Effect customer behaviour in online food purchasing on customer perceptions of the existence of online food marketing for sustainable food security in Pekanbaru municipality

Anne Mudya Yolanda[1], *Fanny* Septya[2*], and *Yulia* Andriani[2]

[1]Universitas Riau, Department of Mathematics, Faculty of Mathematics and Natural Sciences, Jl. HR. Soebrantas, Km. 12.5, Pekanbaru, 28293, Indonesia
[2]Universitas Riau, Department of Agribusiness, Faculty of Agriculture, Jl. HR. Soebrantas, Km. 12.5, Pekanbaru, 28293, Indonesia

Abstract. Pandemic COVID 19 and the digitalization era had changed consumer preference for food purchasing from offline to online. So, online food marketing was alternative food access in order to support food security. This research aimed to analyse the effect of customer behaviour in food online purchasing on customer perceptions of online food marketing of the existence of online food marketing for sustainable food security in Pekanbaru City using Structural Equation Modelling (SEM). SEM is a combination of factor analysis and multiple regression analysis, was used to explain the relationships between multiple variables. Using this, the indirect effect of indicators on each variable could also be investigated. The data used in this study were obtained through the purposive sampling of 100 customers who met the criteria of having shopped for food online at least twice, being of productive age (18-25 years), being married, and residing in Pekanbaru. Customer behaviour was measured by five indicators: Online Shopping Attitudes, Perceptions of Ease of Shopping, Quality of Service, Products, and Prices, whilst the perception was evaluated by three indicators: Food Availability, Food Access, and Food Utilization. With a 5% significance level, it could be concluded that the Perceptions of the Ease of Shopping, Products, and Prices have an impact on customer perception.

1 Introduction

Food Security is a condition of fulfilling food for the state to individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable and affordable and does not conflict with religion, belief, and culture of the community, in order to be able to live healthy, active, and productive sustainably [1]. Consumer behaviour had an impact on food security as well. Previous research found that

* Corresponding author: fannyseptya@lecturer.unri.ac.id

cultural background, seasonal changes (variation), gender, and buying power were powerful variables that influence customer dietary preferences, exposing them to food insecurity [2]. Besides that, customer profiles also have an impact on food safety and security. Pertaining to a study, sanitation aspects (the presence of toilets and water sources in the house), the use of the main fuel for cooking, the location of the household, as well as the age, status, education level, and type of livelihood of the head of household, all have an impact on household food security [3]. As information technology advances, some people have begun to convert their food shopping habits into an online system. This is because using the internet can save time and energy, and it is also more practical than traditional shopping. People's shopping habits are shifting away from directly in traditional and modern markets toward online shopping, particularly in urban areas. Since the Covid 19 pandemic, this behaviour has become more aggressive. As a result, online shopping media has evolved into an alternative food access channel that aids in the development of food security. Consumers can conduct sales and purchases whenever and wherever they want by using a platform that can be accessed via mobile phone and prefer cashless payment [4]. The impact of the COVID-19 pandemic on food security discourses as well as urban consumer perceptions and representations should be studied in depth [5].

Indonesia is ranked 69th out of 113 countries in 2021 with overall score is 59.2 for The Global Food Security Index (GFSI) is a composite indicator developed by the Economist Intelligence Unit and sponsored by DuPont that monitors progress toward food security at the country level [6]. countries [7]. On a nationally, The Food Security Index (FSI), which refers to the definition of food security and the subsystems that comprise the food security system (food availability, food affordability, and food utility), is used to assess the level of food security in a region and its supporting factors. Following the provincial FSI ranking, the six provinces with the lowest score are Papua (35.48), Papua Barat (46.05), Maluku (58.70), Maluku Utara (59.58), Kepulauan Riau (63.26), and Riau (66.84). Riau is the province with the lowest FSI score in group five (secure). Pekanbaru Municipality, which represents economic growth in Riau Province, has an FSI of 90.56, placing it in the very secure category [1]. Sustainable food security development is a challenge for Riau Province, whose food needs are supplied from outside the region. Urban areas in Riau Province with dense community economic activities, a diversity of consumer tastes, and the ability to access adequate technology provide opportunities for online food marketing, ensuring food availability, affordability, and utilization now and in the future.

This research concentrates on the indirect effect of customer behaviour and perception of the existence of online food marketing on long-term food security using Structural Equation Modelling (SEM). SEM is a statistical technique used to demonstrate the relationships between multiple variables. Structured relationships can be studied with SEM using a set of equations that define the causality between constructs in an analysis. Most previous studies used regression [8, 9], mixed method [10], and logit analysis [11, 12] to establish a relationship between these sorts of variables. PLS-SEM (Partial Least Squares-Structural Equation Modelling) was implemented in the related study to predict food consumption behaviour models and vance associations between all constructs. Food access, food quality and safety, and food pricing all have a direct impact on consumer food stress and consumption behaviour, as demonstrated by the analyses [13]. Based upon it, researchers are interested in carrying out studies to examine the impact of customer behaviour in online food purchasing on customer perceptions of the existence of online food marketing for sustainable food security in Pekanbaru Municipality. Because SEM is based on two main multivariable techniques (factor analysis and multiple regression analysis), it can be categorized as a unique combination of interdependence or dependency techniques. To address the shortcomings of ordinary least square regression [14], this study employs PLS-SEM, variance-based SEM [15], as well as a form of SEM that incorporates formative and reflective variables. Thus,

with PLS-SEM as statistical analysis, this research could produce model that examines both direct and indirect effects causal and also relationships of customer behaviour in online food purchasing on customer perceptions of the existence of online food marketing for sustainable food security in Pekanbaru Municipality.

2 Methods

Data for this study were collected through direct survey or primary data collection methods. Purposive sampling was used to gather information for this study in some districts of Pekanbaru, such as Bukit Raya, Sail, Senapelan, Marpoyan Damai, Lima Puluh, Pekanbaru Kota, Sukajadi, Bina Widya, and Tuah Madani. We interviewed 100 respondents with specific criteria, such as having done at least two online food purchases, being of productive age (18-25 years old), married, and residing in Pekanbaru Municipality.

Variables in SEM consist of latent (endogenous and exogenous) variables and manifest variables. Endogenous latent as dependent variable in this research is Customer Perceptions of the Existence of Online Food Marketing for Sustainable Food Security in Pekanbaru Municipality. This variable can only be observed indirectly and imperfectly through its effect on the observed variable which refers to the Food Security Index of the Food Security Agency of the Ministry of Agriculture, 2018. It was evaluated using several indicators, or what is known as manifest variables (a variable that can be measured empirically), as shown in Table 1.

Table 1. Indicators of perceptions of the existence of online food marketing for sustainable food security.

Indicators	Items
Food Availability	1. Food needs are satisfied in sufficient quantities. 2. Food products are varied. 3. Food products are readily available at any time. 4. Easy access to high-quality food products. 5. The online market fulfils all of the food needs.
Food Access	1. Food is relatively affordable in the online market. 2. Online food purchases make it easier for consumers to purchase food that is available over long distances. 3. Online media offers a number of services that facilitate buying and selling transactions. 4. With the presence of online media, the food distribution system from producers to consumers is indeed very good.
Food Utility	1. The online market provides food products other than staple food. 2. The nutritional quality of food products available on the online market is very good. 3. Sanitation and hygiene of food products sold online is maintained. 4. The online food market provides consumers with a wide and varied and nutritious menu.

From a social perspective, research on consumer behaviour is expected to be a reference for product development as well as marketing channels and describe consumer personas during the pandemic related to online purchases. Online shopping behaviour refers to the process of purchasing products through the internet. With the development of the internet, grocers can penetrate a wide consumer market, but with the help of social media platforms seller can interact with the consumer market. Sellers need to know the characteristics (like age, gender, education, occupation, and income of consumers) and online purchasing

behaviour. Purchasing characteristics and behaviour shape consumer perceptions of the existence of online food markets in supporting indicators of food security and sustainable food development. Customer behaviour as exogenous latent variables (independent variables) was measured by five indicators, namely Online Shopping Attitudes, Perceptions of Ease of Shopping, Quality of Service, Products, and Prices. Table 2 provides more information.

Table 2. Indicators of customer behaviour.

Indicators	Items
Online Shopping Attitudes (Attitudes)	1. I enjoy doing my grocery shopping online. 2. I feel comfortable shopping online. 3. I am confident in the transaction's factual accuracy.
Perceptions of Ease of Shopping (Easy)	1. The ordering procedure appears to be simple to me. 2. Information on food products being sold is easy for me to get. 3. I find it easy to make payments.
Quality of Service (Quality)	1. Admin responds quickly to my questions. 2. Admin answered my questions. 3. Admin resolved my complaint.
Products	1. I believe that the food products sold online are of good quality. 2. Food products purchased online are neatly packaged and arrive safely. 3. Food products stay fresh even when purchased online.
Prices	1. I believe the price of food purchased online is affordable. 2. I believe that the cost of food purchased online is reasonable for the quality. 3. The price of the product offered by the seller changes every time

PLS-SEM was analysed with Smarts to determine the relationship between latent variables and latent variables with their indicators. Both variables in the analysis using formative indicators. The following is a preliminary model of the relationship between Customer behaviour and perceptions of the Existence of Online Food Marketing for Sustainable Food Security research approach (Fig. 1). Both variables in the analysis using formative indicators.

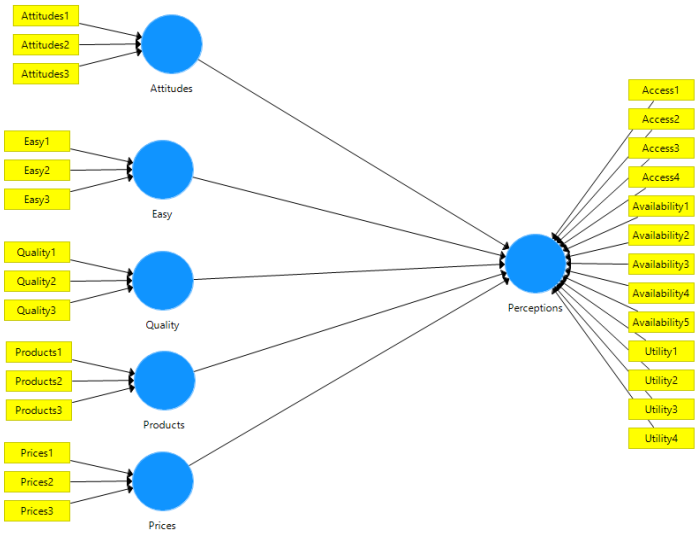

Fig. 1. Relationship between variables.

3 Results and discussion

Before entering into the in-depth analysis and hypothesis testing of SEM, the model is evaluated first. Evaluation of the measurement model (outer model) is used to assess the validity and reliability of the model. The initial outer model analyses each indicator from five variables: price, convenience, product, quality, and shopping attitude, each of which has three indicators representing consumer behaviour in online shopping and consumer perception variables in online shopping on food security to be tested. The final model reveals that there are 16 indicators with a loading factor greater than 0.7. There are four indicators that reflect consumer perception as the dependent variable, namely Availability4, Utility2, Utility3, And Utility4. The second test is each latent variable should have an Average Variance Extracted (AVE) above 0.5 to be considered as a good model. Furthermore, discriminant validity will be evaluated since different constructs should not be highly correlated. Based on the results of the analysis, it is evident that AVE is greater than the correlation among the variables and the number of cross-loading indicators used to adjust the variable on its own is greater when compared to other variables. Therefore, it can be concluded that the variables and indicators used in the study are in accordance with the provisions of the discrimination validity. The next evaluation is to test the model's reliability to demonstrate the instrument's accuracy, consistency, and precision in measuring the construct. First reliability test involves calculating composite reliability and Cronbach's Alpha on latent variables and models. The study indicate that all latent constructs had good, accurate, and consistent composite reliability values because they met the requirements with composite reliability values greater than 0.7 for each latent construct.

The inner model evaluates relationship between latent variables with R-square. R-square on the endogenous latent variable is 0.595, which means that price, easy, product, quality, and attitude can explain 59.5% of perception of consumers, while the rest is explained by other variables outside the study. These findings reveal significant variables in PLS-SEM (look Fig. 2 (a)) with three, two, two, three, and one item in attitudes, easy, quality, products, and prices are moderate model.

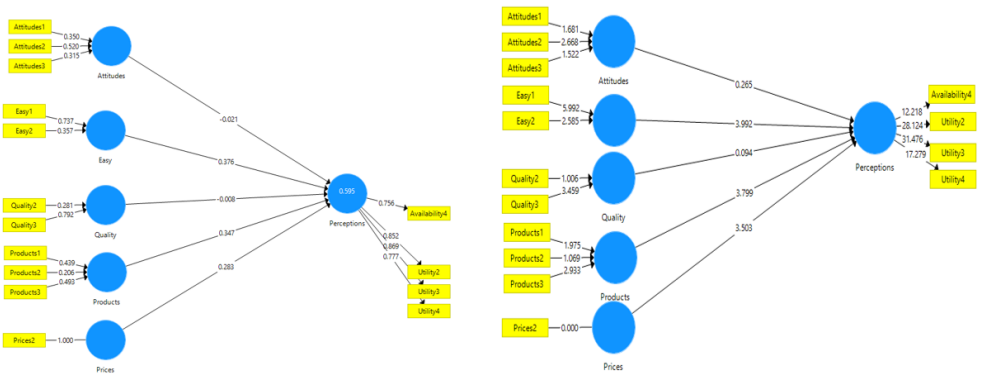

Fig. 2. Significant variable (a) before (b) after bootstrap analysis.

The inner model is then measured using bootstrapping on the final outer model by assessing the t-test as statistical analysis in hypothesis testing on each path of the relationship from exogenous variables to endogenous variables. The bootstrapping results in Figure 2 (b) show that there are several paths that have a significant effect with a significance level of 0.05 (two-tailed), namely EASY, PRODUCT, and PRICE. The results of the test statistics with a 5% significance level are presented in Table 3.

Table 3. Hypothesis testing using bootstrap analysis.

Hypothesis	Variable	p-value	Results
H1	Attitudes	0.789	Reject H1
H2	Easy	0.000	Failed to reject H2
H3	Quality	0.927	Reject H3
H4	Products	0.000	Failed to reject H4
H5	Prices	0.001	Failed to reject H5

Table 3 above explains there is insufficient evidence to conclude that attitude and quality have a significant effect on affects Customer Perceptions of the Existence of Online Food Marketing for Sustainable Food Security. In moreover, there are three variables (easy, products, and prices) have a significant effect on affects Customer Perceptions of the Existence of Online Food Marketing for Sustainable Food Security. The coefficient value of each path shows the magnitude of the effect of exogenous latent on endogenous latent.

Table 4. Coefficient value.

Variable	Coefficient Value
Easy	0.376
Products	0.347
Prices	0.283

The coefficient value of each path shows the magnitude of the effect of exogenous latent on endogenous latent. The Easy, Products, and Prices variable have a statistically significant beneficial effect on perceptions of 0.376, 0.347, and 0.283. In other words, increasing the easy, products, and prices variables will increase perception by 37.6%, 34.7%, and 28.3%, respectively.

4 Conclusion

With a 5% significance level, it could be concluded that the Perceptions of the Ease of Shopping, Products, and Prices have an impact on Customer Perceptions of the Existence of Online Food Marketing for Sustainable Food Security. Each variable, namely the products, easy, and prices variables will increase perception by 37.6%, 34.7%, and 28.3%, respectively.

This paper and research behind it would not have been possible without the funding support of Institute for Research and Community Service (LPPM) Universitas Riau for research grant number 1378/UN19.5.1.3/PT.01.03/2022 from Budget Implementation List (DIPA) Universitas Riau 2022.

References

1. Pusat Ketersediaan dan Kerawanan Pangan Badan Ketahanan Pangan Kementerian Pertanian 2021 *Indeks Ketahanan Pangan 2021* (Jakarta: Badan Ketahanan Pangan Kementerian Pertanian RI)
2. M. Beckline, M. S. Kato, Assessing the Impact of Consumer Behaviour on Food Security in South West Cameroon *J. Food Secur.* **2** 87–91 (2014)

3. L. Y. Devi, Y. Andari, L. Wihastuti, R. K. Haribowo, *J. Ekon. dan Pembang.* **28** 103–16 (2020)
4. M. Wahyudin, F. N. Azali, Consumer shopping behavior through online store for food and beverages *The 1st International Conference on Agriculture and Bioindustry 2019 - IOP Conference Series: Earth and Environmental Science 425* (IOP Publishing) p 012026 (2020)
5. C. D. Vasiliu, I. S. Brumă, Discursive Framework of Food Security and Its Impact on Urban Consumers' Cognition and Behavior *Shifting Patterns of Agricultural Trade* (Springe) pp 203–27 (2021)
6. A-C Thoma, B. D'Hombres, C. Casubolo, M. Saisana, F. Kayitakire, *The use of the Global Food Security Index to inform the situation in food insecure countries* (EUR 28885 EN, JRC Science Hub, Ispra 2017)
7. The Economist Group 2021 The Global Food Security Index *Glob. Food Secur. (Index 2021)*
8. I. Rakasyifa, G. W. Mukti, Agribisnis J. Pemikir. Masy. Ilm. Berwawasan Agribisnis **6** 275 (2020)
9. M. Janssen, B. P. Chang, H Hristov, I. Pravst, A. Profeta, J. Millard, Germany, and Slovenia *Front. Nutr.* **8** 1–20 (2021)
10. S. L. Godrich, J. Lo, K. Kent, F. Macau, A. Devine, *Nutr. J.* **21** (2022)
11. E. Wang, N. An, Z. Gao, E. Kiprop, X. Geng, *Food Secur.* **12** 739–47 (2020)
12. A. Zainuddin, R. Wibowo, L. P. Suciati, I. K. Setyawati, I. Seldon, Magfiroh, I. Ibanah, R. Y. Rahman, and E. S. Han, *SOCA J. Sos. Ekon. Pertan.* **16** 63–73 (2022)
13. M, Nekmahmud, *J. Foodserv. Bus. Res.* (2022)
14. G. Prayitno, M. I. Ahari, W. I. Rukmi, *J. Int. Stud.* **14** 153–71 (2022)
15. J. Henseler, C. M. Ringle, M. Sarstedt, *J. Acad. Mark. Sci.* **43** 115–35 (2015)