

Web-based E-retailing system for CTU food innovation centers: Design, acceptability, and functionality

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ABSTRACT

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The advantages of using e-retailing in promoting and distributing the products and services are so coveted that an e-retailing system to enhance the traditional way of marketing and distributing the products and services of CTU Food Innovation Centers (FIC) not only in Tuburan but across satellite campuses will be developed to enhance the current system of marketing products and services in the FIC Tuburan is word of mouth or referral system, un-systematized posting using social media, brochures, and exhibits, which results in a low generation of income and less attention to the public. This study designs and proposes a web-based e-retailing system and subsequently determines its acceptability as perceived by stakeholders and experts. This research study utilized quantitative research methods and applied design with the use of a descriptive method to determine how a web-based application can be developed for promoting a product. Improvement of the current system of delivering the products and services of the FIC to its clientele is the main objective. The survey questionnaires using 4-point Likert scale helped in assessing the perception of the intended customers of FIC towards the acceptability of the system. In light of the discoveries, it may be reasoned that FIC Web-based Retailing Systems are compliant with the basics of e-commerce, which leads to positive behavior and acceptance, the system's design was able to overwhelmingly catch the attention of the respondents, the system's features were satisfactorily observed; the system's functionality was able to effectively transmit a quick and fast way of service to the respondents; the system's aesthetics was able to create the necessary impression to its users, and the system's security was effectively observed.

1. Introduction

The introduction of the web has permeated and transformed all fields of life from a convention to something radical, especially in the business arena. Traditional selling and buying have now slowly diminished because of the presence of the Internet, which gave birth to electronic commerce, where people recognize its convenience, time, and cost-efficiency. Nowadays, people do not need to apprehend heavy traffic, long queues in the counter area, gasoline, etc., since purchasing can be done in the comforts of their homes (Combe, 2006).

Moreover, the importance of electronic retailing has been immensely recognized not only in developed countries like the US but even in the third world like the Philippines when the threatening contagious disease Covid-19 hit the world. People are required to stay at home most of the time to stay away from the chance of getting infected with the virus. The good news is that electronic retailing is abundantly available. With just a click, people can now purchase the products and services of their needs (Fryer, 2021).

Apparently, electronic retailing has been influential in the market as it continues to contribute not only to the convenience of the buyers but also to the economy. In an online store or merchandise, many products can be chosen in a single click and can easily be compared at prices significantly different from the traditional ones.

Hargrave (2021) defines e-retailing as selling products and services using the Internet. He added that this kind of platform is effective and efficient, especially in distributing or moving the products since this kind of platform can make distribution faster and reach a broader scope of customers compared to the traditional one. This is indeed a better platform for retailing for customers nowadays who are busy with their work and could not afford to fall in a long line waiting for long hours which could have been spent more productively on other important matters. Moreover, Sharma (2018) elaborated that e-retailing has become very important to people's lives as it provides customers with a wider variety of choices of products and services by visiting different online stores without the burden of facing heavy traffic and long queues. Indeed, it has expanded the boundaries of traditional commerce. Moreover, it has minimized the cost of operations by cutting overhead expenses of traditional commerce like rentals, management costs, salary, and many others.

Furthermore, Khan (2016) stressed the importance of getting acquainted with the advancement of information and communication technology which brought many changes, especially in the business arena, which catalyzed E-commerce. In his study on the advantages and difficulties of using online business, he emphasized how this business model brought a great deal of advantages that enhance customer fulfillment concerning accommodation, enabling companies to acquire a more upper hand over different contenders.

In line with the advantages of using e-retailing in promoting and distributing the products and services, it is coveted that an e-retailing system enhances the traditional way of marketing and distributing the products and services of CTU Food Innovation Centers (FIC) not only in Tuburan but across satellite campuses will be developed. The current system of marketing products and services in the FIC Tuburan is through word-of-mouth or referral systems, with no systematized posting using social media, brochures, and exhibits. This current situation resulted in a low generation of income and less attention to the public.

This has been the plight of FIC since it was established in 2018. It has become distressing as it gradually defeats the primary purpose which is to assist and encourage stakeholders and Small-Medium Enterprises (SMEs) to increase their productivity, accelerate competitiveness, and tap a broader market. Presumably, this thrust of FIC as a shared facility of the government will be executed well through adapting the digitalization of its products and services.

Hence, this study designed and proposed a web-based e-retailing system and subsequently determined its acceptability as perceived by stakeholders and experts. Specifically, this study assessed the consumers' behavior and the perceived level of acceptability toward FIC's Web-based Retailing System at Cebu Technological University, Tuburan Campus during the School Year 2021 - 2022.

2. Theoretical basis

This section indicates a summary of theories/theoretical points/research that have been conducted previously. On that basis, propose research models, research hypotheses, or analytical frameworks.

Consumer behavior is a study that determines how an individual, group of people, or even organization undergoes the process of selecting or purchasing to meet consumer satisfaction and eventually improve the quality of services provided (Kuester, 2012). This research endeavors to determine consumer behavior and the perceived acceptability of electronic retailing and to delve empirically. This research undertaking is anchored on Susan Munro's Three-Stage Model of Service Consumption and Davis' Technology Acceptance Model.

The three-stage model presumes that consumer behavior can be shown in various forms and stages, which need to be understood by any business firm to make and convey administrations that lead to customer satisfaction. These stages can be translated into the following queries that need to be understood: first, why do clients act the way they do; how do customers arrive at conclusions about purchasing and utilizing services; and what decides their fulfillment with the products or services after consumption. According to Munro, Administration Consumption can be isolated into three phases: the pre-buy stage, administration experience, and post-experience stage (Lovelock & Wirtz, 2018).

The pre-buy phase of the administration consumption starts with the necessity arousal/mindfulness and is followed by data search and assessment of options. The desire to purchase a product or to avail of help is set off by a fundamental need or need excitement, which is set off by people's oblivious psyche or impulse buying, state of being, and outer sources.

Sharma, Sivakumaran, and Marshall (2009) stated that consumers could take part in motivation purchasing or "unplanned behavior," but this happens not as commonly in administrations as in products because of the greater saw hazard and fluctuation related to administrations. On the other hand, Tsiotsou and Wirtz (2012) emphasized that when the consumer purchases on a planned behavior basis, he becomes more motivated to proceed to the next step, which is the search for information. For instance, Juan de la Cruz's need for a haircut was set off when he recalled that he had a prospective employee meeting toward the finish of the month.

The consumer is conscious of his needs and will become more motivated to look for information so that he can attain the looks that best suit him for the interview. Another reason that triggers the need for arousal is Physical Condition. Maria's hunger, for instance, leads her to purchase a burger.

Lastly is the External Source, which includes the marketing activities of the business firm. For instance, a juice drink is promoted as a product that could lose weight and might trigger people's need to become slimmer. Once needs are identified, customers become motivated to search for solutions to satisfy their needs. These solutions include past experiences and external sources, as mentioned earlier. Finally, the consumer makes a purchase decision after carefully considering key attributes that are important in evaluating and comparing the alternative offerings of the market (Lovelock & Wirtz, 2018).

The pre-purchase stage is very critical since it is where consumers make decisions based on their gathered information on the products and services that they plan to purchase or avail, which was triggered by the need for arousal. Hence, understanding customer direction is critical to recognizing and promoting difficulties and potential open doors. It is vital to adjust showcasing endeavors to the means that clients attempt to choose what to purchase (Solomon, 2021).

Service Encounter Stage or “the moment of truth,” metaphorically coined by Richard Norman from bullfighting to show the significance of contact focuses with clients just like the bull and the matador. This stage involves interactions with the consumer and the service firm.

Service can be classified into two levels depending on the contact length between the customer and the service firms. These are High-Contact Services and Low-Contact Services. The former truly intends that there is a face-to-face relationship between the customer and the service provider all through the conveyance of the service. Hospitals and restaurants are classified as high-contact service providers since they center around handling individuals as opposed to lifeless things. The advertising challenge for service providers is to make the experience satisfying and convincing to the clients as far as customer relations and actual climate. The latter is more related to electronic retailing, where it involves small if any, actual contact among clients and specialist organizations since connection happens through electronic channels. This kind of service has immensely increased, giving birth to online transactions like the very famous Alibaba, Lazada, Amazon, Shopee, etc., because of its convenience. High-contact services have gradually transformed into this kind of service (Lovelock & Wirtz, 2018).

There are some models and theories that would make service encounters with both high and low contacts to be appealing and convincing. One best example is the Seen Power theory, which asserts that clients should have command of the situation during the service encounter. This theory presumes the higher the perceived power level, the higher the level of satisfaction will be. This means that the consumer should have a say in the services he will encounter. For instance, in online services, customers always want to know if their transactions are processed or not. Thus, there must be some scripts or signals that communicate to the customer (Bateson & Hoffman, 2011). It is essential to comprehend the consumer behavior and circumstances of the service interaction since it affects how the client and the business interact.

The final stage of good turn consumption is the stage following an encounter. At this point, it involves consumers’ attitudinal and behavioral responses to the service experience. Specifically, these embrace customer satisfaction, service quality perceptions, repeat purchases, and customer loyalty. In this stage, the consumers evaluate the services they experienced as provided by the firm and juxtapose them with the expectations they had during the pre-purchase and the service encounter. Then, this leads to a judgment or customer satisfaction. Satisfaction can be determined by comparing customers’ expectations with the service level insight and performance. However, it should be noted that satisfaction and service quality are different constructs. An appraisal of a single consumption experience is the satisfaction or is a direct and prompt reaction to that encounter. At the same time, generally, consistent attitudes and perceptions regarding a company are referred to as service quality. Customer Satisfaction and Service Quality can lead to repeat purchases and customer loyalty which is very important to any business firm. Therefore, understanding the post-encounter stage helps managers to emphasize the services of the company’s strengths and to concentrate improvement efforts where they are most needed (Oliver, 2010).

Thus, consumer behavior is an essential field of study, most especially for the rising online marketers for them to comprehend what factors affect consumers’ purchasing decisions and eventually help marketers select how to showcase their items in a way that promotes sales by filling in market gaps, identifying needed and obsolete products, and the greatest effect on consumers and most importantly reach and engage your clients and persuade customers to make purchases from you (Bird, 2020). The best way to understand it is through the consumption of services in three stages.

On the other hand, the demographic profile of the person can influence his behavior in making decisions about purchasing a product. Niosi (2021) stated that people do not make the same decisions because they inherit and learn different behavioral tendencies. This makes marketers imperatively consider the factors that influence their decisions in purchasing.

According to Niosi (2021), both internal and external influences can have an impact on people's decision-making a purchase. Internal factors include perception, learning, motivation, personality, and attitudes, while demographic, social, situational, and cultural cover the external factors.

Demographic Influences should not be taken for granted in understanding consumers' behavior in making purchases. Demographic variables include age, sex, income, education, marital status, and mobility which are all considered essential in influencing consumer behavior. People with higher incomes tend to buy different products and with other qualities than those who have lesser incomes. This implies that income is a contributing factor that influences and defines the target buyer (Niosi, 2021).

Another contributing factor, according to Niosi (2021), that influences purchasing decisions is social standing which is referred to as a gathering of individuals. who share the same socioeconomic background or level of education, which can be determined by occupation. People with the same occupation or social class tend to have similar buying patterns or behavior to those with different occupations.

Moreover, gender cannot be overlooked by marketers as it is among the contributing elements that could influence the buying decisions of consumers. Mitchell and Walsh (2004) (as cited in Lakshmi, Niharika, & Lahari, 2017), males and females undoubtedly have distinct preferences for and methods of obtaining different things. Consumer behaviors are significantly influenced by gender. Because men and women have different expectations, wants, needs, lifestyles, etc., they demonstrate their consumption patterns (Akturan, 2009, as cited in Lakshmi et al., 2017).

In addition, age does not only influence the purchasing way of acting. It is a significant element influencing marketing strategy and market segmentation. Marketers divide their target market into segments based on age. Several products are only promoted to millennials. Similarly, some items designed for the elderly also satisfy the demands of the past Middle Ages. As a result, as people become older, their preferences for brands and goods start to shift. Since aging brings about changes that impact our tastes, a young guy's choices can be very different from those of an older man. An elderly person might experience more severe decisions and lose his youthful sense of humor.

Another factor to consider is culture. It's crucial to take a country's cultural history, cultural identity, and psychological characteristics into account when developing a marketing strategy. For instance, collectivism is a fundamental cultural value in Chinese culture and in many other Asian nations. This means that while making a purchase selection, it's crucial to take the requirements of your family and other members of your community into account as opposed to picking the one that would currently benefit you the most (Forgeard, 2022).

To sum up, the factors that could influence consumer behavior purposely chosen in the study are Age, Gender, Occupation or Social Class, and monthly income. These factors influence the decision process in purchasing and availing of services which are reflected in every stage of the three-stage model of consumer behavior.

Another way of looking into the end user's acceptance behavior towards an emergent technology is by using theoretical models such as the Model for Technology Acceptance (TAM),

which was presented in 1989 by Fred Davis and has been applied widely and tested empirically by many research undertakings. Accordingly, this model is anchored and an outcome of the integration of Social Psychology Theory and Reasoned Action Theory, which asserts that someone's belief influences his attitude; thus, someone's intention brings him or her to their behavior or actions (Ma & Liu, 2004).

In TAM, perceived utility and perceived simplicity of use are the two important elements in understanding the end-user's acceptance of technology. The former is defined by Davis as the users' subjective probability that using a specific application or technology will enhance their jobs, lives, and ways of doing things. The latter is defined as the user's expectation of the target system or technology if it is free of much effort on its functionalities and usage. These two significant factors are the determinants of the other two factors of the technology acceptance model, which are Behavioral Intention to use and Actual Usage (Surendran, 2012).

Behavioral Intention to Use is the factor that measures the user's probability of employing the technology after testing and proving that the technology has helped him enhance his job, life, and ways of doing things. Likewise, it is the user's likelihood to use the technology after discovering that the technology is free of effort upon using it. Actual usage is defined as the acceptance of the user as influenced by the major factors (Surendran, 2012).

Based on the postulates of the Technology Acceptance Model, it is only appropriate that the user's perceived acceptance of the Web-based Retailing System of FIC Tuburan be measured using the factors posited by this model. This research would like to measure stakeholders' perceptions of whether this emergent technology will enhance the way FIC's main objectives, products, and services are promoted to the public as a shared facility. Moreover, this would measure stakeholders' perception of their experience in using the technology if it has made them stress-free.

Based on the Behavior and Perceived acceptance of the users towards this Web-based Retailing System, an enhanced technology will be developed. It is also deemed necessary to review literature on the models of ecommerce and empirical studies that would lead to understanding consumer behavior and perceived acceptance of emergent technology.

Design features for e-commerce

Malhotra (2021) stressed that without certain basic design considerations, none of the e-commerce apps would be conceivable. The true problem is to attract visitors and turn them into customers. If the fundamental design factors are done correctly, it will lead to a successful Internet-based business.

Design of e-commerce Website. The importance of the portal's design should be given enough value. Customers should be able to locate exactly what they are looking for when they visit the site. Web pages should load quickly and enable smooth, intuitive navigation across all electronic devices and an e-commerce gateway should be fast and responsive to clients' needs (Malhotra, 2021).

Easy Navigation. Any website, but especially one that sells items online, needs to be simple to navigate. Customers choose e-commerce sites that respond quickly to their needs and respond quickly to their questions. There is a great risk of losing customers if product descriptions are not correctly supplied on an eCommerce portal's shopping menu (Malhotra, 2021).

Simple check-out. Malhotra (2021) pointed out that if check-out processes involve numerous and complicated steps, it leads to customers' disappointment and might give up on

making a purchase. The process should be smooth and simple. Moreover, the system should offer a variety of payment methods, such as cash on delivery, digital wallets, credit and debit cards, net banking, and so on. Likewise, there should be no hidden fees at the time of product delivery; the payment procedure should be transparent and explicitly identify the shipping charges, taxes, and any other fees that may apply.

Logistics. Management in this area is one of the factors to consider in doing online business either locally or internationally. Proper logistics should be in place to receive and fulfill orders.

Likewise, Bright Cloud Studio (2022) proposes seven (7) essentials to consider when developing e-commerce which were also the basis of the FIC's Web-Based Retailing System. These include a shopping cart that is user-friendly, a Checkout Process, Mobile Friendliness, Calls to Action, Pictures and Descriptions, Assistance to customers, security, and privacy.

When a term or homepage is used to describe easy navigation of the online store, a greater chance of making sales could be achieved. Moreover, it suggests having a homepage that is enticing to visitors to click, and instructions should be self-explanatory. Likewise, it suggests having a search bar that easily and quickly finds the list of all applicable products.

The shopping cart and Checkout Process is another essential to consider, which suggests that it should be easy to add products to the shopping basket. Color and design preferences should be simple to see and choose. Customers prefer to see what they have added to their basket while they are still shopping, so make sure that the site's design and functionality make it easy for them to do so.

Mobile Compatibility is another essential to consider which suggests that e-commerce should be designed and built compatibly to all devices since 80% of the people are using mobile phones and not just laptops or computers.

Call to Action (CTA) is an essential feature to consider for it makes sure that the customers are guided to the specific actions the system wants them to do. For instance, in offering a discount, the CTA feature would say, "click here to avail discount." Extending further assistance creates confidence in the business for it demonstrates care to the customers.

Images and Description are essential features to consider for it substitutes the real and physical products which the customer cannot see or touch using eCommerce. It is critical to have high-resolution photographs of the products, as well as images from a variety of angles, perspectives, and even contexts; and to give a full description of the products for the potential customers to feel secure that they are knowledgeable of the products they are about to purchase and for them not to go elsewhere.

Last is the Security and Privacy. E-commerce systems should ensure the security of encrypted data through an SSL certificate. This essential feature also encourages e-commerce systems to have transparent policies on how customers' privacy can always be protected.

E-commerce systems should not only be visually appealing, but they should also provide a stress-free buying experience. Moreover, one can keep the customers and grow one's business by creating an online store that is simple to use and has a flawless check-out procedure on any device (Bright Cloud Studio, 2022).

Malhotra (2021) has also required seven (7) essential technology features in designing an eCommerce system. First, e-commerce should be ubiquitous, which means that it can be accessed from everywhere and at any time as long as there is Internet connectivity. Second, an e-commerce

system should have global reach, which means that it should have an international presence considering that its potential market is the global population.

Third, since the system has a global reach, it should also have universal technical standards. This means that regardless of which technology platform any of them uses the eCommerce system should allow any computer to communicate with any other computer in other countries. Fourth, eCommerce should have rich advertising and branding by delivering video, audio, animation, billboards, signs, etc. Fifth, an eCommerce system should be designed in such a way that two-way communication between the merchant and the consumer is allowed.

Sixth, the use of e-commerce technologies minimizes the amount of data cost of gathering, storage, communication, and processing of information. Likewise, it has improved the quality of information, making it more accurate information that is more important and useful than ever before. Lastly, e-commerce should be personalized and customized on the basis of name, interests, and past purchase behavior products (Malhotra, 2021).

Alraja and Aref (2015) examined the customer acceptance of e-commerce in the Sultanate of Oman using the perceived danger, perceived usability, and perceived ease of use are examples of the Technology Acceptance Model. Factors that influence perceived risk, such as risks associated with information misuse, failure to reap the benefits of a product, and ineffective functionality, were also investigated. The use of multiple linear regression analysis was used to analyze the data. It was found that customer acceptability of e-commerce is significantly influenced by the Information Misuse Risk (IMR), Failure to Gain Product Benefits Risk, Functionality Inefficiency Risk, and Perceived Ease of Use. This empirical study strengthens the conduct of this research as it becomes a basis for the Technology Acceptance Model that can be used to determine the acceptability of eCommerce.

Bashir (2013) studied customer behavior when purchasing electronics online, particularly in Pakistan. Two of the country's largest cities' questionnaire surveys and emails from personal connections were used to gather primary data. Pakistan, price, time-saving, and convenience were identified as important factors that lead to certain buying behavior in online shopping. Price, time savings, and convenience were found to be significant influences on specific purchasing decisions made while online shopping. This empirical study proves that the perception of the consumers toward e-commerce could be done by using a survey questionnaire.

Tallud (2014) investigated consumer behavior among Small and Medium-Sized Entrepreneurs (SMEs) who were purchasing online. The owners and managers of SMEs engaged in trading and service-related industries made up the study's respondents. It was found out that SMEs thought that online shopping would save their money, effort, and time as a result reducing their outlay for purchases. They viewed the return policy, product details, and transaction security as crucial components of online shopping since they will make them feel secure. They were also a little worried about the availability and selection of goods offered for sale online. It was also found that SMEs were having trouble staying competitive in their business strategies and it was recommended that SMEs should continue to use Internet shopping as a tool for their businesses to open various prospects to improve, eventually boost their sales and profits using their products.

Whether there is a significant correlation between consumer perception and purchase behavior in online shopping among students at Mindanao University of Science and Technology was examined by Tubio et al. (2016). Two hundred respondents were chosen through a random sampling technique in the four colleges in the university. A survey questionnaire was the tool to gauge three elements of perceptions and behavior. Both the respondents' attitudes and their

purchasing behavior about Internet shopping were found to be very positive. At 0.05 level of significance, the correlational analysis revealed a highly significant correlation between their beliefs and conduct. It was recommended that web designers provide features for convenience, security, advantages, and relaxation on their websites to sustain consumers' high perception of online shopping. Students spend more time online than any other demographic, and this fact should be considered by online marketers, business owners, and entrepreneurs since it is likely to lead to an increase in online buying among students.

Ratilla (2016) studied the consumer behavior of Czechs, Slovaks, and Filipinos. Specifically, he determined the rate of adoption of online commerce, identified significant factors and obstacles influencing the adoption and rejection of online purchasing, and explained the effects of a country's culture. It was discovered that compared to Filipinos, Czechs, and Slovaks used the Internet to purchase more frequently. The three nationalities all agreed that the safe payment method had a significant impact on how much they engaged in online buying. The way people shop online is also influenced by culture. Filipinos, in contrast to Czechs and Slovaks, exhibit a high reliance on the influence of interpersonal contact or the opinions of friends and relatives, including superiors' thoughts and opinions, as well as making purchases based on immediate necessities. It was also discovered that Czech and Slovaks place less emphasis on risk and take less initiative to reduce it by paying attention to reliable product names and avoiding new items and innovation. It was recommended that e-retailers devise strategies to create a more positive online shopping experience for a wide range of customers, which include accurate descriptions of products, on-time delivery, various payment options, and an effective dispute resolution facility.

The reviewed empirical studies are all attempts to understand the consumer behavior and perceived acceptability of electronic retailing to help entrepreneurs and or marketers to keep their businesses on track and aligned to the changing needs of the time.

3. Methodology

This research study utilized quantitative research using applied design with the use of a descriptive method to determine how web-based applications can be developed for promoting a product. At the same time, this study employed survey questionnaires that were patterned after the System Usability Scale (SUS) adapted from Brooke (1995) as a primary tool in gathering data to generally assess the expert's and consumer perception of the system quality and system acceptability towards the developed technology of Cebu Technological University - Tuburan Campus Food Innovation Center.

To provide the data needed by the researcher, there were two groups of respondents who were purposively chosen. The first group comprised experts who are knowledgeable and have experience in designing and developing web applications. These experts worked and/or resided in locations A, B, and C, Province of Cebu. The second group comprised the customers, comprising the regular buyers using online shopping as their platform of choice. To ensure that the respondents would provide a fair and objective assessment of the system quality dimensions and system acceptability, the researcher selected the respondents from those who have been regular customers of online shopping for at least two years and have sustained their patronage until the time of the study. Among the respondents, the experts who are knowledgeable and have experience in designing and developing web applications comprised 28 percent of the respondents, while the regular customers of online shopping comprised 72 percent.

The information gleaned from the survey questionnaires was handled statistically with different statistical tools. The weighted mean was employed to establish the perceptions of

consumer and professional opinions on the system quality and acceptability toward the developed web-based application of FIC electronic retailing.

4. Result and discussion

4.1. Prior arts for electronic retailing

Modern markets are prevalent in the Philippines nowadays. Lazada and Shopee are the two of the most common e-retailing system that is widely used by most Filipinos. The systems used in these online platforms happen to be the prior arts of the proposed FIC's Wb-based Retailing System.

Like the existing online market platforms, the proposed web-based system applies the basics of eCommerce. First, it has easier, more convenient, and wider access to the service of FIC since the transaction can be done online. Second, consumers will simply look for the website's uniform source locator to register and log in before accessing the products, services, and everything about the FIC which includes its vision and mission. Third, the system also utilizes high technical standards for the users using different types of computers to access the website. Moreover, high-quality graphics and images are used to entice the attention of the consumer and enrich its branding and advertising using video, audio, animation, billboards, signs, etc. Fourth, this proposed system is created with the intention that in such a way that two-way communication between the merchant and the consumer is allowed. Fifth, this proposed system minimizes the amount of data cost of gathering, storage, communication, and processing of information. Lastly, this proposed system is designed to be personalized and customized.

4.2. Aspects of developed fic web-based electronic retailing

Below are the aspects of the FIC's Web-Based E-Retailing based on the prior and existing systems available in the market nowadays.

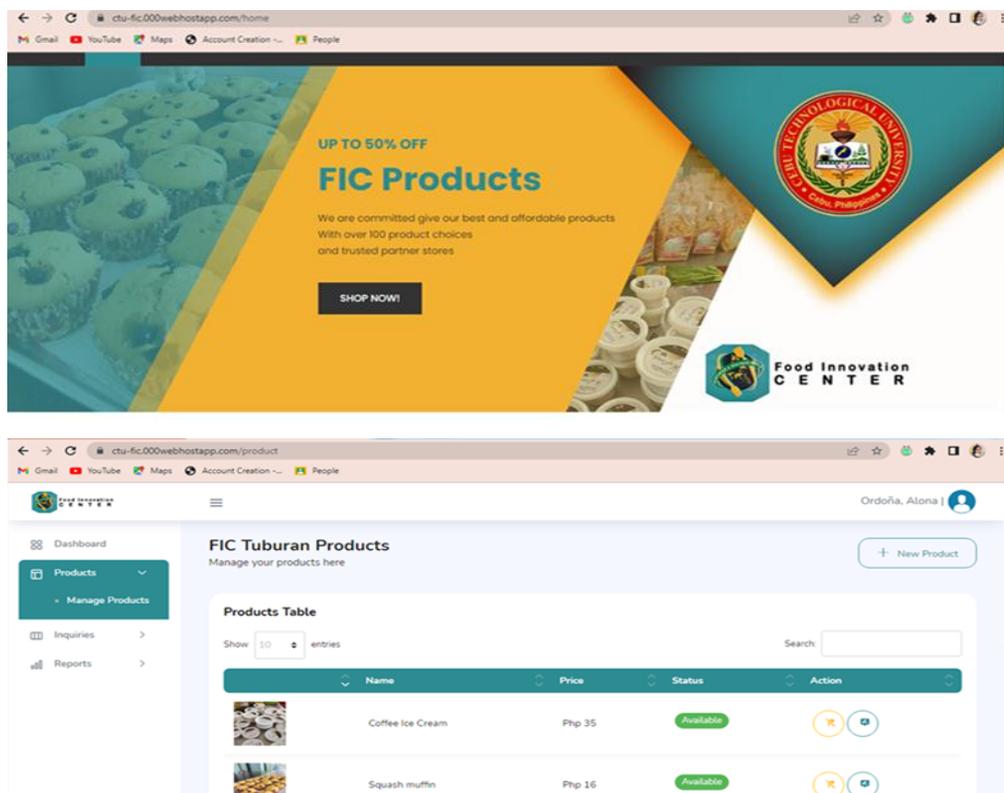


Figure 1. Homepage

The design of the web-based application shows the look and functions of the online retail store. It shows how the lines and colors are arranged to give a pleasant look to the web-based application. It consists of a method for constructing a website dedicated to aesthetics considerations, including layout, user interface, and other aesthetic elements to improve the website's usability and visual attractiveness. To achieve the desired style, web designers use a variety of software packages and tools, including Dreamweaver, Photoshop, and many others. In addition, web designers consider the target audience, the website's goal, and the design's visual appeal to produce a successful layout.

Features

The web-based application has an accessible search box for product search. As far as usage is concerned, it has a user-friendly interface, and a product management tool is also available. Also, it has a user management tool, a visual product inquiry management tool, and a system access control.

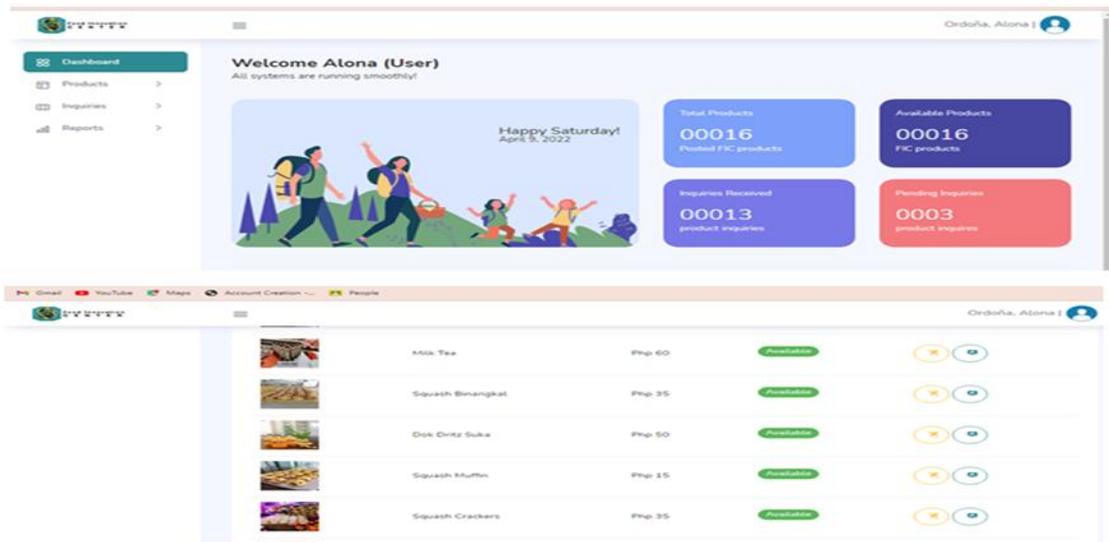


Figure 2. Features

Functions

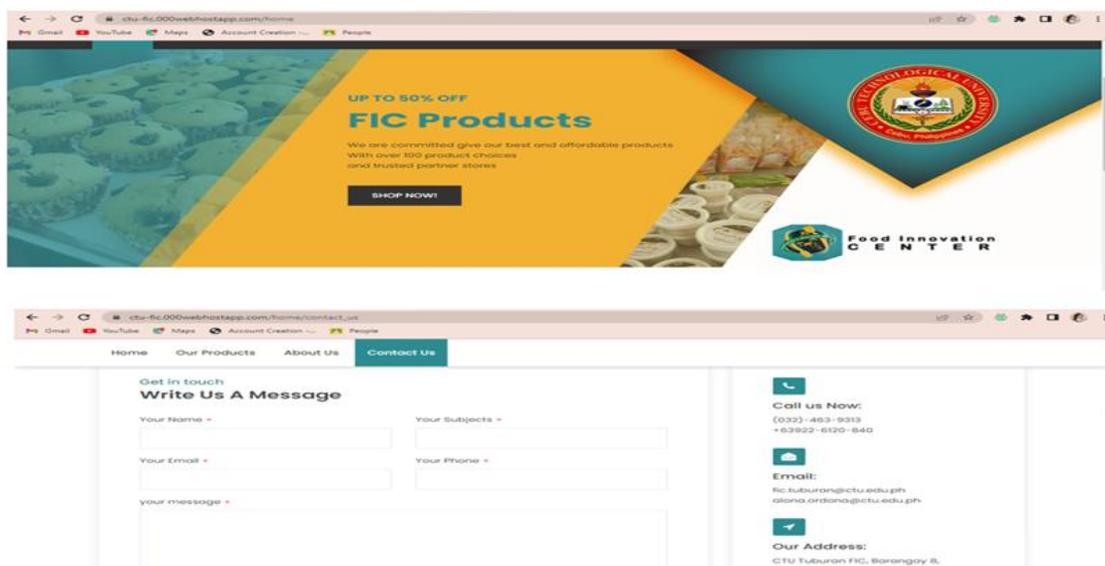


Figure 3. Functions

The web-based application is customer-friendly; it has an easy search engine for the availability of products that consumers can easily browse in the online retail store. It has a send product inquiry for customers who want to avail of the products posted on the e-retailing store. Online buyers can easily browse the available products. On the other hand, the web-based application has an administration in which they can change or reset the password. In addition, the web-based application has a user log-in and log-out functionality. The application's administration can view and manage product inquiries, upload new products, and change the product's description and prices. The application's administration must register first to the web-based application e-retailing store before they can manipulate it.

Aesthetics

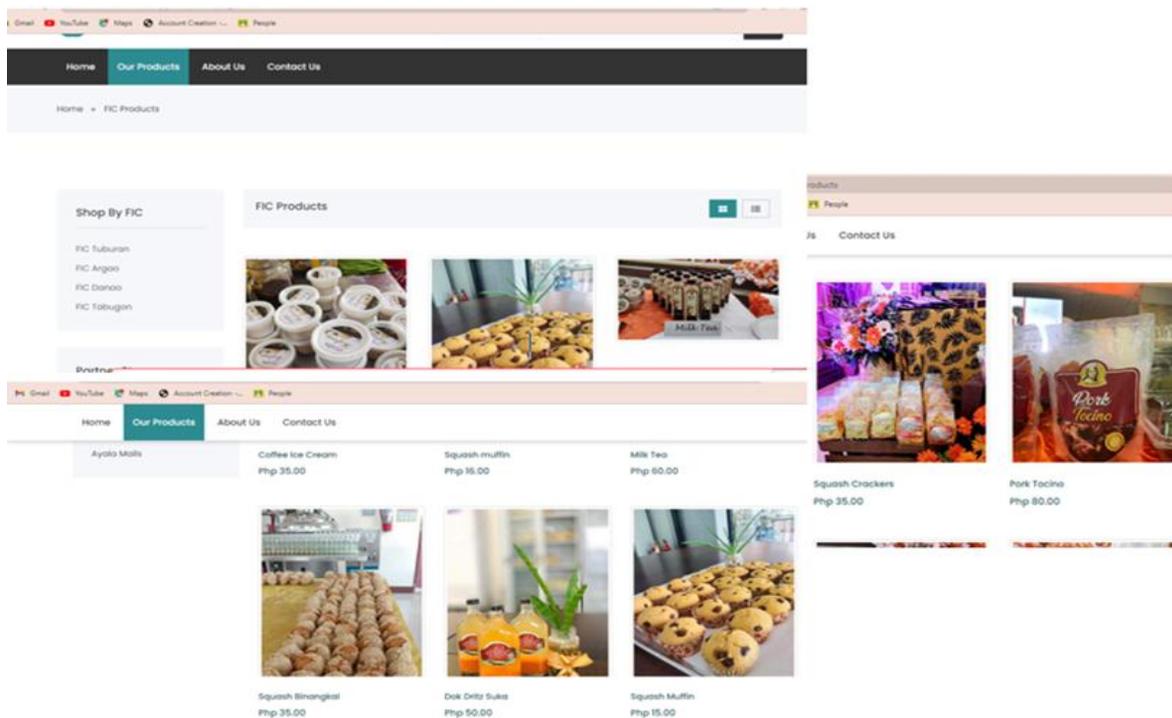


Figure 4. Aesthetics

Overall, the system is aesthetically appealing. The interface of the system is mobile-friendly. The system also follows an enticing color scheme that is cool and relaxing to the eyes. Pictures and graphics are appealing and relevant. System navigation generally matches the customers' expectations and delivers a consistent and continuous message to the browsers.

Safety

With regards to safety, all sites and resources except those specifically meant to be public require authentication. All authentication controls are enforced on the server side. Untrusted parties cannot access administrative interfaces. After the session ends, authorized data is removed from client storage such as the browser's DOM and all input data is verified.

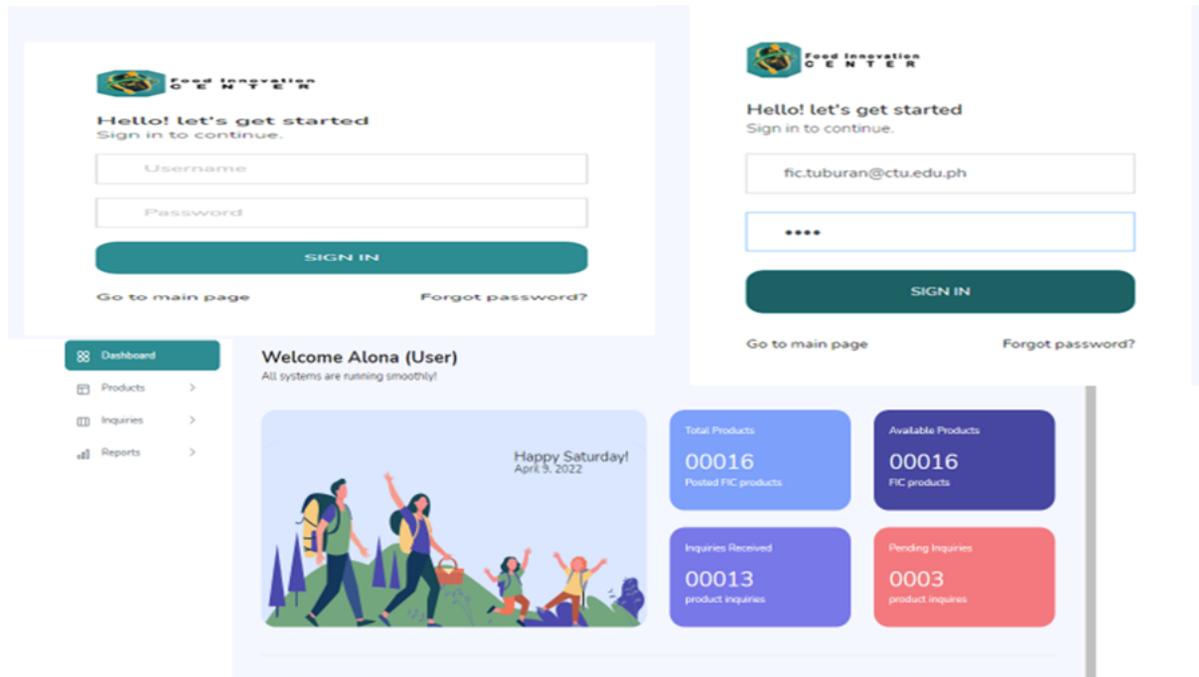


Figure 5. Safety

Overall, the proposed system has been compliant to the basics of ecommerce as its features provide a pleasant look to the web-based application, an accessible search box for product search, customer-friendly experience, an aesthetics appeal and safety based on the Design Features for E-Commerce proposed by Malhotra (2021).

4.3. Satisfaction of experts toward the developed web-based application electronic retailing

Table 1

Perception of experts toward FIC’s web-based retailing as to design

ASPECT	Weighted Mean	Verbal Description
1. The system is functioning smoothly and is well-integrated	3.80	SA
2. The system is user-friendly	3.80	SA
3. The system navigation is simple and easy to use	3.75	SA
4. The system has all the functions and capabilities I expect it to have	3.25	SA
5. The system design is simple and easy to use	3.82	SA
Average Weighted Mean	3.68	Very satisfied

Legend: 4.00-3.26 (Strongly Agree); 3.25-2.51 (Agree); 2.50-1.76 (Disagree); and 1.75-1.00 (Strongly Disagree)
 Source: Research findings

It is indicated on the table that four (4) items out of five (5) were rated with a weighted mean of 3.80, 3.80, 3.75, 3.25, and 3.82 with verbal descriptions of Strongly Agree. The average weighted mean was 3.68 which is verbally described as Strongly Agree. Moreover, it is indicated that the fifth item of design obtained the highest rating from the respondents with a weighted mean of 3.82, while item four (4) was rated the lowest with a weighted mean of 3.25.

The above data imply that the system, in terms of design, was able to get the attention and interest of the respondents which further implies that the respondents were very satisfied with the appearance, graphics, pictures, and illustrations of the system's design. Malhotra (2021) said that the web portal's design should be given enough value. It is critical to have high-resolution photographs of the products as well as images from a variety of angles, perspectives, and even contexts; and to give a full description of the products for the potential customers to feel secure that they are knowledgeable of the products they are about to purchase and for them not to go elsewhere (Bright Cloud Studio, 2022). Hence, FIC's Web-Based Retailing design was given enough value by providing high standard resolution of pictures for it overwhelmingly catches the respondents' attention as revealed by the data.

Table 2

Perception of experts toward FIC's web-based retailing as to features

ASPECT	Weighted Mean	Verbal Description
1. The system provides an accessible search box for product searching	3.83	SA
2. The system is a user-friendly interface	3.80	SA
3. The system contains a product management tool and product inquiry	3.76	SA
4. The system provides a user management tool	3.71	SA
5. The system contains system access control	3.76	SA
Average Weighted Mean	3.77	Very satisfied

Legend: 4.00-3.26 (Strongly Agree); 3.25-2.51(Agree); 2.50-1.76 (Disagree); and 1.75-1.00 (Strongly Disagree)

Source: Research findings

It is indicated on the table that all items on the system's features obtained weighted means of 3.83, 3.80, 3.76, 3.71, and 3.76 which were verbally described as Strongly Agree. In fact, the lowest item has a weighted mean of 3.71 which is a bit higher than the starting point of the largest scale. Moreover, the first item obtained the highest weighted mean of 3.83 and the system's feature obtained an overall weighted mean of 3.77.

These data imply that the FIC's Web-Based Retailing System's features were able to lead the respondents to the products they wanted to know through a very accessible and user-friendly search engine. The product inquiry and management tool were able to bring the respondents to the specifics or details of the products and services offered in FIC. Hence, this feature of the proposed system was satisfactorily observed. Bright Cloud Studio (2022) suggests that a homepage should be enticing to visitors to click and instructions should be self-explanatory. Likewise, it suggests having a search bar that easily and quickly finds the list of all applicable products.

Table 3

Perception of experts toward FIC's web-based retailing as to functions

ASPECT	Weighted Mean	Verbal Description
1. The system provides an easy search for available product customer	3.77	SA
2. The system sends product inquiries to the customer	3.71	SA
3. The system provides a browse of available products to customer	3.71	SA
4. The system provides a select and view product information to the customer	3.75	SA
5. The system can change passwords and reset password	3.80	SA
Average Weighted Mean	3.75	Very satisfied

Legend: 4.00-3.26 (Strongly Agree); 3.25-2.51(Agree); 2.50-1.76 (Disagree); and 1.75-1.00 (Strongly Disagree)

Source: Research findings

It is shown in the table above that all items in the aspect of functionality weighted means of 3.77, 3.71, 3.71, 3.75 and 3.80 which were all verbally described as strongly agree. Likewise, it can be observed that the lowest item obtained a weighted mean of 3.71, which is an immense difference from the starting point of the scale. Altogether, functionality obtained an average weighted mean of 3.75.

These data imply that the functionality of FIC's Web-based Retailing system was able to load and display the necessary features the consumer wanted to see. Moreover, search engines were able to find things in a matter of seconds and display the necessary graphics or images for the specific command without wasting much time. Thus, the system provides a quick and accurate response every time commands were given which was very evident in the result provided in the table. Barnard (2022) emphasized that functionality is a great measure of seeing how effective the company is at communicating its ideas to its clients or customers in face-to-face situations.

With the way respondents rated the functionality of the system, it can be held that this proposed system was able to effectively transmit its quick and fast way of service to the respondents.

Table 4

Perception of experts toward FIC's web-based retailing as to aesthetics

ASPECT	Weighted Mean	Verbal Description
1. The interface of the mobile system is friendly	3.70	SA
2. The system follows an enticing color scheme	3.66	SA
3. The pictures and graphics of the system are appealing and relevant	3.10	SA
4. The system navigation matches my expectations and delivers a consistent and continuous message	3.74	SA
5. Overall, the system is aesthetically appealing	3.69	SA
Average Weighted Mean	3.58	Very Satisfied

Legend: 4.00-3.26 (Strongly Agree); 3.25-2.51(Agree); 2.50-1.76 (Disagree); and 1.75-1.00 (Strongly Disagree)

Source: Research findings

The s indicates that four (4) out of five (5) items obtained weighted means of 3.70, 3.66, 3.74, and 3.69, which was verbally described as Strongly Agree while only one (1) was rated 3.10, which was verbally described as Agree. Aesthetics, as one of the aspects of developing the system, obtained an average weighted mean of 3.58 or Strongly Agree.

These data suggest that the respondents were very satisfied and enticed with how the system uses images, graphics, color schemes, etc. Likewise, these imply that the system was able to satisfactorily represent the content or the products that the customer cannot physically touch or see. Bright Cloud Studio (2022) suggested that images and descriptions of the products and services are essential in eCommerce for it substitutes the real products which are displayed virtually. Katrina (2019) added that aesthetics is critical in eCommerce, particularly in the Internet world for the first impression is not only to increase profit but is also something that will never change in the jungle of online shopping. The further implication is that the proposed FIC Web-based Retailing system was able to create the necessary impression on its users.

Table 5

Perception of experts toward FIC's web-based retailing as to safety

ASPECT	Weighted Mean	Verbal Description
1. The system secures all sites and resources except those specifically meant to be public and require authentication	3.368	SA
2. The system is secure on the server side; all authentication restrictions are put into effect	3.72	SA
3. The system's secure administration untrusted parties cannot access interfaces	3.69	SA
4. The system secures all input data to be validated	3.10	SA
5. The system is secure after the session ends, authorized data is removed from client storage, such as the browser's DOM	3.63	SA
Average Weighted Mean	3.56	Very satisfied

Legend: 4.00-3.26 (Strongly Agree); 3.25-2.51(Agree); 2.50-1.76 (Disagree); and 1.75-1.00 (Strongly Disagree)

Source: Research findings

As indicated in the table, five (5) items obtained weighted means of 3.36, 3.72, 3.69, and 3.63, which were verbally described as Strongly Agree, and one (1) item obtained 3.10, which was verbally described as Agree. Together, the aspect of security obtained an average weighted mean of 3.56 which was described as Strongly Agree.

These data imply that the FIC Web-based system was able to satisfy the respondent's shopping experience in terms of security and privacy upon using the system. Likewise, these also mean that the system provides the necessary security measures for the users to keep confidentiality during online shopping. Chin (2023) stated that cyber security is one of the most important features of e-commerce to avoid putting the owner and the shopper at risk for payment fraud. He added that e-commerce should have an SSL certificate to ensure that the information reaches only the intended person. The data imply further that safety was fully observed by the respondents as the system values security by using an SSL certificate, ensuring that the user's privacy will be protected and avoiding fraud in every transaction to be made in the future.

Table 6

Summary of the quality dimensions of the FIC web-based electronic retailing system

Dimension	Weighted Mean	Verbal Description
Design	3.68	VS
Features	3.77	VS
Functions	3.75	VS
Aesthetics	3.58	VS
Safety	3.56	VS
Over-all Weighted Mean	3.67	VS

Legend: 4.00-3.26 (Very Satisfied); 3.25-2.51(Satisfied); 2.50-1.76 (Unsatisfied); and 1.75-1.00 (Very unsatisfied -VS)
Source: Research findings

Table six (6) shows the summary of the quality dimensions of the FIC web-based electronic retailing system. There are five dimensions of quality where features garnered the highest weighted mean of 3.77 with a verbal description of strongly agree. Safety as one of the quality dimensions got the lowest weighted mean of 3.56 with a verbal description of strongly agree. The overall weighted mean on the five quality dimensions of the FIC web-based electronic retailing system is 3.67 with a verbal description of strongly agree.

These data suggest that the respondents were very satisfied and enticed with how the system uses images, graphics, color schemes, etc. Furthermore, it implies that the propose FIC web-based electronic retailing system was able to create the necessary impression of the users.

4.4. Acceptability of fic's web-based retailing as perceived by the consumers

Table 7

Perceived utility of web-based electronic retailing system

Aspect	Weighted Mean	Verbal Description
A. Perceived Utility		
1. The system is helpful to me in promoting products	3.72	SA
2. The system is valuable to me in searching for product availability	3.66	SA
3. The system works well for me in knowing more about the products and services	3.72	SA
4. I find this system helpful in selecting and purchasing products and availing of the services	2.33	U
Average Weighted Mean	3.36	SA

Legend: 4.00-3.26 (Strongly Acceptable); 3.25-2.51(Acceptable); 2.50-1.76 (Unacceptable); and 1.75-1.00 (Strongly Unacceptable)

Source: Research findings

It can be observed that for perceived utility, there were three (3) out of four (4) items in this aspect of acceptability were rated with a weighted means of 3.72, 3.66, and 3.72 which were verbally described as strongly acceptable, while the other one (1) item was rated 2.33 which was verbally described as unacceptable. Moreover, it obtained an average weighted mean of 3.36 which was described as strongly acceptable.

The data imply that the FIC web-based retailing system was able to improve the respondent's way of accessing essential information about the products and services of the Food and Innovation Center. However, the system was not totally helpful in selecting, purchasing, and or availing products and services for the system has yet to accommodate these processes and is still undergoing system improvement.

Table 8

Perceived usability of FIC web-based electronic retailing system

Aspect	Weighted Mean	Verbal Description
B. Perceived Usability		
5. I believe the interface is clear and user-friendly	3.70	SA
6. The system appears to be operating efficiently and has good integration	3.76	SA
7. I find the system would be fun for its own sake	3.23	A
8. I need technical support to use this system	3.68	SA
Average Weighted Mean	3.59	Strongly Acceptable

Legend: 4.00-3.26 (Strongly Acceptable); 3.25-2.51(Acceptable); 2.50-1.76 (Unacceptable); and 1.75-1.00 (Strongly Unacceptable)

Source: Research findings

It can be observed that three (3) out of four (4) items in this aspect of acceptability were rated with weighted means of 3.70, 3.76, and 3.68 which were verbally described as strongly acceptable, while the other one (1) item was rated 3.23 which was verbally described as acceptable. Moreover, it obtained an average weighted mean of 3.59 which was described as strongly acceptable.

These data imply that the proposed Web-Based Retailing System of the FIC was able to make the respondent's experience free of hassle for it functions smoothly and well. Moreover, the system was self-sufficient, for it could be operated alone with no need for much assistance from others, especially from experts. Lazar (2020) explained that e-commerce should be free of effort and easy to use since online consumers are busy people who do not have ample time to fill out a lengthy form about why a return is being made and lengthy processes before availing the products and services they want. Furthermore, the technology acceptance model posits that technology should make the user comfortable and convenient to use.

Hence, it can be implied further that the system could provide convenience and comfortable shopping and purchasing to FIC's clients in the future.

Table 9

Use with the behavioral intention of FIC web-based electronic retailing system

Aspect	Weighted Mean	Verbal Description
C. Use with Behavioral Intention		
9. I find the system more entertaining	3.71	SA
10. I think I'm comfortable using the system	3.76	SA
11. I think most people can learn this system	3.68	SA
12. I find the graphics of the system more attractive and stimulating	3.24	A
Average Weighted Mean	3.60	Strongly acceptable

Legend: 4.00-3.26 (Strongly Acceptable); 3.25-2.51(Acceptable); 2.50-1.76 (Unacceptable); and 1.75-1.00 (Strongly Unacceptable)

Source: Research findings

It can be observed that for the use with behavioral intention, the first three items were rated with weighted means of 3.71, 3.76, and 3.68, which were all described as strongly acceptable and the fourth item obtained a weighted mean of 3.24 which was described as acceptable. Together, this aspect of acceptability obtained an average weighted mean of 3.60 which was also described as strongly acceptable.

This data implies that the respondents would have a greater probability of using the web-based retailing system in availing of the products and services of the FIC. Surendran (2012) stated that users would probably use a technology after discovering that it has helped him enhance his way of doing things and is free of effort upon using it. Hence, it can be deemed that this web-based retailing system enhances the consumer's way of purchasing products and is also easy to use.

Table 10

Actual usage of FIC web-based retailing system

Aspect	Weighted Mean	Verbal Description
D. Actual Usage		
13. I will use the system to know/promote products and services of FIC	3.20	A
14. I will use the system in selecting, purchasing, and availing of the products and services of FIC	2.11	U
15. I will use the system to pay for the items I ordered	2.02	U
Average Weighted Mean	2.44	Unacceptable

Legend: 4.00-3.26 (Strongly Acceptable); 3.25-2.51(Acceptable); 2.50-1.76 (Unacceptable); and 1.75-1.00 (Strongly Unacceptable)

Source: Research findings

It is indicated in the table that for actual usage, only the first item was rated positively by the respondents, which obtained a weighted mean of 3.20, which was described as acceptable. While the other two succeeding items were rated 2.11, and 2.02 which were

described as unacceptable, which leads to an average weighted mean of 2.44, which was also described as unacceptable.

The overall weighted mean for the level of acceptability of FIC's Web-based Retailing in terms of perceived utility, perceived usability, use with behavioral intention, and actual usage was 3.24, which was described as acceptable.

These data imply that the system is already acceptable in terms of disseminating the products and services of FIC since it already has a wider coverage compared to its current system of promotion. However, the system is not yet feasible for purchasing and paying which will be proposed as one of the research study's major recommendations. Nevertheless, the system was still able to entice the respondents, for it still obtained an overall 3.24 weighted mean, described as acceptable. In other words, the responses have seen a greater improvement in the delivery of the merchandise and services of the FIC to its client compared to the existing system.

Table 11

Summary of the development of a web-based electronic retailing system

Aspect	Weighted Mean	Verbal Description
Perceived Utility	3.36	Strongly Acc
Perceived Usability	3.59	Strongly Acc
Use with Behavioral Intention	3.60	Strongly Acc
Actual Usage	2.44	Unacceptable
Overall Weighted Mean	3.24	Acceptable

Legend: 4.00-3.26 (Strongly Acceptable); 3.25-2.51(Acceptable); 2.50-1.76 (Unacceptable); and 1.75-1.00 (Strongly Unacceptable)

Source: Research findings

Table 11 shows the summary on development of FIC Web-Based Electronic Retailing System as to the four aspects of acceptability. Use with behavioral intention got the highest weighted mean with a verbal description of strongly acceptable. Actual Usage got the lowest weighted mean of 2.44 with a verbal description of unacceptable. The overall weighted mean on the four aspects of the development of the FIC web-based electronic retailing system is 3.24, with a verbal description of acceptable.

The data presented above imply that the system is already acceptable in terms of disseminating the products and services of FIC since it already has wider coverage compared to its current system of promotion.

5. Conclusions and recommendations

Based on the findings, it can be concluded that the FIC Web-based Retailing system is compliant with the basics of eCommerce, which leads to positive behavior/perception and acceptance. The use of this proposed retailing system in daily operations would increase public attention, which would lead to an increase in sales of the products and services of the FIC. With the current limitation of the system's check-out and payment options, it is recommended that the system should improve and finalize these features for a better customer experience; the system should adapt the concept of mobilization; the system should establish a stronger branding, and the system should be used in the daily operations of the Food Innovation Center.

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