## Analysis of Consumer Satisfaction Levels Based on the Type of Purchase of Goods Online and Offline

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Abstract: The rapid development of technology has made several aspects of life better. The world economy, which previously fell drastically due to the Covid-19 pandemic, has made people start looking for alternative ways, one of which is by utilizing e-commerce applications. E-commerce can be a place to fulfill human needs practically and efficiently, for example buying fashion, electronics and food goods. On the other hand, purchasing goods online can also give a negative impression to consumers compared to purchasing goods offline. Therefore, the authors want to conduct research on differences in levels of customer satisfaction based on the type of purchase of goods online and offline. Data analysis was carried out using several methods, namely validity test, reliability test, chi-square test, proportion test, and Cramer's Contingency Coefficient V test.

## Keywords— E-commerce, Customer satisfaction, Online purchases, Offline purchases

## **1. INTRODUCTION**

Currently, technological developments are growing rapidly. The internet is not only used as a communication tool, but is also used to find information, entertainment, business and other jobs. The pattern of buying and selling transactions also influences the development of internet use. transactions that were originally carried out offline are now starting to be carried out online. Buying and selling transactions carried out online is called e-commerce. The use of e-commerce can also be interpreted as a form of technology application in the face of increasingly fierce business competition. That is, selling various types of products or services in both physical and digital formats.

In gaining trust in e-commerce, there are several principles that must be met, including openness (business practice disclosure), that is, the transaction will be carried out according to what was promised. Transaction integrity (transaction integrity), namely bills that are in accordance with the transaction. And also protection of information (information protection), namely safeguarding information so that it does not fall into parties that are not related to the business (Ratnasingham in Handoko, 2001).

Despite the inherent use of e-commerce as a means of profitable transactions in this globalization and postpandemic era, several companies still use offline (direct) trade transactions by implementing manual marketing strategies or meeting directly with consumers and this is also very limited. Offline marketing is a situation when a seller offers/sells his products personally to both individual consumers and businesses (Rhonda & Abram, 2008). To attract more consumers, an offline offer can be added or enlarged. The new competition is not in what sellers offer consumers, but in what sellers include in the buying standard in terms of the advantages and disadvantages of offline selling. The first advantage of offline purchases is that all five tools can influence purchases. Second, it can trigger memories. Third, there is still a product model. Fourth, get to know new stuff. Fifth, there are no electronic limitations. Sixth, there is a social relationship due to face-to-face contact between buyers and sellers (Lalwani, 2016). Meanwhile, the shortage according to the offline purchase system. First, it requires a relatively large amount of effort compared to online companies. Second, it's a waste of time because you have to wait and queue at the time of payment and feel insecure. Third, the time available in standard working hours. The four buyers must come to the sales location to check the market (Lalwani, 2016).

Behind buying and selling transactions online are increasing and there are many enthusiasts in Indonesia, there are some customers who choose to shop offline. The reason consumers choose to shop offline is because the items to be purchased can be seen directly. The difference between online and offline purchases is found in the evaluation of each consumer's goods. In online purchases, consumers can save time without going to offline stores. however, consumers cannot see and inspect the goods directly, they can only see through the descriptions and pictures provided by the store. Whereas in offline purchases, consumers can see and inspect goods directly, but it takes more time because they have to go to the place where the goods they want to buy are sold. Prices of goods offline are also more expensive than online.

Like the purchase of fashion items, some people prefer online because of the choice of more goods and cheaper prices. Consumers can also choose goods without having to go to the place where they want to sell the goods. Some people also choose offline. Meanwhile, when buying electronic goods, most consumers prefer to buy offline because they can

check the goods directly. And also food items, some people like online purchases because it is easy not to have to leave the house. There are also those who prefer offline purchases because they are fresher. However, it is also possible that the purchase of fashion, electronic, and food goods both online and offline will get goods that do not meet consumer expectations.

Therefore, the author wants to conduct research on the difference between consumer satisfaction levels based on the type of online and offline purchases of goods in the fashion, electronics, and food categories. This research was conducted with the aim of analyzing how the difference in consumer satisfaction with purchasing goods online and offline, whether consumers are more satisfied to buy goods online or offline. In this study, what will be studied is about product suitability, efficiency of time and consumer energy, and price differences between buying goods online and offline.

## 2. Literature Review

## 2.1 E-commerce

The definition of e-commerce or Electronic Commerce is still not uniform. This is because e-commerce continues to grow rapidly which causes almost every time ecommerce experiences changes and new formations. Even so, it does not mean that e-commerce does not have meaning. Below are some definitions of e-commerce.

E-commerce in general refers to all forms of interrelated transactions with commercial activities, both individuals and organizations based on digitized transaction processes, including text, sound and images. According to Laudon (1998), e-commerce is a process of buying and selling products electronically by consumers and from company to company with computers as intermediaries for business transactions. Media that can be used in e-commerce activities is the world wide web internet.

There are many definitions of e-commerce, but when people talk about e-commerce, they usually understand it as an online business or a business related to the internet. ecommerce is also known as E-business, E-tailing (for vital sales), Riswandi (2019). It can be concluded that e-commerce is a business process that connects companies, consumers and certain communities through electronic transactions, as well as trade in goods, services or services and information that is carried out electronically.

## 2.2 Online Purchases

Indirect marketing (online) is marketing carried out by sellers through online online shops that use electronic media that can be accessed via the internet network. According to Nabila (2019), the development of marketing techniques is due to the rapid development of digital technology supported by the internet. Shopping via the internet helps buyers or consumers to be able to see in advance the goods and services they want to shop through the web promoted by the seller. This marketing was first introduced by Michael Aldrich in 1979 by developing a real-time transaction process via telephone wires.

Shopping indirectly or online is a new (modern) type of shopping activity that does not require direct face-to-face communication between sellers and buyers. This greatly facilitates activities because it can be accessed only by running an electronic device that is connected to internet access services.

## **2.3 Offline Purchases**

Direct marketing (offline) is marketing that is carried out by communicating directly with each individual customer who is directed carefully, both to get a quick response and to build relationships with customers over a long period of time. So, offline purchases are buying and selling processes carried out by consumers by communicating directly with sellers, Purbaningtyas (2021).

## 2.4 Customer Statisfaction

According to Philip Kotler and Kevin Lane Keller (2014: 177) quoted from the book Marketing Management, it says that customer satisfaction is a person's feelings of pleasure or disappointment that arise after comparing the performance (outcome) of the service expected to the performance expected. According to Zeithal, consumer satisfaction is an assessment of a product or service against the expectations and needs of consumers.

According to Kotler (2003), there are several ways to measure customer satisfaction.

- 1. Complain and suggestion system
- 2. Customer satisfaction surveys
- 3. Ghost shopping
- 4. Lost customer analysis

## 2.5 Validity Test

The validity of the research shows the degree of accuracy of the research. Validity test is a test used to show how well the instrument is used in measuring what is being quantified. Ghozali (2009) states that the validity test is used to measure the validity of a questionnaire Validity test can be calculated using the formula below.

$$r_{xy} = \frac{n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{\sqrt{(n\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2)} (n\sum_{i=1}^{n} y_i^2 - (\sum_{i=1}^{n} y_i)^2)} (1)$$

Information:

$r_{xy}$	: correlation coefficient between X and Y variable
$x_i$	: the i-th data value for the X variable group
$y_i$	: the i-th data value for the Y variable group
n	: data size

#### 2.6 Reliability Test

The reliability of a test refers to the level of stability, consistency, predictability, and accuracy. Ghozali (2009) states that reliability is a tool for measuring a questionnaire which is an indicator of a variable or construct. A survey is considered reliable or trustworthy when the responses to statements are consistent or stable over time. Reliability test can be calculated using the formula below

$$r_{11} = \frac{n}{n-1} \left( 1 - \frac{\sum_{i=1}^{n} S_i^2}{S_t^2} \right)$$
(2)

Information:

 $r_{11}$  : reliability coefficient

*n* : the number of questions

 $S_i^2$  : the variance of the score of the i-th item

 $S_t^2$  : total variance score

## 2.7 Chi-Square Test

The *Chi-Square* test is a non-parametric method for determining the relationship between two variables in categorical data (Sugiyono, 2017). The *Chi-Square* test hypothesis is as follows:

- H<sub>0</sub>: The two variables are mutually independent (independent)
- H<sub>1</sub>: These two variables are not mutually independent (dependent)
- The statistics for the Chi-Square test are as follows.

$$X^{2} = \sum_{i=1}^{b} \sum_{j=1}^{k} \frac{\left(n_{ij} - e_{ij}\right)^{2}}{e_{ij}} \sim X^{2}(v)$$
(3)

v = (b - 1)(k - 1)Information:

- $n_{ij}$  : The frequency of observations in the i-th row and j-th column
- $e_{ij}$  : Expected frequency in the i-th row and j-th column
- $e_{ij}$  :  $(n_i n_j)/n_{..}$

## 2.7 Proportion Test

The two-proportion difference test is a hypothesis test to prove whether there is an average or proportion difference between the two groups of data taken from two populations (Rachmat, 2012, p. 148). If there are two samples or two populations of different proportions of an event then a test can be performed to see if the difference between the two proportions is significant or not.

Hypothesis testing of different proportions has two possible outcomes, namely success (having certain observed characteristics) and failure (not having certain observed characteristics). While the proportion in the success category is annotated with p. In our study, the p notation shows the proportion of purchases of goods (*fashion*, electronics, food) online while the notation q indicates the proportion of purchases of goods offline.

To test whether the proportions of each category are the same, the following hypothesis is used :

H<sub>0</sub>: There is no difference in proportion between the variables of category A and category B or  $p_1 = p_2 = \dots = p_n = 0$ 

H<sub>1</sub> : There is a difference in proportion between the variables of category A and category B or at least there is one  $p_i$  different; i = 1, 2, ..., n

The general formula in calculating the proportion test is:

 $P = \frac{x}{N}$  (4) Meanwhile, the proportion can be stimulated using the following proportion test calculation statistics :

$$\hat{p} = \frac{x}{n} \tag{5}$$

With is *q* a failed event, the value formulation is *q* :  $\hat{q} = 1 - \hat{p}$  (6)

The statistical value of the test can be calculated by the formula:

$$Z_{test} = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}\hat{q}\left[\frac{1}{n_1} + \frac{1}{n_2}\right]}}$$
(7)

Description :

 $Z_{test}$  = test statistical value

P = Proportional test statistical value

 $\hat{p}$  = Estimator statistical value *Chi-Square* test (success event)

 $\hat{q}$  = Estimator statistical value *Chi-Square* test (failed event)

x = Assess the frequency of successful observations n = Sample size

## 2.8 Cramer's Contingency Coefficient V

Cramer Coefficient V is a measure of the degree of relationship between two groups of variables. This test is useful if the information or data we have is nominal or

categorical in scale (Ghozali, 2006). The value of the cramer coefficient is never negative, only ranging from 0 and 1, this is because the variables do not pay attention to the order between the two variables (Purnomo, 2014).

The C Contingency Coefficient Test (*Cramer Coefficient*) is a test whose usefulness is to analyze the association or relationship between two nominally scaled variables in the contingency table, and  $b \times kb$  more than 2 and asymmetric (The results of  $kb \neq k$ ). This study will be presented in the form of tables and narratives for interpretation and discussion of research results.

The calculated statistics of *the Cramer's* Contingency Coefficient V test are :

$$V = \sqrt{\frac{\chi^2}{nmin(b-1,k-1)}}$$
(8)

Description :

V = Statistical Value of Cramer's Contingency Coefficient Test V

 $\chi^2 = Chi$ -Square test k statistical value

n = Minimum sample rate

b = Ba row in a contingency table

k = The number of columns in the contingency table

#### 3. Research Methods

#### **3.1 Types of Research**

The type of research used in this research is quantitative research with the type of correlational method. Correlational quantitative research is research conducted to measure the influence or relationship between two or more variables (Creswell, 2014). This research was conducted to analyze the differences in the types of online and offline purchases of goods on consumer satisfaction.

#### 3.2 Data Sources and Data Collection Strategy

The data source to be examined is primary data. Primary data was collected through data collection using an online survey method. The sampling technique used is simple random sampling. The sample in this study were 136 respondents. Kerlinger and Lee (2000) suggest 30 samples as the minimum number of samples in quantitative research.

This study used a questionnaire as an instrument for taking and collecting data. Questionnaires were compiled and made using Google Forms (online questionnaires) which were then distributed to various social networks to respondents who were the object of research according to the research sample. In addition, literature studies, discussions, data processing and analysis, and writing of scientific articles are carried out with the help of related software. This research took place from the third week of October 2022 to the third week of November 2022.

#### 3.3 Variable and Variable Categories

In this study, each variable description has 3 information of consumer statisfaction. First is unstatisfactory, second is fairly statisfactory, and third is very statisfying.

Data Type	Variable	Information	Scale
	Description		
Qualitative	Consumer Satisfaction	1: Unsatisfactory	Ordinal
	based on	2 · Fairly	
	Fashion	Satisfactory	
		,, ,, , , , , , , , , , , , , ,	
		3 : Very Satisfying	
Qualitative	Consumer	1: Unsatisfactory	Ordinal
	Satisfaction		
	based on	2 : Fairly	
	Electronics	Satisfactory	
		3 : Very Satisfying	
Qualitative	Consumer	1: Unsatisfactory	Ordinal
	Satisfaction		
	based on	2 : Fairly	
	Food	Satisfactory	
		3 : Very Satisfying	

The following is the formula used to make categorization in this study.

Maximum Score	= Number of questions x largest			
	scale score			
Minimum Score	= Number of questions x smallest scale score			
Theoretical Mean $(\mu)$	= 1/2 (Maximum Score + Minimum Score)			
Population Standard	= 1/6 (Maximum Score -			
Deviation ( $\sigma$ )	Minimum Score)			

Based on the above calculations, each respondent will be classified into three categories as follows

#### Table 2. Three category formula

Category	Score Range	
Low	$X < \mu - 1\sigma$	
Medium	$\mu - 1\sigma \le X < \mu + 1\sigma$	
High	$X \ge \mu + 1\sigma$	

#### Then the calculation is obtained as follows

#### Table 3.Variable categorization

Category	Score Range
Unsatisfactory	<i>X</i> < 8
Fairly Satisfactory	$8 \le X < 12$
Very Satisfying	$X \ge 12$

#### 3.4 Data Analysis Procedures

The data analysis steps in this study are:

- 1. Conduct validity tests based on equations (1) and reability tests on research data based on equations (2).
- 2. Conduct a descriptive analysis to analyze the distribution of respondents in the different types of offline and *online* purchases of goods.
- 3. Compile research data into contingency tables based on calculation X to determine categorization.
- 4. Perform *Chi-Square* test analysis based on equation (3) to analyze the relationship between the two variables.
  - 1. Counts the sum of row and column values.
  - 2. Calculates the expected frequency value on each cell.
  - 3. Calculating the value of *Chi-Square*.
  - 4. Comparing calculated *Chi-Square* values with *Chi-Square* table or  $\chi^2_{\alpha(r-1)(c-1)}$
  - 5. Make decisions with critical areas: Subtract  $H_0$ , if  $\chi^2 > \chi^2_{\alpha(r-1)(c-1)}$
  - 6. Make a conclusions regarding the results of the *Chi-Square* test analysis obtained.
  - 7. Conduct further analysis by testing proportions based on equations (4) to analyze the different proportions that cause the interrelationships between variables.
  - 8. Draw conclusions about the proportion test results if any.
- 5. Performed a test analysis of *contingency* coefficient *Cramer's* V with equation (8) to analyze the magnitude of the association for both variables.

6. Provide recommendations that are in accordance with the results of the analysis in this study.

#### 4. Results and Discussion

#### 4.1 Questions Validity Test

 
 Table 4. Validity Test Results on Types of Online Purchases with Fashion Item Categories

Question	P-value	R-value	Conclusion
1	0,000	0,811	Valid
2	0,000	0,793	Valid
3	0,000	0,819	Valid
4	0,000	0,740	Valid

 
 Table 5. Validity Test Results on Types of Online Purchases with the Electronic Goods Category

Question	P-value	R-value	Conclusion
1	0,000	0,852	Valid
2	0,000	0,851	Valid
3	0,000	0,876	Valid
4	0,000	0,713	Valid

 Table 6. Validity Test Results on Types of Online Purchases with Food

 Goods Category

Question	P-value	R-value	Conclusion
1	0,000	0,865	Valid
2	0,000	0,832	Valid
3	0,000	0,672	Valid
4	0,000	0,858	Valid

 
 Table 7. Validity Test Results on Types of Offline Purchases with Fashion Goods Category

Question	P-value	R-value	Conclusion
1	0,000	0,818	Valid

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2	0,000	0,782	Valid	
3	0,000	0,719	Valid	_
4	0,000	0,827	Valid	

 
 Table 8. Validity Test Results on Types of Offline Purchases with the Electronic Goods Category

Question	P-value	R-value	Conclusion
1	0,000	0,781	Valid
2	0,000	0,777	Valid
3	0,000	0,722	Valid
4	0,000	0,811	Valid

 
 Table 9. Validity Test Results on Types of Offline Purchases with Food Goods Category

Question	P-value	R-value	Conclusion
1	0,000	0,785	Valid
2	0,000	0,846	Valid
3	0,000	0,809	Valid
4	0,000	0,886	Valid

Based on Table 4. – Table 9., it is found that all questions have a p-value of 0.000 which is smaller than the significance level of 0.05 or a calculated r value of more than r table with a value of 0.1684 so that it can be said that all questions are declared valid based on the validity test.

## 4.2 Result Reliability Test

Table 10. Reliability Test Results on Cronbach Alpha

Category	Onlin	Conclusio	Offlin	Conclusio
	e	n	e	n
Fashion	0,788	Reliable	0,795	Reliable
Electroni	0,840	Reliable	0,776	Reliable
С				
Food	0,809	Reliable	0,849	Reliable

From the reliability test conducted, a Cronbach Alpha value of 0.788 was obtained for online purchase type

items from the fashion goods category, 0.840 for online purchase type items from the electronic goods category, 0.809 for online purchase type items from the food goods category, 0.795 for offline purchase type items from the fashion goods category, 0.776 for offline purchase type items from the electronic goods category, and 0.849 for offline purchase type items from the food item category. So it can be said that all six items of question variables have met the assumption of reliability for each category.

## 4.3 Descriptive Statistics

From the results of research that has been carried out, it can be described about the percentage of someone who has used e-commerce applications in the following picture



Picture 1. Percentage of e-commerce app usage

Based on figure 1, the percentage of respondents who have used *e-commerce* application is 74% or as many as 101 respondents. While the rest is the percentage of respondents who have never used *an e-commerce* application, which is 26% or as many as 35 respondents.



Picture 2. Comparison of Types of Purchase of Fashion Goods

Based on picture 2, the majority of respondents were very satisfied with purchasing *fashion* items *online*. This is evidenced by the percentage of respondents' answers to the

purchase of *fashion* goods online getting very good satisfaction with a percentage of 84.81% compared to quite satisfactory statements which were 69.70% of respondents and unsatisfactory with a percentage of 45.83%. Meanwhile, respondents' answers to purchasing *fashion* items offline received more unsatisfactory statements than very satisfactory and quite satisfactory statements. The percentage of respondents who were unsatisfactory when buying fashion goods offline was 54.17, then respondents who were quite satisfied with buying fashion goods offline were 30.30 %, and the percentage of *buying fashion* goods *offline* was very satisfactory at 15.19%.



Picture 3. Comparison of Types of Electronic Goods Purchases

Based on picture 3, the majority of respondents were very satisfied with the purchase of electronic goods *online*. This is evidenced by the percentage of respondents' answers to online purchases of electronic goods getting a percentage of 84.15% compared to quite satisfactory statements of 57.58% of respondents and unsatisfactory with a percentage of 61.90%. Meanwhile, the majority of respondents' answers to offline purchases of electronic goods received quite satisfactory statements, namely 42.42%. The percentage of respondents who were unsatisfactory when buying goods offline was 38.10 and the percentage of purchasing electronic goods *offline* was very satisfactory at 15.85%.



Picture 4. Comparison of Types of Food Purchases

Based on picture 4, the majority of respondents felt very satisfied with purchasing food online. This is evidenced by the percentage of respondents' answers to online food purchases getting a percentage of 88.64% compared to a fairly satisfactory statement of 56.00% of respondents and unsatisfactory with a percentage of 39.13%. Meanwhile, the majority of respondents' answers to offline food purchases received unsatisfactory statements, namely 60.87%. The percentage of respondents who were quite satisfied when buying food offline was 44.00% and the percentage of offline food purchases was very satisfactory at 11.36%.

## **4.4** Relationship between Consumer Satisfaction and Purchasing Fashion Goods Online and Offline

Table 11.	Contingency Table of Purchase Type with Consumer	Satisfaction
	Based on Fashion	

Customer	Purchase	Total	
Satisfaction —	Online	Offline	
Unsatisfactory	11	13	24
Fairly Satisfactory	23	10	33
Very Satisfying	67	12	79
Total	101	35	136

## A. Chi-Square Test

The following is a hypothesis formulation to test whether there is a relationship between consumer satisfaction and purchasing fashion goods online and offline.

 $H_0$ : There is no relationship between consumer satisfaction and purchasing fashion goods online and offline.

 $H_1$ : There is a relationship between consumer satisfaction and purchasing fashion goods online and offline.

The following table is the result of observation *Chi-Square Test* using the equation (8)

Table 12. Chi-Square Test Results

			Asymptotic
Pearson	Value	Df	Significance
Chi-Square			(2-sided)
-	15,108	2	0,005

## Decision :

Reject  $H_0$ , because it meets a critical area ( $\chi^2_{test} > 5,991$ ).

Conclusion :

There is a relationship between the level of consumer satisfaction with purchasing fashion goods online and offline.

#### **B.** Proportion test :

The following is a hypothesis formulation to test whether there is a relationship between consumer satisfaction and purchasing fashion goods online and offline.

H<sub>0</sub>: There is no difference in proportion between the level of consumer satisfaction with online and offline fashion purchase or  $p_1 - p_2 = p_1 - p_3 = p_2 - p_3 = 0$ .

H<sub>1</sub>: There is a difference in the proportion between the level of consumer satisfaction with online and offline fashion purchases or at least one  $p_i - p_j$  is different; i = 1,2,3 and  $p_j = 1,2,3$  by  $i \neq j$ .

1. Proportions based on 'Unsatisfactory' to 'Fairly Satisfactory' satisfaction levels

 Table 12. Proportion Test Results (1)

Z Score	Z-Value	P-Value
	-1,81	0,070

Decision :

Failure to Reject  $H_0$ , because  $Z_{test}$  is outside the critical area

 $(|Z_{test}| < 1,96).$ 

Conclusion :

There is no difference in the proportion between the level of satisfaction of 'Unsatisfactory' and 'Fairly Satisfactory' consumers towards online and offline fashion purchases or  $p_1 = p_2$ .

 Proportions based on 'Unsatisfactory' to 'Very Satisfying' satisfaction levels

Table 13.	Proportion	Test	Results	(2)

Z Score	Z-Value	P-Value
	-3,90	0,000

Decision :

Reject  $H_0$ , because  $Z_{test}$  meets a critical area ( $|Z_{test}| > 1.06$ )

1,96).

Conclusion :

There is a difference in the proportion between the level of satisfaction 'Unsatisfactory' with 'Very Satisfying' consumers of fashion purchases online and offline or  $p_1 \neq p_3$ .

3. Proportions based on 'Fairly Satisfactory' to 'Very Satisfying' satisfaction levels

Table 14. Proportion Test Results (3)

Z Score	Z-Value	P-Value
	-1,84	0,066

Decision :

Failure to Reject  $H_0$ , because  $Z_{test}$  is outside the critical area

 $(|Z_{test}| < 1,96).$ 

Conclusion :

There is no difference in the proportion between the level of satisfaction of 'Unsatisfactory' and 'Fairly Satisfactory' consumers towards online and offline fashion purchases or  $p_2 = p_3$ .

Based on the results of the proportion test for each consumer satisfaction, it can be concluded Decision :

Reject  $H_0$ , because  $p_1 - p_3 \neq 0$ .

## Conclusion :

There is a difference in proportion between the level of consumer satisfaction with online and offline fashion purchases, namely the relationship between the level of satisfaction 'Unsatisfactory' and 'Very Satisfying'. Since  $p_1 = p_2$  and  $p_2 = p_3$  but  $p_1 \neq p_3$ , it is  $p_1$  and  $p_3$  that have different proportions or the proportion of 'Unsatisfactory' and 'Very Satisfying' satisfaction levels have different proportions.

## C. Cramer's V coefficient

With:

The result of the calculation of the coefficient *of Cramer's V* using the equation (8) is as follows:

$$V = \sqrt{\frac{\chi^2}{n\min(b-1,k-1)}}$$
$$\chi^2 = 15.1076$$

$$\chi^{2} = 15,10,$$
  
 $n = 136$   
 $b = 3$   
 $k = 2$ 

The calculation of *Cramer's coefficient V* uses the equation (8)

$$V = \sqrt{\frac{15,1076}{136 x \min(2,1)}} = \sqrt{\frac{15,1076}{136 x 1}} = 0,333$$

Thus, it can be concluded that the large association between the level of consumer satisfaction with the purchase of fashion goods online and offline is 33%.

**4.5** Relationship between Consumer Satisfaction and Purchasing Electronic Goods Online and Offline

Table 15.	Contingency Table of Purchase Type with Consumer Satisfaction
	Based on Electromics

Customer	Purchase	Total	
Satisfaction —	Online	Offline	
Unsatisfactory	13	8	21
Fairly Satisfactory	19	14	33
Very Satisfying	69	13	82
Total	101	35	136

## A. Chi-Square Test

The following is a hypothesis formulation to test whether there is a relationship between consumer satisfaction and purchasing electronic goods online and offline.

 $H_0$ : There is no relationship between consumer satisfaction and purchasing electronic goods online and offline.

 $H_1$ : There is a relationship between consumer satisfaction and purchasing electronic goods online and offline.

The following table is the result of observation Chi Square Test using the equation (8)

Table 16. Chi-Square Test Results

			Asymptotic
Pearson	Value	Df	Significance
Chi-Square			(2-sided)
-	10,677	2	0,005

## Decision:

Reject  $H_0$ , because it meets a critical area ( $\chi^2_{test} > 5,991$ )

## Conclusion:

There is a relationship between the level of consumer satisfaction with purchasing electronic goods online and offline.

## A. Proportion test :

The following is a hypothesis formulation to test whether there is a relationship between consumer satisfaction and purchasing electrnic goods online and offline.

H<sub>0</sub>: There is no difference in proportion between the level of consumer satisfaction with online and offline electronic purchase or  $p_1 - p_2 = p_1 - p_3 = p_2 - p_3 = 0$ .

H<sub>1</sub>: There is a difference in the proportion between the level of consumer satisfaction with online and offline electronic purchases or at least one  $p_i - p_j$  is different; i = 1,2,3 and  $p_j = 1,2,3$  by  $i \neq j$ .

1. Proportions based on 'Unsatisfactory' to 'Fairly Satisfactory' satisfaction levels

 Table 17. Proportion Test Results (1)

Z Score	Z-Value	P-Value
	0,32	0,752

Picture 6. Proportion Test Results

#### Decision :

Failure to Reject  $H_0$ , because  $Z_{test}$  is outside the critical area

 $(|Z_{test}| < 1,96).$ 

Conclusion :

There is no difference in the proportion between the level of satisfaction of 'Unsatisfactory' and 'Fairly Satisfactory' consumers towards online and offline electronic purchases or  $p_1 = p_2$ .

2. Proportions based on 'Unsatisfactory' to 'Very Satisfying' satisfaction levels

Table 18. Proportion Test Results (2)

Z Score	Z-Value	P-Value
	-2,26	0,024

## Decision :

Reject  $H_0$ , because  $Z_{test}$  meets a critical area ( $|Z_{test}| >$ 

1,96).

Conclusion :

There is a difference in the proportion between the level of satisfaction 'Unsatisfactory' with 'Very Satisfying' consumers of electronic purchases online and offline or  $p_1 \neq p_3$ .

3. Proportions based on 'Fairly Satisfactory' to 'Very

Satisfying' satisfaction levels

 Table 18.
 Proportion Test Results (3)

Z Score	Z-Value	P-Value
	-3,04	0,002

## Decision :

Failure to Reject  $H_0$ , because  $Z_{test}$  is outside the critical area  $(|Z_{test}| < 1.96)$ .

#### Conclusion :

There is difference in the proportion between the level of satisfaction of 'Fairly Satisfactory' and 'Very Satisfying' consumers towards online and offline electronic purchases or  $p_2 \neq p_3$ .

Based on the results of the proportion test for each consumer satisfaction, it can be concluded Decision :

Reject  $H_0$ , because  $p_1 - p_3 \neq 0$  and  $p_2 - p_3 \neq 0$ 

#### Conclusion :

There is a difference in proportion between the level of consumer satisfaction with online and offline electronic purchases, namely the relationship between the level of satisfaction 'Unsatisfactory' and 'Very Satisfying' and between 'fairly satisfactory' and 'Very Satisfying'. Since  $p_1 = p_2$  and  $p_2 = p_3$  but  $p_1 \neq p_3$ , it is  $p_1$  and  $p_3$  that have different proportions or the proportion of 'Unsatisfactory' and 'Very Satisfying' and 'Very Satisfying' satisfactory' and 'Very Satisfying' and 'Very Satisfying' satisfactory' and 'Very Satisfying' satisfact

#### B. Cramer's V coefficient

The result of the calculation of the coefficient *of Cramer's V* using the equation (8) is as follows:

With:  

$$V = \sqrt{\frac{\chi^2}{n\min(b-1,k-1)}}$$
With:  

$$\chi^2 = 10,677$$

$$n = 136$$

$$h = 3$$

k = 2

The calculation of *Cramer's coefficient V* uses the equation (8)

$$V = \sqrt{\frac{10.677}{136 \, x \, \min(2,1)}} = \sqrt{\frac{10,677}{136 \, x \, 1}} = 0,280$$

Thus, it can be concluded that the large association between the level of consumer satisfaction with the purchase of electronic goods online and offline is 28%.

## **4.6** Relationship between Consumer Satisfaction and Purchasing Food Goods Online and Offline

 Table 19. Contingency Table of Purchase Type with Consumer Satisfaction

 Based on Food

Fairly Satisfactory	23	10	33
Very Satisfying	67	12	79
Total	101	35	136

## A. Chi-Square Test

The following is a hypothesis formulation to test whether there is a relationship between consumer satisfaction and purchasing electronic goods online and offline.  $H_0$ : There is no relationship between the level of consumer satisfaction with online and offline food purchases.  $H_1$ : There is a relationship between the level of consumer satisfaction with online and offline food purchases

The following table is the result of observation Chi Square Test using the equation (8)

Т	able 20. Chi-Squa	<i>ire</i> Test Re	Results			
			Asymptotic			
Pearson	Value	Df	Significance			
Chi-Square			(2-sided)			
	28,729	2	0,000			

#### Decision :

Reject  $H_0$ , because it meets a critical area ( $\chi^2_{test} > 5,991$ ).

#### Conclusion :

There is a relationship between the level of consumer satisfaction with online and offline food purchases.

#### **B.** Proportion test :

The following is a hypothesis formulation to test whether there is a relationship between the level of consumer satisfaction with online and offline food purchases here is a relationship between consumer satisfaction with online and offline food purchases.

H<sub>0</sub>: There is no difference in proportion between the level of consumer satisfaction with online and offline food purchases or  $p_1 - p_2 = p_1 - p_3 = p_2 - p_3 = 0$ .

H<sub>1</sub>: There is a difference in proportion between the level of consumer satisfaction with online and offline food purchases or at least one  $p_i - p_j$  is different; i = 1,2,3 and  $p_j = 1,2,3$  by  $i \neq j$ .

1. Proportions based on 'Unsatisfactory' to 'Fairly Satisfactory' satisfaction levels

Table 21. Proportion Test Results (1)

Customer	Purchase	Туре	Total	Z Score	Z-Value	P-Value
Satisfaction <sup>–</sup>	Online	Offline			1,17	0,243
Unsatisfactory	11	13	24			

#### Decision :

Failure to Reject  $H_0$ , because  $Z_{test}$  is outside the critical area

## $(|Z_{test}| < 1,96).$

Conclusion :

There is no difference in the proportion between the level of satisfaction of 'Unsatisfactory' and 'Fairly Satisfactory' consumers towards online and offline food purchases or  $p_1 = p_2$ .

2. Proportions based on 'Unsatisfactory' to 'Very Satisfying'

satisfaction levels

Table 22. Proportion Test Results (2)



Decision :

Reject  $H_0$ , because  $Z_{test}$  meets a critical area ( $|Z_{test}| > 1,96$ ).

Conclusion :

There is a difference in the proportion between the level of satisfaction 'Unsatisfactory' with 'Very Satisfying' consumers of purchase food online and offline or  $p_1 \neq p_3$ .

3. Proportions based on 'Fairly Satisfactory' to 'Very

Satisfying' satisfaction levels

 Table 23. Proportion Test Results (3)

Z Score	Z-Value	P-Value
	-3,70	0,000

Decision :

Failure to Reject  $H_0$ , because  $Z_{test}$  meets a critical area

 $(|Z_{test}| > 1,96).$ 

Conclusion :

There is a difference in the proportion between the level of satisfaction of 'Unsatisfactory' and 'Fairly Satisfactory' consumers towards of purchase food online and offline or  $p_2 = p_3$ .

Based on the results of the proportion test for each consumer satisfaction, it can be concluded Decision :

Reject  $H_0$ , because  $p_1 - p_3 \neq 0$  and  $p_2 - p_3 \neq 0$ 

#### Conclusion :

There is a difference in proportion between the level of consumer satisfaction with online and offline food purchases, namely the relationship between the level of satisfaction 'Unsatisfactory' with 'Very Satisfying' and between 'Satisfying' with 'Very Satisfying'.Because  $p_1 = p_2$ , then only the proportion between the satisfaction levels of 'Unsatisfactory' and 'Enough Satisfactory' is the same. For  $p_1 \neq p_3$  and  $p_2 \neq p_3$ , it can be concluded that the difference between proportions is caused by  $p_3$  or the satisfaction level of 'Very Satisfactory'.

#### C. Cramer's V coefficient

The result of the calculation of the coefficient *of Cramer's V* using the equation (8) is as follows:

$$V = \sqrt{\frac{\chi^2}{n\min(b-1,k-1)}}$$

With:

$$\chi^2 = 28,729$$
  
 $n = 136$   
 $b = 3$   
 $k = 2$ 

The calculation of Cramer's coefficient V uses the equation (8)

<u>:</u>

$$V = \sqrt{\frac{28,729}{136 \, x \min(2,1)}} = \sqrt{\frac{28,729}{136 \, x \, 1}} = 0,460$$

Thus, it can be concluded that the large association between the level of consumer satisfaction with the purchase of online and offline food purchases is 46%.

#### 5. Conclusion

This study was conducted to analyze the effect of consumer satisfaction levels based on the type of purchase of goods online and offline in the fashion, electronics and food categories. The results obtained in this study using the Chi-Square Test, namely the types of online and offline purchases of goods affect the level of consumer satisfaction with a Pvalue above 5%. Based on the results of research using this satisfaction level, it shows that most consumers are satisfied and helped by the existence of e-commerce services in the fashion, electronics and food categories. Implications for readers are expected to add insight and become a consideration for traders in utilizing technology to support the business being run. The government is expected to further support and maximize technology to improve the community's economy. Researchers recommend further research to be able to conduct further analysis by adding influencing variables or using other analysis methods.

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