ as fulfilling the compulsory requirements of Universiti Teknikal Malaysia Melaka (UTeM) and the Faculty of Technology Management and Technopreneurship (FPTT). I appreciate this opportunity to express gratefulness to those who made this project become possible.

Besides that, I want to give a big thanks to my supervisor Madam Adilah Binti Mohd Din that gives a lot of guidance during this semester in session 2021/2022 on her knowledge expertise, suggestion, and useful comment while completing this research project.

I also would like to extend my thankfulness to the most precious persons in my life, my father and mother for all their moral support, financial and advice in all aspects during the report completion from the beginning till the end. Lastly, I want to express my gratitude to the all respondents that spend their time helping me to fulfill the questionnaire. I am truly appreciative and honestly grateful to all that participate while making this project.

ABSTRACT

Food packaging is one of the most important in the food industry that helps in maintaining the quality of food products during storage, transportation and distribution. It is done primarily to protect food products from external influences such as biological, chemical or mechanical damage; to contain food, preserve it in its condition as packaged by preventing deterioration of quality, and to attract consumers and provide product and nutritional information. There are many packaging materials in use since then. Each type of packaging material has a different role to play in packaging. Also packaging materials such as biodegradable packaging or edible packaging may ensure the world's need for eco -friendly and natural foods which is a major global concern nowadays. The food packaging industry has greatly innovated with technology in recent years with the advancement of new food packaging technologies, such as active packaging, aseptic packaging, smart packaging, bioactive packaging, edible packaging which is a research trend. Advances in such packaging technology can prevent food spoilage by maintaining food standards at the highest level which can assist in meeting the needs of consumers along the food supply chain as well as meeting the requirements under the Food Packaging Law.

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CHAPTER 1

INTRODUCTION

1.1 Background of study

This chapter gives an overview of the background of research which explains the innovation technology food packaging for supplier in Malaysia . This chapter also explains the problem of Malaysia technology food product packaging to supplier, then the researcher come up with two research questions and developed two research objectives. The researcher also goes through the scope and limitations of the study in detail. The researcher also discusses the relevance and contribution of this study.

One of the government's goals, particularly the Melaka state government's goal of becoming a green technology state, is to use green food packaging technologies. Environmentally friendly food packaging technology should be stressed in the food packaging business, especially in emerging nations like Malaysia. The business is under pressure not just to meet nutritional and safety standards, but also to protect human health and the environment. To begin with, what is food packaging? Food packaging serves as a wrapper or barrier for foods that contain a variety of substances. Plastic, glass, metal, laminate and metal film, tin plate, polyester, paper, and paper board are the most common materials used for food packaging today. The materials used are largely non-decomposable, can't be recycled, and can't be reused, causing environmental issues. With the correct technology and packaging materials, product quality, freshness, and protection from external threats may all be preserved. A complete investigation of the material determines the package's environmental effect from manufacture through disposal. The combination of green and packaging, according to Gumienna M. and Górna B. (2021), will be a new choice in consumer development markets such as Malaysia.

According to Ramsey (2017), food packaging is at the heart of the modern food industry, and nearly no items are offered without it. Good packaging reduces waste and guarantees that the food included is of the highest quality throughout its shelf life. The capacity of food packaging to preserve the food inside while simultaneously preventing microbial contamination and facilitating storage is

the most important of its numerous functions. It allows customers to distinguish between brands supplying the same product, provides product and content information, and, of course, facilitates food transit, whether locally or worldwide. In some circumstances, the materials used to make food packaging are a high priority for food since some must be able to endure microwave heat. Popcorn, for example, is a microwave-safe and microwave-ready snack. It also helps with the logistics side of food delivery. (Kyle, 2017) There are various steps in the packaging process.

Structure, colour, graphics, and typeface are all design components in product packaging. (Paoloni P., and Modaffari G.2022) performed a prior research to investigate how food packaging features impact customer purchase choices. Packaging features can impact purchase decisions, according to the findings of this study. (Paoloni P., and Modaffari G.) stated that food production and distribution have undergone technical advancements and changes in recent years, resulting in a growth in the quantity and brands of food products accessible on the market. This may promote brand similarity in product classification, resulting in the brand being the same and difficult to identify from its competitors, giving the impression that buyers may have difficulty deciding which brand to buy. As a result, food makers' goods must be at odds with those of their rivals.

Only examining food product packaging features impacts consumer buying intention, according to Paoloni P. and Modaffari G. (2022), however the researcher concentrated on food product packaging design impacting consumer buying intention for this study. Food product packaging design was chosen by researchers because it may provide a competitive edge as well as a product attraction for customers. According to a research conducted by Romanova O.A. and Kuzmin E. (2021), today's phenomena has prompted manufacturers to make their products in an engaging manner that helps customers distinguish their products from rivals while also serving as a tool for attraction. Manufacturers have utilised packaging design as a method to create appealing packaging in order to catch consumers' attention. When selling items to end consumers, packaged products provide you a competitive edge. Good food package design is regarded as a critical component of corporate success and customer purchase intentions. As a result, this research will reveal how product

package design may assist food manufacturers in gaining customer interest in their products.

1.2 Problem Statement

Food packaging has become one of the most sensitive and crucial qualities that may impact both consumers and suppliers. Packaging may also encourage suppliers and customers to acquire the goods and play a supporting role in creating purchase intent. Many firms encounter issues with food packaging while using the marketing mix. One of the issues with packaging is the necessity to determine if it makes a suitable advertising tool. Claimed that with more competitors throughout the world, food product promotion is essential and food packaging may be even more significant as a brand's communication intermediary. had said that the corporation is forced to follow supplier demands and wants because of the constantly shifting consumer views and behavioral dynamics. Therefore, this study seeks to examine the awareness of innovation technology in food packaging for supplier in Malaysia is still lack of.

Food packaging has become the most sensitive and crucial attribute that might effect customers, according to Ashraf S.A., Siddiqui A.J., (2021). Food packaging may also encourage customers to acquire items and assist in the formation of purchase intentions. Elkhalifa A.E.O. (2021) goes on to say that, in the present, the design of food packaging may provide businesses a competitive advantage over competitors that make the same sort of product. Because the market is saturated, marketers must think outside the box in order to stay one step ahead of their rivals. Packaging design may be used by marketers as one of the markers for surviving in a crowded market. Khan, M.I., and Patel, M., (2021) highlighted that as the number of rivals worldwide grows, product marketing has become more crucial, and product packaging may play a larger role as a communication intermediate for companies. According to a recent research by Mohammad Nejad (2020), changes in customer attitudes and dynamics push organisations to follow the needs and wishes of customers on a daily basis. Following the dynamics of consumer behaviour and attitude development, good quality goods with a modern and adaptable design, proportional and compatible with customer perceptions are needs that must be addressed. To create

a unique package design, as well as the creation of its instructions from many perspectives.

The Malaysian government has begun using green technology for food packaging utilising biodegradable materials as a solution to the problem in 2019. Following the state government's directive, Malaysians must bring their own shopping bags while purchasing items or food packing. The government has proclaimed a total ban on plastic bags and polystyrene containers made of non-biodegradable materials on all Malaysian sites, with cash counters replacing them with biodegradable bags made of plant-based materials. As a result, in order to deploy green food packaging technology in Malaysia, it is required to first investigate consumer approval of this technology in their country. While eliminating polystyrene food containers is a positive step, alternative packaging must first be developed, and customers must consider if they are ready to pay the increased cost incurred if the polystyrene is replaced with a somewhat more costly paper-based container (Malaysian Digest, 2018). This is because consumer understanding and awareness of the new creation of environmental food packaging technology in Malaysia is still in its early stages, and many are unaware of the reasons for its installation and use. Consumer perception and knowledge vary and are impacted by a variety of viewpoints.

The goal of product packaging is to improve the product's reputation and influence customer views of both the product and the company (Rudy, 2020). Furthermore, packaging adds value to such objects by serving as a tool to distinguish products from a large range of comparable items, potentially assisting buyers in their product selection process. Abdul (2019) and Mallik (2018) found that an individual's preferences will impact his or her purchasing behaviour, and that perceived interest has a direct effect on food purchase intentions. Despite an increase in point-of-purchase decisions that boost the communication power of food packaging, empirical study has been undertaken to understand how package design aspects create product evaluations and customer brand perceptions (Edmund 2015). However, research have revealed that there is no unanimity on how package elements should be classified. Many researchers are interested in all possible package elements and their impact on customer purchasing decisions

1.3 Research Question

I. What is the the factors that affect awareness technology food packaging for suppliers?

II. What is the relationship between food packaging facility technology innovation and suppliers' awareness of food packaging technology in Malaysia?

III. How does technology innovation effect suppliers in food packaging awareness in Malaysia?

1.4 Research Objective

I. To determine the factors that affect awareness technology food packaging for suppliers.

II. To investigate the relationship between food packaging technology innovation and suppliers' awareness of food packaging technology in Malaysia.

III. To study how does technology innovation effect suppliers in food packaging awareness in Malaysia.

1.5 Scope of Study

The focus of this analysis is to identify the awareness of the use of food packaging innovation technology to suppliers in malaysia. This research will use several theories. The analysis of food product packaging that affects supplier intention was the goal of this study. Four aspects that are connected to customer purchase intents for food product package design have been proposed by the researcher in this study. The packaging's color, form, symbols, and typography are its four main components. According to the researcher, these components have a strong association with the food product package design and supplier intentions.

1.6 Limitation of the study

There were certain limitations in this study when it came to doing it. First, because it exploits the concepts and impacts of food packaging awareness in Malaysia, the process of locating sources such as data and information is difficult. It is perceived as a challenging task since it is still considered a process of societal adaptation of new technologies. As a result, there were few publications and journals published. Furthermore, data collecting might be time-consuming since I must collect all of the target respondents from a big sample size in order to create accurate and dependable results. The researcher discovered numerous constraints when conducting these studies. The investigation was limited by time constraints and geographical factors. Due to a time restriction, this research was only done in Melaka, Malaysia, a tiny city with a small population. Furthermore, the researcher experienced trouble acquiring secondary data when doing this investigation. To read or access some publications, data, and online reports, researchers had to pay in advance. Next, researchers struggle to find a publication because there are no previous studies on this topic. Lastly, the survey is distributed both by hand and online

1.7 Significant of Study

The methodology described in this study will give a major and effective way of raising awareness of food packaging technology innovation improvements, and the impact of using these food packaging technology innovations will undoubtedly have a big influence on suppliers. It is intended that the suggested model's significant and positive outcomes would offer data on the proper approach to employ food packaging technology innovation advancements and raise awareness of their use. The research findings will assist the community since they give significant insights that will enable residents to understand and appreciate the creative functionalities of food packaging technology innovation. As a result, it may be beneficial in improving their purpose to use the knowledge they have gained.

1.8 Summary

This chapter provides the background of the study where it introduces about the technological awareness of food packaging innovation to suppliers in Malaysia. Followed by a problem statement that defines the needs of this research. Meanwhile, four research questions and four research objectives will be discussed further. Scope of research that focuses on how acceptance and behavior people will respond when using this technology in their daily basis. Limits at the same time, it takes quite a long time to collect data and information while preparing the report. The importance of the study is to enhance and contribute to the intention of the public to use food packaging innovation technology in Malaysia.

CHAPTER 2

(LITERATURE REVIEW)

2.1 Introduction

This chapter explores an analysis focused on reading list of published writings related to innovation technology. It's also related to know more in what food packaging is and what is impact to supplier . Besides that, this study will clarify on innovation food packaging in malaysia ,effects and measures for suppliers. In this chapter, it will brief more on type of innovation technology food packaging, factor and effect technology food packaging for supplier in Malaysia.

2.2 Food Packaging

Food packaging is the most prevalent packaging strategy for preserving food items is active packaging, which is Food is said to be enclosed to prevent tampering or contamination from physical, chemical, and biological sources. The present food system focuses upon packaging, and relatively few commodities are sold unpackaged. Adnan M. says that good packing lowers waste and guarantees that the product retains its desired quality throughout time (2021). Food packing is another sort of food packaging. A package provides security, resistance to tampering, and specific physical, chemical, or biological needs. It might include a nutrition label as well as other details about the product being sold. Food packaging is the process of enclosing food in order to protect it from damage, contamination, deterioration, insect attacks, and manipulation while it is transported, stored, and sold in stores. The package often includes a list of the ingredients, nutritional information, cooking instructions, and shelf life. The box needs to be designed and picked out in a way that doesn't interfere negatively with the meal. Packaging types include, but are not limited to, bags, bottles, cans, cartons, and trays.

The collaboration and work of advertisers, designers, and users culminates in successful package design and the package itself. Food packaging is also a valuable resource for the development of new consumer products. (Garly and James 2020) estimate that the packaging will wow customers, communicate the company's name and identity, separate the brand from competitors, and increase product features. As a result, food packaging is seen as a permanent contact device in the procurement process, providing customers with product information. The notion focuses on the

placement of products in advertising and promotional design; the position indicates the value of the product and brand identity, as well as the importance of differentiating the product in consumers' perceptions. This stance helps boost awareness of packages and goods by offering it to rivals based on attributes that cannot be supplied by a corporate name or brand. (Garly and James, 2020) explores an innovation mix that comprises pricing, location, marketing, and product, all of which will be impacted by product positioning. These components assist customers in finding and entering the proper product position. Many components are integrated in the position depending on the positioning strategy. This can be a consumer culture that is transnational, local, or foreign, with distinct roles and goals in design, packaging, and performance. However, the main objectives is to investigate the link between food packaging innovation technology and customer acceptance in Malaysia. As a result, food packaging and design are centred on the supplier, while the company's position allows it to appropriately innovate its goods.

Simply said, packaging maintains the benefits of food processing even after the process is complete, enabling foods to be transported safely across great distances from their point of origin while still being nutritious at the time of consumption. Packaging technology must, however, balance food safety with other issues including growing energy and material costs, more social and environmental awareness, and strict regulations on pollutants and the disposal of municipal solid waste. Everyone eats three meals a day, making food the sole product category where this is true. As a result, food packaging makes up around two thirds of all packaging waste. Additionally, around half of all package sales are made up of food packaging (by weight). The relationship between packaging and the environment is still poorly understood, despite advancements in the specific knowledge since the publication of the First Scientific Status Summary, which hinders efforts to address the impact of discarded packaging materials on the environment.

One of the most critical procedures for preserving the integrity of food goods for storage, transit, and consumption is packaging (Kelly 2018). It keeps the quality of the product from deteriorating and makes distribution and marketing easier. Protection, information confinement, and convenience are the three primary functions of packaging (Kelly, 2018). A decent packaging may help a firm not only retain the quality of its product but also increase its profits. Packaging has additional uses such

as marketing and sales promotion in addition to its primary function of preservation. However, the primary purpose of food packaging is to guarantee the safe transportation and preservation of food products till consumption. Throughout distribution, the food product's quality might deteriorate biologically, chemically, and physically. Food packaging thereby contributes to extending the shelf life of food products while also preserving their quality and safety.

2.3 Food Packaging Materials

The distinct and original quality of the product will be represented and reinforced by the features and qualities of the food package design. A well-crafted package promotes the product through good touch and attentiveness. John (2018) identified the four major food packaging components that impact the supplier's purchasing choice based on a review of the literature. Visual elements and information elements are two types of such elements. The visual aspects include logos and packaging size or type. The data components comprised product information as well as any facts regarding the packaging method.

The design and structure of food packages have a significant impact on the shelf life of the items. Product quality and freshness are maintained during distribution and storage thanks to careful material selection and packaging technologies. Glass, metal (aluminium, foil and lamination, tin plate, and tin-free steel), paper and paperboard, and plastic have all been used in food packaging in the past. In addition, a variety of polymers in both hard and flexible forms have been created. Today's food packaging frequently blend various substances to take use of each material's functional or aesthetic properties.

2.3.1 Glass

Glass has a long history of use in food packaging; the oldest glass food containers date back to the year 3000 (Sachin and Griff (2019)). The process involves heating a mixture of silica (glass container), sodium carbonate (melting agent), limestone/calcium carbonate, and alumina (stabiliser) at high temperatures until the liquid material becomes a concentrated liquid mass, which is then poured into a mould. Recycled shattered glass (cullet) is also utilised in glass manufacture, accounting for around 60% of all raw materials. Surface coating is commonly used on glass containers used in food packaging to offer lubrication in manufacturing lines, minimise surface

scratches or abrasions, and reduce line congestion. The glass coating also boosts and preserves the bottle's strength, reducing breaking. Manufacturers may utilise thinner glass with improved breakage resistance, which saves weight and is easier to dispose of and carry (McKennie 2020). Glass offers various advantages for food packaging applications since it is odourless and chemically inert with practically all food products: Because it is impervious to gases and vapours, it keeps the product fresh for a long period without sacrificing taste or flavour. Because of its capacity to tolerate high processing temperatures, glass may be used to thermally sterilise both low and high acid foods. Glass is robust, provides excellent insulation, and comes in a wide range of forms.

2.3.2 Metal

Of all the packaging materials, metal is the most flexible. It combines excellent physical barrier and protective qualities with formability, aesthetic potential, recyclability, and consumer acceptance.

2.3.2.1 Aluminium Foil

Aluminum foil is formed by rolling pure aluminium metal into extremely thin sheets, which are then annealed to provide the sheets the ability to fold firmly due to its dead-folding properties. Furthermore, there are different thicknesses of aluminium foil, with thinner foils being used to wrap food and thicker foils being used for trays. Like all metal packaging, foil serves as a barrier to moisture, air, odour, light, and microbes. It doesn't require any kind of protection or lacquer and is resistant to acidic foods. Despite the fact that aluminium can be recycled with ease, foils created from recovered aluminium cannot be produced without the thin sheets developing pinholes.

2.3.2.2 Laminates and metallized films

To increase barrier qualities, packaging lamination involves attaching aluminium foil to paper or plastic sheet. It's simple to use because of the narrow gauge. While laminating to plastic allows for heat sealing, it does not entirely keep out moisture and air. Laminated aluminium is frequently used to wrap high-value items such as dry soups, herbs, and spices because it is quite expensive. Metallic film is a less expensive alternative to laminated packaging. A metallic film is a plastic with a tiny coating of aluminium metal embedded in it (Fellows and Axtell 2021). The film