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Research Article

The Elimination of Plastic Bags: A Customer Perspective on Logistics Challenges

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Abstract

Plastic bags have become synonymous with the culture of our society today. The use of plastic bags is very widespread and facilitates the consumers especially in facilitating them to carry goods such as supermarkets, retail stores, and others. Every year nearly 1 trillion shopping plastic bags have been used, as they are easy to carry, cheap, and convenient to use. But with constant use, it has had a negative impact not only on the environment but also on the logistics perspective. In response, the Malaysian government has launched a campaign to discourage the use of plastic bags known as a 'No Plastic Bag Day". The objective of the program is to educate the consumer on the impact of plastic bags on the environment. However, this campaign has drawn a mixed response from the customer which is against the traditional practice of using a plastic bag as many of the customers still fail to bring their bag for packing their purchased items. As such, this study aims to investigate the impact of the campaign from the logistics perspective by examining the relationship between logistics challenges and customer awareness on the implementation of the campaign. This research used a quantitative method by distributing a questionnaire to understand the customer perspective toward the logistics challenges on the elimination of plastic packaging. A total of 132 questionnaires were completed and returned for analysis by SPSS. The findings of this study, contribute a significant impact on logistical challenges in terms of the safety of goods, material handling, and customer readiness on the implementation of the campaign. According to the inferential analysis that was conducted from the data collected, customer readiness was the best factor that influenced the level of customer awareness on the elimination of plastic usage for shopping. Whereas the variable of customer readiness and safety & security which are less than 0.05 shows a unique contribution to the dependent variable. Based on the current research, the recommendations that can be made for future research are by doing a mixed-method and expand the scope of the study to get a better understanding of the localized perception before developing the mass survey.

***Keywords*:** Supply Chain Management, Logistics Management, Elimination of Plastic Bags

1. Introduction

Despite concern about the environmental harm of plastic bag usage, the plastic bag is still popular among the consumer and retailer because it is inexpensive, light, strong, and adaptable to accommodate a different size of goods (Muthu et al .2009), (Tan, & Mehta, 1994), (Jalil et all . 2013). It is also perceived as having no cost as a seller is absorbing it as part of the cost of goods sold (COGS). As such, the volume of plastic bag production is increasing every year.(Plastic Bag Facts, 2019). A plastic bag may be the most versatile material to carry goods during shopping, but it is also one of the worst pollutants that has been producing contributing to the unprecedented damage to the world's delicate ecosystems. It is not only damaging the beautiful scene of the ocean but also endangers all the lifeforms within the ocean as well as increasing landfill content.

The impact of the shopping plastic bag has received enormous attention in the research field which mainly focuses on the impact of shopping plastics bags on the environment and economics. It is noted that there is none of the previous research to understand the impact of eliminating the usage of the shopping plastic bag on the logistics process. As such, this study is set to explore the challenge and impact of the concern on the usage of shopping paper bags from the perspective of logistics.

2. Research Background

In Malaysia, the effort to eliminating plastic bag usage has been started since 2009 initiated by Penang state which declared ' No plastic Bag day' every Monday for the state. It is then been extended to Tuesday and Wednesday in 2010. The success of the campaign at Penang state has motivated the government to introduce a long-term National roadmap in achieving zero plastics usage which the objective is to establish a policy direction for all the stakeholders including the State Governments in taking a unified and collective approach (ESTEC, 2018).

This campaign has received a positive response from the community as well as the private organization. In 2011, Tesco, one of the biggest shopping stores in Malaysia has launched an initiative to educate their customer by

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introducing a campaign of 'No plastics day' every Saturday. In the early stage of the implementation, the campaign has drawn a mixed response from the customer since customers are still having an option to purchase a plastic bag at MYR 0.50/pcs. The idea of charging a plastic bag has sparked an important challenge for the (Zen et all. 2013)However, Tesco has slowly enforced the rule which is currently totally no plastic bag unless for the wet goods. As such, the customer is required to bring their bag during shopping at Tesco. As encouragement, TESCO will give a reward point for those customers that bring their paper bag. TESCO also encourages the customer to use a degradable bag or carry their bag as part of the initiative to eliminate the plastic bag usage for the purchased packaging. However, this campaign didn't bring the expected awareness to the customer. Instead, they find it difficult to manage the goods if they are not bringing a bag which gives them a hustle experience during purchase goods at Tesco.

This has made several implications to the consumer itself such as damage to the item and difficulty to move to the vehicle which could have an impact on the physical posture of the customer, and the safety of the product. Additionally, goods purchased in bulk can also damage other products that are easily damaged if placed with heavy goods. This causes the item to be damaged and it will bring dissatisfaction from the customer. This experience may lead to dissatisfaction with customers due to the issue in managing the purchased item which is warranted to be investigated from the perspective of logistics management.

3. Conceptual Issues in the Eliminating of Plastics Bag Usage from the Perspective of Logistics

The following terms, which are an inherent part of the title of the study, are discussed in more detail to provide greater clarity to the research design.

3.1. Packaging

Packaging is one of the most important factors in the face of purchases made at the point of sale, where it is an essential part of the selling process (Jönson, G. 2000), (Saghir, M. 2002), (Panwar, 2004). It is an act that contains protection to the goods (Mohamed & Suleman, 2013), (Bix et all. 2004) and facilitating the handling, and transportation to their destination in a good state, as they were, at the time of production (Boyce et al. 2008).

3.2. Material handling

Material handling is linked to production flows that have a direct influence on transit times, resource use, and service levels. It is a comprehensive concept that involves movement, storage, control, and protection of materials to provide time and place convenience (Tompkins et al. 1996), (Ballou, 1992) said material handling is a physical process to move the raw material into small quantities in a relatively short distance. The Material Handling Handbook, (Boyce et al. 2008) mentions material handling used by the customer in a supermarket includes a Shopping trolley & Shopping basket (Grandclement, 2009).

4. Literature Review

4.1. Interaction of retail logistics

Retailing refers to the sale of goods or merchandise to end customers, from a fixed location for use and direct consumption by the purchaser. While purchasers may be individuals or businesses that sell the goods directly to the customer who intends to buy and use the goods (Farfan, 2018).Retail is about stocking, displaying, and describing the product features and to the right customers at the right time. Most of the retailers involve purchasing goods or services from manufacturers, wholesalers, agents, importers, or other retailers and sell them to consumers for their personal use. The price charged for goods or services includes retail expenses and includes profits. The objective of the retail logistics system is to ensure the smooth flow of goods to customers through efficient logistics movement. It is the process of managing the flow of goods from supply sources to customers. Large retailers deal with a variety of products. This has created the need for systematic planning of the movement of many goods until they are sent to customers. Retail logistics ensures everything is available to offer better delivery and services at lower prices through efficient and value-added logistics.

Retailers function mainly to add values to the offerings specific to their target segments. This includes providing a convenient location, sufficient stock, and a mix of suitable goods in packages according to customer needs. According to the book by (Levy & Weitz, 2001), four major activities carried out by retailers:

Collecting an assortment of offers: A retailer's selection of merchandise is by an assortment. Where the retailer purchases in big quantities and sells the product in small quantities to the customer. Offering an assortment enables the customer to choose from a variety of selections of products in one location. Most consumers are well aware of the product assortment that the retailer offer.

Breaking bulk: This task refers to the physical repackaging of the product by the retailer, to form into the size that suits the needs of the customer and the stock requirements.

Holding stock: To ensure that products are available for the consumer to purchase, the retailers must maintain the level of the inventory. Usually, customers are depending on the retailers directly to deliver their stock at home. By maintaining the inventory, it would give benefit the customer as they reduce the customer's cost of storing products. To determine the amount of holding stock, forecast data from the previous sales history are used by retailers.

Added services: Additional services are provided by retailers are to provide convenience and satisfaction for customers who come to the stores and purchase their products. Packaging is a key element in added value in the supermarket. An added service package can help the consumer to transport their goods. Every supermarket

provides the most common transporter package which is either a plastic or paper bag. By using the plastic purchase packaging that supermarket has provided, it has made it easier for consumers to carry their purchases to their vehicle after shopping. With that, the added service of packaging has been given satisfaction and pleasure for consumers while shopping without any difficulty in carrying their purchased goods. The set of added services by the retailer may be part of their care delivery, service after the sale would lead to an enjoyable shopping experience for the customer.

4.2. Retail logistics process

4..2.1. Packaging

Packaging is one of the most important factors in the aspect of purchases made at the point of sale, where it is an essential part of the selling process. The packaging is a medium to provide safe, secure, efficient, and effective handling of the purchased items during transport, distribution, storage in maximizing consumer value, sales, and profits (Saghir, M. 2002).. Packaging refers to the material used for protection, handling, delivery, and presentation of the goods. There are 3 main functions of packaging (1) to promote the product (2) to protect the product and (3) to identify the relevant product based on the label (Pau et all. 2011) The packaging expressed by (Panwar, 2004). is an act that contains, protects, and presents content through a long chain of production, handling, and transportation to their destination in a good state, as they were, at the time of production. The packaging of consumer products is very important at the point of sale. It plays an important role when the product is purchased. In addition to the basic functions that have been stated above the function to protect, contain and preserve the product, packaging can also be attributed to 3 categories which are logistics, marketing, and environment (Jönson, 2000)., below is an overview of important packaging functions.

Table 1
Packaging Function

Logistical function	• Facilitate distribution • Protect both product and the environment • Provide information about condition and locations
Marketing function	• Graphic design, format • Legislative demands and marketing • Customer requirements/consumer convenience for end-use as well as distribution
Environmental function/ aspect	• Recovery and recycling • Dematerialization • One-way vs. reusable package • Toxicity

The material used in packaging is also an important element that will prevent the product from any damage or loss (Smith & Taylor, 2004).High-quality materials will attract customers more than low-quality materials. It proved that high-quality material may attract customers from a lower quality of the material. Consumer perception of certain materials can change the quality of the perceived product. A study of the "role of packaging in Jordanian consumer's perception" conducted by (Mohamed, & Suleman, 2013), has stated that the functions in packaging which are (1) protection against product and consumer, (2) promotion of products, (3) Facilitating of storage facilities and convenience use of products (4) the facilitating of recycling and reducing the environmental damage.

4.3.Function of packaging

Protection of product and consumer - In (Mohamed, & Suleman, 2013), findings regarding Jordan's consumer perceptions of product quality at the point of purchase, show a significant statistical effect where this function is an important role in the packaging. Increased attention was drawn to focus on package safety especially for medicines, household cleaners, and other potentially harmful products, especially to children. However, a study conducted (Bix et all. 2004), unveils a failure of packaging function to fully protect the product that led to damage and waste, reduce lifespan, and loss of taste and effectiveness. The problem with insufficient protection can lead to customer dissatisfaction which means there is a relationship between packaging capability to protect product and customer satisfaction or perceptions of product quality. (Boyce et all. 2008)found that the key features required in the food packages (food delivery) are: the ability to protect food, does contain no spilled products, and store individual food separately in the same package; It means that the package's capability to protect and contain products is one of the features that consumer is required to take out food packages that determine the user's readiness. The facilitation of moving the goods -The packaging is the convenience of moving goods from one place to another. The movement of the goods by using the packaging can increase the level of safety of the goods. Apart from facilitating the movement, it also protects the goods from any object that can damage the goods. The use of plastic packing in retail stores such as supermarkets has made it easier for customers to carry and transfer the purchased goods from the counter to their vehicles. It is also easy for customers to move goods from the vehicle to their home.

4.4.Material handling

Material handling management is one of the factors that contribute to improving the performance of the company. Material handling is linked to production flows. Therefore, it has a direct influence on transit times, resource use, and service levels. (Tompkins et all 1996), light on the material handling more than just handling the material. It is a comprehensive concept that involves movement, storage, control, and protection of materials to provide time and place convenience. However, there is no unique definition that can include all the features and activities in internal MHS. Some researchers have determined the internal MHS concept from their point of view. Here is a part of the definition of material handling: (Magad & Amos, 1995), the handling of internal

materials is the art and science to move, store, protect and control the material, preparing the right amount of material, at the right time, in the right place and with the right method. While Mulcahy (1998) in the Material Handling Handbook (1998) mentions some of the goals to be achieved by the concept of product transport:
To provide a proper flow of materials and information
To ensure the lowest possible operating cost
To ensure timely and accurate delivery
Minimize material damage and employee injuries
Reuse of a surface carrying the load and also the introduction of material at any time.

4.5. *Material handling used by the customer in a supermarket*

4.5.1. Shopping trolley

The shopping trolley is a large metal basket on wheels provided by stores such as supermarkets for customers to use while they are at the store. It is used by customers in the store to transport goods from checkout counters at the time of shopping to their vehicle. In many cases, customers can also use the trolley to transport their purchased items to their vehicles, but some trolley is designed to prevent them from leaving the store. The shopping cart is the last link in the food supply chain in the era of mass consumption. It allows fast-moving consumer goods to be liberated from their weight and to move easily from the store shelves to the customer's car (Grandclement, 2009), Most modern shopping trolleys are made of metal or metal and plastic combined and have been designed to nest each other in one line to facilitate the accumulation and transfer of at one time and also to save storage space. The trolley can fit in many sizes, with larger ones carrying children.

4.5.2. Shopping basket

An alternative to shopping carts is a small shopping basket. Customers may prefer a basket for a small number of goods. Small shops, where the trolley will not be practical, often supply baskets only or can offer small trolley that uses shopping carts included in a small trolley to give customers choice.

4.6. Customer experience in the retail process

Many studies suggested the importance of customer expectations as a key to the establishment of customer fulfillment and loyalty. Therefore, marketers need to know their customers' expectations first because failure to meet or exceed these expectations can lead to dissatisfaction. This was supported by (Ofir, & Simonson, 2007)., where customer expectations are the main factor in their use through experience, satisfaction, and loyalty. Customer experience is included in every point of contact where customers interact with the business, product, or service provided. Customer experience management is a business strategy designed to manage customer experience. It is a strategy that generates a win-win situation between retailers and customers (Grewal et all. 2009), In retail, customer expectations for the delivery of retail services are very high. No upgrade service or additional incentives will replace empty shelves. Modern retailers use sophisticated and complex infrastructure to meet the availability of goods and services. But all this involves costs, so retailers need to provide retail services efficiently and achieve productive profits through the use of retail logistics.

4.7. Elimination of plastics usage packaging

4.7.1. The issue in eliminating plastic usage

Plastics are one of the most complicated wastes since most plastics are not biodegradable. Although plastic manufacturers have been producing biodegradable plastics, there is still a question of whether this easily damaged plastic can eliminate environmental hazards or simply act as a marketing tool for plastic manufacturers. Plastic bags have gained popularity among consumers and retailers. From that, the plastic bag is used as the main packing material. It is widely used to pack all kinds of goods. It is also used as a secondary packaging material by retailers to enable their customers to carry daily groceries and other food items from the store to their vehicles (Kamaruddin, & Yusuf, 2012), The plastic bag is the last item added to the packaging mix, supplied at the point of sale for transportation or separation of goods and materials. Plastic bags are usually used as disposable items and will most likely be discarded after initial use. Methods disposal of plastic bags is greatly affected by the purpose of plastic bags (Tough, 2007).. Apart from being lightweight with high load storage capacity, they are also transparent proof and water. Features of plastic carry bags making it so popular that people avoid the habit of carrying their bags during shopping. Approximately 500 billion plastic bags are used annually throughout the world (ESTEC, 2018) This widespread use is due to its cheapness and ease of use. Most of these bags are disposed of as waste usually after a single use. It is believed that plastic waste takes a long time to naturally degrade and thereby poses a challenge of disposal without being described by sunlight (Frech, 2002), In response to environmental impact, many authorities have introduced an initiative to eliminate plastic usage such as Penang state that introduces the "No Plastic Bag" campaign every Monday since 2009 and from 2010, "No Plastic Day" extended to Monday, Tuesday 15, and Wednesday. And in Selangor, Saturday has been gazette as a "No Plastic Bag Day" effectively from 1st January 2010 to reduce plastic bags use (Kamaruddin, & Yusuf, 2012).

4.8. Previous studies

4.8.1.Ban on plastic bags.

The ban on plastic bags is considered a ban on retailers to sell single-use plastic bags in certain areas (Martín, 2015). Many countries have successfully implemented and enforced a strict ban on plastic bags as a bag carrier. For example, the Philippines has only allowed biodegradable bags to be used as carrier bags and penalized those retailers that are still supplying a plastic bag to the customer through fines, cancellations of business licenses, or prisons (Hogaza, 2014). However, the ban on plastic usage is less successful in China despite much earlier in the introduction as compared to the

Philippines. This is because of the lack of monitoring which reported that at least 80% of supermarkets in rural areas in China do not stop at providing plastic bags to the customer (Block, 2013) Meanwhile (Piazza Research, 2012), a study on the ban of plastic bag usage in Canberra, Australia, reported a positive change in consumers' attitudes which shows more than 84% of customers admitted carrying their reusable bags as a result of the ban. This study shows the difficulty in reaching an agreement on banning and eliminating plastic bag usage which becomes a controversial issue around the world.

4.8.2. Public participation.

A case study was carried (Alumni, 2015), on "Public participation and effectiveness of no plastic bag day program in Malaysia". They are conducting observations on 560 customers in supermarkets and hypermarkets such as Jusco, Tesco, Giant, Mydin, Ikea, Speedmart, and cold storage and their observation areas in urban areas in Peninsular Malaysia. The result of the study shows a mixed acceptance level of the customer in the campaign, where 28.75% of all the customers used to carry their carrier bags to the supermarket. While 107 out of 560 customers are not carrying bags, they prefer to carry their purchase items with their own hands or using a trolley to handling the purchased item to their vehicle. Besides, 267 customers willing to pay the charge for plastic bags. The remaining customers did not bring their bags but require themselves to buy the degradable bags from the counter. The findings indicated a potential success of the campaign but require more structured planning and strategies to bring an effective awareness to the consumer on the campaign.

The awareness Another study was done by (Valarmathy, 2015)., to study the use of plastic bags carried by the public of Chennai, the awareness and perception of eliminating the use of plastic carry bags. The study reveals that on 12% of the public is a responsible citizen where they are cautious about the environment and use separate dust bin for plastic waste while 88% of the citizen responsible on littering the plastic bag by throwing in the street after using the plastic bag freely supplied by the supermarket. The free distribution of plastic bag from the supermarket or another grocery store, it has almost eliminated the habits of carrying their carry bag. As a result of their observations, 79.5% of the respondents had their bags and only 19.5% of it regularly bring during shopping and the rest carries them sometimes. Only 17% are comfortable carrying their bag while going shopping, 42% of respondents tend to forget to carry their bags while 28% of them considered it as a burden. The findings have shown that the people in Chennai are aware of the environmental issue that will occur using plastic bags.

4.8.3. Challenges on Eliminating plastic packaging

- Safety of the purchased goods - Plastics packaging has been playing an important role in achieving the objectives of safety and waste prevention in the purchase process. The safety of purchased goods is a major challenge in the campaign to eliminate plastic bags usage. Free distribution of plastic bags by supermarkets, vegetable & fruit sellers, grocery stores, and bakeries for more than two decades almost eliminate customers to bring their carry habits shopping bag (Valarmathy, 2015), but after the campaign " No Plastic Bag " is carried out, some of the customers find it difficult to maintain the safety of goods that they had bought. For perishable items, they are easily damaged when placed with heavy items. Indirectly, it may damage the physical form of the item. Examples of perishable items such as vegetables, fruits, eggs, and so on. If there is no plastic to hold them, they are easy to damage, and this will make customers unhappy. Another challenge is on wet groceries such as fish, meat, chicken, and other wet items. The items may result in impurities on the counter during the time of payment. Where the item is likely to leak and cause impurities and it led to the lack of cleanliness.
- Handling of purchased goods - The use of plastic bags is very important in dealing with goods after making payment at the counter. They are good at carrying items only a short distance before they become damaged or weakened, rendering them unusable again (Miller, 2012), To the customer who doesn't bring their bag, they may face some difficulties in handling their purchased items to the vehicle.

5. Conceptual Framework

A conceptual framework is important in describes the theory that has been explaining why the research problem under this research exists. Below shows the research conceptual framework for the dependant and the independent variable in this research.

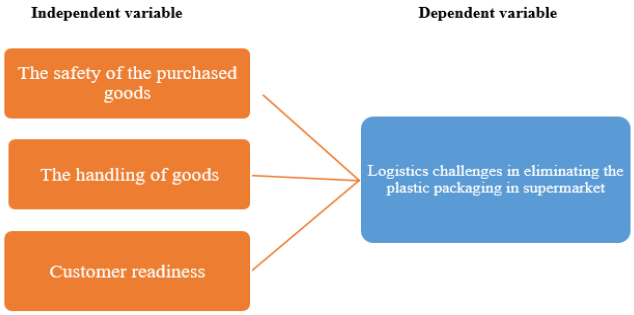

Fig. 1. Conceptual framework for the study

6. Research Approach

In this study, the data was collected based on a quantitative method to explore and understand the experience of the respondent on their empirical observations and critical interpretations of subject research. The use of the quantitative method is appropriate in investigating individual perception in social science (Creswell, 2014), The closed-ended questions were developed to collect the information from the and 132 respondents who participated in answering the

questions. This number is sufficient for the data analysis requirement using Statistical Package for Social Sciences (SPSS). The data collected from the survey were analyzed using descriptive and inferential analysis to identify converging or diverging areas of interest.

7. Result And Discussion

This finding from the survey is discussed using descriptive and inferential analysis as the following sub-heading:

7.1. Descriptive Analysis

7.1.1. The level of awareness of banning plastic usage in the supermarket

To gain an understanding of the level of awareness of banning plastic usage in the supermarket, respondents were asked to express their personal opinion on the following aspects as illustrated in table 2.

Table 2
The level of awareness

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
The banning plastic usage in Tesco supermarket	5 (3.8%)	12 (9.1%)	44 (33.3%)	36 (27.3%)	35 (26.5%)	3.64	1.086
Support such campaign that has implemented in Tesco	5 (3.8%)	14 (10.6%)	33 (25.0%)	43 (32.6%)	37 (28.0%)	3.7	1.103
Plastic is harmful in long term	3 (2.3%)	4 (3.0%)	25 (18.9%)	29 (22%)	71 (53.8%)	4.22	1.006
A reusable bag is better to use for our environment	3 (2.3%)	2 (1.5%)	38 (28.8%)	30 (22.7%)	59 (44.7%)	4.06	1.002

Four (4) questions were developed to understand customer perception towards the implementation of the ‘’Zero Plastics Bag’’ campaign and the level of awareness of banning plastic usage at Tesco Supermarket. The result has shown that the majority of the respondent agreed about the banning of plastic usage in Tesco supermarkets and the harmful impact of the plastic bag in the long term. This finding also revealed the level of awareness with a large majority of respondents which indicated their understanding of the purpose of the introduction of reusable bags for the carrying of the purchased goods.

7.1.2. Logistics challenges in safety and security

Although a significant awareness among the customer on the impact of plastic usage, there is still various issues on the implementation that become significant challenges to the customer. Hence, this study is to explore various issue related to the logistics challenges on the implementation that plays a significant impact on educated the customer on the importance of the campaign.

To identify the logistics challenges to the customer on the implementation of the campaign, the questionnaires were developed into 2 parts consists of 12 questions, in terms of safety and security, and material handling. The question was developed to understand what customers experienced during the campaign. In this safety and security finding, it is unveiled another risk and effect that directly impact the purchased goods that were easy to damage due to the inflexibility of the reusable bag. The reusable bag in nature is not flexible in carrying different types and sizes of goods in particular for wet products. This supported the finding by (Frank &. Paine, 1992), where plastics packaging is a good medium to prevent damaged items during the shopping processes. The respondent also raises concerns about the safety of the purchase goods that are exposed for theft or missing while carrying in loose without a reusable bag.

Table 3
Logistics challenges in safety and security

Safety and security	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
The items easily damage when no carrier use	7 (5.3%)	26 19.7%)	37 (28.0%)	45 (34.1%)	17 (12.9%)	3.3	1.089
Goods easily missing because no plastic bag	7 (5.3%)	24 (18.2%)	37 (28.0%)	46 (34.8%)	18 13.6%)	3.33	1.089
Purchases are not safe without using plastic bag	8 (6.1%)	32 (24.2%)	42 (31.8%)	43 (32.6%)	7 (5.3%)	3.07	1.013
Purchases once fall because it was slippery from hand	18 (13.6%)	41 (31.1%)	39 (29.5%)	20 (15.2%)	14 (10.6%)	2.78	1.181
Often feel pain in arms because lift so much	11 (8.3%)	29 (22.0%)	40 (30.3%)	33 (25.0%)	19 (14.4%)	3.15	1.169
Feel posture hurts when carrying goods without carrier	15 (11.4%)	27 (20.5%)	43 (32.6%)	30 (22.7%)	17 (12.9%)	3.05	1.187

Besides, respondents were also confronted with a situation like a spillage that happens from wet groceries due to no plastic bag use. This finding has supported the study by (Boyce et all. 2008)that found that the packages of the goods can protect the products from spilling and waterproof (Spokas, 2008), The spillage that happens from the goods not only affects the customer but also the other customer, where hygiene is not guaranteed. This has created discomfort for the customers. Moreover, the degradable bag also does not maintain high hygiene where the design and size of the bag do not fulfill the maximum satisfaction.

Further, most of the respondents had experienced pain in their arms and on their posture as they lift too many goods without using plastic or any carrier.

This finding points out that the safety and security challenges during the logistics process require an immediate solution to maintain the campaign's sustainability.

7.1.3. Logistics challenges in material handling

In terms of material handling, the majority of respondents having trouble carrying the goods without a plastic bag. They also have a hard time moving the goods to their car. Most of the respondents are still prefer to use a plastic bag as it is more flexible to carry goods. The design of the plastic bags that were used for the purchased packaging is purposely to cater to the need for packaging requirements, which is capable of protecting all the goods during handling and transit to the customer vehicle. This finding was supported by

(Miller, 2012)., which he mentioned that the plastic bag is good at carrying items only a short distance before they become damaged or weakened, rendering them unusable again. Furthermore, the purpose of a degradable bag, which is more fragile and not suitable to handle heavy items and the design also somehow limited and it is not fully user-friendly for all the items. The flexibility of plastic bags caters to all items either heavy or not. But for the degradable bags, the wet and dry groceries will be putting together as it will result in inconvenience to carry the goods.

Table 4
Logistics challenges in material handling

Material handling	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
Having trouble carrying goods without plastic bag	10 (7.6%)	23 (17.4%)	35 (26.5%)	41 (31.1%)	23 (17.4%)	3.33	1.177
Having a hard time of carrying and moving the goods to car	7 (5.3%)	27 (20.5%)	33 (25.0%)	44 (33.3%)	21 (15.9%)	3.34	1.131
Prefer to use plastic bag as it is more flexible	7 (5.3%)	26 (19.7%)	36 (27.3%)	41 (31.1%)	22 (16.7%)	3.34	1.131
Spillage from wet groceries often occur	19 (14.4%)	22 (16.7%)	44 (33.3%)	35 (26.5%)	12 (9.1%)	2.99	1.175
Reusable bag is not suitable size for amount of shopping	9 (6.8%)	32 (24.2%)	36 (27.3%)	40 (30.3%)	15 (11.4%)	3.15	1.122
Cost of single use plastic is cheaper than reusable bag	7 (5.3%)	12 (9.1%)	35 (26.5%)	46 (34.8%)	32 (24.2%)	3.64	1.107

7.1.4. Customer readiness

The campaign has a niche impact on the logistics process that poses a critical factor to the success of the campaign. The preparation for logistics challenges such as the use of the degradable bag is critical to support such an initiative on banning plastic usage in plastic packaging.

Table 5
Customer readiness

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
Expecting on the campaign for shopping experience	1 (0.8%)	13 (9.8%)	57 (43.2%)	46 (34.8%)	15 11.4%)	3.46	0.851
To be charged for using a single use plastic bag	27 (20.5%)	19 (14.4%)	34 (25.8%)	31 (23.5%)	21 (15.9%)	3.00	1.359
Still want to use plastic bags during shopping	15 (11.4%)	18 (13.6%)	40 (30.3%)	35 (26.5%)	24 (18.2%)	3.27	1.235
There will be a reward or penalty system implemented to encourage customer to bring reusable bag	15 (11.4%)	6 (4.5%)	37 (28.0%)	39 (29.5%)	35 (26.5%)	3.55	1.250
Willing to be frequent customer to abolish the usage of plastic bag	6 (4.5%)	15 (11.4%)	44 (33.3%)	38 (28.8%)	29 (22.0%)	3.52	1.095

7.2. Inferential analysis

There is a relationship between the logistics challenges and customer awareness on the implementation of the campaign.
Multiple regressions have been used in this study to analyze further the logistics challenges and customer readiness and test the relationship. To evaluate the predictor and their relation to the criteria, multiple regression analyses were performed. In other words, it is necessary to identify the relationship between a dependent variable and several independent variables. Multiple regression was used to analyze the relationship between these variables to have a better understanding of the relationship between customer awareness and logistics challenges.
The requirement of multiple regressions must be met to ensure the accuracy of the results from the regression analysis. There are three steps in the analysis of the outcome by using the standard multiple regression techniques, as said. The step includes the requirement to check the assumptions, evaluating the model as well as each of the independent variables.

7.2.1. Step 1: Checking the assumptions

Multiple regression assumptions were tested as follows before using standard multiple regression techniques to analyze the results.

7.2.1.1. Sample size

By taking into account the number of independent variables that need to analyze, (Tabachnick & Fidell, 2011), has suggested a formula for calculating the sample size requirements as shown below:

Formula of sample size = $N > 50 + 8m$
(m = number of independent variables)

According to the formula, 74 respondents were sufficient to proceed with the regression requirement. As such a total of 132 answers collected from the respondent is sufficient to meet the requirements of the standard regression.
Outliers were checked using Mahalanobis distance tests using multiple regression programs. The maximum score from the test was 12.383.
The critical value for evaluating the Mahalanobis distance values in this study was 11.345. and it is adopted from (Pallant, 2005), (Tabachnick & Fidell, 2011),

Table 6
Outlier Residual Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.641	5.419	3.636	.781	132
Std. Predicted Value	-2.556	2.284	.000	1.000	132
Standard Error of Predicted Value	.069	.244	.128	.037	132
Adjusted Predicted Value	1.694	5.455	3.636	.782	132
Residual	-3.048	1.826	.000	.755	132
Std. Residual	-3.990	2.390	.000	.988	132
Stud. Residual	-4.025	2.407	.000	1.004	132
Deleted Residual	-3.103	1.852	.000	.780	132
Stud. Deleted Residual	-4.290	2.453	-.002	1.020	132
Mahal. Distance	.069	12.383	2.977	2.323	132
Cook's Distance	.000	.172	.008	.019	132
Centered Leverage Value	.001	.095	.023	.018	132

a. Dependent Variable: The level of awareness

7.2.1.2. Normal P-P plot of regression standardized residual

The Normal Probability Plot (P-P) Regression Standard Residual has evaluated this assumption. Moreover, the normal sample is also shown in the Normal P-P of the Regression Standard Residual. The figure below shows a normal plot of the regression standardized residual which shows that the data was suitable for use in multiple regression analyses.

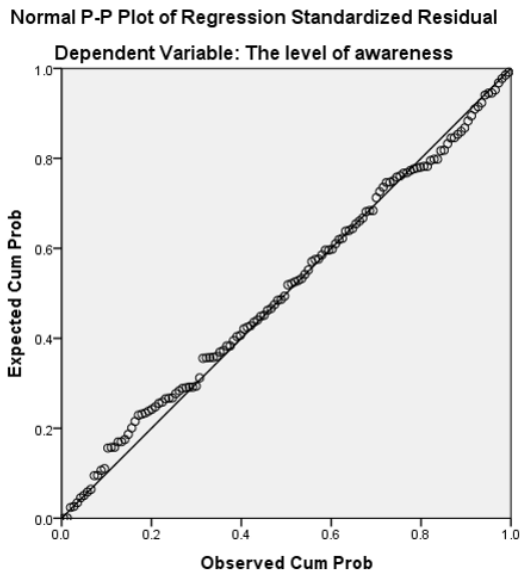

Fig. 2. Normal P-P Plot of Regression Standardised Residual

According to figure 2 the Normal P-P plot, all points are placed on a diagonal line that runs straight from the bottom left to the top right. However, from the straight diagonal line, there are some indirect points, but generally, there are no major signs of deviation from normality. As a result, the normality results are appropriate and reasonable as the residual showed a straight line from bottom left to top right relationship with the predicted dependent variable scores.

7.2.1.3. Histogram

Figure 3 indicates that the data were appropriate as the residuals are usually distributed according to the predicted dependent scores, which can be used in multiple regression.

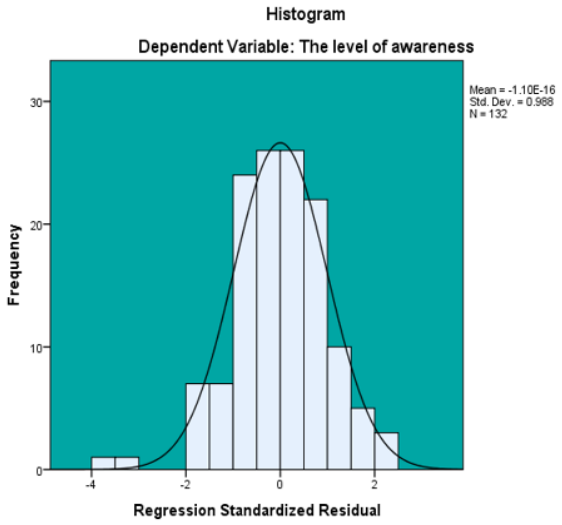

Fig. 3. Histogram

7.2.1.4. Coefficients

The tolerance and variance inflection factor (VIF) results are shown in Table 7. Cut-off points are a tolerance value of less than 0.10 as well as a VIF value of above 10 to determine the existence of multicollinearity. In this study, the tolerance value for each independent variable was higher than .10, and VIF values below 10 supported these results. Consequently, the results indicated that the multicollinearity assumption between the variables was not violated. In conclusion, all assumptions were met during the regression analysis. Thus, the appropriateness of this finding is confirmed.

Table 7
Coefficient

Model		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Beta			Tolerance	VIF
1	(Constant)		3.691	.000		
	Safety and security	-.202	-2.354	.020	.511	1.957
	Material handling	-.018	-.188	.851	.430	2.326
	Customer readiness	.636	9.180	.000	.786	1.272

1) Dependent Variable: The level of awareness

7.2.2. Step 2: Evaluating the model

Table 8 summary model consists of 6 columns on it, which the first column as no. of Model. While the second column refers to the value of R, the value of the multiple correlation coefficient between the predictor and the result. Based on table 4.8, the value of the multiple correlations between predictor and the outcomes is 0.719.

Next, the second column in Table 8 gives the R^2 value known as the measure of how much of the variability in the outcome

is taken into account by the predictor. The R^2 value in the model was 0.517 which is expressed as a percentage multiplied by 100 will result in 51.7%. As a result, the model explained 51.7% of the variance in the frequency of the level of awareness.

Moreover, the third column refers to the adjusted R^2 which provides some ideas on how the model was widespread. The R^2 adjusted values are preferably to be equal to or close to R^2 values. The value was lower than the value of R2 based on the adjusted R2 in table 8. The difference between R2 and adjusted R2 was 0.517-0.505 = 0.012 resulting in 1.2%. The reduction in value in this model means that it would account for approximately 1.2% of the variance in the outcome if data were obtained from the population rather than the sample.

Table 8
Summary Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.719[a]	.517	.505	.764

a. Predictors: (Constant), Customer readiness, safety, and security, material handling
b. Dependent Variable: The level of awareness

7.2.2.1. ANOVA

ANOVA test was also used to identify whether the model is better considerably at predicting the outcomes. Table 9, consists of 4 columns are the first column is the Sum of Squares, the second column is the degree of freedom (df), where it means the number of predictors, while the third column represents the Mean Square which refers to the Sum of the Squares divided by degree of freedom (df).

Table 9
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.836	3	26.612	45.595	.000[b]
	Residual	74.709	128	.584		
	Total	154.545	131			

a. Dependent variable: The level of awareness
b. Predictors: (Constant), Customer readiness, safety, and security, material handling

The table above shows the result of the data that have been collected for this study. In the ANOVA table 9, it represented two values of the data in the model which are the value of Regression and another one is the value of residual. The second column refers to the Sum of the Square of the data collected, for the regression value it shows 79.936 while the Residual value is 74.709, as a result, the total of the squares for these two variables is 154.545.

Furthermore, the third column which represented the Degree of Freedom (df) refers to the number of predictors for the regression coefficient. According to the data in the table, the df is 3 which means the number of predictors (factors). The df for the Residual is 128 which is the total value of observations – df of regression calculated as 131 – 3 = 128. Besides, for the Mean Square, it means the difference of Sum of Square divided the Degree of Freedom. Thus, the Mean Square of regression for this data collected is 26.612 while the residual is 0.584.

The F-ratio is the ratio of two different measures of variance for the data collected. This ratio was used to determine either the null hypothesis is rejected or accepted. The F must be greater than 1 to show the accuracy of the model. By using SPSS it calculates the exact probability of F which the result in this model is 45.595 where it is significant ($p < 0.001$)

7.2.3. Step 3: Evaluating the independent variables

The last step in this section is evaluating the independent variables which discuss the 3 independent variables that include in the model contributed to the predictor (the level of awareness). All the variables shown in table 7 except material handling, resulted ($p<.05$) which made a significant contribution to the predictor (the level of awareness). Besides, the beta coefficient only used standardized coefficient reasonably as highlighted by (Pallant, 2005), such values have been transformed to the same level so that each of the different variables can be correlated with the outcome. The result in table 7 points out that the independent variable (customer readiness) was the highest beta coefficient with 0.636 which means that this independent variable made the strongest contribution to explain the dependent variable.

As a result, customer readiness was the best factor that influenced the level of customer awareness on the implementation of banning plastic usage at Tesco supermarket. Where the customer is ready in preparing some preparation for the implementation of the campaign in terms of safety and material handling. However, the Beta value for material handling with -.018 was slightly lower which indicates less contribution to the dependent variable. The significant value of customer readiness and safety and security is less than 0.05, as a result, the variable is making a significant unique contribution to the dependent variable.

Therefore, the null hypothesis Ho1, there is a relationship between the logistics challenges and customer awareness on the implementation of the campaign was accepted.

The third finding is customer readiness on the implementation of the campaign in terms of customer readiness in the logistics environment. This finding seems like a niche in the logistics, however, it gives an impact to the challenges on the campaign. Where the customer needs to do the preparation such as using a degradable bag and so on to support such initiative on banning plastic usage in plastic packaging.

To conclude, these findings indicated the challenges for customers on the implementation of the campaign. The results of the data analysis were quite conclusive and not particularly uprising to this researcher. The result of data analysis in the previous chapter, which indicated the sample size of 132 of this study was sufficient to meet the standard regression requirement.

Outliers are tested using multiple regression using Mahalanobis distance checks. The test's maximum score was 12.382. The critical value in this study was 11.345, where it has 3 independent variables. Moreover, from the ANOVA analysis, it was evident that the safety and security, material handling, and customer readiness significantly affected the level of awareness. Customer readiness shows the highest Beta coefficient with 0.636 means that this independent variable made the strongest contribution to explain the dependent variable. As a result, customer readiness was the best factor that influenced the level of customer awareness on the implementation of banning plastic usage at Tesco supermarket. It contributes to the readiness of customers on preparing in logistics in terms of material handling and safety and security to the goods and customers themselves during the shopping experience. As a result, the null hypothesis Ho1, where there is a relationship between the logistics challenges and customer awareness was accepted.

8. Conclusion

The research provides a comprehensive conceptual framework regarding the implementation of banning plastic bags for purchase packaging at Tesco. The whole conceptual framework has identified logistics challenges as a threat in the campaign which is still unaware to most of Malaysia. There logistics variables namely safety and security, material handling, and readiness were identified to facilitate the investigation.

The first variable is the safety of the goods, which has a significant impact on logistical challenges. Where the issue faced by the customer if no plastic bag use it can easily damage the goods which also known as improper packaging. This factor contributes significantly to customer readiness, were to achieve the campaign objectives, the government can take the initiative to continue this campaign in stages and these campaigns must be applied across all supermarkets. Other than that, it also gives several implications to the safety health of a customer in terms of physical posture. This research found that some of the customers had pain in their arms and back pain due to carrying goods without a plastic bag or degradable bag. Customer safety is also very important in logistics where physical posture needs to be focused to avoid injuries while shopping.

The second variable is material handling which also gives a contribution to the logistic challenges on the implementation of the campaign. According to (Tabachnick & Fidell, 2011), the concept of material handling is involved in the movement of goods, storage, control, and protection of goods to provide convenience in time and place. Most of the customers faced trouble in handling moving goods without a plastic bag and they more prefer to use plastic bags as it is a flexible material to use to carry all types of goods.

The third variable is customer readiness on the implementation of the campaign in terms of customer readiness in the logistics environment. This variable obtains a significant contribution to the dependent variable. The customer readiness also gives an impact on the logistic challenges on the campaign, where most of the customer is aware of the banning campaign and some of them had done some preparation such prepare a degradable bag to support the campaign on eliminates plastic usage.

From the result, it appears that either the government or Tesco should emphasize customer readiness in terms of the logistics aspect which is the critical success factor in this campaign. The consumer should be guided properly in terms of logistics processes that include handling, safety, and the right procedure. Here, a more holistic approach must focus on educating the consumer in their knowledge and readiness to handle the logistics process which is the main aspect of the campaign.

This research can be deemed as successful as it gave a lot of positives reviews and opinions that can be used for future research.

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