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Marketing Research Quantitative Analysis for Large Sample: Comparing of Lisrel, Tetrad, GSCA, Amos, SmartPLS, WarpPLS, and SPSS

Agus Purwanto[1], Masduki Asbari[2], Teguh Iman Santoso[3], Marissa Grace Haque[4], Nurjaya[5]
[1]Universitas Bina Bangsa, Indonesia
[1]AGUSPATI Research Institute, Indonesia
[2]STMIK Insan Pembangunan, Indonesia
[3]Universitas Sumatera Selatan, Indonesia
[4]STIE Indonesia Banking School, Kota Jakarta Selatan, DKI Jakarta, Indonesia
[5]Universitas Suryakancana, Cianjur, Jawa Barat, Indonesia
Email: aguspurwanto.prof@gmail.com

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ABSTRACT

The purpose of this study is to compare the results of quantitative research data analysis in the marketing field using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software for a large sample, in this study the number of samples was 500 respondents. This research method is quantitative and research data analysis uses the four types of software to obtain a comparison of the results of the analysis. The analysis in this study focuses on the analysis of hypothesis testing and regression analysis. The data from this study uses quantitative data derived from questionnaire data totaling 500 respondents with three research variables, namely the independent variable digital marketing, customer satisfaction, and the dependent variable customer loyalty. Based on the results of the analysis using Lisrel, GSCA, SPSS, SmartPLS, WarpPLS and Amos software for a large sample of 500 respondents, the results showed that there was no significant difference in the significance value of p-value and t-value. There is also no significant difference in the determination value, and the correlation value in the resulting structural equation also has no significant difference in results.

Keywords: Data analysis; Lisrel; Tetrad; GSCA; SPSS; SmartPLS; WarpPLS; Amos; Marketing Research

INTRODUCTION

In this digital era, the use of statistical software such as Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos dominates most of the quantitative research in the social sciences, especially in the marketing field. AMOS stands for Analysis of Moment Structure is one of the CB-SEM programs with the advantages of being relatively easy to operate and the user interface does not use a coding program, but is considered to have drawbacks, namely the price is relatively expensive, unable to eliminate variables that make the results invalid before running on structural equation model or SEM (Hair, 2014). The use of Amos software for research in the field of marketing was carried out by Rahi, S., & Abd Ghani, M. (2018) who examined a structural equation modeling (SEM-AMOS) to investigate brand loyalty and

customer intentions towards internet banking adoption. Hair, J. F., Gabriel, M., & Patel, V. (2014) analyzed the AMOS covariance-based structural equation modeling (CB-SEM) as a guide for its application as a marketing research tool. Levin, N., Zahavi, J., & Olitsky, M. (1995) investigated AMOS for a probability-driven customer-oriented decision support system for target marketing. Sia, L.A., & Tan, T.A.G. (2016) examined the effect of organizational justice on job satisfaction in a hotel. Ganguli, S., & Roy, S. K. (2011) examined the dimensions of service quality based on generic technology in banking as an impact on customer satisfaction and loyalty. Hunjra, A. I., Akhtar, M. N., Akbar, S. W., & Niazi, G. S. K. (2011) examined the relationship between customer satisfaction and service quality of Islamic banks. Rosenbaum, M. S., & Spears, D. (2009) used group comparisons in AMOS to examine customer purchase satisfaction.

LISREL is the third and most frequently used statistical software in education. LISREL stands for Linear Structural Relationship. Initially developed by Karl Joreskog (1973) which is the name of a structural equation model. There have been many researches in marketing using lisrel, namely by Steenkamp, J. B. E., & Van Trijp, H. C. (1991) use of LISREL in validating marketing constructs. Gunawan, A., & Wahyuni, S. F. (2018) analyze the effect of marketing mix, service quality, Islamic values and institutional image on students' satisfaction and loyalty. Rahman, F. Y., Yuliati, L. N., & Simanjuntak, M. (2019) analyze the influence of marketing mix and word of mouth towards brand image and usage of online bike usage. Indonesian Asgarnezhad Nouri, B., Zarei, G., Bashirkhodaparasti, R., Saebnia, S., & Nazer Asl, A. (2020) examining the impact of marketing capabilities and marketing strategies on business performance of export firms. Murpraptomo, S. H., Yuliati, L. N., & Sartono, B. (2019) analyze the influence of marketing mix, perceived risk, and satisfaction on word of mouth in clinic. Limakrisna, N., & Zahara, R. (2017) analyze the determinants of pharmaceutical industries marketing performance. Danurdara, A. B., Hidayah, N., & Masatip, A. (2017) anayze experiential marketing the customer value. Dehghani Soltani, M., Mohammadi, E., Hemmati, A., & Raufi, M. (2020) analyze of the impact of customer relationship management on marketing performance by clarifying mediating role of innovation and marketing memory.

GSCA (Generalized Structured Component Analysis) is a variant-based Structural Equation Modeling (SEM) or often referred to as component-based, which is a powerful analysis method because it is not based on many assumptions. GSCA has a single criterion consistently to minimize residuals in order to get an estimate of model parameters so that GSCA provides an optimal solution and can provide a mechanism to assess the overall goodness-fit of the model. Research in the field of marketing that uses GSCA as software was carried out by Afthanorhan, A., Foziah, H., Rusli, R., & Khalid, S. (2019) analyze reflective constructs in generalized structure component analysis to service quality and customer. Purwaningsih, I., Surachman, S., Pratikto, P., & Santoso, I. (2019) analyze the influence of packaging elements on beverage product marketing. Hermawati, A. (2020) analyzes transglobal leadership approach to sustainable tourism competitiveness at tourism sector-engaged MSMEs through integrated human resource performance and responsible marketing. Sutantio, R. A., Sularso, R. A., Irawan, B., & Dimyati, M. (2020) analyze examination of the effect of adaptive selling, customer preference, and customer satisfaction on customer trust toward cluster housing developers. Langga, A. (2021) analyze the influence of intensive distribution and sales promotion towards corporate image, customer-based brand equity, repurchase intention and word of mouth using generalized structured component analysis. Sihombing, S., Astuti, E. S., Al Musadieq, M.,

Hamied, D., & Rahardjo, K. (2018) analyze the effect of servant leadership on rewards, organizational culture and its implications for employee's performance. Cooper, L., Newell, A., & Atkinson, D. (2019) investigating the impact growth has on customer satisfaction and brand loyalty

SPSS stands for Statistical Package for the Social Sciences which has a user friendly interface with an easy-to-use way and is commonly used for processing and analyzing data with statistical analysis capabilities and a data management system with a graphical environment. This software is usually used for social sciences only, but subsequent developments are used for various disciplines. Research in the field of marketing that uses SPSS as a data analysis tool, namely Karim, R., & Chowdhury, T. (2014) analyzes customer satisfaction on service quality in the private commercial banking sector. Saad, N.M. (2012) analyzed customer satisfaction at Islamic and conventional banks. Vujić, M., OrĎevi, S., & Lakićevi, M. (2019) analyzed service quality and customer satisfaction in the hospitality industry. Yaghoubi, M., Asgari, H., & Javadi, M. (2017) analyzed the impact of management customer relations on organizational productivity, customer trust and satisfaction by using a structural equation model. Tong, J., & Shen, J. (2021) analyzed customer satisfaction based on two discount promotion strategies. Yaghoubi, M., Asgari, H., & Javadi, M. (2017) analyzed customer relationship management on organizational productivity, customer trust and satisfaction in hospitals. Nwoko, EG, Eze, P., & Maduka, CO (2021) analyzed the influence of internal marketing on customer satisfaction. Nasution, M. A., Siregar, Z. M. E., & Pristiyono, P. (2021) analyzing the satisfaction and loyalty of Indonesian customers after COVID-19.

SmartPLS or Smart Partial Least Square is statistical software with the same goal of testing the relationship between variables, both among latent variables and with indicator variables (Asbari et al.2019). The use of Smart PLS is highly recommended when we have a limited number of samples while the model built is quite complex. The advantages of SmatPLS are that it is easier to use, the price of the software is more competitive, while the drawback is that not all types of SEM can be done because this software is dedicated to processing SEM data with small samples, so it is not suitable for research with large samples. Research in the field of marketing that uses SmartPLS as a data analysis tool, namely Khoi, B. H., & Van Tuan, N. (2018) analyzes the quality of internet services. Pegas, Cham. Thaker, H. M. T., Sakaran, K. C., Nanairan, N. M., Thaker, M. A. M. T., & Hussain, H. I. (2020) analyze non-Muslim loyalty to Islamic banking. Johan, Z.J., Hussain, M.Z., Mohd, R., & Kamaruddin, B.H. (2020) analyzes the interest of Muslim and non-Muslim customers intending to have a credit card that is compliant with sharia. Raj, S., Nijjer, S., Ongsakul, V., & Singh, H. (2019) analyze the determinants of the main aspects of job satisfaction in the banking sector. Setiawan, E.B. (2021) analyze customer loyalty through customer experience, perceived price, and customer satisfaction. da Costa Oliveira, Z.C., Saldanha, E.S., & Vong, M. (2020) analyzed the mediating effect of restaurant image on the relationship between service & food quality and customer satisfaction. Rivai, J. (2021) analyzed the role of purchasing decisions in mediating product quality, price perception, and brand image on customer satisfaction. Al-Slehat, Z.A.F. (2021) analyzing the influence of the quality of banking services.

WarpPLS is a variant-based SEM model analysis software or better known as Partial Least Square. SEM analysis model with WarpPLS can identify and estimate the relationship between latent variables whether the relationship is linear or non-linear (Hair et al., 2014).

Research in the field of marketing that uses WarptPLS as a data analysis tool, namely Gunawan, D., & Arseto, D.D. (2021) analyzed the smartphone customer satisfaction model during the pandemic. Sholeh, M. S., & Bamban, R. (2021) analyzed the effect of service quality, facilities and prices on customers. García-Alcaraz, J. L., Montalvo, F. J. F., Sánchez-Ramírez, C., Avelar-Sosa, L., Saucedo, J. A. M., & Alor-Hernández, G. (2019) analyzes organizational structures for TQM success and customer satisfaction. Parawansa, D.A.S. (2018) analyzed the effect of commitment and customer satisfaction on the relationship between service quality and customer retention. Isaskar, R., Darwanto, D. H., & Waluyati, L. R. (2019) analyzed consumer satisfaction with products. Susanta, S., Widjanarko, H., Utomo, HS, & Suratna, S. (2019) analyzed the role of satisfaction as mediating the effect of relational benefits on bank customer commitment. Setya, BI, & Soni, H. (2018) analyzed the effect of image brands and products on customer satisfaction and willingness to pay.

TETRAD is a program for creating, simulating data from, estimating, testing, predicting, and searching for, statistical causal models and the aim of this program is to provide a cutting-edge, user-friendly method that requires minimal statistical expertise and programming knowledge (Gudergan, S.P., Ringle, C.M., Wende, S. and Will, A., , 2008).This program is not intended to be a substitute for a flexible statistical programming system. TETRAD is freeware that can perform many functions in commercial programs. TETRAD is limited to models with categorical data which can also be used for ordinal data and linear models of structural equation models with Normal distribution and for some time series models. Tabet, S. M., Lambie, G. W., Jahani, S., & Rasoolimanesh, S. M. (2020) the TETRAD program describes the causal model in three main parts or stages: firstly an image, presenting a graph of the causal relationship between hypothetical variables, secondly specifying the family of probability distributions and types of parameters related to the model graphically and thirdly specifying the numerical values of these parameters. The development of SEM methods is becoming increasingly significant in the practice of social, behavioral and management research along with advances in information technology. Hamann, P. M., & Schiemann, F. (2021) CB-SEM has several limitations including the number of samples that must be large, the data must be normally distributed multivariately, the indicators must be reflective, the model must be based on theory, and there is indetermination. To overcome these limitations, a component-based SEM or variant called Partial Least Square (PLS) was developed.

Many studies have compared the results of research software comparisons, namely Velmurugan, M.S., & Velmurugan, M.S. (2017) examines adoption of information technology on 3G mobile phones in India: empirical analysis with SPSS 20, SmartPLS2. 0M3 and LISREL8. Ong, M. H. A., & Puteh, F. (2017) analyzed quantitative data selecting between SPSS, PLS, and AMOS in social science research. Nam, S.T., Kim, D.G., & Jin, C.Y. (2018) analyzed the comparison of structural equation modeling (AMOS, LISREL and PLS). Bacon, L. D. (1999) used LISREL and PLS to measure customer satisfaction. Jahn, S. (2007) structural equation modeling with LISREL, AMOS and SmartPLS. Hair Jr, JF, Matthews, LM, Matthews, RL, & Sarstedt, M. (2017) analyzing PLS-SEM or CB-SEM: current guidelines on which method to use. Amaro, S., Abrantes, JL, & Seabra, C. (2015) compared the results of CB-SEM and PLS-SEM. Ali, F., & Kim, W. G. (2015) conducted a comparison of CB-SEM and PLS-SEM for theory development in hospitality research. Many researchers have doubts about the software that will be used for their research, previous research by Purwanto et al. (2021) compared the use of statistical software such as Amos, SmartPLS, WarpPLS, and SPSS with a

medium sample size of 120 respondents, therefore there needs to be a study or research that is able to answer this problem, especially for larger samples. The purpose of this study was to compare the results of research data processing in the field of marketing using SPSS, SmartPLS, WarpPLS and Amos software with a large sample.

METHOD

This research method is quantitative, research data analysis uses Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software to obtain a comparison of the results of the analysis. The analysis in this study focuses on the analysis of hypothesis testing and regression analysis. Regression analysis is used to measure how much influence the independent variable has on the dependent variable. The data from this study used quantitative data derived from questionnaire data with a large sample of 500 respondents. In the data there are 3 variables, namely the independent variable digital leadership, customer satisfaction, and the dependent variable customer loyalty which was developed from Bernato et al. (2020); Juliana et al.(2021); Purwanto et al.(2020); Asbari et al. (2021) and Novitasari et al (2020) with the following research model:

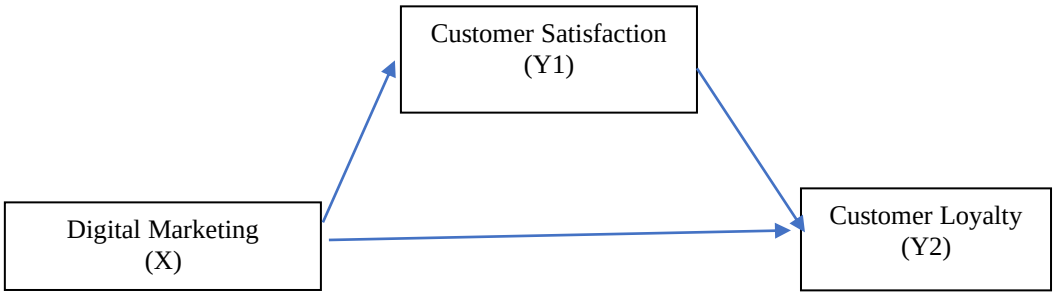

Fig 1. Research Model

X is digital marketing, Y1 is customer satisfaction and Y2 is customer loyalty. The relationship models to be analyzed are as follows:

1. The relationship between digital marketing (X) and customer loyalty (Y2).
2. The relationship between digital marketing (X) and customer satisfaction (Y1).
3. The relationship between customer satisfaction (Y1) and customer loyalty (Y2).
4. The relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction (Y1).

RESULT AND DISCUSSION

Testing the Significance of t-Value

The first stage of data analysis is testing the significance of the relationship between the independent digital marketing variable (X), with the dependent variable customer satisfaction

(Y1) and customer loyalty (Y2). By looking for t-Value using SPSS, Amos, SmartPLS, WarpPLS and SPSS software. the decision criteria if the t-Value value is greater than 1.96 or > 1.96 then the relationship is significant, if less than 1.96 or < 1.96 then the relationship is not significant (Hair et al. 2014). For WarplPLS does not produce a t-statistic value, the significance test can be seen on the p-value, so that the t-statistic value will be obtained.

The test results with 4 software for a direct relationship can be seen in Table 1 below:

Table 1
Comparison of t-Value Results Direct Relationship

	Amos	Lisrel	GSCA	Tetrad	SmartPLS	WarpPLS	SPSS	Result
X -Y1	28.765	27.654	-	12.3097	30,030	-	24.690	Significant
X -Y2	6.213	6.176	-	17.9694	5,996	-	7.113	Significant
X- Y1-Y2	9.983	9.182	-	2.1666	9.663	-	10.161	Significant

Source: Lisrel. SPSS, SmartPLS, WarpPLS and Amos Processing Results (2021)

1. The relationship between digital marketing (X) and customer satisfaction (Y1)

Based on the results of the Amos software analysis, the results of the t-Value using Amos of 28,765 are greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant. The t-Value using SmartPLS is 30,030, which is greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant. The results of the t-Value using SPSS of 24,690 are greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant. The results of the t-Value using Lisrel is 27,654 are greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant Tests using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software gave the same results, which were significant.

2. The relationship between digital marketing (X) and customer loyalty (Y2)

Based on the results of the software analysis, the results of the t-Value using Amos of 6213 are greater than 1.96 so that it is concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant. The t-Value using SmartPLS is 5,996, which is greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant. The results of the t-Value using SPSS of 7,113 are greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant. The results of the t-Value using Lisrel is 6.176 are greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant Tests using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software gave the same results, which were significant.

3. The relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1)

Based on the results of the software analysis, the results of the t-Value using Amos of 9983 are greater than 1.96 so that it is concluded that the relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1) is significant. The t-Value using SmartPLS is 9,663 which is greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1) is significant. The results of the t-Value using SPSS of 10,161 are greater than 1.96 so that it is concluded that the relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1)) is significant. The results of the t-Value using Lisrel is 9.182 are greater than 1.96, so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1) is significant. Tests using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software gave the same results, which were significant.

Testing the Significance of p-Value

The second stage is data analysis, namely testing the significance of the relationship between the independent digital marketing variable (X) with the dependent variable customer loyalty (Y2) and customer satisfaction (Y1) by looking for p-value using SPSS, Amos, SmartPLS, WarpPLS and SPSS software. the decision if the p-value is less than 0.050 or <0.050 then the relationship is significant, if it is more than 0.050 or >0.050 then the relationship is not significant (Hair et al. 2014).

The test results with 4 software for direct connection are as follows:

Table 2
Comparison of P-value

	Amos	Lisrel	GSCA	Tetrad	SmartPLS	WarpPLS	SPSS	Result
X -Y1	0,001	0.001	-	0.000	0.000	0.001	0.000	Significant
X -Y2	0,000	0.000	-	0.000	0.000	0.001	0.000	Significant
X- Y1-Y2	0,001	0.000	-	0.030	0.000	0.001	0.000	Significant

Source: Lisrel. SPSS, SmartPLS, WarpPLS and Amos Processing Results (2021)

1. The relationship between digital marketing (X) and customer satisfaction (Y1)

Based on the results of the software analysis, the p-value using Amos was 0.001 less than 0.050 so that it was concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) was significant. The p-value using SmartPLS is 0.000 less than 0.050 so it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant. The p-value using WarpPLS is 0.001 less than 0.050 so it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant. The p-value using SPSS is 0.000 less than 0.050 so that it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant. The p-value using Lisrel is 0.000 less than 0.050 so that it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant .Tests using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software gave the same results, which were significant.

2. The relationship between digital marketing (X) and customer loyalty (Y2)

Based on the results of the software analysis, the p-value using Amos is 0.00 smaller than 0.050 so that it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant. The p-value using SmartPLS is 0.000, which is smaller than 0.050, so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant. The p-value using WarpPLS is 0.001 smaller than 0.050, so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant. The results of the p-value using SPSS of 0.000 is less than 0.050 so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant. The p-value using Lisrel is 0.000 less than 0.050 so that it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) is significant .Tests using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software gave the same results, which were significant.

3. The relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1)

Based on the results of the software analysis, the p-value using Amos was 0.001 less than 0.050, so it was concluded that the relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1) was significant. The p-value using SmartPLS is 0.000 less than 0.050 so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1) is significant. The p-value using WarpPLS is 0.000 less than 0.050 so it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) through customer satisfaction mediation (Y1) is significant. The p-value using SPSS is 0.000 less than 0.050 so that it can be concluded that the relationship between digital marketing (X) and customer loyalty (Y2) through the mediation of customer satisfaction (Y1) are significant. The p-value using Lisrel is 0.000 less than 0.050 so that it can be concluded that the relationship between digital marketing (X) and customer satisfaction (Y1) is significant .Tests using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software gave the same results, which were significant.

Coefficient of Determination Test

Testing the coefficient of determination to calculate the influence of the independent variable on the dependent variable. In this study, the R Square termination coefficient was calculated for the independent digital marketing variable (X) with the dependent variable customer loyalty (Y2) and customer satisfaction (Y1). The results of the R Square test using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos are as follows:

Table 3
Comparison of R Square Hasil Results

	Amos	Lisrel	Tetrad	GSCA	SmartPLS	WarpPLS	SPSS
Y1	0,512	0.519	0.000	0.522	0.536	0.520	0.551
Y2	0,524	0.534	0.000	0.514	0.543	0.540	0.540

Source: Lisrel, SPSS, SmartPLS, WarpPLS and Amos Processing Results (2021)

Based on the results in Table 3, the R Square value for customer satisfaction (Y1) using Lisrel software is 0.522 or 52.2%, meaning that the customer satisfaction variable (Y1) is influenced by the digital marketing variable (X) by 52.2% while the remaining 47.8% is affected. by other variables not discussed in this study. The R Square value for customer satisfaction (Y1) using GSCA software is 0.514 or 51.4%, meaning that the customer satisfaction variable (Y1) is influenced by the digital marketing variable (X) by 51.4% while the remaining 48.6% is affected. by other variables not discussed in this study. The R Square value for customer satisfaction (Y1) using Amos software is 0.512 or 51.2%, meaning that the customer satisfaction variable (Y1) is influenced by the digital marketing variable (X) by 51.2% while the remaining 48.8% is affected. by other variables not discussed in this study. The value of R Square for customer satisfaction (Y1) using SmartPLS software is 0.536 or 53.6%, meaning that the customer satisfaction variable (Y1) is influenced by the digital marketing variable (X) by 53.6% while the remaining 46.4% is influenced by other variables not discussed. in this research. The value of R Square for customer satisfaction (Y1) using WarpPLS software is 0.520 or 52.0%, meaning that the customer satisfaction variable (Y1) is influenced by the digital marketing variable (X) by 52.0% while the remaining 48.0% is influenced by other variables not discussed. in this research. The value of R Square for customer satisfaction (Y1) using SPSS software is 0.551 or 55.1%, meaning that the customer satisfaction variable (Y1) is influenced by the digital marketing variable (X) by 55.1% while the remaining 44.9% is influenced by other variables not discussed. in this research.

Based on the results in Table 3, the R Square value for customer loyalty (Y2) using Amos software is 0.524 or 52.4%, meaning that the customer loyalty variable (Y2) is influenced by digital marketing variables (X) and customer satisfaction (Y1) by 52.4 % while the remaining 47.6% is influenced by other variables not discussed in this study. The value of R Square for customer loyalty (Y2) using Lisrel software is 0.534 or 53.4%, meaning that the customer loyalty variable (Y2) is influenced by digital marketing variables (X) and customer satisfaction (Y1) by 53.4% while the remaining 46.6% is influenced by by other variables not discussed in this study. The value of R Square for customer loyalty (Y2) using GSCA software is 0.514 or 51.4%, meaning that the customer loyalty variable (Y2) is influenced by digital marketing variables (X) and customer satisfaction (Y1) by 51.4% while the remaining 48.6% is influenced by by other variables not discussed in this study. The value of R Square for customer loyalty (Y2) using SmartPLS software is 0.543 or 54.3%, meaning that the customer loyalty variable (Y2) is influenced by digital marketing variables (X) and customer satisfaction (Y1) by 54.3% while the remaining 46.7% is influenced by by other variables not discussed in this study. The value of R Square for customer loyalty (Y2) using WarpPLS software is 0.540 or 54.0%, meaning that the customer loyalty variable (Y2) is influenced by digital marketing variables (X) and customer satisfaction (Y1) by 54.0% while the remaining 46.0% is influenced by by other variables not discussed in this study. The value of R Square for customer loyalty (Y2) using SPSS software is 0.540 or 54.0%, meaning that the customer loyalty variable (Y2) is influenced by digital marketing variables (X) and customer satisfaction (Y1) by 54.0% while the remaining 46.0% is influenced by by other variables not discussed in this study.

Correlation Coefficient Test

The correlation coefficient shows the strength of the linear relationship and the direction of the relationship between variables. If the correlation coefficient is positive, then the two variables have a unidirectional relationship. This means that if the value of the variable X is high, then the value of the variable Y will be high as well. Conversely, if the correlation coefficient is negative, then the two variables have an inverse relationship. This means that if the value of the variable X is high, then the value of the variable Y will be low and vice versa. According to Hair et al (2017) to make it easier to interpret the strength of the relationship between two variables, the following criteria are provided:

- 0 means there is no correlation between two variables
- >0.00 – 0.25 means the correlation is very weak
- > 0.25 – 0.50 means enough correlation
- >0.50 – 0.75 means strong correlation
- > 0.75 – 0.99 means the correlation is very strong
- 1.00 means perfect correlation

The results of testing the correlation coefficient for structural equations using Amos, SmartPLS, WarpPLS and SPSS software are as follows:

Table 4
Comparison of Structural Equation Results

Software	equation
Amos	Y1= a+ 0.718X + e
	Y2= a+ 0.476X + 0.334Y1 +e
Lisrel	Y1= a+ 0.723X + e
	Y2= a+ 0.454X + 0.381Y1 +e
Tetrad	Y1=a -0.5819X1 + e
	Y2=a -0.6874X1 +0.6721Y1 +e
GSCA	Y1= a+ 0.502X + e
	Y2= a+ 0.474X + 0.384Y1 +e
SmartPLS	Y1= a+ 0.732X + e
	Y2= a+ 0.462 + 0.328Y1 +e
WarpPLS	Y1= a+ 0.720X + e
	Y2= a+ 0.435X + 0.363Y1 + e
SPSS	Y1= 6.854 + 0.848X + e
	Y2= 5.353 + 0.379X + 0.474Y1 + e

Source: Lisrel, SPSS, SmartPLS, WarpPLS and Amos Processing Results (2021)

The results of the structural equation using Lisrel software obtained a direct equation is Y1 = a + 0.723X + e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer satisfaction (Y1) is 0.723, meaning that there is a strong correlation and shows that if the digital marketing value (X) increases by 1 unit, then the value of customer satisfaction (Y1) will increase by 0.723. This means that the direct effect of digital marketing (X) on customer satisfaction (Y1) is 72.3%. The indirect equation is Y2= a+ 0.454X + 0.381Y1 +e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer loyalty (Y2) is 0.454, meaning that there is sufficient

correlation and indicates that if the value of digital marketing (X) increases of 1 unit, while the value of customer satisfaction (Y1) remains, the value of customer loyalty (Y2) will increase by 0.454. This means that the effect of digital marketing (X) on customer loyalty (Y2) partially is 45.4%. The value of the correlation coefficient of the influence of the customer satisfaction variable (Y1) on customer loyalty (Y2) is 0.381, meaning that there is a sufficient correlation and shows that if the value of customer loyalty (X) increases by 1 unit, while the value of digital marketing (X) remains the value of customer loyalty. (Y2) will increase by 0.381 . This means that the effect of customer satisfaction (Y1) on customer loyalty (Y2) partially is 38.1%.

The results of the structural equation using GSCA software obtained a direct equation is Y1 = a + 0.502X + e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer satisfaction (Y1) is 0.502, meaning that there is a strong correlation and shows that if the digital marketing value (X) increases by 1 unit, then the value of customer satisfaction (Y1) will increase by 0.5023. This means that the direct effect of digital marketing (X) on customer satisfaction (Y1) is 50.2%. The indirect equation is Y2= a+ 0.474X + 0.384Y1 +e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer loyalty (Y2) is 0.474, meaning that there is sufficient correlation and indicates that if the value of digital marketing (X) increases of 1 unit, while the value of customer satisfaction (Y1) remains, the value of customer loyalty (Y2) will increase by 0.474. This means that the effect of digital marketing (X) on customer loyalty (Y2) partially is 47.4%. The value of the correlation coefficient of the influence of the customer satisfaction variable (Y1) on customer loyalty (Y2) is 0.384, meaning that there is a sufficient correlation and shows that if the value of customer loyalty (X) increases by 1 unit, while the value of digital marketing (X) remains the value of customer loyalty. (Y2) will increase by 0.384 . This means that the effect of customer satisfaction (Y1) on customer loyalty (Y2) partially is 38.4%.

The results of the structural equation using Amos software obtained a direct equation is Y1 = a + 0.718X + e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer satisfaction (Y1) is 0.718, meaning that there is a strong correlation and shows that if the digital marketing value (X) increases by 1 unit, then the value of customer satisfaction (Y1) will increase by 0.718. This means that the direct effect of digital marketing (X) on customer satisfaction (Y1) is 71.8%. The indirect equation is Y2= a+ 0.476X + 0.334Y1 +e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer loyalty (Y2) is 0.476, meaning that there is sufficient correlation and indicates that if the value of digital marketing (X) increases of 1 unit, while the value of customer satisfaction (Y1) remains, the value of customer loyalty (Y2) will increase by 0.476. This means that the effect of digital marketing (X) on customer loyalty (Y2) partially is 47.6%. The value of the correlation coefficient of the influence of the customer satisfaction variable (Y1) on customer loyalty (Y2) is 0.334, meaning that there is a sufficient correlation and shows that if the value of customer loyalty (X) increases by 1 unit, while the value of digital marketing (X) remains the value of customer loyalty. (Y2) will increase by 0.334 . This means that the effect of customer satisfaction (Y1) on customer loyalty (Y2) partially is 33.4%.

The results of the structural equation using SmartPLS software obtained a direct equation is Y1 = a + 0.732X + e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer satisfaction (Y1) is 0.732, meaning that there is a strong correlation and shows that if the digital marketing value (X) increases by 1 unit, then the value

of customer satisfaction (Y1) will increase by 0.732. This means that the direct effect of digital marketing (X) on customer satisfaction (Y1) is 73.2%. The indirect equation is Y2= a+ 0.462X + 0.328Y1 +e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer loyalty (Y2) is 0.462, meaning that there is sufficient correlation and indicates that if the value of digital marketing (X) increases of 1 unit, while the value of customer satisfaction (Y1) remains, the value of customer loyalty (Y2) will increase by 0.462. This means that the effect of digital marketing (X) on customer loyalty (Y2) partially is 46.2%. The correlation coefficient value of the influence of the customer satisfaction variable (Y1) on customer loyalty (Y2) is 0.328, meaning that there is sufficient correlation and shows that if the value of customer loyalty (X) increases by 1 unit, while the value of digital marketing (X) remains, the value of customer loyalty (Y2) will increase by 0.328 . This means that the effect of customer satisfaction (Y1) on customer loyalty (Y2) partially is 32.8%.

The results of the structural equation using WarpPLS software obtained a direct equation is Y1 = a + 0.720X + e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer satisfaction (Y1) is 0.720, meaning that there is a strong correlation and shows that if the digital marketing value (X) increases by 1 unit, then the value of customer satisfaction (Y1) will increase by 0.720. This means that the direct effect of digital marketing (X) on customer satisfaction (Y1) is 72.0%. The indirect equation is Y2= a+ 0.435X + 0.363Y1 +e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer loyalty (Y2) is 0.462, meaning that there is sufficient correlation and indicates that if the value of digital marketing (X) increases of 1 unit, while the value of customer satisfaction (Y1) remains, the value of customer loyalty (Y2) will increase by 0.435. This means showing the effect of digital marketing (X) on customer loyalty (Y2) partially is 43.5%. The correlation coefficient value of the influence of the customer satisfaction variable (Y1) on customer loyalty (Y2) is 0.435, meaning that there is sufficient correlation and shows that if the value of customer loyalty (X) increases by 1 unit, while the value of digital marketing (X) remains, the customer loyalty value (Y2) will increase by 0.435 . This means that the effect of customer satisfaction (Y1) on customer loyalty (Y2) partially is 43.5%.

The results of the structural equation using SPSS software obtained a direct equation is Y1 = 6.854 + 0.848X + e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer satisfaction (Y1) is 0.848, meaning that there is a strong correlation and shows that if the value of digital marketing (X) increases by 1 unit, then the value of customer satisfaction (Y1) will increase by 0.848 units plus a constant of 6854 units. This means that the direct effect of digital marketing (X) on customer satisfaction (Y1) is 84.8%. The indirect equation is Y2 = 5.353 + 0.379X + 0.474Y1 + e, meaning that the correlation coefficient value of the influence of digital marketing variables (X) on customer loyalty (Y2) is 0.379, meaning that there is sufficient correlation and shows that if the digital marketing value (X) increases by 1 unit, while the value of customer satisfaction (Y1) remains, the value of customer loyalty (Y2) will increase by 0.379 units. This means that the effect of digital marketing (X) on customer loyalty (Y2) partially is 37.9%. The value of the correlation coefficient of the influence of the customer satisfaction variable (Y1) on customer loyalty (Y2) is 0.474, meaning that there is sufficient correlation and it shows that if the value of customer loyalty (X) increases by 1 unit, while the value of digital marketing (X) remains the value of

customer loyalty. (Y2) will increase by 0.474 plus a constant of 5.353 units . This means that the effect of customer satisfaction (Y1) on customer loyalty (Y2) partially is 47.4%.

CONCLUSION

Based on the results of the analysis for a large sample using Lisrel, Tetrad, GSCA, SPSS, SmartPLS, WarpPLS and Amos software for a large sample of 500 respondents, the results showed that there was no significant difference in the significance value of p-value and t-value. The determination value for the large sample produced also has no significant difference, and the correlation value in the resulting structural equation is also almost the same value and there is no significant difference in the results. The correlation coefficient test results also show results that are not much different between Amos, SmartPLS, WarpPLS, and SPSS software. So this study found the fact that the four software can be used entirely for marketing research for large samples and management, without any doubt about the difference in processing results. Suggestions for the next researcher is to add comparisons with other software and analyze a small sample.

REFERENCES

Asbari, M., Hidayat, D. D., & Purwanto, A. (2021). Managing Employee Performance: From Leadership to Readiness for Change. International Journal of Social and Management Studies, 2(1), 74-85,

Asbari, M., Prasetya, A. B., Santoso, P. B., & Purwanto, A. (2021). From Creativity to Innovation: The Role of Female Employees' Psychological Capital. International Journal of Social and Management Studies, 2(2), 66-77.

Asbari, M., Purba, J. T., Hariandja, E. S., & Sudibjo, N. (2021). From Leadership to Innovation: Managing Employee Creativity. Jurnal Manajemen Strategi Dan Aplikasi Bisnis, 4(1), 143–154, https://doi.org/https://doi.org/10,36407/jmsab.v4i1,287

Bernarto, I. (2017). Pengaruh Perceived Value, Customer Satisfaction dan Trust terhadap Customer Loyalty Restoran XYZ di Tangerang. JOURNAL FOR BUSINESS AND ENTREPRENEURSHIP, 1(1).

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. International Journal of Multivariate Data Analysis, 1(2), 107-123,

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European business review.

Steenkamp, J. B. E., & Van Trijp, H. C. (1991). The use of LISREL in validating marketing constructs. International Journal of Research in marketing, 8(4), 283-299.

Gunawan, A., & Wahyuni, S. F. (2018). The effect of marketing mix, service quality, islamic values and institutional image on students' satisfaction and loyalty. Expert Journal of Marketing, 6(2).

Rahman, F. Y., Yuliati, L. N., & Simanjuntak, M. (2019). The influence of marketing mix and word of mouth towards brand image and usage of online bike usage. Indonesian Journal of Business and Entrepreneurship (IJBE), 5(3), 287-287.

Asgarnezhad Nouri, B., Zarei, G., Bashirkhodaparasti, R., Saebnia, S., & Nazer Asl, A. (2020). Examining the Impact of Marketing Capabilities and Marketing Strategies on Business Performance of Export Firms (Case Study: Chocolate Industry in Tabriz). Journal of International Business Administration, 3(3), 65-87.

Murpraptomo, S. H., Yuliati, L. N., & Sartono, B. (2019). The influence of marketing mix, perceived risk, and satisfaction on word of mouth in XYZ clinic. Journal of Consumer Sciences, 4(1), 13-24.

Hamann, P. M., & Schiemann, F. (2021). Organizational performance as a set of four dimensions: An empirical analysis. Journal of Business Research, 127, 45-65.

Limakrisna, N., & Zahara, R. (2017). Determinant of Pharmaceutical Industries Marketing Performance in Indonesia. International Review of Management and Marketing, 7(3), 274-280.

Danurdara, A. B., Hidayah, N., & Masatip, A. (2017). How Does Strong Experiential Marketing Affect the Customer Value?. International Journal of Marketing Studies, 9(4), 89-96.

Dehghani Soltani, M., Mohammadi, E., Hemmati, A., & Raufi, M. (2020). An Examination of the Impact of Customer Relationship Management on Marketing Performance by Clarifying Mediating Role of Innovation and Marketing Memory. Commercial Strategies, 16(13), 59-78.

Juliana, J., Felicia, F., Ghozali, E., Ellen, H., & Figo, W. (2020). Analisis Pengaruh Disiplin Kerja Dalam Meningkatkan Produktivitas Kerja Ex Trainee Program Studi Pengelolaan Perhotelan Universitas Pelita Harapan. Jurnal Perspektif, 18(2), 116-121.

Novitasari, D., Goestjahjanti, F. S., & Asbari, M. (2020). The Role of Readiness to Change between Transformational Leadership and Performance: Evidence from a Hospital during Covid-19 Pandemic. APMBA (Asia Pacific Management and Business Application), 9(1), 37–56, https://doi.org/10,21776/ub.apmba.2020,009.01,4

Novitasari, D., Siswanto, E., Purwanto, A., & Fahmi, K. (2020). Authentic Leadership and Innovation: What is the Role of Psychological Capital?. International Journal of Social and Management Studies, 1(1), 1-21,

Purwanto, A. (2021). Partial Least Squares Structural Squation Modeling (PLS-SEM) Analysis for Social and Management Research : A Literature Review. Journal of Industrial Engineering & Management Research, 2(4), 114 - 123, https://doi.org/10,7777/jiemar.v2i4,168

Purwanto, A., Asbari, M., & Santoso, T. I. (2021). Analisis Data Penelitian Sosial dan Manajemen: Perbandingan Hasil antara Amos, SmartPLS, WarpPLS, dan SPSS Untuk Jumlah Sampel Medium. International Journal of Social and Management Studies, 2(4), 43–53. https://doi.org/10.5555/ijosmas.v2i4.50

Purwanto, A., Purba,J.T, Bernarto,I., Sijabat,R.(2021). The Role of Transformational Leadership, *Organizational citizenship behaviour*, Innovative Work Behaviour, Quality Work Life, Digital Transformation and *Leader member exchange* on Universities Performance. Linguistica Antverpiensia.2021(2).2908-2932

Purwanto, A., Purba,J.T, Bernarto,I., Sijabat,R.(2021).Pengaruh Servant, Digital dan Green leadership Terhadap Kinerja Industri Manufaktur Melalui Mediasi Komitmen Organisasi, Jurnal Riset Inspirasi Manajemen dan Kewirausahaan Volume 5 No. 1 Edisi Maret 2021 Hal 1-13, DOI : https://doi.org/10.35130/jrimk

Purwanto, A., Purba,J.T, Bernarto,I., Sijabat,R.((2021).Peran Organizational Citizenship Behavior (OCB), Transformational and Digital Leadership Terhadap Kinerja Melalui Mediasi Komitmen Organisasi Pada Family Business. Jenius. 4(3). 256-262.http://dx.doi.org/10.32493/JJSDM.v4i3.10454

Purwanto, A., Purba,J.T, Bernarto,I., Sijabat,R (2021). Effect Of Transformational Leadership,Job Satisfaction, And Organizational Commitments On Organizational Citizenship Behavior. Inovbiz: Jurnal Inovasi Bisnis 9 (2021) 61-69

Purwanto, A., J. T. Purba, I. Bernarto, and R. Sijabat. 2021. Effect of Management Innovation, Transformational leadership and knowledge sharing on Market Performance of Indonesian Consumer Goods Company. Jurnal Aplikasi Manajemen, 19(2), 424–434. Malang: Universitas Brawijaya. http://dx.doi.org/10.21776/ub.jam.2021.019.02.18.

Rahi, S., & Abd Ghani, M. (2018). A structural equation modeling (SEM-AMOS) for investigating brand loyalty and customer's intention towards adoption of internet banking. Economic and Social Development: Book of Proceedings, 206-220.

Hair, J. F., Gabriel, M., & Patel, V. (2014). AMOS covariance-based structural equation modeling (CB-SEM): Guidelines on its application as a marketing research tool. Brazilian Journal of Marketing, 13(2).

Levin, N., Zahavi, J., & Olitsky, M. (1995). AMOS—A probability-driven, customer-oriented decision support system for target marketing of solo mailings. European Journal of Operational Research, 87(3), 708-721.

Sia, L. A., & Tan, T. A. G. (2016). The influence of organizational justice on job satisfaction in a hotel setting. DLSU Business & Economics Review, 26(1), 17-29.

Ganguli, S., & Roy, S. K. (2011). Generic technology-based service quality dimensions in banking: Impact on customer satisfaction and loyalty. International journal of bank marketing.

Hunjra, A. I., Akhtar, M. N., Akbar, S. W., & Niazi, G. S. K. (2011). Relationship between customer satisfaction and service quality of Islamic banks. World Applied Sciences Journal, 13(3), 453-459.

Rosenbaum, M. S., & Spears, D. (2009). Using group comparisons in AMOS to explore shopping as a travel driver. International Journal of Culture, Tourism and Hospitality Research.

Karim, R., & Chowdhury, T. (2014). Customer satisfaction on service quality in private commercial banking sector in Bangladesh. British Journal of Marketing Studies, 2(2), 1-11.

Saad, N. M. (2012). Comparative analysis of customer satisfaction on Islamic and conventional banks in Malaysia. Asian social science, 8(1), 73.

Vujić, M., ĐorĎević, S., & Lakićević, M. (2019). Service quality and customer satisfaction in the hotel industry in Serbia. Менаџмент у хотелијерству и туризму, 7(1).

Yaghoubi, M., Asgari, H., & Javadi, M. (2017). The impact of the customer relationship management on organizational productivity, customer trust and satisfaction by using the structural equation model: A study in the Iranian hospitals. Journal of education and health promotion, 6.

Tong, J., & Shen, J. (2021, March). Research on Customer Satisfaction under Two Restrictive Discount Promotion Strategies Based on SPSS analysis *software*. In 2021 2nd International Conference on E-Commerce and Internet Technology (ECIT) (pp. 404-409). IEEE.

Yaghoubi, M., Asgari, H., & Javadi, M. (2017). The impact of the customer relationship management on organizational productivity, customer trust and satisfaction by using the structural equation model: A study in the Iranian hospitals. Journal of education and health promotion, 6.

Nwoko, E. G., Eze, P., & Maduka, C. O. (2021). Effect of Internal Marketing on Customer Satisfaction with Telecommunication Companies in Anambra State.

Nasution, M. A., Siregar, Z. M. E., & Pristiyono, P. (2021). Strengthening Bumdes through Customer Satisfaction and Loyalty as the Defense of the Bumdes Business in Indonesia Post-Covid-19. Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences, 4(3), 3962-3970.

Khoi, B. H., & Van Tuan, N. (2018, January). Using SmartPLS 3.0 to analyse internet service quality in Vietnam. In International Econometric Conference of Vietnam (pp. 430-439). Springer, Cham.

Thaker, H. M. T., Sakaran, K. C., Nanairan, N. M., Thaker, M. A. M. T., & Hussain, H. I. (2020). Drivers of loyalty among non-Muslims towards Islamic banking in Malaysia: Evidence from SmartPLS. International Journal of Islamic and Middle Eastern Finance and Management.

Johan, Z. J., Hussain, M. Z., Mohd, R., & Kamaruddin, B. H. (2020). Muslims and non-Muslims intention to hold Shariah-compliant credit cards: a SmartPLS approach. Journal of Islamic Marketing.

Raj, S., Nijjer, S., Ongsakul, V., & Singh, H. (2019). Determinants of key facets of job satisfaction in the banking sector: applying SMART PLS and artificial neural networks. Journal for Global Business Advancement, 12(2), 298-323.

Setiawan, E. B. (2021). How To Build Customer Loyalty: Through Customer Experience, Perceived Price, And Customer Satisfaction. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(4), 1546-1554.

da Costa Oliveira, Z. C., Saldanha, E. S., & Vong, M. (2020). The Mediation Effect of Restaurant Image on the Relationship between Service & Food Quality and Customer Satisfaction. Timor Leste Journal of Business and Management, 2, 10-20.

Rivai, J. (2021). The Role of Purchasing Decisions Mediating Product Quality, Price Perception, and Brand Image on Customer Satisfaction of Kopi Janji Jiwa. Journal of Business and Management Studies, 3(2), 31-42.

Al-Slehat, Z. A. F. (2021). Determining the Effect of Banking Service Quality on *Customer loyalty* Using Customer Satisfaction as a Mediating Variable: An Applied Study on the Jordanian Commercial Banking Sector. International Business Research, 14(4), 1-58.

Sholeh, M. S., & Bamban, R. (2021). Partial Least Square In Analyzing The Influence Of Service Quality, Facilities And Price On Customer. Procedia of Engineering and Life Science, 1(2).

García-Alcaraz, J. L., Montalvo, F. J. F., Sánchez-Ramírez, C., Avelar-Sosa, L., Saucedo, J. A. M., & Alor-Hernández, G. (2019). Importance of organizational structure for TQM success and customer satisfaction. Wireless Networks, 1-14.

Tabet, S. M., Lambie, G. W., Jahani, S., & Rasoolimanesh, S. M. (2020). The factor structure of outcome questionnaire–45.2 scores using confirmatory tetrad analysis–partial least squares. Journal of Psychoeducational Assessment, 38(3), 350-368.

Parawansa, D. A. S. (2018). Effect of commitment and customers' satisfaction on the relationship between service quality and customer retention in rural banks in Makassar, Indonesia. Journal of Management Development.

Isaskar, R., Darwanto, D. H., & Waluyati, L. R. (2019, June). Consumer Satisfaction on Mocaf (Modified Cassava Flour) Based Food Products in Supporting Industrial Revolution 4.0: SEM Approach. In IOP Conference Series: Materials Science and Engineering (Vol. 546, No. 5, p. 052033). IOP Publishing.

Susanta, S., Widjanarko, H., Utomo, H. S., & Suratna, S. (2019, January). The Role of Satisfaction as Mediation Influence Relational Benefits against Bank Customer Commitment: Survey on Institutional Customers. In 1st Aceh Global Conference (AGC 2018) (pp. 484-491). Atlantis Press.

Setya, B. I., & Soni, H. (2018). The effect of brand image and product on customer satisfaction and willingness to pay at coffee bean Surabaya. Russian Journal of Agricultural and Socio-Economic Sciences, 73(1).

Velmurugan, M. S., & Velmurugan, M. S. (2017). Information technology adoption on 3G mobile phones in India: the empirical analyses with SPSS 20, SmartPLS2. 0M3 and LISREL8. 80-part 2. International Journal of Business Innovation and Research, 13(2), 147-166.

Ong, M. H. A., & Puteh, F. (2017). Quantitative data analysis: Choosing between SPSS, PLS, and AMOS in social science research. International Interdisciplinary Journal of Scientific Research, 3(1), 14-25.

Nam, S. T., Kim, D. G., & Jin, C. Y. (2018). A Comparison Analysis among Structural Equation Modeling (AMOS, LISREL and PLS) Using the Same Data. Journal of the Korea Institute of Information and Communication Engineering, 22(7), 978-984.

Gudergan, S.P., Ringle, C.M., Wende, S. and Will, A., (2008). Confirmatory tetrad analysis in PLS path modeling. Journal of business research, 61(12), pp.1238-1249.

Weiber, R., & Mühlhaus, D. (2014). Strukturgleichungsmodellierung: Eine anwendungsorientierte Einführung in die Kausalanalyse mit Hilfe von AMOS, SmartPLS und SPSS. Springer-Verlag.

Bacon, L. D. (1999, February). Using LISREL and PLS to measure customer satisfaction. In Sawtooth *Software* Conference Proceedings (pp. 2-5).

Husain, T. (2019). An Analysis of Modeling Audit Quality Measurement Based on Decision Support Systems (DSS). measurement, 275, 326.

Jahn, S. (2007). Strukturgleichungsmodellierung mit LISREL, AMOS und SmartPLS: eine Einführung (An introduction to structural equation modeling with LISREL, AMOS and SmartPLS). AMOS und SmartPLS: Eine Einführung (An Introduction to Structural Equation Modeling with LISREL, AMOS and SmartPLS).

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. International Journal of Multivariate Data Analysis, 1(2), 107-123.

Amaro, S., Abrantes, J. L., & Seabra, C. (2015). Comparing CB-SEM and PLS-SEM results: an empirical example.

Ali, F., & Kim, W. G. (2015). A comparative study of CB-SEM and PLS-SEM for theory development in hospitality research. 3rd World Research Summit for Tourism and Hospitality, Orlando, FL.

Weiber, R., & Mühlhaus, D. (2014). Strukturgleichungsmodellierung: Eine anwendungsorientierte Einführung in die Kausalanalyse mit Hilfe von AMOS, SmartPLS und SPSS. Springer-Verlag.