

CHAPTER IV

RESULT AND ANALYSIS

1.1 Introduction

The findings obtained from the data analysis process. The main purpose of this chapter is to evaluate and present the results obtained from multiple regression analysis which is used to evaluate the hypotheses formed in this study. The findings were obtained from the data analysis process. The main purpose of this chapter is to evaluate and present the results obtained from multiple regression analysis which are used to evaluate the hypotheses formed in this study. Then also in this chapter explains each of the similarities in the identity of the respondents, namely gender, age and occupation (job) using descriptive statistical analysis.

1.2 Pilot Test

Pilot studies can have two different meanings in social science research. First, a pilot study can be interpreted as a feasibility study. In this sense, a pilot study is a small version of a study or an experiment (trial run), which is carried out in preparation for a larger study. Second, a pilot study can also be an initial test or trial and error of a research instrument. There are several advantages to implementing this pilot test, including: provide advance warning of where major research is likely to fail, be a clue to researchers on which part of the protocol will fail to run, determine whether the method or instrument proposed or planned by the researcher is good enough, simple, appropriate or too complicated. The researcher used Cronbach's Alpha for this analysis, which tests internal consistency and the closeness between a set of the variable. The alpha reliability coefficient of Cronbach normally varies from 0 to 1. The alpha value above 0.7 was taken as an indicator of strong internal consistency. Moreover, alpha values above 0.7 indicate good reliability and values between 0.6 and 0.7 can be recognized as additional indicators are good (Miremedi et al., 2020). The following table is the reliability statistics for 30 respondents. The

0.923 Cronbach Alpha is extremely accurate, because it is greater than 0.7. This result also reveals that the assertion of the questionnaire is right and reliable.

Table 1 : Reliability Statistics (30 respondents)

Source : Output from SPSS)

Reliability Statistics

Cronbach's Alpha	N of Items
.923	4

1.3 Descriptive Statistics Analysis

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data.

1.3.1 Respondents Identity

To compile the profile used questions about the demographics of the respondents. To summarize the data set obtained from distributing questionnaires, descriptive statistics were used. Respondents will be based on many characteristics such as email, name, gender, age and occupation.

1.3.1.1 Gender

According to table 6, the results showed that 200 respondents were listed in total. Based on Figure 9, from 200 respondents, were 42.5% (85) of male respondents and were female respondents, which was 57.5% (115). The findings indicate that the percentages of women who participated in this research were significantly higher.

Table 2 : Frequency and Percentage of Gender

(Source : Output from SPSS)

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	85	37.6	42.5	42.5
	Female	115	50.9	57.5	100.0
	Total	200	88.5	100.0	
Missing	System	26	11.5		
Total		226	100.0		

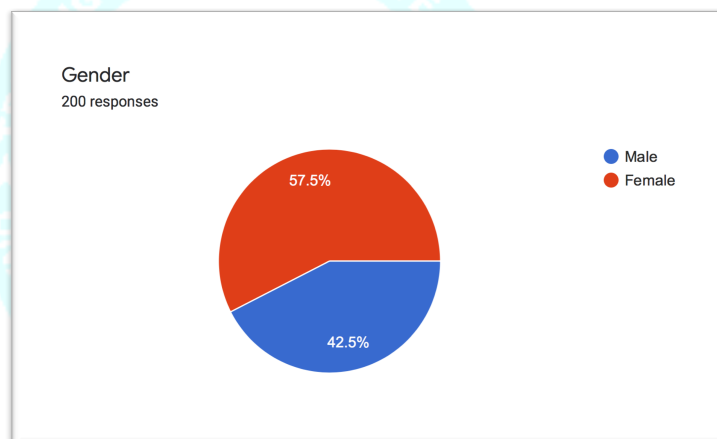


Figure 1 : Pie Chart of Race

1.3.1.2 Age (Years)

The result of the age group of respondents is shown in Table 7. There are four groups in total in the age group. Based on Figure 10, the highest is in the 15-25 years age group were those with 152 respondents (70.0%) and, following that, 32 (16.0%) in the 26-30 years age group, 14 (7.0%) in the 31-40 years age group, 2 (1.0%) in the >40 years age group.

Table 3 Frequency and Percentage of Age

(Source : Output from SPSS)

Age

	Frequency	Percent	Valid Percent	Cumulative Percent
15-25 Years	152	76.0	76.0	76.0
26-30 Years	32	16.0	16.0	92.0
Valid 31-40 Years	14	7.0	7.0	99.0
>40 Years	2	1.0	1.0	100.0
Total	200	100.0	100.0	

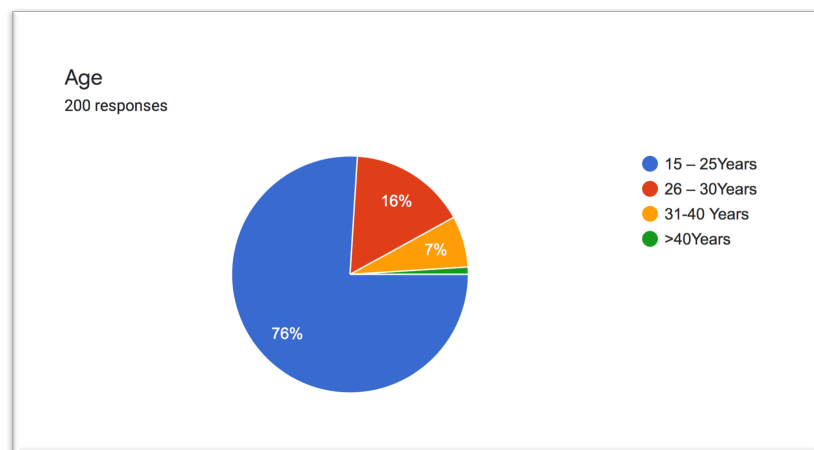


Figure 2 : Pie Chart of Age

1.3.1.3 Job

Table 8 shows that the occupation (job) of the respondents. Respondents with student status were in the first rank, namely 55.5% which is 111 respondents and employees at the position of 39 respondents or 19.5%. Meanwhile, there were 19 respondents who worked as entrepreneurs or 9.5% of 200 respondents. Then for other jobs there were 31 respondents or 15.5%.

Table 4 : Frequency and Percentage of Job

(Source : Output from SPSS)

Job

	Frequency	Percent	Valid Percent	Cumulative Percent
Students	111	55.5	55.5	55.5
Employees	39	19.5	19.5	75.0
Valid Entrepreneurs	19	9.5	9.5	84.5
Others	31	15.5	15.5	100.0
Total	200	100.0	100.0	

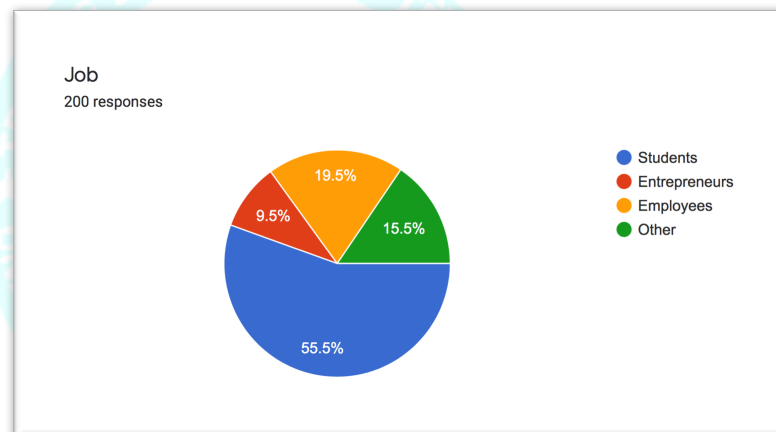


Figure 3 : Pie Chart of Job

4.4 Validity Test

Thus, the table below shows the validity test of all variables including the independent variable, which is content-based filtering, recommendation cluster analysis and collaborative filtering recommendation system and dependent variable, which is online consumer satisfaction.

4.4.1 Content-based Filtering

Table 9 is the reliability statistics for 200 respondents for the first independent variable, which is content-based filtering. The Cronbach's Alpha for content-based filtering is 0.842 and it is in high reliability, thus, the statements of the questionnaire are appropriate. Table 10 is the item-total statistics for 200 respondents for content-based filtering. The Cronbach's Alpha of statements for CF1, CF2, CF3, CF4 and CF5 are in high reliability, which is 0.805, 0.798, 0.808, 0.819, and 0.818. Thus, all of the statement of the questionnaire is valid tested by the 200 respondents among online consumer.

Table 5 : Reliability Statistics for 200 Respondents

(Content-based Filtering) (Source : Output from SPSS)

Reliability Statistics	
Cronbach's Alpha	N of Items
.842	5

Table 6 : Item-Total Statistics for 200 Respondents (Source : Output from SPSS)

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CF1	15.33	9.730	.665	.805
CF2	15.34	9.631	.688	.798
CF3	15.28	10.042	.654	.808
CF4	15.25	10.166	.612	.819
CF5	15.21	10.147	.614	.818

4.4.2 Recommendation Cluster Analysis

Table 11 is the reliability statistics for 200 respondents for the second independent variable, which is recommendation cluster analysis. The Cronbach's Alpha for customer service is 0.819 and it is in high reliability, thus, the statements of the questionnaire are efficacious. Table 12 is the item-total statistics for 384 respondents for customer service. The Cronbach's Alpha of statements for RCA1, RCA2, RCA3, RCA4, and RCA5 are in high reliability, which is 0.797, 0.776, 0.773, 0.789 and 0.784. Thus, all of the statement of the questionnaire is valid tested by the 200 respondents among online consumer.

Table 7 : Reliability Statistics for 200 respondents

(Recommendation Cluster Analysis)

(Source : Output from SPSS)

Reliability Statistics

Cronbach's Alpha	N of Items
.819	5

Table 8 : Item-Total Statistics for 200 respondents

(Recommendation Cluster Analysis) (Source : Output from SPSS)

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
RCA1	15.74	9.007	.566	.797
RCA2	15.65	8.339	.639	.776
RCA3	15.65	8.662	.650	.773
RCA4	15.75	9.050	.593	.789
RCA5	15.65	8.832	.610	.784

4.4.3 Collaborative Filtering Recommender System

Table 13 is the reliability statistics for 384 respondents for the dependent variable, which is customer loyalty. The Cronbach's Alpha for collaborative filtering recommender system is 0.861 and it is in high reliability, thus, the statements of the questionnaire are practicable. Table 14 is the item-total statistics for 384 respondents for collaborative filtering recommender system. The Cronbach's Alpha of statements for CFRS 1, CFRS2, CFRS 3, CFRS 4, and CFRS5 are in high reliability, which is 0.836, 0.842, 0.823, 0.828, and 0.831 respectively. Thus, all of the statement of the questionnaire is valid tested by the 200 respondents among online consumer.

Table 9 : Reliability Statistics for 200 respondents

(Collaborative Filtering Recommender System) (Source : Output from SPSS)

Reliability Statistics

Cronbach's Alpha	N of Items
.861	5

Table 10 : Item-Total Statistics for 200 respondents (Source : Output from SPSS)

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CFRS1	15.64	10.333	.662	.836
CFRS2	15.66	10.366	.641	.842
CFRS3	15.70	9.942	.714	.823
CFRS4	15.58	10.306	.695	.828
CFRS5	15.62	10.328	.682	.831

4.4.4 Online Consumer Satisfaction

Table 15 is the reliability statistics for 200 respondents for the dependent variable, which is online consumer satisfaction. The Cronbach's Alpha for online consumer satisfaction is 0.886 and it is in high reliability, thus, the statements of the questionnaire are practicable. Table 16 is the item-total statistics for 200 respondents for online consumer satisfaction. The Cronbach's Alpha of statements for OCS1, OCS2, OCS3, OCS4, and OCS5 are in high reliability, which is 0.864, 0.869, 0.851, 0.860, and 0.862.

Table 11 : Reliability Statistic for 200 respondents

(Online Consumer Satisfaction) (Source : Output from SPSS)

Reliability Statistics

Cronbach's Alpha	N of Items
.886	5

Table 12 : Item-Total Statistics for 200 respondents

(Collaborative Filtering Recommender System)

(Source : Output from SPSS)

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
OCS1	15.67	10.777	.713	.864
OCS2	15.66	11.031	.691	.869
OCS3	15.72	10.424	.767	.851
OCS4	15.71	10.621	.730	.860
OCS5	15.70	10.494	.721	.862

4.5 Reliability Test

According to Sugiyono (2017: 130) the statement that the reliability test is the extent to which the measurement results use the same object, will produce the same data. Besides, reliability refers to accuracy, validity, and repeatability of findings in quantitative research, which means that the results of a researcher are considered reliable, if similar results have been obtained in the same but different circumstances (Mohajan, 2017).

Table 17 showed results based on four different variables and one dependent variable. The number of statements used by the researcher to calculate the study was the N of items, which is 25. The Cronbach's Alpha is appropriate because it has an excellent and higher reliability for all variables, 0.819. 25 questions are analyzed by the Cronbach Alpha, which including five questions for each on content-based filtering, recommendation cluster analysis and collaborative filtering recommender system as independent variables and five more for online consumer satisfaction as the dependent variable. Therefore, Cronbach's Alpha of this research indicates that the question is highly accurate and reliable for the research.

Table 13 : Reliability Statistic for 200 respondents

(All Variable) (Source : Output from SPSS)

Reliability Statistics

Cronbach's Alpha	N of Items
.819	5

4.6 Inferential Analysis

The inferential analysis is used to test whether differences are probably due to the possibility of patterns identified in the descriptive analysis (Monsen, 2017). Inferential statistics tend to conclude population knowledge by making

conclusions about the populations' differences concerning some particular variables or parameters.

4.6.1 Pearson's Corelation Analysis

In response to the objective of this research, to identify the impact between artificial intelligence (AI) recommendation engine technology on online satisfaction which is to identify the relationship of the independent variables and dependent variable. Pearson relationship coefficient is undesirable or misdirected. It explores how well monotonous discretion can represent a relationship between two factors without presuming that these factors are repetitively distributed (Thirumalai et al., 2017). Therefore, in measuring the interconnection between the variables in this study based on Table , a Pearson relationship coefficient was used. The correlation coefficient (r) estimate of -1 is negatively related and $+ 1$ is a positive relationship. To achieve an average result used as part of correlation analysis and hierarchical regression analysis, a construction's multi-functionality was designed. Correlations between independent and dependent variables may show the degree of intensity and importance of the relationship. The following table is the rules of thumb of the interpretation of the size of a correlation coefficient:

Table 14 : Rule of Thumb for Interpreting the
Size of a Correlation Coefficient

(Source : Scientifics Research)

Size of Correlation	Interpretation
0.90 to 1.0	Very high positive correlation
0.70 to <0.90	High positive correlation
0.50 to <0.70	Moderate positive correlation
0.30 to <0.50	Low positive correlation
0.00 to <0.30	Negligible correlation

The results of the correlations between each independent variable and the dependent variable have been shown in Table . First of all, the correlation relationship between the first independent variable, content-based filtering (CF) and dependent variable, online consumer satisfaction (OCS) is showed that there is significant (p-value = 0.000), moderate positive correlation ($r = 0.707^{**}$). Secondly, correlation relationship between the second independent variable, recommendation cluster analysis (RCA) and dependent variable, online consumer satisfaction (OCS) is significant (p-value = 0.000), moderate positive correlation ($r = 0.799^{**}$). Next, correlation relationship between the third variable, collaborative filtering recommender system (CFRS) and dependent variable, online consumer satisfaction (OCS) is significant (p-value = 0.000), moderate positive correlation ($r = 0.806^{**}$).

Furthermore, the result of the correlation strength among two continuous variables has also been shown in Table 19. First of all, correlation relationship between the first independent variable, content-based filtering (CF) and the second independent variable, recommendation cluster analysis (RCA) is significant (p-value = 0.000), moderate positive correlation ($r = 0.779^{**}$). Secondly, correlation relationship between the first independent variable, content-based filtering (CF) and the third independent variable, collaborative filtering recommender system (CFRS) is significant (p-value = 0.000), moderate positive correlation ($r = 0.728^{**}$). Thirdly, correlation relationship between the second independent variable, recommendation cluster analysis (RCA) and third independent variable, collaborative filtering recommender system (CFRS) is significant (p-value = 0.000), moderate positive correlation ($r = 0.789$).

To summarize, the variables are important and interrelated and the association between them is positive.

Table 15: Corellations

(Source : Output from SPSS)

Correlations

		CF	RCA	CFRS	OCS
	Pearson Correlation	1	.779**	.728**	.707**
CF	Sig. (2-tailed)		.000	.000	.000
	N	200	200	200	200
	Pearson Correlation	.779**	1	.789**	.799**
RCA	Sig. (2-tailed)	.000		.000	.000
	N	200	200	200	200
	Pearson Correlation	.728**	.789**	1	.806**
CFRS	Sig. (2-tailed)	.000	.000		.000
	N	200	200	200	200
	Pearson Correlation	.707**	.799**	.806**	1
OCS	Sig. (2-tailed)	.000	.000	.000	
	N	200	200	200	200

** . Correlation is significant at the 0.01 level (2-tailed).

4.6.2 Multiple Regression Linear (MLR)

For this analysis, the simultaneous effects from several independent variables, which content-based filtering, recommendation cluster analysis and collaborative filtering recommendation system on the scaled interval dependent variable, which is online consumer satisfaction were evaluated using multiple regression analysis. Therefore, multiple regression analysis aims to learn and understand the degree to which a variety of predictors clarify the variance in the dependent variable.

Based on the Model Summary Table (20), the findings indicate that the correlation coefficient of (R) value is 0.850, which there is a high positive correlation between independent variables, which content-based filtering, recommendation cluster analysis and collaborative filtering recommender

system, on the dependent variable, which is online consumer satisfaction in this study. Furthermore, the value of R square is 0.723, which means it had 72.3% of the variance affected content-based filtering, recommendation cluster analysis and collaborative filtering recommender system. The remaining 27.7% were then affected by other factors not included in the study.

Table 16 : Model Summary

(Source : Output from SPSS)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.850 ^a	.723	.719	2.136

a. Predictors: (Constant), CFRS, CF, RCA

Based on Table 21 analysis of the ANOVA, it was shown that the F-test value was 170,427 and that the $p = 0.000$ value was significant. This result means that the overall probability of the relationship between the dependent variable, which is online consumer satisfaction and all independent variables, which is content-based filtering, recommendation cluster analysis and collaborative filtering recommender system.

This analysis shows that the p-value is 0.000 and that the probability for these findings is below 0.05. Thus, the relationship between independent and dependent variables is significant.

Table 17 : ANOVA

(Source : Output from SPSS)

ANOVA^a

	Regression	2331.716	3	777.239	170.427	.000 ^b
1	Residual	893.864	196	4.561		
	Total	3225.580	199			

a. Dependent Variable: OCS

4.6.2.1 Hypothesis Analysis Test

Regression analysis was chosen to assess the impact of independent variables to achieve hypotheses testing. Such analyzes examine whether or not the findings are accurate. The t-value is greater than 1.96 and the p-value less than 0.05 will support this hypothesis (Samudro et al., 2020). Thus, when the p-value is more than 0.05, the independent variable did not have a significant impact on the dependent variable. In the regression analysis, the independent variables were content-based filtering, recommendation cluster analysis and collaborative filtering recommender system while online consumer behavior was the dependent variable. As seen in table 28 and outlined in table 29, the findings of the hypotheses are concerned.

Hypothesis Testing 1 :

- H₀: **Content-based** Filtering has no impact on Online Consumer Satisfaction
- H₁: **Content-based** Filtering impact on Online Consumer Satisfaction

The results of the regression indicate that the Beta value = 0.088 and t-value = 2.401 at a significance level of 0.000, which is lower than 0.05. It means that content-based filtering has a significant relationship with online consumer satisfaction and its t-value exceeds 1.96. Thus, the alternative hypothesis, H₁ is supported and null hypothesis, H₀ is rejected.

Hypothesis Testing 2:

H₀: Recommendation Cluster Analysis has no impact on Online Consumer Satisfaction

H₁: Recommendation Cluster Analysis impact on Online Consumer Satisfaction

The results of the regression indicate that the Beta value = 0.386 and t-value = 5.509 at a significance level of 0.000, which is lower than 0.05. It means that recommendation cluster analysis has a significant relationship with online consumer satisfaction and its t-value exceeds 1.96. Thus, the alternative hypothesis, H₁ is supported and null hypothesis, H₀ is rejected.

Hypothesis Testing 3:

H₀: Collaborative Filtering Recommender System has no impact on Online Consumer Satisfaction

H₁: Collaborative Filtering Recommender System impact on Online Consumer Satisfaction

The results of the regression indicate that the Beta value = 0.438 and t-value = 6.832 at a significance level of 0.000, which is lower than 0.05. It means that collaborative filtering recommender System has a significant relationship with customer loyalty and its t-value exceeds 1.96. Thus, the alternative hypothesis, H₁ is supported and null hypothesis, H₀ is rejected.

Table 19 : Coefficient (Source : Output from SPSS)

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.470	.830		1.772	.078
1 CF	.092	.065	.088	2.401	.000
RCA	.391	.071	.386	5.509	.000
CFRS	.448	.066	.438	6.832	.000

a. Dependent Variable: OCS

b. Predictors (Constant), CFRS, CF, RCA

Table 18 : Summary of Hypothesis Testing

Hypothesis	Result
Content-based Filtering impact on Online Consumer Satisfaction	Supported
Recommendation Cluster Analysis impact on Online Consumer Satisfaction	Supported
Collaborative Filtering Recommender System impact on Online Consumer Satisfaction	Supported

4.7 Conclusion

Five types of analysis have been used in this chapter in interpretation of data collected by surveys from 200 respondents such as descriptive statistical analysis, reliability analysis, Pearson correlation analysis, multiple regression analysis, and hypothesis testing. With SPSS version 20, all data were collected and analyzed. Therefore, Chapter 5 will discuss more finding and implications.