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AI Customer Service in the Digital Business World: Understanding Customer's Thoughts on AI-Driven Personalization in E-Commerce and Social Media

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Abstract: AI in the digital business world means the use of artificial intelligence technology to improve efficiency, productivity, and customer experience in various operational and strategic areas of a company. The Focus of this study is to see customer thoughts on the implementation of artificial intelligence in the online shopping sector. This study will be carried out in 4 different phases, including; comprised of data searching, data inputting, data processing, and editing phase. This research data was processed using the SmartPLS (Partial Least Squares) application. The study's findings indicate that artificial intelligence (AI) has profoundly transformed the manner in which e-commerce platforms engage with consumers. The results of our study demonstrate that the provision of effective AI services can significantly improve customer satisfaction. These findings underscore the importance of implementing AI in e-commerce marketing strategies, as by understanding customer preferences and providing relevant recommendations, companies can increase customer engagement and loyalty. This study underscores the significance of AI services in enhancing customer experience and paves the way for further research that can deepen our understanding of the interaction between technology and consumer behavior in the context of e-commerce

Keywords: Artificial Intelligence, Customer Service, Digital Business, E-commerce, SmartPLS (Partial Least Squares)

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1. Introduction

AI has significantly improved and evolved over the years. So much in fact that Artificial Intelligence has spread throughout many aspects of life and daily activities as we know it, most notably is AI evolution and implementation in the business world which is today known as the digital business world. AI in the digital business has become a tool for online marketing to be more efficient [8]. These technologies consist of techniques and algorithms such as machine learning, natural language processing, and big data analytics, which enable companies to quickly and accurately manage and analyze large amounts of data [6]. In this case, the large number of customers with a variety of behaviours that affect which items to buy has become the center of attention for businesses in the digital market today in order to create a system that can determine how to cater to customer's needs [7]. Artificial Intelligence (AI) has and will become valuable for businesses in order to adapt to the digital transformation in today's never ending evolution as well as adapting to newer technologies [9]. Overall, the application of AI in digital businesses not only helps companies adjust to the fast-paced market dynamics, but also creates more value for customers and increases competitiveness in the digital era [15]. The implementation and development of AI personalization in e-commerce has impacted the way businesses communicate with consumers, resulting in a more relevant and customized shopping experience [12]. Many previous studies have researched how different customer behaviours can affect and influence the AI algorithm into recommending items that the customer is and might be looking for, therefore influencing the customer's behaviour to pull them into buying the items they want to buy [5]. Thus, AI personalization not only improves customer engagement, but also drives sustainable business growth in an increasingly competitive market [13].

Since the introduction and implementation of AI in the digital business world, there have been many researchers who have taken up this topic to learn more about the use of AI in e-commerce [2]. The objective of this research is to find out how satisfied customers feel when using AI-based services in online shopping applications, in addition to satisfaction we also look for the level convinience to find the desired product. This research aims to make a difference with previous research by focusing only on customer's opinions and thoughts about the presence of Artificial Intelligence (AI) in e-commerce along with it's convenience and efficiency. With this research, we hope this topic will be further discussed in future research so that more people know the importance of customer satisfaction in the digital business world. We also hope that this research produces outputs that make more people open to the implementation of AI in e-commerce.

This paper is divided into 5 discussions, the first is the introduction of the research where the paper begins with a brief explanation of the background and inspiration for this research. Second, there is related work that discusses previous research and its relation to the current research. Third is the research method which discusses what methods and approaches we use in this research. Fourth, results

and discussion discuss the results of the data obtained so that it can be used as material for discussion. And finally there is a research conclusion that contains the contributions, implications, and limitations of this research.

2. Related Work

This research article takes inspiration from previous studies about the use of AI in the digital business world. The Focus of this study is to see customer thoughts on the implementation of artificial intelligence in the online shopping sector. This study will question the ease, efficiency, convenience, and future development of AI technology in the digital business sector.

Previous studies have made several key points and arguments on the topic of customer related thoughts on AI services in e-commerce as well as AI personalization. Most of the researchers agreed that AI in e-commerce makes online shopping more efficient [3], more personalized [14], trustworthy [16], and promising towards future development [10].

All of these factors contribute to the extension of customer loyalty in online shopping platforms [3]. One of the most significant benefits of AI-driven personalization is its ability to enhance customer engagement. By offering a shopping experience that is tailored to individual preferences, businesses can create a deeper, more meaningful connection with customers [11]. Along with the development in the customer service sector, businesses also take the chance of using AI services on their platforms to have a more competitive edge by having an alternative option other than offline sales, businesses can use AI services to pull in more customers online by programming AI to cater to the customer's preference [4]. Our approach on this study is purely based on customer's thoughts on AI services and whether or not they have delivered on the promise as advertised.

3. Methods

This study is carried out by members of the research division with help from other members of The Department of Student Development in order to complete this paper. the purpose of this study is to determine whether or not AI services can create a more personalized page for customers in order to achieve satisfaction and build trust.

This study will be carried out in 4 different phases, with 4 different teams that will work together to complete each task. The first phase is comprised of data searching, the method we are using to collect data is via a questionnaire that we spread with a target of 96 respondents being only students of the Economics and Business faculty in University of Muhammadiyah Surakarta. The second pahse will be data inputting, where the data received from the questionnaire are taken, moved, and placed in a new csv format to be able to move on with the next phase. The Third phase will be data processing, by using SmartPLS 4, we can easily determine each variable and see which ones influence on another.

The fourth and final phase will be the editing phase in which the team will be tasked with making and editing the paper by the standards of the publisher. The study officially started on April 28th with the data searching team moving to get responses and with a week interval between phases, the study ends officially on the 16th of Mei with the indicator of success being the full paper being completed.

4. Results and Discussion

In the course of our research, we were able to gather a total of 96 samples from respondents, which is considered a reasonably representative sample size for statistical analysis within the context of this research study. Each respondent was meticulously selected to represent the characteristics of the population relevant to the focus of our research. Following the collection of the data, it was processed using the SmartPLS (Partial Least Squares) application, a sophisticated software program frequently utilized for structural models and structural equation modeling (SEM). SmartPLS facilitates the examination of relationships between variables through a flexible approach, particularly in scenarios where data does not adhere to the assumption of normality or has a relatively limited sample size. The application enabled the acquisition of substantial and quantifiable outcomes, thereby furnishing a precise depiction of the interrelationship between variables within the research model. The results are then compared and analyzed to ensure their suitability with the objectives of our research. The overarching aims of our research are to reveal significant patterns of relationships and to determine the relevance of these findings in the context of the theory and practice that we are studying. Consequently, the processed data offers substantial and trustworthy evidence to substantiate the conclusions of this study.

4.1 Outer Loading

The results of our data processing produce a factor loading value that correlates between the indicators and their constructs. Therefore, it is imperative to ascertain that the Outer Loading Value exceeds 0.6, a threshold that can be deemed as **valid** given its substantial and substantial correlation with the construct it represents. This validity is an essential foundation for asserting that the instrument utilized in this study has successfully measured the intended concepts with precision and can be scientifically substantiated.

Outer loadings - Matrix

	X1	X2	Y	Z
aya menggunakan layanan berbasis AI dalam plikasi atau situs web online shopping.			0.669	
aya merasa efisiensi waktu menjadi salah satu unggulan layanan berbasis AI.		0.767		
aya merasa inovasi AI dianggap sebagai solusi ang efektif dalam bisnis modern.		0.828		
aya merasa inovasi teknologi menciptakan eluang karier baru di sektor bisnis digital.				0.836
aya merasa ketertarikan terhadap pemanfaatan i dalam operasional bisnis semakin meningkat.				0.900
aya merasa lebih nyaman menggunakan latform e-commerce yang memiliki layanan AI...		0.777		
aya merasa pemahaman AI menjadi kebutuhan enting bagi generasi muda, khususnya ...				0.865
aya merasakan bahwa penerapan AI secara ptimal diyakini mampu memberikan ...				0.886
aya setuju bahwa AI dapat belajar dari riwayat teraksi pengguna untuk meningkatkan ...	0.852			
aya setuju bahwa AI sangat membantu ketika referensi saya ditemukan.	0.722			
aya setuju bahwa implementasi AI dalam ustomer service membuat online shopping leb...			0.834	
aya setuju bahwa layanan AI dalam mencari referensi saya lebih cepat dan mudah ...	0.659			
aya setuju bahwa layanan manual dengan ayanan berbasis AI berbeda dalam rangka ...			0.726	
aya setuju bahwa penggunaan AI mendukung eningkatan kualitas layanan secara keseluruhan.		0.812		
aya setuju bahwa selain menyesuaikan ekomendasi barang yang saya butuh, layanan ...	0.828			
aya setuju bahwa semakin banyak saya enggunakan layanan AI, semakin banyak AI ...	0.787			
aya setuju dengan adanya layanan AI dalam nline shopping membuat berbelanja online ...			0.795	
aya setuju penggunaan AI dalam layanan elanggan sudah dikenal di kalangan penggun...			0.799	
aya setuju respon yang diberikan AI dinilai nformatif dan sesuai dengan permintaan saya.		0.761		

Figure 1. Outer Loadings data table via SmartPLS 4

In this study, the factor loading value is defined as the relationship or correlation between the indicators utilized and the construct to be measured or evaluated. In this context, if the Outer Loading value of an indicator is greater than 0.6, then the indicator can be considered **valid**, because it shows a significant relationship with the relevant construct. Therefore, if each indicator in this research variable has an outer loading value greater than 0.6, it can be concluded that all indicators used in this study meet the established validity criteria and can be considered **valid** to measure the intended construct.

4.2 Discriminant Validity

Discriminant validity is defined as the extent to which a construct or variable in a research model differs significantly from other constructs or variables. This approach guarantees that the constructs in the model do not overlap, thereby ensuring that they truly measure different dimensions.

- The presence of an AVE greater than 0.5 suggests that a latent variable can account for more than half of the variance in its indicators, which is considered valid.
- The Average Variance Extracted (AVE) is less than 0.5, indicating that the number of errors in the indicators or items exceeds the variance value of the construct.

Construct reliability and validity - Overview

	Cronbach's alpha	Composite reliability (r...	Composite reliability (r...	Average variance extrac...
X1	0.829	0.842	0.880	0.597
X2	0.849	0.857	0.892	0.623
Y	0.824	0.835	0.876	0.588
Z	0.895	0.904	0.927	0.761

Figure 2. Construct Reliability and Validiy data table via SmartPLS 4

The primary prerequisite for the assessment of discriminant validity is as follows: In the event that the AVE value exceeds 0.5, it can be concluded that the latent variable possesses the capacity to elucidate more than half of the variance inherent within its indicators. This stipulation signifies that the construct in question is deemed valid. Conversely, if the AVE value is less than 0.5, this indicates that there are many errors in the indicators or items, and the variance explained by the construct is lower than the errors or inaccuracies in its indicators. Therefore, the construct does not meet the expected validity standards.

Moreover, it is imperative to acknowledge the significance of the reliability of the indicators in the variables. The Composite Reliability method is a quantitative technique that can be employed to assess the reliability of these indicators. The Composite Reliability value of each indicator in the variable must exceed 0.7 to be considered reliable. This indicates that the indicator is consistent and stable in measuring the intended construct. Furthermore, the measurement results using Cronbach's Alpha, a method employed to assess reliability, demonstrate that all constructs in this study exhibit a value greater than 0.70. This finding indicates that all variables in this study exhibit a high degree of reliability, thereby ensuring the trustworthiness and utilization of the collected data for subsequent analysis with a satisfactory level of accuracy. Consequently, based on the findings of these tests, it can be concluded that this study possesses valid and reliable constructs.

4.3 Composite Reliability

It contains measurements of the extent to which indicators in a construct are interrelated and can be trusted to represent the construct. In this particular instance, a higher value (typically > 0.70) is indicative of optimal reliability.

Conventionally, a Composite Reliability value greater than 0.70 is indicative of a reliable construct, signifying that the measurement outcomes can be trusted and relied upon for subsequent analysis. In the context of this study, all indicators in each variable demonstrate a Composite Reliability value that exceeds 0.70. This finding suggests that each variable in the research model possesses adequate internal consistency and can be considered reliable. Consequently, the construct formed by these indicators is capable of consistently and accurately representing the measured reality. Consequently, the data obtained from the measurement of each variable exhibits a high degree of reliability, thereby enabling its utilization for model testing with the assurance that the measurement instrument functions stably and consistently.

4.4 Cronbach's Alpha

The internal reliability measure is a quantitative metric employed to assess the consistency or uniformity between items within a scale. Values greater than 0.7 are generally considered to indicate reliable performance. A value below 0.6 may be indicative of an instrument that lacks sufficient reliability. Cronbach's Alpha values greater than 0.70 are typically regarded as indicative of a satisfactory degree of reliability. This is because such values signify that the components of a variable or construct possess sufficient internal consistency. Conversely, if the Cronbach's Alpha value is below 0.60, it may suggest inadequate correlation between the items, leading to the instrument's classification as less reliable.

The results of the Cronbach's Alpha measurements in this study indicate that all variables have **values greater than 0.70**. This finding suggests that all constructs in the research model exhibit high internal consistency, and each indicator employed to measure these variables has demonstrated consistent reliability in representing the intended concept. Consequently, it can be concluded that the instruments utilized in this study **possess a high degree of reliability**, thereby ensuring the trustworthiness of the collected data for subsequent analysis and the validity of the conclusions derived from these measurements.

4.5 R-squared (R^2)

This is a statistical measure that is utilized to ascertain the extent to which a regression model is capable of elucidating the variability present in the data. R^2 is a measure of the proportion of variance in the dependent variable that can be explained by the independent variables. It is imperative to note that the model's strength is indicated by its correlation coefficient of 0.25, which can be interpreted as a weak model. The value of 0.50 is indicative of a moderate model. The model's strength is equivalent to 0.75.

R-square - Overview

	R-square	R-square adjusted
Y	0.450	0.432
Z	0.614	0.606

Figure 3. R-Squared (R^2) data table via SmartPLS 4

In the context of this study, the R^2 value for variable Y (AI Understanding) was obtained at 0.45. This finding indicates that the independent variables X1 (AI Service) and X2 (Online Convenience) collectively account for 45% of the variation in the dependent variable Y (AI Understanding). In summary, the model demonstrates a moderate to weak predictive capacity, with a residual variation of 55% not explained by the model. This residual variation is likely influenced by variables not addressed by the study.

Concurrently, the R^2 value for variable Z (Customer Satisfaction) is 0.614. This indicates that 61.4% of

the variation in customer satisfaction levels can be attributed to variables X1 (AI Service) and X2 (Online Convenience). Consequently, the model exhibits a moderate to strong degree of predictive capability, suggesting that the two independent variables employed in this study contribute significantly to the explanation of the customer satisfaction variable. The residual 38.6% of the variance is attributable to factors not incorporated into the model, suggesting the necessity for further research to consider additional variables that may enhance the model's overall explanatory power.

4.6 Hypothesis Testing

Statistical procedures are utilized to assess the veracity of an assumption or statement (hypothesis) concerning the relationship between variables, with the assessment being grounded in empirical data. The primary objective of hypothesis testing is to ascertain the existence of a substantial impact between the independent variables and the dependent variable. This process enables the generation of valid and scientifically accountable conclusions. In this context, the assessment of statistical significance is predicated on two primary parameters: the t-statistic value and the p-value. Each of these parameters plays a pivotal role in determining the statistical significance of the relationship between variables.

Hypothesis testing is a method of evaluating hypotheses derived from data analysis or factual findings. This process utilizes t-statistics and p-values to ascertain the relationship between variables.

T-statistic: The T-statistic is a value employed in hypothesis testing to ascertain the level of significance.

Requirements:

1. The T-statistic is considered to be significant when it exceeds 1.96.
2. The T-statistic is considered to be insignificant when it is less than 1.96.
3. P-value: The P-value is defined as the probability of obtaining results that are at least as large as the observed results.
4. The following prerequisite must be met: $\alpha = 0.05$.

   In the context of statistical analysis, a p-value that is less than or equal to the alpha level is indicative of a result that is deemed to be "accepted."

   In the context of statistical analysis, a P-value that exceeds the significance level (α) is indicative of a rejection of the null hypothesis.

The t-statistic value is a measure used to ascertain the extent to which the regression coefficient value deviates from zero in standard error units. Consequently, as the t-statistic value increases, the confidence in the existence of a true relationship between the variables, as opposed to a mere coincidence, also increases. The prevailing statistical analysis requirement stipulates that the t-statistic value must exceed 1.96 (at a 5% significance level) to be deemed statistically significant. In the event that the t-statistic value is less than 1.96, it is considered not to be significant.

Conversely, the p-value is indicative of the probability that the observed results in the data set are merely

a product of chance, under the assumption that the null hypothesis (absence of effect) is true. The p-value is a quantitative metric that quantifies the strength of evidence in support of the alternative hypothesis. A smaller p-value indicates a stronger evidence base supporting the rejection of the null hypothesis. In accordance with prevailing conventions, if the p-value is determined to be less than the stipulated significance level, typically set at $\alpha = 0.05$, then the alternative hypothesis is deemed to have been substantiated. This conclusion indicates the presence of a substantial effect between the variables in question.

Path coefficients - Mean, STDEV, T values, p values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
X1 -> Y	0.310	0.303	0.196	1.580	0.114
X1 -> Z	0.476	0.474	0.107	4.465	0.000
X2 -> Y	0.513	0.525	0.191	2.688	0.007
X2 -> Z	0.360	0.368	0.116	3.108	0.002
Z -> Y	-0.141	-0.139	0.134	1.059	0.290

Figure 4. Path Coefficients data table via SmartPLS 4

Based on the results of hypothesis testing in this study, the following hypothesis were obtained:

- As demonstrated in Hypothesis 1 (H1), the p-value is 0.114, which is greater than 0.05. Additionally, the t-statistic is 1.580, which is less than 1.96. This finding suggests that hypothesis 1 is to be rejected, thereby indicating that variable X1 (AI Service) does not exert a significant effect on Y (AI Understanding).
- Hypothesis 2 (H2) demonstrates a p-value of 0.000, which is less than 0.05, and a t-statistic of 4.465, which significantly exceeds the threshold of 1.07. Therefore, hypothesis 2 is accepted, signifying that variable X1 exerts a substantial influence on Z (Customer Satisfaction).
- Hypothesis 3 (H3) obtained a p-value of 0.007, which is less than 0.05. Additionally, it had a t-statistic of 2.688, which is greater than 1.91. Therefore, hypothesis 3 is accepted, and it can be concluded that X2 (Online Convenience) has a significant effect on Y (AI Understanding).
- Hypothesis 4 (H4), the p-value of 0.002 is less than 0.05, and the t-statistic of 3.108 is greater than 1.16. This finding lends further credence to Hypothesis 4, suggesting that X2 exerts a substantial influence on Z, which in this case is defined as Customer Satisfaction.
- Hypothesis 5 (H5) shows a p-value of 0.290, which exceeds 0.05, and a t-statistic of 1.059, which is lower than 1.34. Consequently, this hypothesis is rejected, indicating that Z (Customer Satisfaction) does not exert a substantial influence on Y (AI Understanding).

The results of this hypothesis testing provide a clear picture of the pattern of relationships between variables in the research model. The findings reveal that while several independent variables exhibit a substantial impact on the dependent variable, others demonstrate an insignificant influence. This observation underscores the necessity for discerning selectivity in identifying pertinent variables for subsequent research endeavors.

5.1 Comparison with Existing Methods

In the context of e-commerce and consumer behavior, this article presents a comprehensive literature review that methodically analyzes the role of artificial intelligence (AI) in e-commerce personalization and its impact on consumer behavior and market trends. The authors of this study examine the manner in which artificial intelligence is utilized to enhance the user experience through the application of big data analytics and machine learning algorithms. The study's findings indicate that artificial intelligence (AI) has profoundly transformed the manner in which e-commerce platforms engage with consumers. Key findings include enhanced personalization, enhanced customer engagement through the use of chatbots and virtual assistants, optimized inventory management, and the capacity to predict consumer preferences. These findings align with the conclusions of previous studies, which have demonstrated that the implementation of AI in e-commerce not only enhances customer satisfaction but also fortifies brand loyalty by providing more customized and relevant shopping experiences.

However, the article also discusses the challenges and ethical considerations that arise from the use of AI, such as data privacy, algorithmic bias, and the balance between personalization and intrusiveness. This necessity stems from the imperative to comprehend and employ AI-based strategies in a manner that is both ethical and effective. This is crucial for maintaining competitiveness in the evolving digital landscape and aligning with the expectations of technologically sophisticated consumers.

In conclusion, AI-powered personalization is a game-changer in the e-commerce landscape, transforming how businesses interact with consumers. The principles, mechanisms, and algorithms of AI-driven personalization work together to create tailored, engaging experiences (Wan et al., 2020). The impact on customer engagement and satisfaction is substantial, leading to increased conversion rates, customer loyalty, and overall business success. substantial, leading to increased conversion rates, customer loyalty, and overall business success. As evidenced by case studies from industry leaders, AI-driven personalization has become an indispensable tool for e-commerce platforms. studies, AI-driven personalization has become an indispensable tool for e-commerce platforms seeking to remain competitive in the dynamic and ever-evolving digital marketplace.

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Figure 5. Several Segments for AI applications in Marketing Domain [1]

6. Conclusion

In this study, we have explored customers' perceptions of AI-based services in e-commerce and their impact on customer satisfaction. The results of our study demonstrate that the provision of effective AI services can significantly improve customer satisfaction. In fact, 61.4% of the variation in customer satisfaction can be explained by the variables of AI service and online convenience. These findings underscore the importance of implementing AI in e-commerce marketing strategies, as by understanding customer preferences and providing relevant recommendations, companies can increase customer engagement and loyalty. However, this study is not without its limitations. The sample size is limited to students of the Faculty of Economics and Business at Universitas Muhamadiyah Surakarta, which may limit the generalizability of the findings to a wider population. Additionally, there is a possibility that other variables influencing customer satisfaction were not captured in this model. Consequently, future research endeavors are proposed to encompass a more heterogeneous sample and deliberate additional variables, including demographic and psychographic factors, in addition to investigating the integration of AI with other technologies in e-commerce. Consequently, this study underscores the significance of AI services in enhancing customer experience and paves the way for further research that can deepen our understanding of the interaction between technology and consumer behavior in the context of e-commerce.

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Conflict of Interest Statement

”The authors declare no conflicts of interest.”

Ethical Approval

The data for this study was taken from students of the Economic and Business Faculty in University of Muhammadiyah Surakarta. Each respondent has given their consent and approval to fill our form via a terms and conditions at the beginning of our research.

Data Availability

The dataset used in this study is available at [https://journals.cognispectra.com/index.php/aisa/index]. Researchers interested in accessing the data can find it in the public repository maintained by [COGNISPECTRA PUBLISHING].

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