UNIVERSITI TEKNOLOGI MARA

MaBox

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1.0 EXECUTIVE SUMMARY

The objective of this report is to provide an overview of the MaBox food delivery box and to explain its purpose to potential users. An online survey (Google Form) was conducted to identify the challenges faced by users in food delivery service before the development of the product prototype. Based on the findings, a suitable solution was developed to meet consumer needs and market demand. Several issues were identified during the brainstorming process.

From the survey conducted, it was found that users commonly face problems such as food arriving at an unsatisfactory temperature, spillage of food beverages, damaged packaging and delays in delivery. These issues negatively affect customer satisfaction and highlight the need for improvement in food delivery box systems.

The target users of MaBox include food delivery riders, customers, and food service providers. The product was inspired by existing food delivery solutions such as insulated delivery bags and thermal containers currently used in the industry.

To address these problems, the MaBox food delivery box was developed as a practical and user-friendly solution. The product is designed to improve food protection, maintain temperature and reduce spillage during transportation, while at the same time enhancing convenience and safety for riders.

Based on market research and survey data that was obtained, the potential for this product is high. A majority of respondents showed strong support for improved food delivery solutions, particularly in terms of food quality preservation and spill prevention. The results show that 59 out of 60 respondents (98.3%) agreed with the introduction of MaBox in the food delivery industry, indicating strong market acceptance and high demand for an improved food delivery solution. Overall, the findings confirm that MaBox has strong potential to meet consumer needs and improve the quality of food delivery services.

2.0 INTRODUCTION

2.1 BACKGROUND OF STUDY

The growth of technology has changed how people purchase their food and daily necessities. Currently food delivery services have become an essential part of our lives because they provide convenience, save time, and offer flexible access to a wide variety of choices. In Malaysia, platforms like GrabFood have become one of the most popular food delivery services, connecting customers, restaurants and delivery riders through a single digital platform.

The success of food delivery services not only on mobile applications and delivery systems but also on the equipment that are used by riders during the delivery process. One of the important equipment is the motorcycle delivery box, which functions as a storage compartment that will make sure the food will transport safely from restaurants to customers. The delivery box plays a significant role in maintaining food quality, protecting food and ensuring the smooth of delivery operations.

However, there are few issues related to the current delivery box that have been identified through observations and QnA with GrabFood riders. Problems such as food spillage, temperature issue, rider discomfort, and safety concerns that affect service quality and customer satisfaction. Therefore, there is a need to improved delivery box that can better meet with the riders needs and customers while supporting the efficiency of food delivery services.

2.2 RESEARCH BACKGROUND

Recent years the food delivery industry has experienced significant growth due to increasing internet usage, smartphone accessibility, and changing consumer lifestyles. Customers increasingly prefer food delivery services because they are more convenient and can reduce the need to travel to restaurants. As a result, delivery riders have become an important component in the food delivery ecosystem.

The motorcycle delivery box is one of the key tools used by delivery riders. It is the main equipment to protect food during transportation and maintaining food quality until it reaches customers. A well designed delivery box should be more durable, lightweight, comfortable to use, and capable of preserving food temperature.

Despite its importance, many delivery riders face challenges when using the existing delivery boxes. Large and heavy boxes may cause discomfort during long working hours. Other than that, poor internal design also lead to food movement and spillage during transportation.

To better understand these issues, this study will focuses on GrabFood delivery riders and their experiences with the current delivery box. The findings will be used to identify existing problems and will develop an innovative delivery box design that can improve rider comfort, food safety, and customer satisfaction.

2.3 PROBLEM STATEMENT

The increasing demand in food delivery services has created a need for efficient and reliable delivery systems. Although GrabFood successfully established itself as one of the leading food delivery platforms in Malaysia, few challenges remain in the physical delivery process, especially regarding the motorcycle delivery box that are used by riders.

One of the main problems is food spillage and damage happen during transportation. Poor road conditions, sudden braking and food containers move inside the delivery box during delivery causing packaging damage and reduce the quality of food when it reaches customers.

Another issue is the inability of delivery boxes to maintain food temperature effectively. Hot food become cold while cold food may lose its freshness during delivery periods. This can affect customer satisfaction and the overall quality of service.

Rider comfort and safety are also the main concerns. Some delivery boxes are bulky, heavy, and poorly balanced will causing riders struggle and uncomfortable especially during long working hours. These conditions may increase to road safety risks.

Therefore, there is a must to improved motorcycle delivery box that can minimize food damage, maintain food quality, improve rider comfort, and enhance overall delivery performance.

2.4 METHODOLOGY

The data for this study were collected by using the following methods:

1. Google Form Survey

   A Google Form questionnaire was distributed to respondents to gather information according to the issues and challenges that are related to the current GrabFood delivery box. The survey objective is to identify customer and rider concerns on food safety, temperature maintenance, delivery efficiency, and rider comfort. The responses collected were analysed to determine the need for product improvement and innovation.

2. Observation

   Observation was conducted to understand how the design and functionality of the current GrabFood delivery box. This method help us identify the weaknesses, including food spillage, poor temperature flow, rider discomfort, and safety concerns during delivery operations.

3. Literature Review

   Information is gathered from journals, articles, company reports, and online sources about food delivery services, product innovation, delivery box design, rider safety, and customer satisfaction. These references were used to support the product development and innovation process.

2.5 LIMITATIONS

1. Number of Respondents

   The Google Form survey involved a limited number of respondents. Moreover, the findings might not fully represent the opinions and experiences of all GrabFood riders and customers throughout Malaysia.

2. Time Constraints

   The study was conducted within a limited period of time. A longer duration for data collection will provide better comprehensive information and wide understanding of the issues faced by users.

3. Dependence on Respondent Feedback

   The findings of this study are based on the responses collected through the Google Form survey. Since the data collected based on respondents' opinions, the responses may have different opinion depend on each person's experience.

3.0 NEW PRODUCT DEVELOPMENT

3.1 DEFINITION

New Product Development (NPD) refers to the process on how to create a new product or improve the existing product to satisfy customer needs .In addition, the companies need to continuously innovate according to customer preferences, lifestyles, and market demands that are constantly changing. Through NPD, businesses are able to introduce products that are provide better quality, more convenience, and improved value to customers.

NPD is an important process because it helps businesses remain competitive and relevant in the market. A successful product not only meets customer expectations but also provides solutions to the existing problems. The development of a new product usually start with identifying a problem or opportunity in the market. Followed by developing ideas, conducting research, evaluating the the product, developing prototypes, test the product, and past one introduce it to the target market. These stages help ensure that the product is practical, effective, and acceptable to customers.

In addition, NPD allows companies to improve customer satisfaction by offering products that better meet consumer needs. Product innovation will help businesses increase sales, strengthen the brand image, and achieve long term growth. Companies will continuously develop and improve their products and are more likely to maintain their competitive advantage and adapting to changes in the business environment.

In this study, the New Product Development process will focuses on improving the existing GrabFood motorcycle delivery box. Based on the findings from the case study, several issues were identified like food spillage during transportation, poor temperature foow, rider discomfort, and safety concerns. These issue may affect the quality of food delivery services and customer satisfaction. Moreover, an improved delivery box is needed to provide better food protection, maintain food temperature, enhance rider comfort, and improve delivery efficiency. Through this improvement, the product is expected to contribute to a better delivery experience for both riders and customers.

3.2 CLASSIFICATION OF NPD

According to Sinclair and Campbell (2014), New Product Development (NPD) can be classified into two main categories which are Completely New Products and Improvements on Existing Products. This classification will help businesses to identify their type of innovation that is developed and its impact on the market.

1. Completely New Products

Completely new products refer to products that never existed before in the market. These products introduce new ideas, technologies, that create a new market opportunity. Completely new products can be divided into two categories, namely new to the world products and new product lines. New to the world products are innovative products that create an entirely new market, meanwhile new product lines are products that are new to a company but already exist in the market.

2. Improvements on Existing Products

Improvements to existing products include enhancing the quality, features, functionality, design, or performance of products that are already available in the market. The reason for these improvements is to solve existing weaknesses and increase customer satisfaction. Companies always improve existing products to remain relevant, competitive and respond to changing customer needs.

The proposed GrabFood motorcycle delivery box innovations are classified as an improvement on an existing product. This is because delivery boxes are already used by a lot of companies, but few weaknesses have been identified through this case study. The proposed innovation focuses on how to improve the current design by introducing better food protection, improved temperature maintenance, enhanced rider comfort, and ensure rider safety during delivery operations.

Therefore, the suggested delivery box does not create a completely new product category but it improves the functionality and performance of an existing product to meet the needs of riders and customers. Through these improvements the innovation is expected to increase delivery efficiency, maintain food quality, and enhance customer satisfaction.

3.3 NEW PRODUCT DEVELOPMENT PROCESS

3.3.1 Research & Development

A) Idea Generation

The concept behind MaBox comes from recognizing issues shared by the food delivery sector. There are many problems now occurring while transporting online food orders, including food spillage, food temperature drops and damaged food packaging. These issues not only make for poor customer experience and awareness, but they also represent an opportunity for a more efficient packaging system for food delivery.

The first brainstorming meetings addressed the following aspects with regard to food safety, stability and temperature management: Through daily use and informal feedback from both food delivery customers and food delivery riders, it was found that current delivery bags/containers are not adequate for purposes of transport standby, shielding against movements during transport, leakage prevention or heat loss.

Based on these discussions, the idea of a multifunctional food delivery box evolved. MaBox is an integrated solution that aims to solve multiple problems by combining several features. This includes better insulation for a better temperature control, an internal compartment for cold and hot foods, and enhancement of structure to minimize spillage and packaging damage.

Further development of ideas was developed in consideration of practicality for food delivery riders including portability and ease of handling. This resulted in the addition of features such as a cup holder that could be adjusted to reduce spillage of beverages while transporting them, and an adjustable cup holder that was easy to use.

The idea generation process was triggered by the problems in delivery and actual users' experiences and has progressed to the development of MaBox as an innovative solution to address challenges of food quality, safety and delivery reliability.

B) Idea Screening

Idea screening is the process to evaluate all the ideas that have been gathered. This process comes after doing the idea generation process. In this section, I will focus on selecting the most realistic idea by taking into consideration factors such as objectives, assumptions, constraints, feasibility, value, risk and sanity check. All these ideas have been considered and the concept of the MaBox has been chosen for development. There are several features that have been decided to develop the MaBox:

i. The dual compartment design (60% hot and 40% cold) is used.

   The MaBox has two separate compartments to help ensure food quality when delivered. The hot section is used for warm food, and the cold section is used for cold food. Ice or cooling pads have been placed in the cold compartment to keep it cool on the journey.

ii. Cup holder to prevent spills.

   In order to prevent drink spillage, the MaBox has cup holders on both sides of the bag (2 on the right and 2 on the left). These holders help to maintain beverages in position and decrease their motion on delivery.

iii. Reflective safety design.

   The exterior of the MaBox features reflective material to make it easier for riders to be seen during night deliveries. This enables the bag to reflect light and make it more visible in low-light situations.

iv. Convenient and versatile design.
   The MaBox is lightweight and ideal for use by food delivery riders every day. The design is straightforward, efficient and appropriate to the actual delivery context.

In summary, the MaBox is chosen due to its practicality, feasibility, and solution to several delivery food service problems, including rider safety, temperature control, and spillage.

C) Market Survey

To better understand the needs and expectations of customers and food delivery riders, a market survey was conducted using Google Forms. This survey was circulated online using different social media platforms such as WhatsApp, Telegram and others. The survey had a total response rate of 60 respondents.

This survey aimed to collect opinions about the most common food delivery issues that are faced, and attitudes on the acceptance of the food delivery box innovation. This questionnaire was composed of several questions on respondents' demographic details, experiences with food delivery services, concern about food's transportation quality, and opinions about the features of the proposed food delivery box.

The results from the survey will be used to refine the concept a food delivery box and understand the food delivery rider and customer's requirements.

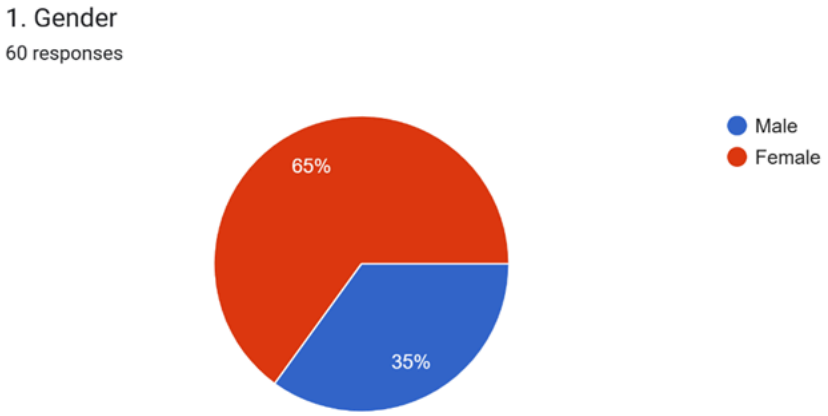

Figure 3.3.1 (a): Percentage of responses based on Gender

Based on the pie chart in Figure 3.3.1 (a) above, there were a total of 60 responses to the survey. The majority of the respondents (39) were female; constituting 65% of the total responses were given by females. In the meantime, 35% (21 respondents) were male. The results show that the female respondents made up the greater percentage in the survey. It gives a general picture of the participants who have been part of a survey and can be used for further analysing the survey data collected.

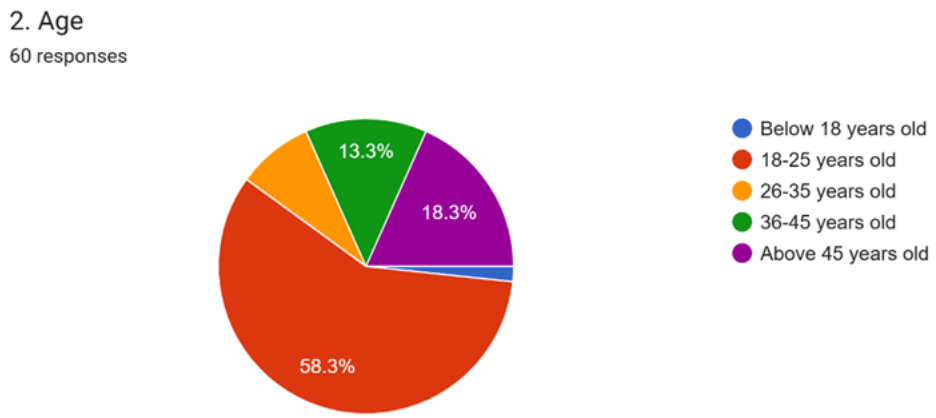

Figure 3.3.1 (b): Percentage of responses based on Age

The above pie chart (Figure 3.3.1 (b)), of which shows survey results, has a total number of 60 responses. 58.3% (35 respondents) of the respondents were of age 18 to 25 years old. This was followed by those who are above the age of 45 years old who made 18.3 percent (11 respondents). Meanwhile, the respondents age group of 36-45 years old made up 13.3% (8 people) and the age group 26-35 years old made up 8.3% (5 people). Respondents aged below 18 years old made up the smallest group with 1 respondent (1.7%).

The results of the survey showed that the majority of participants were young adults ages 18-25. The age distribution illustrates the age of the individuals to whom the respondent corresponds and the mentalities of people who use food delivery services quite often.

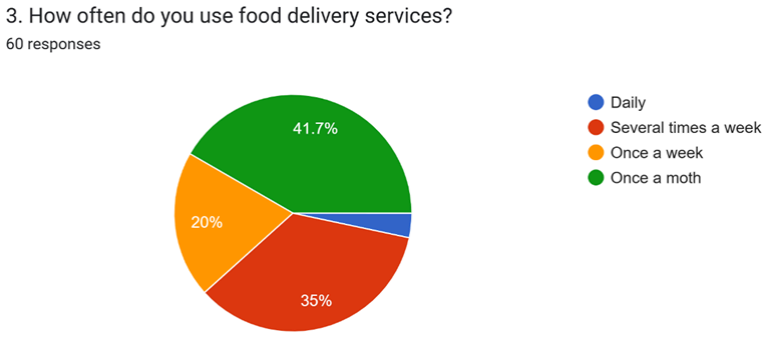

Figure 3.3.1 (c): Percentage of responses based on Frequency of using Food Delivery Services

The pie chart shown in Figure 3.3.1 (c) above shows that 60 people participated in the survey with regard to their frequency of food delivery services. 41.7% (25 responses) of the respondent's states that they make use of the food delivery option on a monthly basis. This was allowed by the respondents using food delivery services a few times weekly who make up 35.0% (21 respondents).

In addition, 20.0% (12 users) used food delivery services once per week. The smallest sample comprised their responses to food delivery services every day 3.3% of total sample (2 respondents).

The findings show that a majority of respondents had used food delivery services on a regular basis but there was a significant number of respondents that had occasionally used food deliveries among those who participated in the survey.

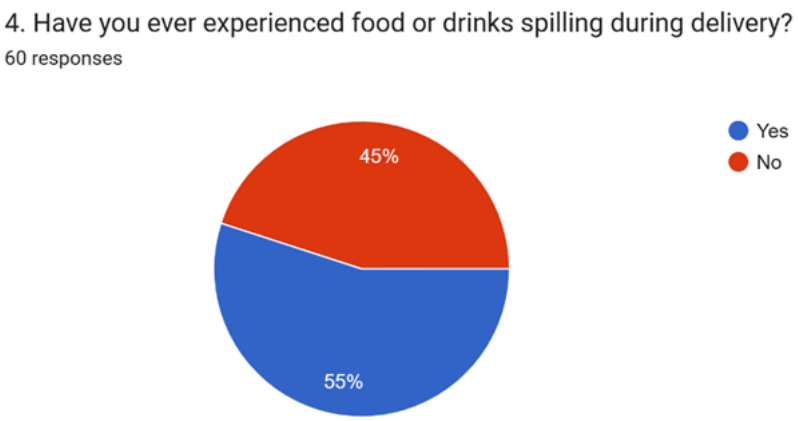

Figure 3.3.1 (d): Percentage of responses based on Experience of Food or Drinks Spillage During Delivery

The pie chart in Figure 3.3.1 (d) above shows that a total of 60 responses were received on the questions on spills of food or drink by the respondents while delivering. Based on the results, it can be observed that majority of them made the observations (33) which correspond to 55.0% has experienced any incident of food or drinks spillage during the trip. However, 45.0% (27 respondents) said they had not experienced this type of problem at all.

The results indicate that there are still many cases of customer's food or drink drop during delivery. This emphasizes the need to enhance food's protection and stability during transportation so food or drink can arrive to customers in the best condition.

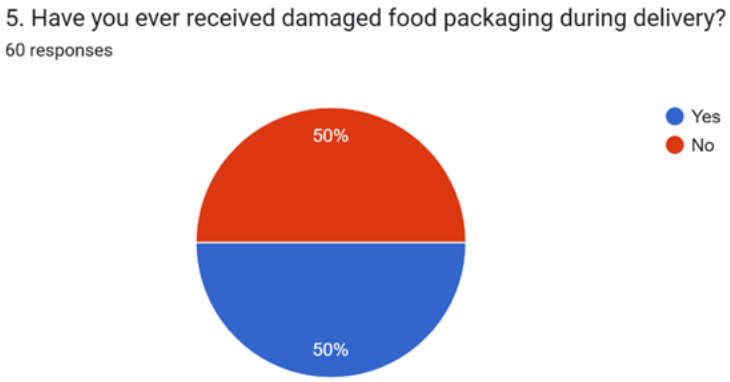

Figure 3.3.1 (e): Percentage of responses based on Experience of Receiving Damaged Food Packaging

According to the pie chart illustrated above which is shown in Figure 3.3.1 (e), the survey had a total of 60 responses about respondents experiences with damaged food packaging during delivery. The outcome has an even distribution both on the "Yes" and "No" side. The proportion of the 50.0% (30 respondents) who indicated that they had received deliveries of food products in damaged packaging could not be distinguished from the proportion of the 50.0% (30 respondents) who reported they had never gotten food packaged in any way to make it easier to eat.

The results suggest that half the food delivery users have experienced damaged food packaging and food delivery waste users are definitely worried about this matter. This shows the significance of providing adequate protection and stability of the food product during transportation to preserve packaging quality and customer's' satisfaction.

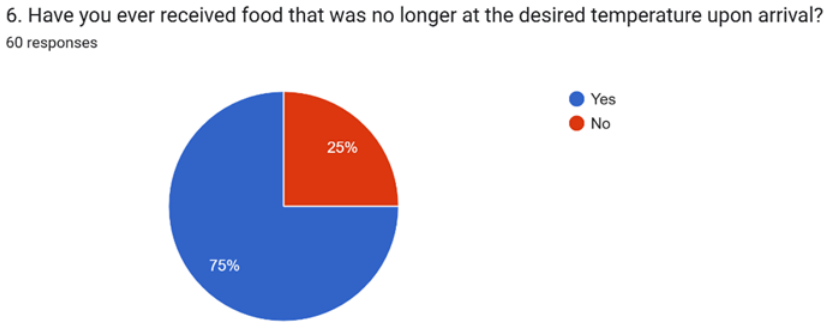

Figure 3.3.1 (f): Percentage of responses based on Experience of Receiving Food or Drinks at a Satisfactory Temperature

The above pie chart (Figure 3.3.1 (f)) shows that the survey received 60 responses about how good/bad the food temperature was when reaching their destination. The findings indicate that the majority of the respondents (75.0% or 45 respondents) have experienced delivery of the food being not at their desired temperature. 25% (15 respondents) did not have such a problem.

It is recommended that the study's results provide the food delivery companies as a challenge to maintain the temperature of food during their transports. A majority said that they suffered temperature-related problems suggesting the need for better temperature holding to maintain food quality and customer satisfaction during deliveries.

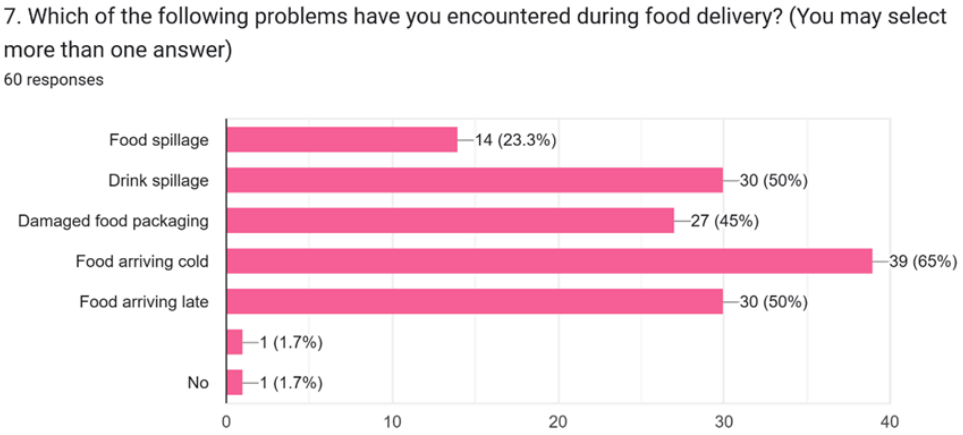

Figure 3.3.1 (g): Percentage of responses based on Common Problems Encountered During Food Delivery

The total count of the responses obtained from the above-mentioned (g) bar chart in figure 3.3.1 is 60.The 60 respondents to the above mentioned (g) bar chart in figure 3.3.1 above responded to the survey on most common problem faced during food delivery services. Food arrives cold was the most reported problem with 65.0% of the respondents (39 participants) marking this option as their choice. Another sub-challenge that was mentioned was spilling drinking water and late delivery of food, faced by 50.0% (30) of respondents. Furthermore, 45.0% (27 respondents) reported that during the shipment process, food-packing materials were affected. 23.3% (14) of participants reported food spillage.

Other responses were indicated by a small number of respondents (1.7 % or 1 respondent) selecting an alternative response, and another 1.7 % (1 respondent) indicating they did not have any of the listed problems.

The results revealed that some of the major issues which customers struggled with in food delivery process include temperature retention, punctuality and storage of food. The issues raise the necessity of the food delivery systems' improvements to enhance the food quality and customers' satisfaction.

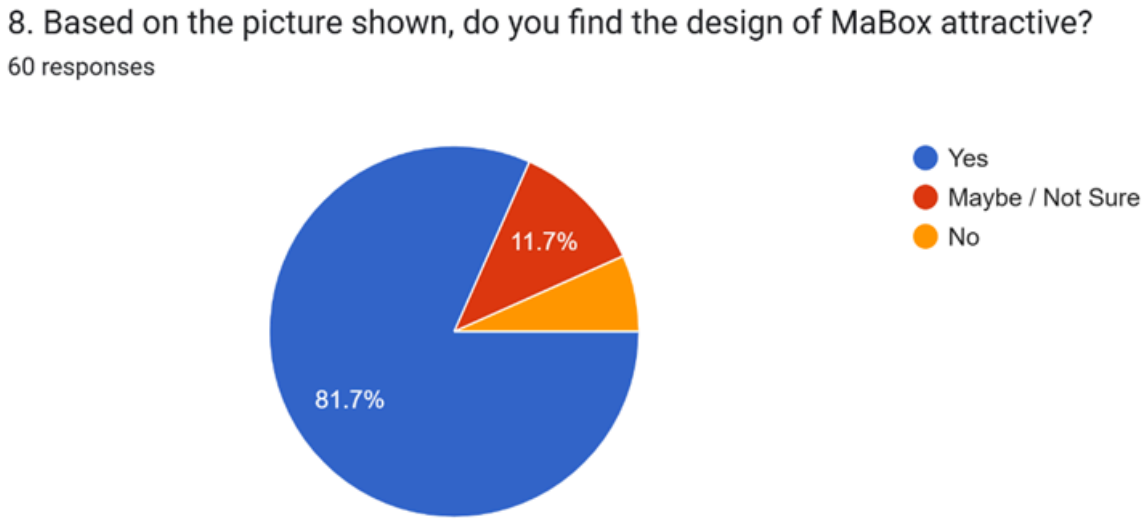

Figure 3.3.1 (h): Percentage of responses based on Design MaBox

The results of the survey on beauty of the MaBox product design are presented by means of the following pie chart (shown in Figure 3.3.1 (g) above). Most respondents expressed interest in the design, with 81.7% (49 respondents) answering “Yes”, when asked if the design was aesthetically pleasing.

7 of the 60 respondents (11.7%) replied with an in-between answer of “Maybe / Not Sure,” meaning they had a neutral or inconclusive opinion regarding the attractiveness of the design. The “No” option was chosen by 6.6% of the respondents (4 respondents) who found the design unattractive.

The results show that the majority of the participants showed a very positive reaction to the aesthetic appeal of the product design of the "MaBox," which reflects its visual satisfaction and acceptance by the target group.

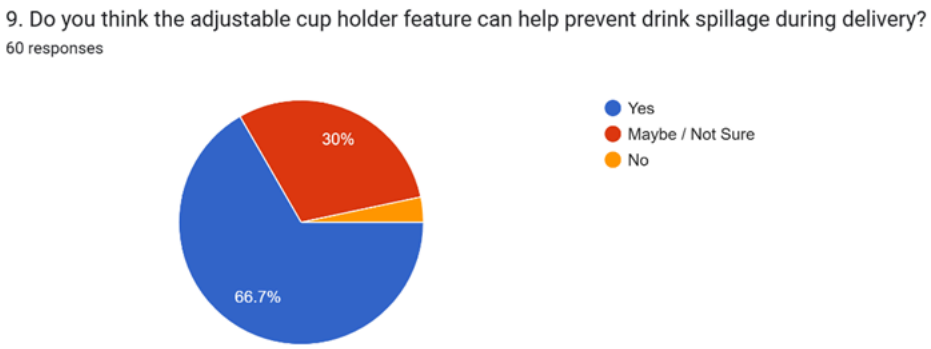

Figure 3.3.1 (i): Percentage of responses based on Perceived Effectiveness of the Adjustable Cup Holder

The pie chart in Figure 3.3.1 (i) above shows the responses to the survey about how useful they found an adjustable cup holder to be in preventing drink spilling while delivering food. The results indicate high confidence level for the proposed feature from the respondents.

Most respondents (40/66.7%) said "Yes" to whether they thought that an adjustable cup holder would be useful for preventing or minimizing drink spills during delivery. The next largest group, 18 (30.0%), answered “Maybe / Not Sure”, indicating a degree of uncertainty or reservations about the effectiveness of this feature. However, a minority of respondents (2, 3.3%) answered “No” which means they do not think the feature would be useful.

In summary, the findings indicate a favourable attitude towards the adjustable cup holder, with a majority of participants expressing trust in its capabilities to enhance delivery safety and minimize beverage-related problems.

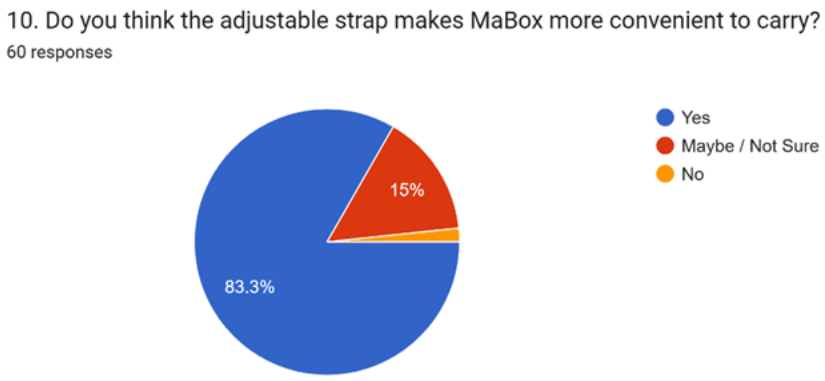

Figure 3.3.1 (j): Percentage of responses based on Portability and Convenience of The Adjustable Strap

For the convenience of MaBox product to improve its portability due to the presence of the adjustable strap, 60 respondents answered the survey illustrated in the pie chart of Figure 3.3.1 (j) above. The results have shown a very positive response to this functional feature.

Most of the respondents (50 respondents) said, “Yes,” an adjustable strap makes MaBox easier to carry. The next most popular response was “Maybe / Not Sure” with 15.0% (9 respondents) indicating their unsure opinion of the feature's role in portability. Conversely, only 1.7% (1 respondent) answered “No,” not seeing this strap as a valuable feature.

In general, the results indicate high acceptance of the adjustable strap, which can be considered as a very useful feature in making the product more portable and convenient to use when transporting the product.

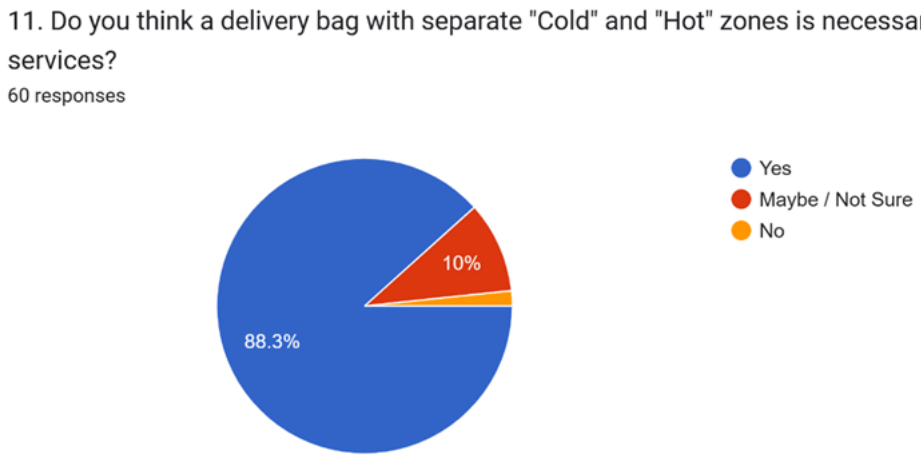

Figure 3.3.1 (k): Percentage of responses based on Necessity of Dual-Temperature “Cold” and “Hot” Zones

The survey received a total of 60 responses regarding the need for a delivery bag with separate section for “Cold” and “Hot” foods from the pie chart shown in Figure 3.3.1(k) above. The results suggest high level of perceived need for this proposed innovation among the respondents. 88.3% (53 respondents) responded that dual temperature compartmentalization is needed to ensure food quality during delivery. 10.0 % (6 respondents) chose “Maybe / Not Sure” indicating some doubt about its need. By contrast, a very few respondents (1.7% of respondents, or 1 respondent) said “No” - that is, they do not think the feature is necessary.

The findings overall show a strong consumer preference for having separate temperature zones, highlighting the value and high consumer demand for the feature to enhance the performance and quality of food delivered to consumers.

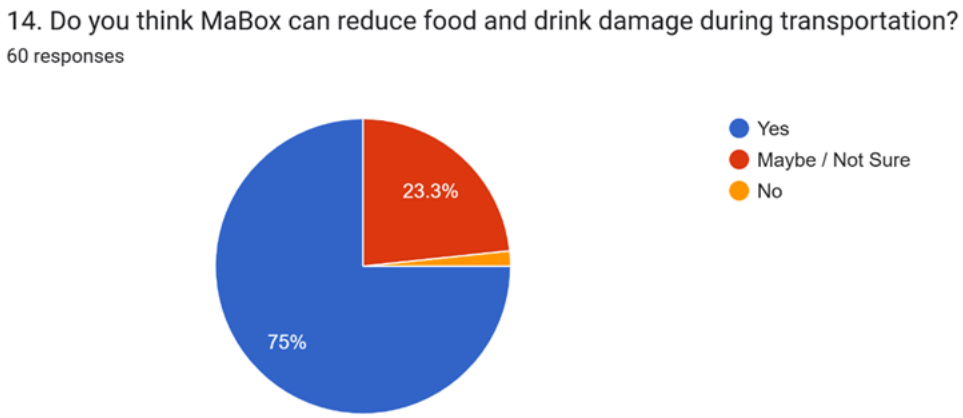

Figure 3.3.1 (l): Percentage of responses based on Confidence in MaBox to Reduce Transit Damage

A total of 60 responses were received from the survey illustrated in the pie chart above (Figure 3.3.1(k)) concerning consumer confidence in MaBox's ability to cause less food and drink damage when transporting. The results show a high level of trust in the protection properties of the product amongst the respondents.

75.0% (45 respondents) answered “Yes” to the question, “Do you think MaBox can play a role in reducing the damage caused by transportation?”. The next 23.3% (14 respondents) chose “Maybe / Not Sure”, indicating some confusion about the product's overall effectiveness. A minority of respondents, 1.7% (1 respondent), answered “No,” meaning they do not think that MaBox can successfully minimize damage in delivery.

Overall, the results indicate high consumer confidence in the use of the MaBox as a protective delivery solution, highlighting that the product is well-suited to the users' needs to address common concerns like spillage and packaging damage in the food delivery process.

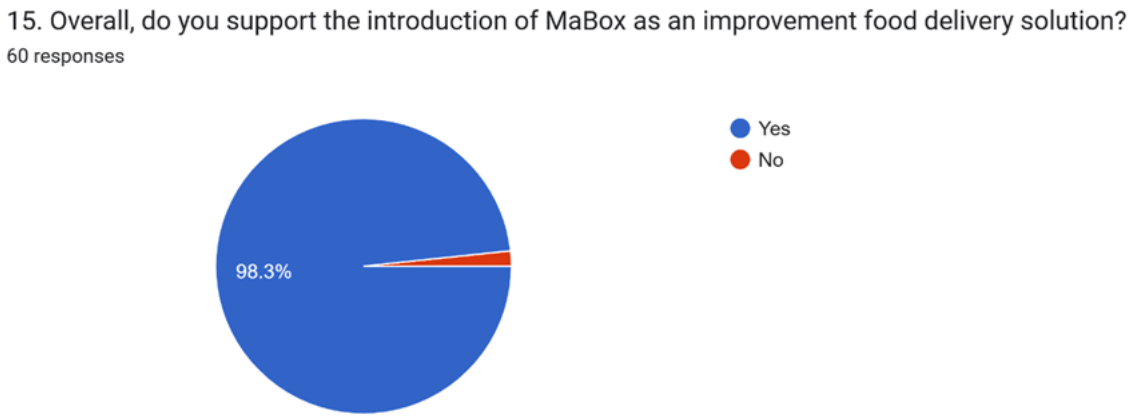

Figure 3.3.1 (m): Percentage of responses based on Overall Market Support of MaBox

Figure 3.3.1 (m) above is the pie-chart of the overall consumer support for the introduction of MaBox as an improved consumer food delivery solution obtained from the survey, which comprises 60 respondents. The results reveal the respondents' overwhelming positive market acceptance level. 98.3% (59 respondents) agreed that MaBox would be a good food delivery product for the market. On the opposite side of the coin, only 1.7% (1 respondent) said “No,” meaning that they opposed the introduction of the product.

In general, the findings provide almost complete market validation for MaBox, reflecting high consumer support and a high perceived need for a better solution to common food delivery problems like spillage, packaging damage and temperature loss.

D) Current Market Need

In the past few years, the food delivery sector has been booming rapidly because of the increasing demand for convenience, the busy lifestyle, and the growth of online food ordering. Despite its popularity, however, there are some ongoing problems that impact the quality of service and customer satisfaction.

The survey results show that there is a definite, and strong, market demand for better protection and transport of food. Most respondents indicated experiencing common problems, including food being too hot or too cold when received (75.0%), spillage of food (55.0%), and packaging damages (50.0%). The outcomes of this analysis reveal that none of the current delivery methods is entirely effective in maintaining the quality of the food en route.

Furthermore, 65.0% of the respondents reported “food arrives cold” as the most common issue, suggesting there are a lot of opportunities for the industry to improve on the temperature control solutions available for the delivery process. This directly impacts on customer satisfaction and decreases the overall perceived value of food delivery services.

Moreover, the survey reveals that consumers are very interested in better delivery packaging solutions. Many reported features important to them included dual-temperature compartments (88.3%), variable cup holders (66.7%) and enhanced portability by adjustable straps (around 83.3%). These results suggest that not only is there awareness of issues but also that users are ready to embrace new approaches to the issues that they may solve.

Most importantly, an overall market response revealed a very high level of acceptance of the proposed MaBox concept with 98.3% of the respondents saying they would welcome its introduction. This indicates that there is a high demand for a smart food delivery box that has multiple functionalities such as minimizing spills, keeping the food warm, and providing a more stable ride during transport.

Overall, the market is signifying the necessity of a more reliable and efficient food delivery packaging system. The innovation of MaBox is aligned with these needs because of the different pain points the customers and delivery riders had in the food delivery industry, making it a very relevant solution and commercially viable.

3.3.2 Product Design/Features

MaBox was created to provide satisfaction to users who do Food Delivery jobs, it also provides satisfaction to customers who use food delivery services. MaBox was also created not only to focus on food delivery workers, but it was also created to be purchased independently by anyone who wants to use it, for example users who want to bring food and drinks to go camping. Innovation and improvements have been made to attract more people to make it easier for them to deliver food and drinks more easily, safely and maintain quality to all places.

A) Branding

The Mabox brand was chosen to reflect the identity and main function of this product. “Ma’ means food and “Box” means the physical structure of the storage box and the purpose of delivery. MaBox carries the identity of “Smart Food Management Box” which is specially built to maintain the quality, freshness and safety of dishes throughout the delivery process. The main objective of this product is to provide customizable, quality, safe and temperature-stable food and beverage storage. MaBox can be used for commercial or personal use such as camping.

The MaBox logo is created in a circular seal to convey a message of safety and quality. The pink delivery box icon, stylized with a fast-moving effect and a heart, symbolizes fast and careful delivery. The name “MaBox” is displayed in a prominent and memorable typography.

B) Product Features (Engineering and Design)

Product Features	Explanation
Dual-Zone Temperature Division System	The interior of the MaBox is divided into 2 sections, namely the hot section and the cold section. The MaBox uses a premium thermal insulation divider design. It also prevents cross-temperature transfer and allows the delivery of hot food and cold drinks to occur simultaneously without reducing the temperature quality.

Lightweight and Sturdy Ergonomic Structure	MaBox is constructed using a combination of high-density polymer composite panels (HDPE) for the internal structure and waterproof ballistic nylon fabric for the external part. This combination makes the MaBox design much lighter. This can reduce rider or user fatigue. Despite being lightweight, MaBox has very strong structural rigidity to protect the contents and withstand the impact of harsh activity environments.
Double-Layer Thermal Lid	This bag is designed with a dual-layer closure system. A secondary (inner) insulation layer is placed under the main outer cover. This layer makes the MaBox more air-gap sealed which works to maintain the temperature stability of the food and drinks inside for longer.
Internal Stabilizing Hooks	Inside Mabox, there are high-strength suspension hooks created on the inner walls of both zones. These hooks function to hang or tie food and drinks. These hooks are able to reduce the effects of inertia, swing, vibration and shock which are usually the cause of food and drink spillage during the food delivery process or dynamic movement.
Dedicated Side Beverage Racks	Two special beverage rack slots are placed on the outside of the bag with an adjustable drawstring system. This separation is done to

	provide vertical stability for bottles to prevent spillage of beverages inside the main compartment of the bag. These slots can also be closed to ensure that beverages remain safe even when exposed to strong winds or any environmental disturbances during the shipping process or personal use.
Drainage Outlet System	A water drainage system is created at the bottom of the main interior to drain water from water pack condensation or water discharge during interior cleaning. This ensures that the interior is always dry and clean.
Special Reusable Hotpack and Icepack	This bag features a custom thermal pack, a high-efficiency PCM gel pack matched to the MaBox's hot and cold zones. This pack is designed to ensure optimal temperature performance, long-lasting and eco-friendly.

Table 3.3.2 (a): MaBox Features

1. Idea Generation for The Product Design

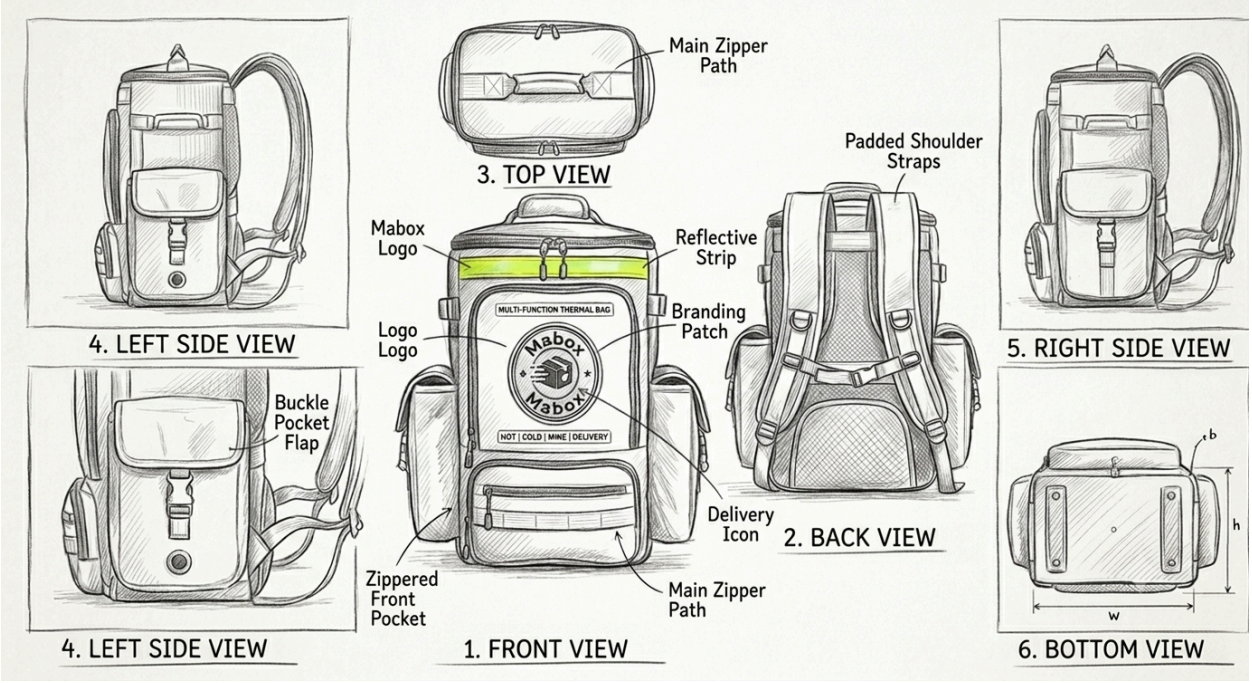

Figure 3.3.2 (a): MaBox Idea Generation Sketch

The physical design of the MaBox product has been carefully developed to meet ergonomic, logistical utility and aesthetic criteria. This design document presents product visualizations from multiple viewpoints to provide a holistic understanding of the product's external structural design, dimensional control and mechanical components.

Product Side Views	**Explanation**
Front View	Featuring a central MaBox logo, dual-layer exterior zipper system, safety reflective strips, bottom accessory storage pocket.
Back View	Demonstrates an ergonomic support system including thickly cushioned shoulder straps, an adjustable sternum strap with quick-release safety clip, and lumbar protectors to reduce user fatigue during long walks or rides.

Upper View	Featuring a top handle for quick manual transport
Left & Right Views	Featuring a symmetrical structural design, special side storage pockets are equipped with clip-on lids to hold beverage bottles upright and maintain their temperature.

Table 4.3.2 (b): MaBox Side Views

Physical Parameters	**Design Dimensions**	**Engineering & Ergonomics Justification**
Length	50 cm	Fits the standard width of commercial delivery motorcycle iron platforms and does not exceed the width of the average human shoulder to avoid excessive wind resistance.
Width	50 cm	Provides sufficient horizontal space to accommodate large food containers flat without tilting.
height	42 cm	Lowers the bag's center of gravity when carried to ensure stability of the user's back posture and prevent the bag from hitting the back of the rider's helmet.

Table 3.3.2 (c): MaBox Size

2. Pallet Colour Selection

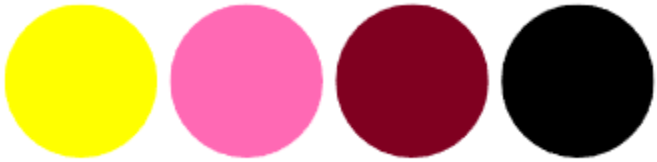

Figure 3.3.2 (b): MaBox Palette Colour

Color Code	**Color Name**	**Visual Representation & Industrial Psychology**	**Main Application on MaBox Design**
#FFFF00	Neon Yellow	Symbolizes warning, critical visibility, and passive safety protection.	Used as a Safety Reflective Strip on the top front of the bag. This strip functions to reflect vehicle lights during nighttime or bad weather operations.
#FF69B4	Vibrant Pink	Symbolizes elements of care, love, and passion for the food industry, as well as providing an image of user-friendly service.	Used on the main front of the bag, straps, pocket trim, as well as the base color of the MaBox round logo design.
#800020	Dark Red	Symbolizes dynamic energy, the speed of food logistics, as well as the psychological connection that stimulates appetite.	Used as the dominant color on the entire body of the bag, top cover, and base to minimize the effects of physical dirt.
#000000	Matte Black	Represents a neat finish, professionalism, as well as the protection function of the outdoor elements.	Used on waterproof zipper systems, top bag handles, drain hole covers, and box bottoms to prevent wear, tear, and dirt.

Table 3.3.2 (d): MaBox Palette Colour Selection

3. Mockup Design

Figure 3.3.2 (c): MaBox Mockup Design

4. Final Design

Figure 3.3.2 (d): MaBox Final Design

C) Presentation of The Product

MaBox introduces a new product that aims to make it easier for users involved in the delivery or storage of food. In the food industry, the most important thing is to maintain the quality of food. Some of the things highlighted in MaBox are:

- Malaysian-made products
- Good quality products
- Sturdy and safe to use
- Can carry food & drinks in large quantities
- Maintains hot and cold temperatures for longer
- No spillage or damage to food and drinks
- Achieving customer satisfaction
- odor and fungus resistant
- Express sanitation system to maintain product cleanliness

Mabox is created in a size that has a length of 50 cm, a height of 50 cm and a width of 42 cm. Mabox provides various innovative features that are not available in existing shipping boxes. Mabox is also created using materials that are lightweight and safe for users.

3.3.3 Concept Testing

A) Purpose

Concept testing is the process of determining how well an idea is accepted by customers prior to large investments in manufacturing or marketing. This process can be used to find out what customers need, prefer, and expect. Eventually, this idea can help the company decide whether the product's characteristics are valuable enough to its intended users.

B) Sample population

This product is for more than just Grab or food delivery riders. Concept testing was conducted with a test population including university students, working adults, frequent travelers, campers, and food carriers for long journeys. The groups were chosen due to the product's potential benefit in maintaining food temperature and supporting food storage.

C) Survey format

Customer feedback was gathered via an online survey. The survey consisted of multiple-choice questions. The questionnaire focused on customers' interests, usefulness, product features, design preferences, and willingness to purchase the product.

D) Communicating the concept

i. Sketch

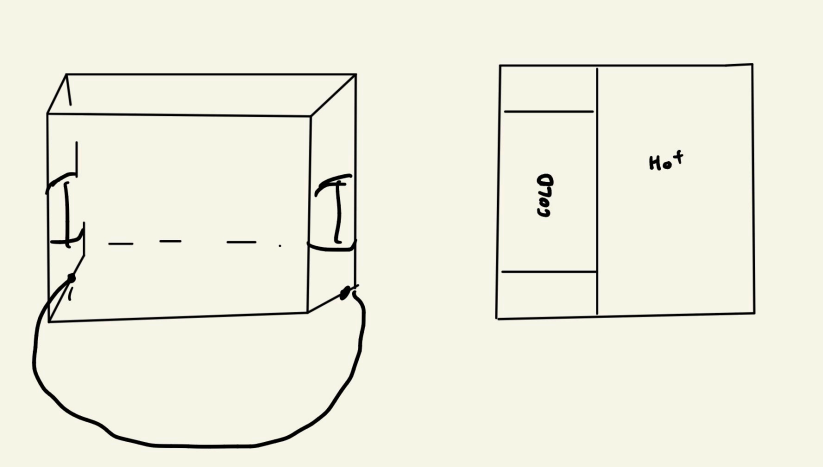

Figure 3.3.3 (a): Sketch of MaBox

ii. Verbal description

- A built-in side beverage holder that is adjustable with a protective cover
- A detachable partition system that separates hot and cold food
- Hot packs and ice packs inside the box
- Thick, padded, and adjustable shoulder straps
- Optional securing straps at the bottom (for a motorcycle)
- A built-in drainage outlet system

iii. Rendering

Figure 3.3.3 (b): Rendering of MaBox

iv. Storyboard

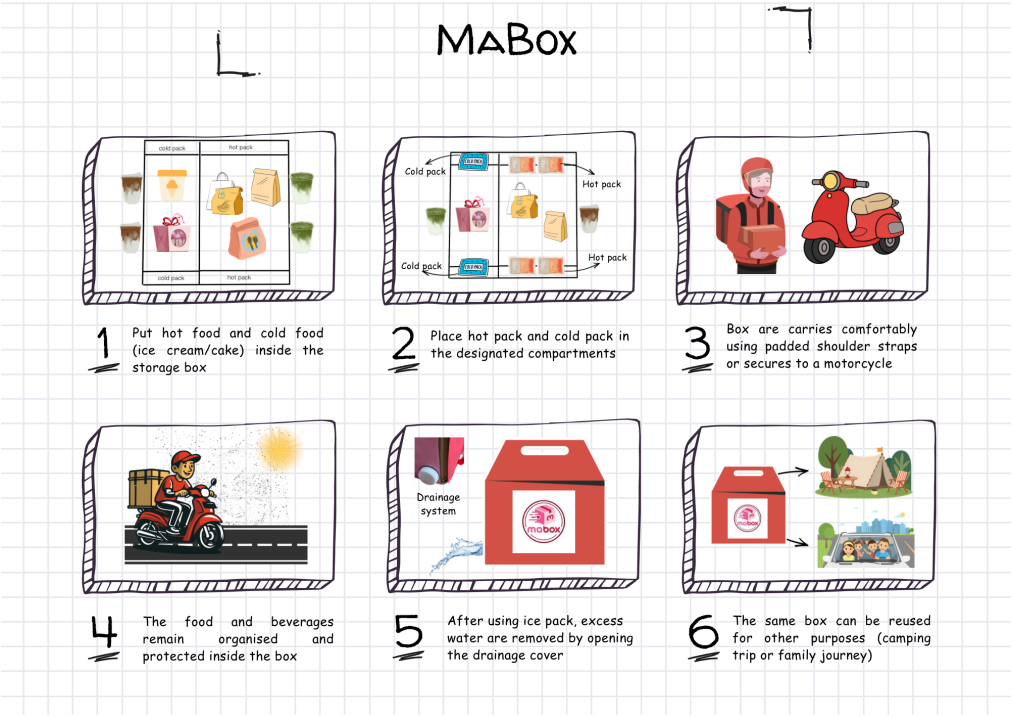

Figure 3.3.3 (c): Storyboard of MaBox

E) Customer Response

Part 1: Qualification

A concept-testing survey was conducted to evaluate customer acceptance and gather feedback on the proposed product, MaBox. A total of 60 respondents participated in the survey. The respondents consisted of university students, working adults, food delivery riders, and potential users of food transportation and storage products.

The purpose of the survey was to determine whether MaBox meets customer needs, assess the appeal of its innovative features, and identify its market potential before launch.

Part 2: Product Description

MaBox is an innovative, multifunctional food storage box designed to improve the transport of food and beverages while maintaining their quality and temperature. Unlike conventional food delivery bags, MaBox implements new features to enhance user convenience and address common issues faced during food delivery.

The product includes a detachable partition that separates hot and cold food to maintain their temperatures. Hot packs and ice packs can be placed inside the box to further maintain the food's freshness and quality throughout the transportation process. An adjustable cup holder is attached to the side of the box to securely hold beverages and reduce the risk of spillage during delivery.

For user comfort, MaBox features padded shoulder straps. This helps the user to carry the box more comfortably over long distances. An optional securing strap that is adjustable at the bottom of the box enables the bag to be fastened to a motorcycle to improve stability during delivery. Additionally, a built-in drainage outlet system with a protective cover allows accumulated water from melted ice to drain easily.

Beyond food delivery, MaBox is designed as a multifunctional storage solution that can also be used for other purposes, including camping, traveling, family trips, and other activities that require food storage. Its versatile design makes it suitable for a wider range of users beyond delivery riders.

F) Measure Customer Response

According to MaBox survey results, customers are accepting at high levels. 81.7% of respondents agreed that MaBox's design has strong appeal, indicating that the product is visually appealing. 66.7% thought the adjustable cup holder would help minimize water spillage when traveling. 88.3% stated that the adjustable shoulder strap is more comfortable and convenient for carrying the product.

The hot and cold partition is detachable, too, and any positive feedback is given. 88.3% of the respondents agreed that it was necessary to have separate temperature zones in a food delivery service. This means there is high demand for improved temperature management. Additionally, 85.0% felt MaBox would be helpful for both food delivery riders and the general public.

The survey also revealed that 76.7% of respondents agreed that MaBox can address common issues with conventional food delivery bags. 75.0% of respondents felt it could help to

minimize damage to food and beverages during transportation. The findings indicate that the product is able to solve problems customers are concerned about food safety and convenience.

The general response from the customers was very positive. 98.3% agreed with implementing MaBox as a more convenient food delivery system. 98.3% said they would recommend the product to their friends and family. In terms of pricing, 40% of the respondents are willing to pay within the price range RM200-RM249.

Customers have responded favorably to the product, and MaBox is likely to have good commercial prospects. Beyond food delivery riders, the product could also be sold to travelers, campers, families, and others who need a sustainable, temperature-controlled food storage system. By adopting the right pricing policy and continually improving the product through customer feedback and effective promotion via social media and online platforms, MaBox can become competitive in the food transport market.

3.3.4 Build Prototype (2D or 3D)

This MaBox delivery box aims to make it convenient for riders and can also be used by all groups of people. This prototype is used to show how the MaBox delivery bag is made and what materials are used in the delivery bag innovation. The diagram below shows the end product prototype of the MaBox delivery box outlook.

Figure 3.3.4 (a): The Prototype of MaBox Delivery Box

A) The MaBox bag materials

The materials used in the making of the MaBox delivery bag

1) Outer shell
   - 1680 D Nylon
2) Insulation layer
   - 8mm-10mm thickness EPE Foam
3) Inner lining
   - Food-grade PEVA
4) Structural support
   - Polypropylene
5) Thermal packs
   - Commercial ice and hot packs

6) Attachment Mechanism
   - Velcro strips
7) Strapping system
   - Heavy-duty nylon

B) The assembly process

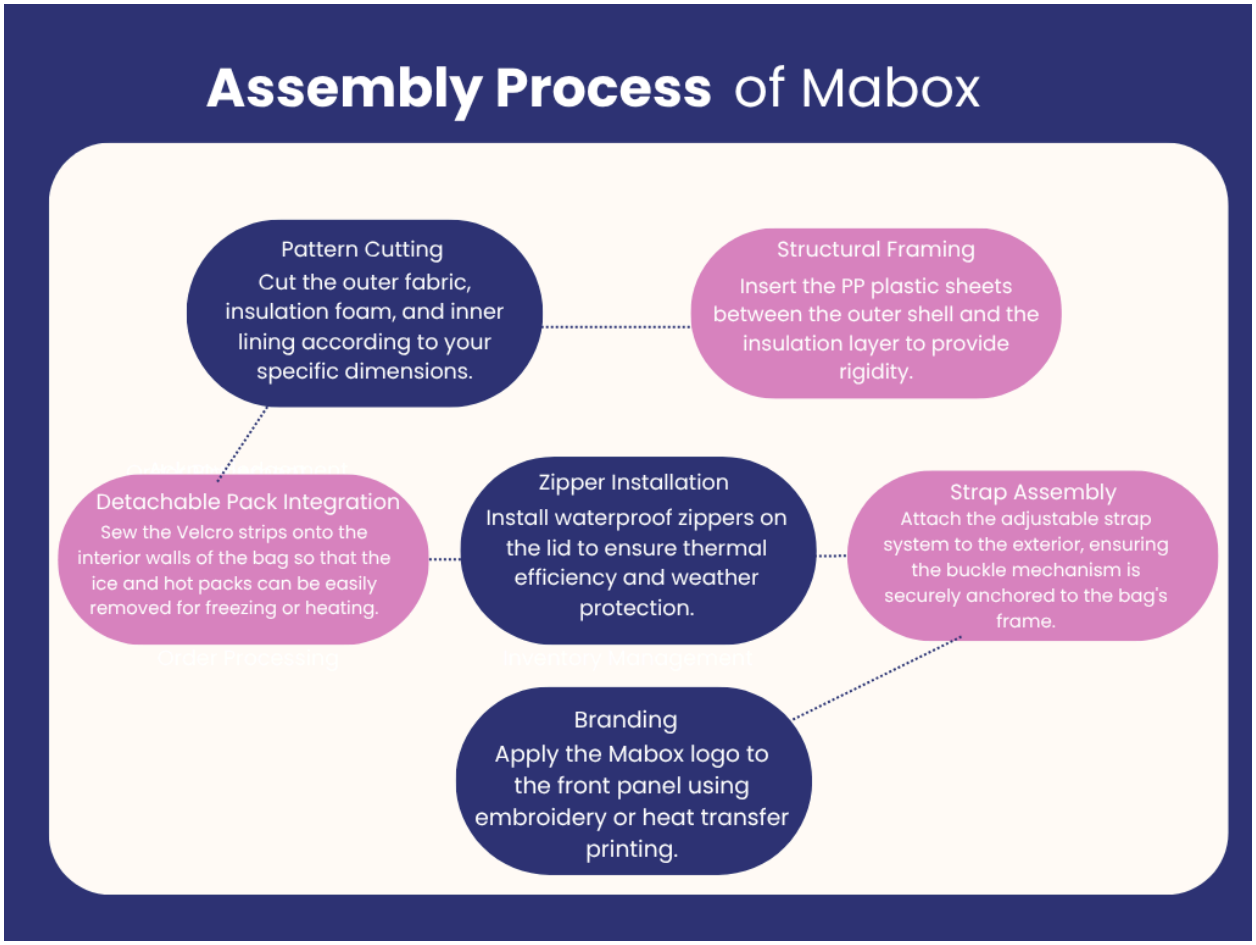

Figure 3.3.4 (b): The Flowchart of MaBox Delivery Box

3.3.5 Test Marketing

A survey was done using google form platform to create questionnaires. This is utilized to conduct a test market among the general public about the MaBox delivery bag.

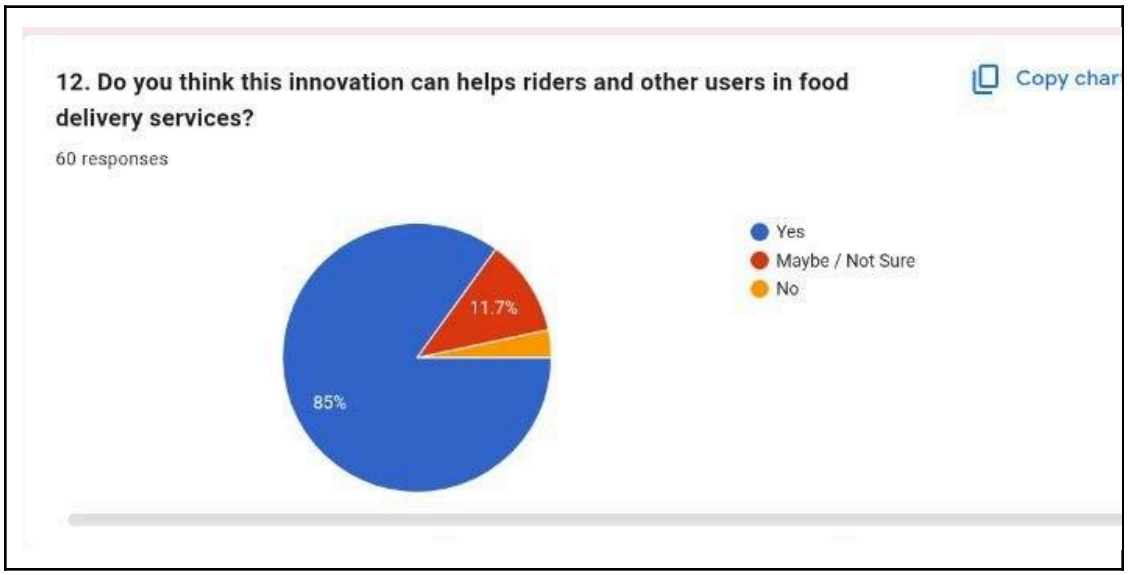

Figure 3.3.5 (a): Percentage response based on if the innovation helps riders and other users in food delivery services.

In this pie chart, show the percentage of respondents who think that this innovation can help riders and other users in food delivery services. Most of the respondents agreed that this innovation helps riders and other users in food delivery services with the percentage 85% (51 respondents), while 7 respondents (11.7%) are not sure and another 2 respondents thinks that this innovation cannot help people.

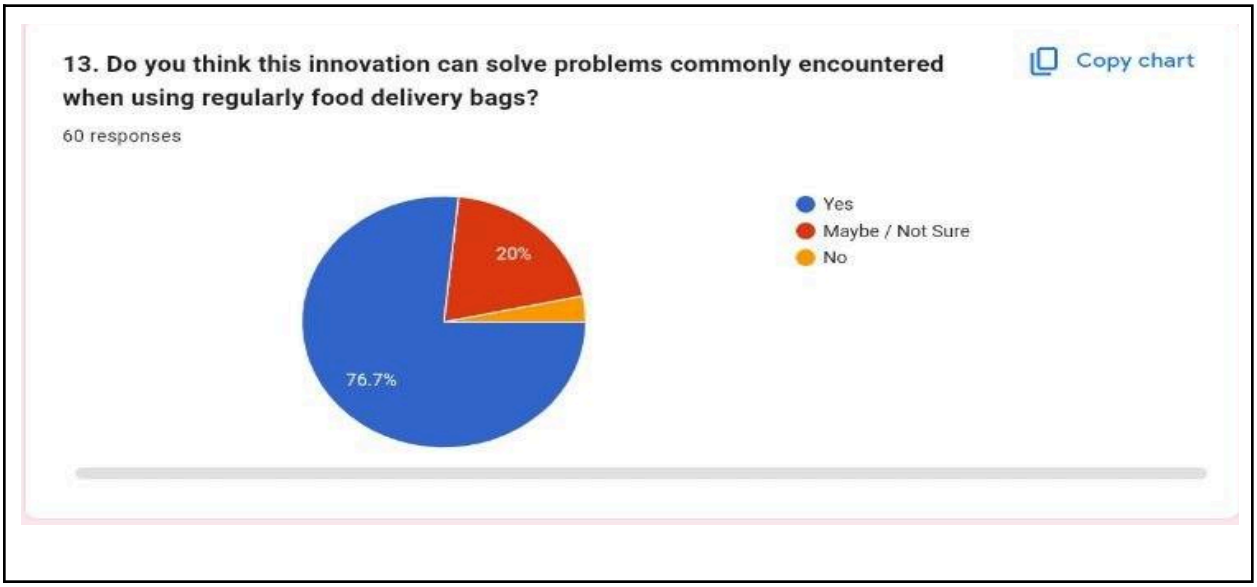

Figure of 3.3.5 (b): Percentage of responses based on respondent's feedback if the innovation can solve problems commonly encountered when using regular food delivery bags.

The pie chart found that 76.7% of the respondents agree that this innovation can solve the problem, meanwhile another 20% are not sure with this question and another 3.3% think that this innovation cannot solve the problem.

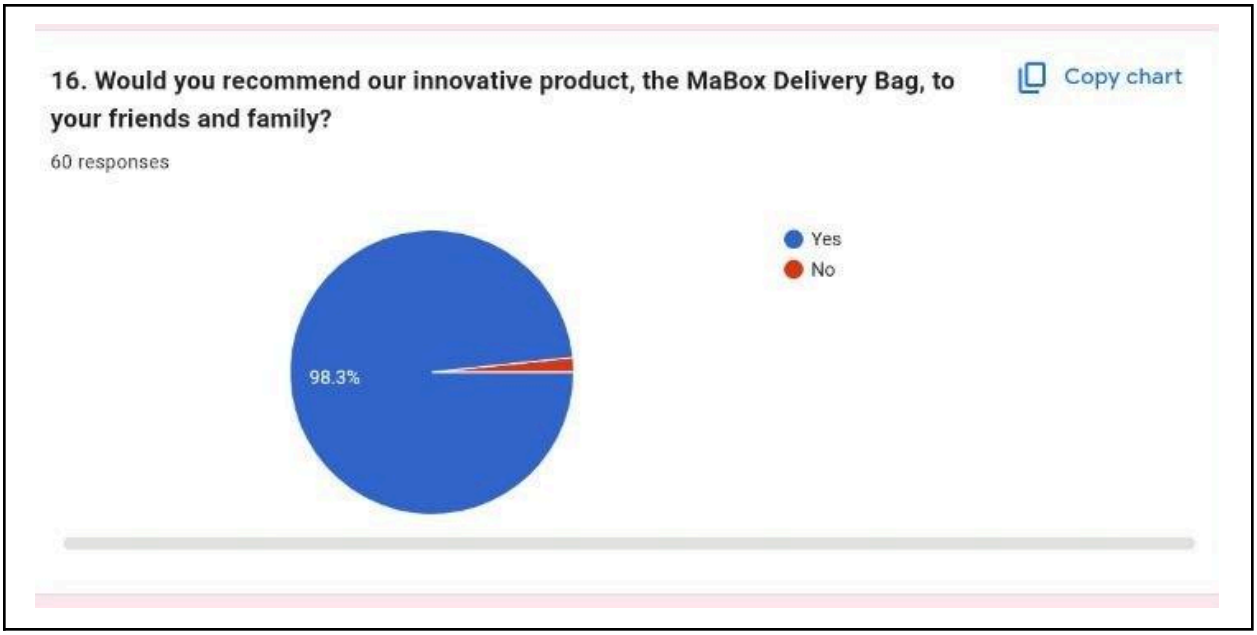

Figure 3.3.5 (c): Percentage of responses that will recommend our innovative product to their friends and family.

98.3% respondents have agreed to recommend this product of MaBox delivery bag to their friends and family while 1.7% have not recommended this product.

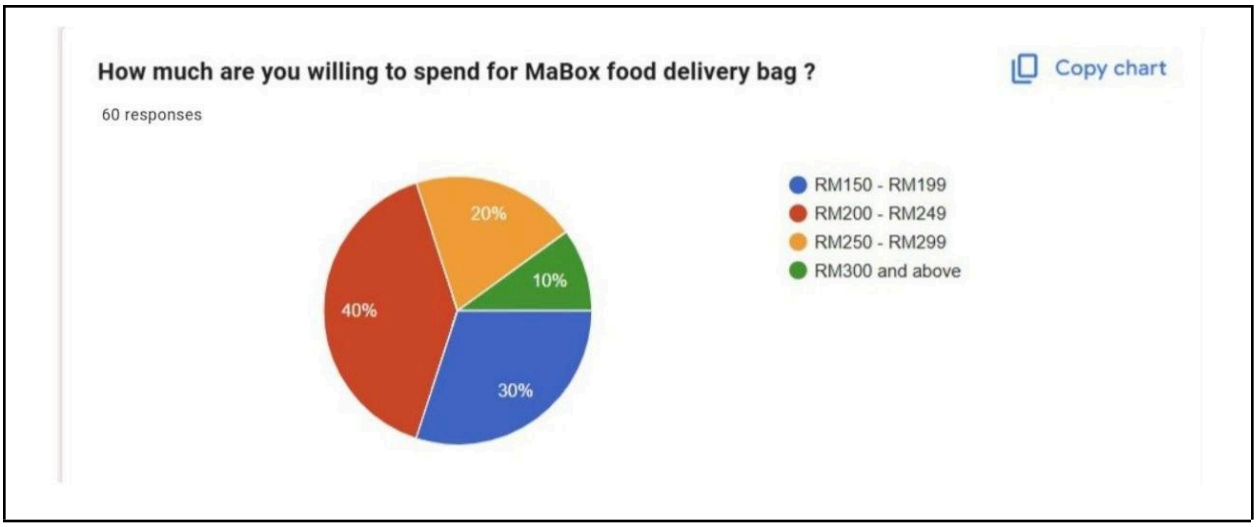

Figure 3.3.5 (d): Percentage of responses based on how much respondents willing to spend for the innovation product

The last pie chart result shows how much respondents are willing to spend for the MaBox delivery bag. There are 4 ranges of price provided which are RM150-RM199, RM200-RM249, RM250-RM299 and RM300 and above. Most of the respondents choose the second range which is 40%, while another 30% choose the first price range. The other respondents' choice is the third range (20%) and another range of 10% choose the last price range.

4.0 CONCLUSION

To conclude, the main development at MaBox is the creation of an innovative solution to improve food transportation. The project began by identifying common problems regarding food transportation, including food delivery bags, poor temperature retention, water spillage, user discomfort, and limited functionality. These issues give us a new idea to develop a product that meets the needs of both food delivery drivers and general consumers. Based on our observations, some respondents remain confused about the MaBox. Regardless, it is a new product; some dissatisfaction may lead to rejection.

To enhance MaBox's competitiveness and marketability, several improvements are recommended for future development. Firstly, MaBox could be introduced in different sizes and capacities to accommodate the varying needs of delivery riders, families, travelers, and outdoor enthusiasts.

In addition, integrating smart features, such as a digital temperature-monitoring system, would enable users to monitor food conditions more effectively during transportation. MaBox could implement a lockable zipper or a built-in security lock to enhance the safety and security of the contents. This feature would help to protect food and beverages from unauthorized access during transportation.

Another improvement to consider is adding an anti-slip base to the bottom of the Mabox. This feature helps to prevent the box from sliding or falling when placed on the floor or secured on a motorcycle during transportation. As a result, food and beverages are more stable, reducing the risk of spills and damage, particularly on uneven roads or during emergency braking.

Lastly, as Technology Entrepreneurship (ENT600) students, we learned as much as we could throughout the course of our research to complete the assignment and design a new product. This assignment has taught us to develop higher-order thinking, imagination, and creativity to prototype concepts that could generate revenue in the future.

5.0 REFERENCES

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6.0 APPENDICES

Customer Perception and Acceptance of MaBox Delivery Bag: An Innovative Food Delivery Solution

Dear Respondent,

We are a group of students from the Faculty of Education, Universiti Teknologi MARA (UiTM), currently conducting a project for our Technology Entrepreneurship (ENT600) course. As part of our product innovation and development study, we are introducing **MaBox Delivery Bag**, an innovative solution designed to improve the efficiency and convenience of food delivery services.

This survey aims to gather your opinions and feedback regarding the proposed innovation. Your responses will assist us in evaluating the practicality, acceptance, and market potential of the MaBox Delivery Bag.

The survey will take approximately **5–10 minutes** to complete. All information provided will be treated with strict confidentiality and will be used solely for academic purposes.

Thank you for your participation and valuable contribution.

1. Gender *

- ◯ Male
- ◯ Female

2. Age *

- ◯ Below 18 years old
- ◯ 18-25 years old
- ◯ 26-35 years old
- ◯ 36-45 years old
- ◯ Above 45 years old

3. How often do you use food delivery services? *

- ◯ Daily
- ◯ Several times a week
- ◯ Once a week
- ◯ Once a moth

4. Have you ever experienced food or drinks spilling during delivery? *

- ◯ Yes
- ◯ No

5. Have you ever received damaged food packaging during delivery? *

- ◯ Yes
- ◯ No

6. Have you ever received food that was no longer at the desired temperature upon arrival? *

- ◯ Yes
- ◯ No

7. Which of the following problems have you encountered during food delivery? *

(You may select more than one answer)

- [ ] Food spillage
- [ ] Drink spillage
- [ ] Damaged food packaging
- [ ] Food arriving cold
- [ ] Food arriving late
- [ ] Other: _____

8. Based on the picture shown, do you find the design of MaBox attractive? *

- ◯ Yes
- ◯ Maybe / Not Sure
- ◯ No

9. Do you think the adjustable cup holder feature can help prevent drink spillage during delivery? *

- ◯ Yes
- ◯ Maybe / Not Sure
- ◯ No

10. Do you think the adjustable strap makes MaBox more convenient to carry? *

- ◯ Yes
- ◯ Maybe / Not Sure
- ◯ No

11. Do you think a delivery bag with separate "Cold" and "Hot" zones is necessary for food delivery services? *

- ◯ Yes
- ◯ Maybe / Not Sure
- ◯ No

12. Do you think this innovation can helps riders and other users in food delivery services? *

- ◯ Yes
- ◯ Maybe / Not Sure
- ◯ No

13. Do you think this innovation can solve problems commonly encountered when using regularly food delivery bags? *

- ◯ Yes
- ◯ Maybe / Not Sure
- ◯ No

14. Do you think MaBox can reduce food and drink damage during transportation? *

- ◯ Yes
- ◯ Maybe / Not Sure
- ◯ No

15. Overall, do you support the introduction of MaBox as an improvement food delivery solution? *

- ◯ Yes
- ◯ No

16. Would you recommend our innovative product, the MaBox Delivery Bag, to your friends and family? *

- ◯ Yes
- ◯ No

17. Do you have any additional comments or suggestions regarding MaBox Delivery Bag? *

Your answer

18. How much are you willing to spend for MaBox food delivery bag ? *

- ◯ RM150 - RM199
- ◯ RM200 - RM249
- ◯ RM250 - RM299
- ◯ RM300 and above