

# Designing Internet Shopping Mall in the Customer Behavior Perspective

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## Abstract

*Internet shopping mall (E-mall) is a form of e-shop expansion that has a trading complexity and many product variants. E-mall is still limited in its application because its development requires relatively large capital than building an e-shop. Moreover, the development of application portfolios and architectural design that facilitates how the physical and virtual value chains are elaborated has not been carried out in many system development studies. In designing the portfolio, it is related to the consumer behaviour perspective. The direction of the study is to build an e-mall design concept that elaborates the physical and virtual value chain. The sample of this research is the target consumers who have shopped online as many as 168 respondents in Indonesia. A multivariate statistical study approach using conjoint analysis was employed to develop the E-mall design. This study produces five main dimensions that can be used as a reference for E-mall developers and further develop an application portfolio.*

*Keywords: Conjoint Analysis, E-mall, Portfolio, Value Chain*

## I. INTRODUCTION

The implementation of e-business has grown in line with the development of breakthrough applied technologies that innovatively drive virtual value chains in entrepreneurial businesses [1], [2] and encourage the growth of many digital platforms in the e-business environment such as e-marketplaces, e-shops, e-payments, e-logistics, and cryptocurrencies. In simple terms, e-marketplace is a digital market, a meeting place for sellers (merchants) and buyers (buyers) in a digital portal [3]. The e-marketplace generation has reached the third generation, where the portal manager acts as a third party that facilitates the presence of trust through the joint account mechanism [4]. In an e-marketplace, there will be many stalls (e-shops). E-shop is a digital store

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that sells products and services. In its context, an e-shop can be in the form of a digital stall that is part of an e-marketplace, or a shop developed through self-service domain hosting. In the marketplace platform, the entrepreneur or shop seller as an element will be bound by the rules that apply to the system, such as logistics rules, campaigns, and bidding for promotions. E-marketplaces grow in line with the increasing literacy rate in Indonesia, reaching 73.7% of the population [5], which indicates potential users and the readiness of entrepreneurs to enter digital businesses. E-marketplaces grow in their evolution to encourage various conveniences of service and create convenience for entrepreneurs to open online stores without having to have domain hosting first. E-shop as part of the online market element (e-marketplace) can be built by integrating the back line of logistics, product management, production, finance, and the front line by displaying products through storefronts that are related to consumers. At the beginning of the internet development, entrepreneurs in building e-shops used a visually designed web page display to attract potential and actual consumers. In the early era of e-shops, it was more dominantly used as a medium to support promotions other than manual promotions such as brochures. In the next phase of e-shop development, many are being abandoned with many inaccessible business domains [6]. It relates to the need for domain hosting maintenance related to costs and skills. This high cost encourages e-shops to be transformed into part of the e-marketplace system. By being part of an e-marketplace, domain hosting costs can be reduced, and entrepreneurs do not need special skills to modify their e-shops.

Support for the development of e-marketplace unicorns, Facebook, and Instagram encourage digital business entrepreneurship to grow and develop. So it is not surprising that there have been issues such as the collapse of malls with large spaces and significant capital that cannot compete with digital micro-businesses carried out from small space and resources, even in the pandemic era [7], [8]. The pandemic creates challenges for business turbulence. Regulatory spaces encourage the birth of medical safety policies versus economic interests. The policy applied is social restrictions for a certain period. It often decreases the number of potential customer visits and even encourages closure. So far, malls have only relied on physical chains [9], so this turbulence has made mall entrepreneurs not agile. The problem of collapsing malls like this should be prevented by developing a virtual chain that reaches consumers through a logistics platform [10], so that when social restrictions or access closures occur, malls can still serve consumers. Various online business platforms are currently encouraging entrepreneurship to be more agile. This platform is different from the Internet mall (e-Mall) concept [11]. E-Malls, such as Matahari mall, Bhinneka mall, and Jakarta Notebook, are transformations of e-shops by strengthening storefront capabilities. Storefronts are products displayed in a virtual catalog. In e-Mall, the number of catalogs displayed is >3000 products, just like a super mall but in a virtual context. It emphasizes product differentiation where the products sold in e-Mall are more diverse, not monotonous, or specialized in only one product type. In developing an e-Mall, an important

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issue that must be considered is the physical and virtual value chain. Especially in the challenges of business turbulence, e-Mall needs to think about synergizing physical [9], [12], and virtual [13]–[15] value chains.

The current problem is related to products online and offline that are not updated, the trustworthiness of the product they want to buy, so consumers need to see the physical product directly [16]. Synergizing physical and virtual value chains, in this study, it is recommended, first, to build virtual services through e-commerce that displays products in malls [17]. Second, build a physical distribution mechanism by direct selling. Physical distribution will reduce the scope of potential consumers but create service value that creates more trustworthiness, wherein the transaction will be possible between consumers and producers to have a cross-check agreement on products to be purchased before making payment at the cashier or can be executed by building a drive-thru service. These physical and virtual value chain synergies [10] will create better response times for e-Mall services.

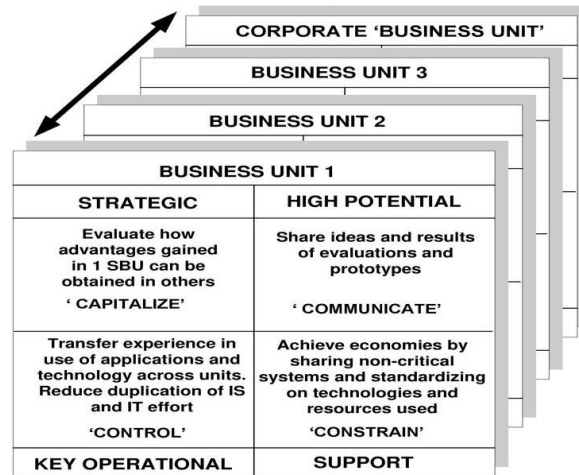
Another emphasis in E-Mall is expanding the target segment, starting from an e-shop perspective with a clear target segment from its demographics and geography. E-Mall's coverage is even broader, in multiple segments and a more comprehensive geographic range. In many perspectives, studies on E-Mall have relevance to brand perceived [18], build loyalty [19], create a broad market through machine learning [20]. However, studies on application portfolios, including strategic and key operational applications, have not been widely developed. In previous research, web development through the perspective of potential users was mapped using the Kano Model [21], [22]. This study looks at from another perspective using conjoint analysis to obtain attribute level rankings and utility values, thus providing a more comprehensive explanation. The direction of this study is to build an application portfolio on the E-Mall design through a conjoint analysis approach. The novelty of this study is to build an E-Mall design that synergizes the virtual value chain and physical value chain that emphasizes drive-thru services as a social distancing solution. Besides, the E-mall design built based on consumer perceptions using a multivariate analysis approach is a novelty in portfolio development. The developed portfolio becomes a recommendation for web developers to develop E-Mall.

## II. LITERATURE REVIEW

### 1. Application Portfolio

Application portfolio management is a categorization in terms of levels and functionality in a systematic and structured that brings together both organization lines (business and technical), considering various actions aimed at optimizing and implementing appropriate actions to identify issues and meet the main goals of the organization [23]. Application portfolio management minimizing the complexity of the application landscape by taking a holistic approach from a business and technical perspective (including other dimensions such as cost, technical

soundness, and business lifecycle). When strategies related to information systems in each business unit are translated into application portfolios, it will be easier for organizations to identify possible mutual relationships between organizations with the emergence of innovations in meeting similar needs more economically. Figure 5 shows the impact of a cross-organizational approach with minimal benefits to the organization compared to cross-business units [23].



**Figure 1. Application Portfolio: Strategic, High potential, Key operational [24]**

The application portfolio consists of, (a) *Strategic* is an application that has a critical influence on the company's future business success. Strategic applications are applications that support the company by providing a competitive advantage. The technology used does not determine whether an application is strategic or not. It is the impact on the company's business that determines. (b) *Key-operational* is an application that supports the company's business continuity. If it stops, the company cannot operate normally, resulting in a decrease in the company's advantage. (c) *Support* is an application that supports companies in improving business efficiency and management effectiveness but does not provide a competitive advantage. (d) *High potential* is an application that may create opportunities for excellence for the company in the future but is still not proven.

## 2. Internet Shopping Mall

Internet shopping malls combine two business processes, namely virtual website-based and traditional shopping malls that provide a wide variety of products for consumers. Internet shopping malls have become part of the e-commerce activity that allows purchasing, inventory, and delivery systems to be integrated with virtual value chains. The emergence of strategic Internet shopping malls platforms has become interesting to study, and the terms have evolved with the same meaning, including cyber-malls, internet malls, electronic shopping malls or electronic malls (E-malls) [25]. Since Internet shopping centres deal with IS and marketing activities, the literature from both areas is appropriate for study. Based on the synthesis of this

work, the quality factors of Internet shopping malls are classified into two categories related to online and offline features. Online features mean the quality of Web systems that adopt IS/Web quality measures such as system quality, information, and temporary services. Online features measure the quality of a Web system or service provided by a Web system. As the Internet shopping mall provides its primary services by the Web environment, the IS-oriented appearance of the Internet shopping mall shows that the driver of consumer acceptance is based on system features such as design, functionality, security, and information quality, and service features, supported by Web systems, such as reliability, responsiveness, and empathy. This study refers to the quality attributes of internet shopping malls based on [26], [27], as follows: (a) Communication quality refers to the two-way interaction between the consumer and the website. (b) Brand Recognition, the brand provides a positive induction on consumers regarding the perception of the product to be received. (c) Marketing Activities, Marketing activities encourage low price-oriented transactions, fast delivery and allow for exchanges and refunds. (d) Interface Quality refers to the ease of use, structured, informative flow of use, creating a pleasant surfing experience. (e) System Quality, referring to E-mail, has good consumer data protection, and the stability of this system will affect consumer retention of a product or organization. (f) Information Quality, information related to data calculation calculations in order invoice clearly, has regular updates for prices and attributes on products to have good information accuracy.

### **3. Perception Approach in System Development**

At present, quantitative studies are not only used for social research such as market design but have been developed in e-commerce development studies that study the interface and build user-friendliness based on the respondents' perceptions. Statistical instruments such as Kano models [28], factor analysis [29], as well as conjoint analysis [30] were used to build a recommendation formulation of essential and strategic elements in a product design, which includes e-commerce design. In this study, the development of perceptions in building a portfolio considers the recommended studies through conjoint analysis. Conjoint analysis is part of multivariate statistics, which aims to determine the respondent's perception of an object formed from several parts, layers, and attributes attached to the object [31]. The output of the conjoint analysis is a form of design recommendation for both products and services whose formulation is desired by most of the respondents. In many applications, conjoint analysis is used as well as in marketing to find out how consumers prefer a product design [32].

## **III. RESEARCH METHODS**

This study uses a quantitative approach to the sample which is the target consumer with the data collection method, namely purposive random sampling. The sample selection is respondents who have shopped online at least five times in the past year, so that a total of 168

samples are obtained. Table 1 shows that most of the respondents are women. The study perspective becomes relevant to household needs, cosmetics, children's school supplies, which become the point of view in answering the questionnaire. Characteristics of respondents in this study are as follows:

Table 1. Respondents Characteristic

	Amount	Percentage
Gender		
Male	31	18.455
Female	137	81.55%

In this study, the method developed refers to the RND Borg and Gall method [33] modified through the following seven steps (A-G):

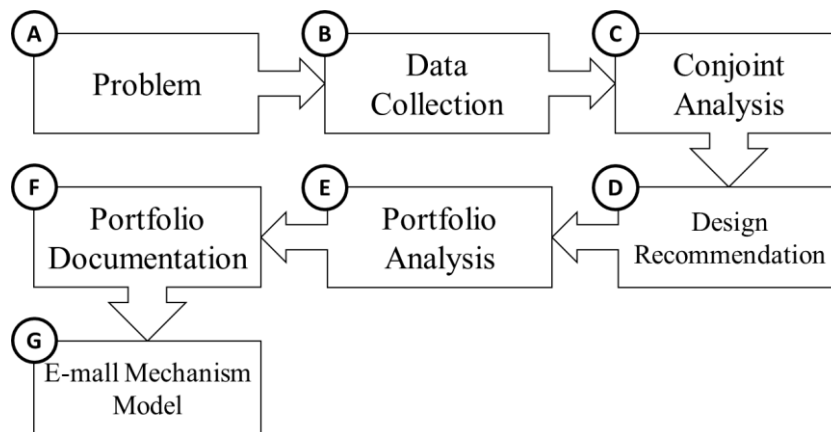


Figure 2. Modified Borg and Gall RND Method

This method was chosen because it can describe consumer perceptions well through categorization in the four quadrants documented in the portfolio. The method in portfolio development needs is described in seven stages as follows: **(a) Problem:** Currently, there are not many E-mall portfolio studies based on a quantitative perception approach from informants. **(b) Data collection** is a preliminary study stage before the perception analysis is developed. Data collection will relate to relevant respondents as potential users in the use of E-mall. This excavation is vital to prepare for the next stage in the conjoint analysis. **(c) Conjoint Analysis,** in this third stage, the application of conjoint analysis includes several steps, such as, determine factors (specific attributes), levels (parts of factors of an object), designing stimuli, combinations of factors or levels called stimuli or treatments which, if taken related examples, such as platforms, themes, are stimuli from many possible combinations, collecting respondents' opinions on any existing stimuli. If there are 15 stimuli generated from a combination of level factors, some respondents are asked to give their opinion on the 15 stimuli. Opinions can be ranked from 1-15 or given a scale of 1-5. This respondent's opinion is considered a utility expressed in numbers and became the basis for conjoint calculations, conducting a conjoint process, based on

respondents' opinions on various stimuli, is carried out to estimate (predict) the shape of the desired product, and determining which predictive accuracy of the conjoint results above will test the results with many Holdout Samples to reveal whether the predictions have revealed high accuracy. **(d) Design Recommendation**, the results of the calculations in the conjoint analysis formulation will provide a reference on the strategic elements of E-mall in the perception of respondents. These references form recommendations that are used to place features in the portfolio. **(e) Portfolio Analysis**, the fifth step, is analyzed by considering the recommendations for the perception of potential users and E-mall managers (owners) based on their importance in the form of an application portfolio referring to the concept of [23]. **(f) Portfolio Documentation**, build portfolio documentation in a 2X2 matrix. Mechanism Model builds the concept of a virtual value chain synergy mechanism with the physical value chain in the E-mall.

#### IV. DISCUSSIONS

The direction of this study is to build a portfolio study in E-mall that allows the presence of synergies in the physical chain and virtual chain. The study is based on the undeveloped portfolio study problems that explain how E-malls are correctly built. The perception approach is used to build recommendations in the conjoint analysis. In the context of its development, in this study, E-mall is built on four dimensions in the form of appearance [18], [27], product [27], [30], category [27], feature [18], [27], multi shipping, and multi-payment [18], [27], [34].

**Table 2. Attribute and Level of E-Mall**

Importance	Attribute	Level	Utility
12.808	Appearance	Simple and Easy to Use	.001
		Attractive E-mall Design	-.061
		E-mall navigation is easy to understand	.061
13.483	Product	Complete, Varied, and Quality	.064
		Suitable description and photos	.006
		Suitable with consumer needs	-.069
15.193	Product Category	New Product	-.018
		Promoted Product	.072
		Best Selling Products	-.054
22.190	Support Services	Shopping cart	.094
		Track Order	.069
		Wishlist	-.008
		Customer Service by WhatsApp	-.154
36.325	Payment and logistics features	Both	.520
		One of them	-.047
		None of them	-.473

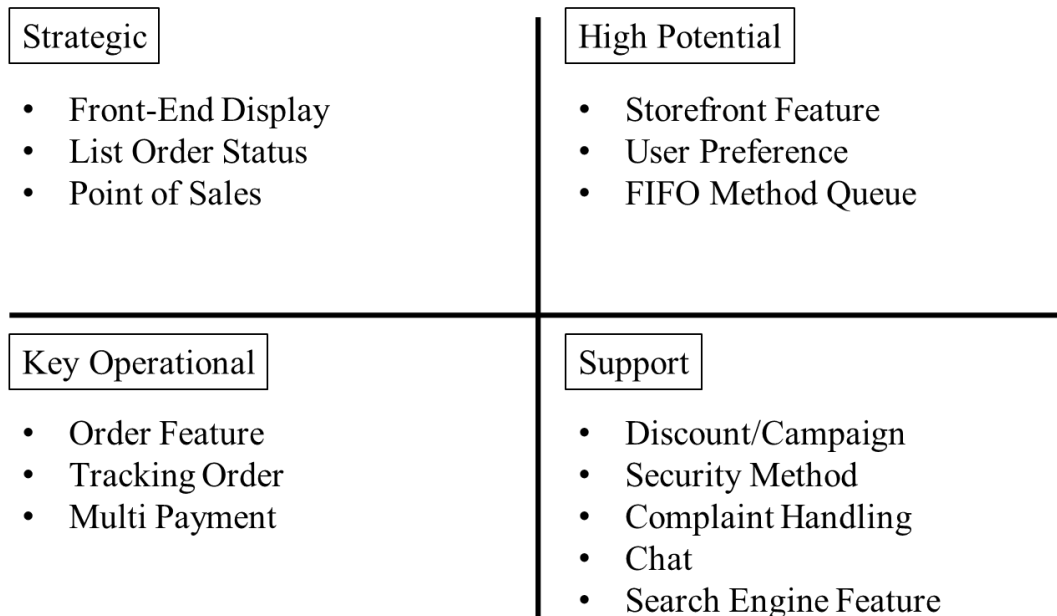
Table 2 refers to step D in the methodology in the utility values of the dimensions developed in the E-mall attribute. (1) In the display dimension, the highest utility value is 0.061.

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Respondents focused on the need for easy-to-understand E-mall navigation, in line with [27]. It is because potential visitors from the E-mall realize that entering the E-mall will find various complexities in it starting from the variety of products, supporting features, services and how to use it. Practical and easy navigation is needed by visitors and has direct implications on E-mall performance. (2) The product attribute has a utility value of 0.064. Respondents have priority on the need for complete, varied, and quality information, in line with [18], [27]. Entering an E-mall, consumers prepare for the possibility to buy many products, so it is crucial on pages that are easily accessible to consumers' visuals to place information related to superior products, product descriptions, product variants, and information related to brand and quality. The availability of complete information will encourage the emergence of impulse buying. (3) Consumers are looking for competitive prices in the product category dimension [27], which has a utility value of 0.072, like visitors to a mall. Discount programs, cashbacks, and promos that are superior for a certain period need to be displayed on pages that are often accessed by consumers, such as login pages and payment transactions. Recommenders of similar products purchased by other consumers are a superior feature to provide recommendations to potential consumers.

(4) The shopping cart level on the E-mall support service attribute [34] has a utility value of 0.094. In developing an E-mall, developers need to place a shopping cart that easily includes products purchased by consumers in the order list. Another crucial aspect is that the availability of online and real-time products in the warehouse must be congruent. The accumulated calculation of purchases per item on an aggregate basis has implemented an algorithm that has precise accuracy. (5) Payment and logistics features are the fifth dimension in E-mall attributes. Respondents placed both features in the E-mall service with a utility value of 0.520, in line with [27], [34]. E-mall must achieve ease of shopping in its innovation compared to competitors. In the context of cryptocurrencies, that further creates multi payments. In its implementation, E-mall has a tendency to serve orders in one city. However, this need can also be developed by cooperating with many logistics units in the form of multi shipping. Of the five attribute dimensions in E-mall, the dimensions of payment and logistics features have the highest index value of 36.325. This is in line with technological developments and innovative breakthroughs offered in relation to current transactions, such as OVO, DANA, Gopay, Shopeepay. Likewise, in the context of the logistics business, currently developing Grab, Go-jek, JNE, J&T, Anteraja, ID Express, where consumers like both financial and logistics platforms are very heterogeneous. The innovation for E-mall system developers, by including multi-payment and multi-shipping, will bridge the diversity of consumer preferences. Trustworthiness is an aspect that cannot be abandoned in the development of E-mall, referring to these five dimensions. Just as when consumers like a payment service using a certain bank, delivery service using a certain logistics service, this trustworthiness is in line with the existence of consumer loyalty to the third party, becoming an important point to improve the overall reputation of the E-mall. Thus, E-mall needs to implement

an alliance business strategy in developing third-party services. The development of portfolio analysis in E-mall is divided into four quadrants with a 2X2 matrix, namely strategic, high potential, key operational, and supporting.



**Figure 3. E-mall Application Portfolio**

Referring to Figure 3, each description of the E-mall application portfolio is as follows:

- High Potential*, (a) storefront features. The storefront feature is very important because it will be in direct contact between the mall seller and potential consumers. Storefront features must be designed with good navigation, easy to use and search. Storefronts are also developed with good photography-based product photos. This storefront becomes the main marketer who invites and encourages purchase intention. (b) User preference, the use of preference algorithm is used as a recommender system user preference. The use of this algorithm will create the sale of other products that are in line with consumer interests through the preferences of other consumers. The goal is to boost other products in the E-mall. (c) Queuing FIFO method, the queuing method used in E-mall is an aspect that is taken into account in the application. Completeness of the order including the time of packing and the order of incoming orders in the form of first in first out is a priority. E-mall sellers need to ensure incoming orders are processed immediately.
- Strategic*, refers to the need for features used for data management on the user side in the form of (a) Front end in E-mall developed with bootstrap which allows access to PC and mobile media using HP. This display structure is recommended to be simple and attractive, strengthening brand awareness in terms of colors, ornaments, and themes on the front end. (c) List Order Status, is a strategic application in E-mall. This feature was developed to store

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buyer order records, monitor the packing, pick-up, and record processes in financial reports. With a list order status, E-mall sellers will be able to measure the achievement of performance both financially and in terms of service by looking at the rate of product returns.

(d) Point of Sales, this application is strategically developed. However, the challenge for E-mall developers is to synchronize the data displayed in the online storefront with physical sales data in the warehouse. Data out of sync will result in unpreparedness of the product to be packaged in fulfilling orders and pose a threat to reputation on an aggregated basis.

- c. *Key operational*, (a) order feature, order feature development can be enabled with transactions with many variants or order accumulation. The calculations used in his calculations have precision. Order time is based on chronological order which provides order information for the warehouse department to check the products requested in the order. (b) Tracking orders, responding directly to email, WA, or other information lines regarding when the order can be physically picked up at the store. (c) multi payment, is a feature that provides payment support through various bank transfers, virtual accounts, third party financial services, as well as cost and delivery payments. The availability of multi-payments is a support for E-mall operations by providing convenience to consumer users.
- d. *Support*, (a) Discount/Campaign, in marketing support, it is important to play the role of pricing and product strategies through promos, campaigns, cashback, and discount prices. This information needs to be displayed on the E-mall page. (b) Security methods, security support for consumer data, transactions, as well as security support through strong authorization to ensure data does not leave the system and are used illegally, are a form of E-mall's reputation in building goodwill. (c) Complaint handling, features that support post-purchase services such as defective products, undelivered products, defective products, require special handling channels by consumer service officers in E-malls that ensure consumers do not give bad rates for the products they buy. (d) Chat, providing communication support between consumers and the E-mall related to information about products that are not contained in the description. (e) Search, is a support feature for consumers to search for products according to the specifications they want. The search feature is important because E-mall has more than 2000 products on display in the storefront.

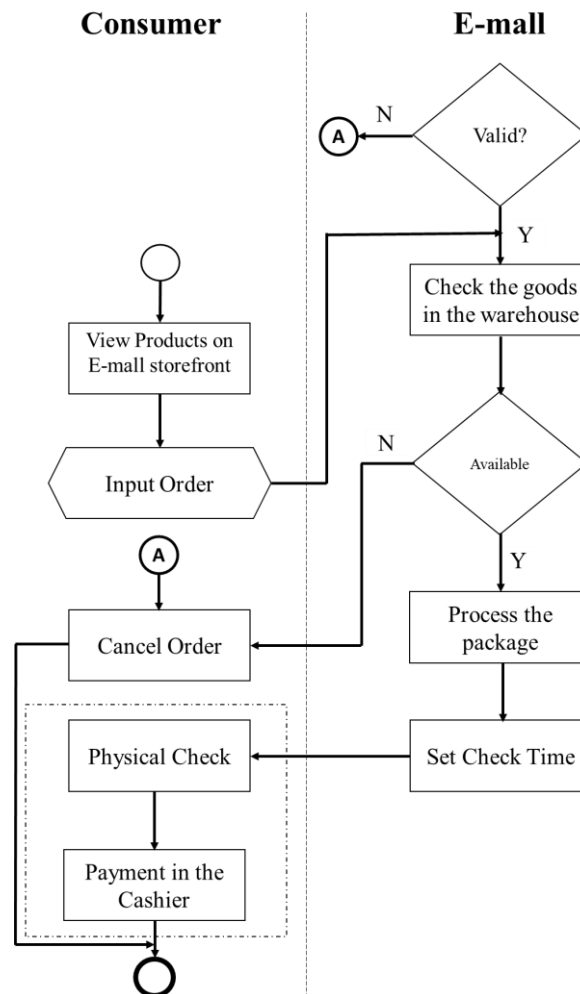


Figure 4. Synergize of Physical and Virtual Value Chain

In simple terms, the construction of an E-mall involves two main entities, namely the E-mall (owner) and the consumer (user). Referring to Figure 4, there are seven main processes in the flow. First, consumers surf the E-mall to find the desired product or respond to the display of superior products that are being discounted. At this stage, navigation plays an important role, with ease of navigation and search the existing features will create comfort in the shopping space. Similarly, the attractiveness of visual communication on the products presented, the quality of information will provide reinforcement for purchase intention. The next step, consumers can enter a shopping cart for the products they purchased by means of the consumer's identity has been registered in advance by using the login mechanism. At this stage, consumers will get billing information for the orders they bought. Payment can be made in multiple payments. The first and second steps are carried out online referring to the virtual value chain. In the third step, the e-mall seller gets an order notification, the e-Mall checks the product according to the physical order in the warehouse. The problem that often arises is that product information in online displays is often

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different from stock items, because products in malls are also purchased offline so that there is often a difference with the number of products actually owned by e-Mall. This stage is often an obstacle, if the product is not available in the warehouse, the e-Mall will immediately provide a notification of the cancellation of the order, so that data updates need to be carried out to create quality information.

The fourth stage is to process orders by E-mall. Several important points to be considered in order processing include paying attention to the FIFO mechanism, ensuring order numbers are not confused, and ensuring that packaging can secure consumer products, for example separating food products from toiletries. Processed orders have been packaged before the pick-up time, then placed in a cabinet that reflects the order order. This fourth process is a physical value chain. The fifth step is physical checking of the product. Consumers will visit the E-mall counter at the appointed time to ensure that the product purchased matches the description and can be used according to its function. In the counter model suggested in the development of E-mall is to use a drive thru model, where consumers take the products they have purchased without leaving the vehicle they are riding. Although this requires investment, the effectiveness of the queue can be arranged in an orderly manner and has a fast service response time. The sixth step is payment. Multi payment will encourage ease of payment in E-mall transactions. To encourage trustworthiness, consumers can also make payments via COD after making sure the product to be purchased really meets their expectations. In many studies, trust in e-commerce, especially in new services that do not yet have good goodwill, is crucial. Consumers' doubts about the E-mall that will be developed need to be eliminated by building customer service support from purchase to post-purchase by prioritizing trust in the built E-mall system.

## VI. CONCLUSION

There are five dimensions in the analysis, including appearance, product, category, features, multi shipping, and multi payment. In developing an E-mall, website navigation that is easily understood by consumers is the focus on display. Consumers expect the products displayed on the website are complete with many variations and quality. Category attributes in E-malls need to prioritize the product section that is being discounted or promos to be able to attract more visitors. While on feature attributes, order tracking or search features are a priority for consumers. The availability of multi-payment attributes will make it easier for consumers to make payments, so that it becomes the focus in E-malls. The application portfolio in E-mall is divided into high potential, strategic, key operational, and support applications. The features in the portfolio application are used from a software developer perspective to help ensure the establishment of IT governance in the E-mall system architecture. The built e-mall ensures that the physical and virtual value chain flows are synergized. In creating an attraction, you can provide promos or discounts on the E-mall page.

Because it combines two value chains, this service creates more customer satisfaction. Products purchased by consumers can be checked for suitability and functionality. If it doesn't go well, the product can be returned immediately and get a replacement. However, merging these two value chains has its limitations. One of them is service coverage that is only within a region or city. In line with the reputation and goodwill possessed by E-mall, it will be able to build its valuation that boosts market value, so that the limited reach of the target market is not an obstacle.

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