

Analysis and Design of E-Commerce Based Sales Information At Pt Bahtera Ekatama Sejahtera With User Centered Design Method

Samuel^{1)*}

¹⁾³⁾Universitas Buddhi Dharma

Jl. Imama Bonjol No 41-Karawaci Ilir, Tangerang, Indonesia

¹⁾samuel@gmail.com

³⁾ author2@domain.edu

Article history:

Received 16 July 2021;
Revised 3 August 2021;
Accepted 8 August 2021;
Available online 30 August 2021

Keywords: {use 4-6 keywords}

eCommerce
UCD
Sale
Information Systems

Abstract

In this increasingly difficult economic situation, there is a lot of competition in various fields of life, including competition in the business world. Many companies are competing to get a market, so this spur stores to try to keep moving forward in improving their business. In addition, with the advancement of technology, companies are required to keep up with the times so as not to be left behind by others. For the company to grow and develop properly, the company must be able to anticipate increasingly competitive economic developments by carrying out the right strategy so as not to be left out in the competition. E-Commerce is a dynamic set of technologies, applications, and business processes that connect companies, consumers, and specific communities through electronic transactions and electronic trading of goods, services, and information. Almost all agencies use the internet and have a website for the smooth running of their business. So far, the company does not have a website that can display the products sold by the store so that consumers are less familiar and product sales are less than optimal. User Centered Design (UCD) is a design philosophy that places the user at the center of the system development process. The UCD approach has been supported by various techniques, methods, tools, procedures, and processes that help design interactive systems that are more user-centric

I. INTRODUCTION

In this increasingly difficult economic situation, there is a lot of competition in various fields of life, including competition in the business world. Many companies are competing to get a market, so this spur stores to try to keep moving forward in improving their business. In addition, with the advancement of technology, companies are required to keep up with the times so as not to be left behind by others. For the company to grow and develop properly, the company must be able to anticipate increasingly competitive economic developments by carrying out the right strategy so as not to be left out in the competition. In addition, the company must also be able to anticipate future economic trends and must be able to compete with other companies engaged in the same field. This is done to maintain the survival and progress of the company. The current lifestyle has an impact on changing the pattern of the sales system from face-to-face to communication through cyberspace or known as e-commerce.

E-Commerce is a dynamic set of technologies, applications, and business processes that connect companies, consumers, and specific communities through electronic transactions and electronic trading of goods, services, and information. Almost all agencies use the internet and have a website for the smooth running of their business. So far, the company does not have a website that can display the products sold by the store so that consumers are less familiar and product sales are less than optimal. User Centered Design (UCD) is a design philosophy that places the user at the center of the system development process. The UCD approach has been supported by various techniques, methods, tools, procedures, and processes that help design interactive systems that are more user centered. UCD's goal is more than just making useful products.

UCD is a new paradigm in the development of web-based systems. User-centered design User Centered Design is a term used to describe a design philosophy. The concept of UCD is that the user is at the center of the system

* Corresponding author

development process, and the goals or properties, context and environment of the system are all based on the user experience. Therefore, an online sales system is designed with an e-commerce website with the aim of minimizing sales process time with the aim of increasing sales volume so that company income can increase, as well as making it easier to find the desired item and can provide search results quickly.

II. RELATED WORKS/LITERATURE REVIEW (OPTIONAL)

Sale

Sales is part of promotion, one part of the whole marketing system [1]. Sales promotions are programs and special offers in the short term that are designed to lure related consumers to make a quick decision to buy a product or service. This promotion often costs a lot of money, but many consider that its influence is very large on consumer decisions [2]. Sales is a system of the company's main activities to trade goods and services that the company produces. In the sales system there are two kinds, namely the cash sales system and the credit sales system [3].

E-Commerce

E-commerce is defined as the use of information and communication technology by businesspeople, individuals, or related parties to run and manage key business processes so that they can provide benefits in the form of security, flexibility, integration, optimization, efficiency, increased productivity, and profit [4]. E-commerce is the distribution of purchase, sale, marketing of goods and services through electronic systems such as the internet or television, www, or electronic data exchange networks, automated inventory management systems, and automated data collection systems [5].

According to [5] in the theory of E-Commerce, there are at least 7 (seven) types of E-Commerce, namely:

1. Business to Business (B2B) B2B is a type of trade that includes all electronic transactions of goods or services carried out between companies. Usually those who use this type are traditional producers and traders. An example of B2B E-Commerce in Indonesia is bizzy.com.
2. Business to Consumer (B2C) B2C is a type of business conducted between businesspeople and consumers as well as between companies that sell and offer their products to consumers traditionally. Producers do business by selling and marketing their products to consumers without any feedback from consumers to do business back to the producers (not subscribing). This means that the company only sells products or services and consumers only as users or buyers. This type of E-Commerce is growing very quickly because of the support for the emergence of websites and the many virtual shops and even malls on the internet that sell various community needs. Several companies in Indonesia are implementing this type of E-Commerce.
3. Customer to Customer (C2C) C2C is a type of E-Commerce which includes all electronic transactions of goods or services between consumers. Generally, these transactions are carried out through a third party that provides an online platform or what is often also known as a marketplace to carry out these transactions. Some examples of the application of C2C on websites in Indonesia are Bukalapak.com, Tokopedia and Blibli are included in this category.
4. Consumer-to-Business (C2B) C2B is a business model where individuals can offer various products/services to certain companies where the company will later buy/pay for the goods or services. This concept is the opposite of business to consumer (B2C). Platforms that generally use this type of E-Commerce are markets that sell royalty-free photos, images, media, and design elements. For example, a professional designer can offer logo or brand design services for a company. Another example is a programmer offering a website template for a particular company in need. Examples of businesses that implement C2B are istockphoto.com and priceline.com.
5. Business-to-Administration (B2A) B2A is a type of E-Commerce which includes all transactions conducted online between companies and public administration. This type of E-Commerce has increased in recent years with investments made through E-Government or government parties. Some examples of public administration websites that implement B2A are tax.go.id.
6. Consumer-to-Administration (C2A) This type of C2A includes all electronic transactions conducted between individuals and public administration. In this example of using E-Commerce, there are taxes.go.id, e-Samsat, etc. The B2A and C2A models are both related to the idea of efficiency and ease of use of services provided to the public by the government, as well as information and communication technology support.
7. Online-to-Online (O2O) O2O is a type of E-Commerce that attracts customers from online channels to physical stores. Although many traditional retail activities can be replaced by E-Commerce, there are elements in physical shopping that cannot be done digitally. The essence of the O2O process is to combine/integrate E-Commerce with physical retail shopping. For example, a buyer orders groceries online on a site owned by the

seller and then picks up the item directly at the nearest store owned by the company. The businesses that implement this type of business are transSMART (carrefour.co.id) and Mataharimall.com.

User Centered Design

User Centered Design (UCD) is a design that places the user at the center of the information system development process. The goal of UCD is more than just making useful products. UCD is a new paradigm in web system development. The concept of UCD is that the user is at the center of the system development process and the goals, context and environment of the system are all based on the user experience. UCD is an interactive process in which the design and evaluation steps are made from the beginning of the project to implementation. This UCD method is used to help design because the main aspect in UCD is user involvement in the whole process [6]. So that this method becomes a guide in creating applications that are oriented to user needs. The processes in UCD are as follows:

1. Define the context of use
At this stage, carried out together with stakeholders for the development of relevant systems and create a vision to create a system that supports the objectives of the project.
2. Define user and organizational requirements
At this stage, analysis of user needs is carried out. This analysis is carried out to help complete the design of the system to be built. At this stage, interviews and questionnaires can be used to obtain the required data related to the needs of users and organizations in developing the new system.
3. System Design
At this stage, the system is designed according to user needs which has been done in the previous stage. This design includes interface, system and database design. The design tool in this study uses the Unified Modeling Language (UML). UML is used to model the process from the analysis generated by the UCD process so that it can be seen clearly
4. Evaluation
At this stage, the system that has been designed is tested according to the needs of system users. This test can be done by testing the system and user needs by utilizing a questionnaire.

User Centered Design (UCD) is a new paradigm in the development of web-based systems. User centered design (UCD) is also often referred to as human centered design. According to ISO 13407 (1999), human centered design is an interactive systems development approach that specifically focuses on making a system useful. Another definition according to, user centered design is an interface design process (interface) that focuses on usability goals, user characteristics, environments, tasks, and workflows in its design. UCD is an iterative process, where design and evaluation are built from the initial step to continuous implementation.

Usability

Informally, usability can be interpreted as the level of ease of a product to use. Usability is defined as “the effectiveness, efficiency, and satisfaction with which specified users can achieve specified goals in particular environments”. The criteria for web usability are as follows:

1. Learnability is a criterion that measures the level of ease of a site to learn and use, especially for users who are seeing and exploring the site for the first time.
2. Efficiency is a criterion that measures the level of user performance when using the site.
3. Memorability is a qualitative criterion that can be seen through the ease with which users can use the product (site) again after not visiting the site for a while.
4. Errors are quantitative criteria on web usability, errors assess the site through the number of errors made by users when performing a given scenario task.

Satisfaction is a qualitative measurement that is felt or also shown by the user, when the system or site used is pleasant and also easy to use will provide comfort to the user or also provide a sense of satisfaction when the user can complete the given task well.

III. METHODS

User Centered Design Analysis

Basically, this stage is the stage of extracting information or data to gather needs from users, then after the information or data is collected, information is arranged from the user's needs data, then user needs are described in various forms or techniques, such as narratives, pictures, or diagrams. In this study, using a closed questionnaire with 15 sample respondents to explore the needs of users in the system.

1. Understand the user context

This stage is the basis of any UCD method, namely, to understand who the intended users of the product are and their environment of use. This includes identifying stakeholders, or anyone who is directly or indirectly involved in system or application development. At this stage, the Identify Stakeholders method is carried out, as follows:

- a. Owner of PT. Bahtera Ekatama Sejahtera as admin of the system who is a policy maker and supervisor of project work from system creation to system operation.
- b. Application Designers and Programmers as those who analyze system requirements, design systems and build systems.
- c. Application users are customers of PT. Ekatama Prosperous Ark with two types of users. As members and non-members.

2. User requirements

From several questions that have been distributed in the questionnaire, several answers were obtained from 15 respondents to get a list of conclusions about the visual design features of PT. Ekatama Prosperous Ark. The results of 15 respondents obtained from the web raosoft.inc.

- a. Provide complete product details, with real image results, also display images with different points of view.
- b. A simple homepage, by prioritizing images of products recommended by members and not full of images that are not important like other e-commerce.
- c. Display a mixed or composite navigation structure, consistent and not difficult for users

IV. RESULTS

Questionnaire Data Processing Using Usability Testing Method

The following is a usability testing conducted using the Likert scale calculation method with a total of 15 respondents:

Table 1 Maximum Value of Answers

Answer	Value	Maximum Value (Score * Number of Respondents)
Strongly agree	5	75
Just Agree	4	60
Neutral	3	45
Disagree	2	30
Do not agree	1	15

With the following value criteria:

$$\text{Interval percentage} \frac{100}{5} = 20\% \quad 5$$

Table 2 Intervals and Values

Category	Information
0%-20%	Not good
21%-40%	Not good
41%-60%	Neutral
61%-80%	Pretty good
81%-100%	Very good

Table 3 Weighted values

5	Strongly agree
4	Just Agree
3	Neutral
2	Disagree
1	Do not agree

Table 4 Weights The following is a usability testing questionnaire submitted to 15 respondents:

Table 4 Usability Testing Questionnaire

1	Learnability	1	The text used on the main page can be read
		2	The menu is complete and easy to understand and understand
		3	Visually, users can understand the use of each button provided in this commerce
		4	The system builder can provide the stages of using the system (user manual)
2	Efficiency	1	Switching from one page to another doesn't take long
		2	The system does not contain pages that the user does not need
		3	Admin confirms user needs quickly
3	Memorability	1	The e-commerce name and logo are displayed on the main page
		2	The e-commerce background color is attractive and in accordance with the user's visualization
4	Error	1	No wrong system link found or error when clicked
		2	There is a help page when purchasing a product
5	Satisfaction	1	The product you are looking for in a physical store is at PT Bahtera Ekatama
		2	Information regarding product details is presented in full
		3	The pictures of the products in e-commerce are real and genuine pictures of the physical store
		4	Want to revisit this e-commerce page

Calculation of the value on the variable Learnability

The calculation of the value on the learnability variable is as follows:

Table 5 Calculation Results of Learnability Variables Question 1

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	14	70	(74:75) X 100 = 99 %
Just Agree	4	1	4	
Neutral	3	0	0	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	74	

Table 6 Calculation Results for Learnability Variables Question 2

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	9	45	(68:75) X 100 = 91 %
Just Agree	4	5	20	
Neutral	3	1	3	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	68	

Table 7 Results of Calculation of Learnability Variables Question 3

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	10	50	(68:75) X 100 = 91 %
Just Agree	4	3	12	
Neutral	3	2	6	

Disagree	2	0	0
Do not agree	1	0	0
Amount		15	68

Table 8 Results of Calculation of Learnability Variables Question 4

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	8	40	(65:75) X 100 = 87 %
Just Agree	4	4	16	
Neutral	3	3	9	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	65	

The following is the overall calculation of the questionnaire processing from the learnability variable:

Table 9 Overall Calculation Results of Learnability Variables

No Question	Percentage Value	Information
1	99,00%	Very good
2	91,00%	Very good
3	91,00%	Very good
4	87,00%	Very good
Total Percentage	99% + 91% + 91% + 87% = 368 %	
Average	368% / 4 = 92%	Very good

Calculation of the value of the variable Efficiency

The calculation of the value of the efficiency variable is as follows:

Table 10 Calculation Results of Variable Efficiency Question 1

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	11	55	(70:75) X 100 = 93 %
Just Agree	4	3	12	
Neutral	3	1	3	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	70	

Table 11 Calculation Results of Variable Efficiency Question 2

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	2	10	(57:75) X 100 = 76 %
Just Agree	4	8	32	
Neutral	3	5	15	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	57	

Table 12 Calculation Results of Variable Efficiency Question 3

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	8	40	(66:75) X 100 = 88 %
Just Agree	4	5	20	
Neutral	3	2	6	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	66	

The following is the overall calculation of the questionnaire processing of the efficiency variable:

Table 13 Overall Calculation Results of Efficiency Variables

No Question	Percentage Value	Information
1	93,00%	Very good
2	76,00%	Pretty good
3	88,00%	Very good
Total Percentage	$93\% + 76\% + 88\% = 257\%$	
Average	$257\% / 3 = 86\%$	Very good

Calculation of the value of the Memorability variable

The calculation of the value on the memorability variable is as follows:

Table 14 Results of Calculation of Memorability Variables Question 1

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	7	35	$(66:75) \times 100 = 88\%$
Just Agree	4	7	28	
Neutral	3	1	3	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	66	

Table 15 Calculation Results of Memorability Variables Question 2

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	6	30	$(49:75) \times 100 = 65\%$
Just Agree	4	4	16	
Neutral	3	1	3	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	49	

The following is the overall calculation of the questionnaire processing from the memorability variable:

Table 16 Overall Calculation Results of Memorability Variables

No Question	Percentage Value	Information
1	88,00%	Very good
2	65,00%	Pretty good
Total Percentage	$88\% + 65\% = 153\%$	
Average	$153\% / 2 = 76\%$	Pretty good

Calculation of the value of the variable Error

The calculation of the score on the error variable is as follows:

Table 17 Calculation Results for Error Variables Question 1

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	8	40	$(66:75) \times 100 = 88\%$
Just Agree	4	5	20	
Neutral	3	2	6	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	66	

Table 18 Calculation Results for Error Variables Question 2

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	7	35	$(66:75) \times 100 = 88\%$
Just Agree	4	7	28	
Neutral	3	1	3	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	66	

Amount	15	66	
---------------	-----------	-----------	--

The following is the overall calculation of the questionnaire processing from the error variable:

Table 19 Overall Calculation Results of Error Variables

No Question	Percentage Value	Information
1	88,00%	Very good
2	88,00%	Very good
Total Percentage	88% + 88% = 176 %	
Average	176 % / 2 = 88%	Very good

Calculation of the value on the variable Satisfaction

The calculation of the value on the satisfaction variable is as follows:

Table 20 Calculation Results of the Satisfaction Variable Question 1

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	4	20	(60:75) X 100 = 80 %
Just Agree	4	7	28	
Neutral	3	4	12	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	60	

Table 21 Calculation Results of the Satisfaction Variable Question 2

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	8	40	(66:75) X 100 = 88 %
Just Agree	4	5	20	
Neutral	3	2	6	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	66	

Table 22 Calculation Results of the Satisfaction Variable Question 3

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	6	30	(66:75) X 100 = 88 %
Just Agree	4	9	36	
Neutral	3	0	0	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	66	

Table 23 Calculation Results of the Satisfaction Variable Question 4

Answer	Value	Respondent	Total Value	Percentage Value (%)
Strongly agree	5	9	45	(68:75) X 100 = 91 %
Just Agree	4	5	20	
Neutral	3	1	3	
Disagree	2	0	0	
Do not agree	1	0	0	
Amount		15	68	

The following is the overall calculation of the questionnaire processing from the satisfaction variable:

Table 24 Calculation Results of the Overall Variable Satisfaction

No Question	Percentage Value	Information
1	80,00%	Very good
2	88,00%	Very good

3	88,00%	Very good
4	91,00%	Very good
Total Percentage	80% + 88% + 88% + 91% = 347 %	
Average	347 % / 3 = 87%	Very good

Here is a graph of the results of all the average values of the variables:

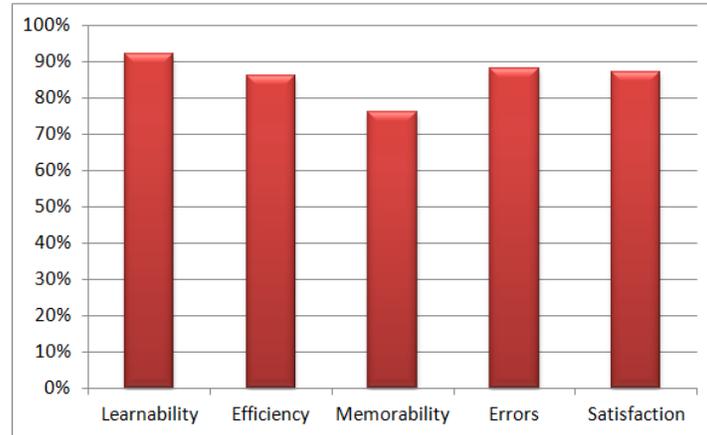


Figure 1 Graph of Results of All Average Values of Variables

The results of the interval percentage of 92% indicate that the accuracy is easy to learn (learnability), efficiency accuracy (efficiency) of 86%, accuracy of memorability of 76%, accuracy of errors (errors) of 88% and accuracy of satisfaction (satisfaction) of 87 %.

V. CONCLUSIONS

Based on the results obtained in writing this thesis, it is concluded: eCommerce can facilitate the management of product sales data computerized and stored in a database so that it is easier to print sales reports. Buyers can order products at PT Bahtera Ekatama Sejahtera online and eCommerce can expand the marketing area.

References

- [1] T. Abdullah dan F. Tantri, "Manajemen Pemasaran," *PT Raja Grafindo Persada*, 2012. .
- [2] Suparyanto dan Rosad, *Suparyanto, 2015*). Bogor: In Media, 2015.
- [3] V. W. Sujarweni, *Akuntansi Manajemen : Teori dan Aplikasi*. Yogyakarta, 2015.
- [4] I. Fahmi, *Pengantar Teori Portofolio dan Analisis Investasi*. Bandung: Alfabeta, 2015.
- [5] H. Malau, *Manajemen Pemasaran, Teori dan Aplikasi Pemasaran Era Tradisional sampei Era Modernisasi Global*. Bandung: CV Alfabeta, 2017.
- [6] I. S. Widiati, W. Hadi, dan W. Hadi, "Analisis Usability Desain Antarmuka Website E-Commerce Menggunakan Metode Evaluasi Heuristik," 2019.