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ARTIFICIAL INTELLIGENCE AND CUSTOMER ENGAGEMENT IN DRIVING CUSTOMER SATISFACTION

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Abstract

To enhance user experience, online ojek applications have integrated Artificial Intelligence (AI) through features like chatbots, service recommendations, and interaction analysis. This study aims to examine the effect of AI implementation and customer engagement on customer satisfaction in the city of Cirebon. Using a quantitative approach with 401 respondents, data were collected through a questionnaire and analyzed using Slovin's formula and Structural Equation Modeling-Partial Least Squares (SEM-PLS). The results show that AI significantly improves customer satisfaction by increasing service accessibility and ease of use. Furthermore, AI positively influences customer engagement, which in turn has a substantial impact on overall customer satisfaction.

Keywords: Artificial Intelligence, Customer Engagement, Customer Satisfaction

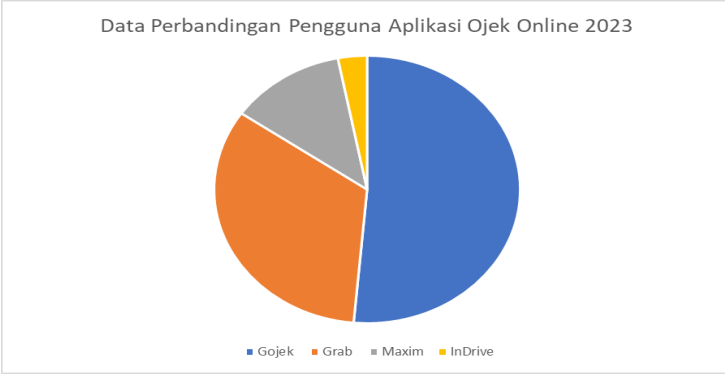
INTRODUCTION

Artificial intelligence (AI) technology in Indonesia is experiencing rapid development in the current digital era. Many customers now prefer machine interaction over human employees, along with the increasing use of recommendation systems and robots (Aguiar-Costa, et.al., 2022). In addition, many applications have also utilized AI to assist their users, thus providing convenience for both parties. AI can be applied in the business world, with the help of AI, marketers can understand consumer behavior more accurately, allowing them to provide a more personal, relevant, and practical experience for each consumer. In addition, AI helps many opportunities in consumer engagement (Arviollisa, et.al., 2021).

Customer engagement can build customer loyalty (Fatimah & Curatman, 2024). Customer engagement refers to the emotional, cognitive, and behavioral involvement of consumers with a brand and is influenced by consumer motivation and circumstances (Arviollisa. et.al., 2021). With the involvement between consumers and the intended goods, consumers are likely to buy repeatedly because there is a sense of satisfaction from consumers when they can get the goods. Customer satisfaction greatly influences subsequent purchases.

Consumers assess their satisfaction or dissatisfaction after purchasing based on the match between real experiences and expectations formed from various sources of information (Ishomi, et.al., 2025). When customers feel valued and satisfied, companies provide relevant offers and understand their preferences. The increasingly accurate and in-depth advancement of AI makes personalization increasingly crucial for companies looking to increase customer satisfaction and engagement (Shaikh, et.al., 2024). As has been implemented in several online motorcycle taxi companies, they take advantage of the very comparative advancement of AI to make it easier for consumers to use their services. Online motorcycle taxi companies have developed a lot with the help of AI, they compete with each other in service excellence to get many consumers. Online motorcycle taxis have emerged using various brands such as Gojek, Grab, Maxim and InDrive which compete with each other to get the most users (Pamungkas, 2023). The following is comparative data on online motorcycle taxi application users.

Figure 1.
Online Ojek Application Users 2023



Source: INDEF (Institute for Development of Economics and Finance)

The use of AI in the Gojek application greatly affects customer satisfaction. Customers find it easier to access information about various foods when they want to buy through Gofood, which makes it easier to access information on travel distances when using Gojek, and can facilitate delivery via Gosend. Through this convenience, customers feel satisfied with their choices when using Gojek (Pamungkas, 2023).

Customer involvement in using services on the Gojek application greatly affects customer satisfaction. AI is a significant source of innovation in various services, utilizing various advanced technologies to collect, process, and act on data. With increasingly human-like capabilities, AI can follow rules, learn from new data, and adapt to environmental changes (Siahaan, 2023).

AI opens up various innovative opportunities in business, especially in digital marketing. The development of AI provides many conveniences for its users, both in the form of services and facilitating engagement between the system and direct users. This can satisfy AI users. Therefore, many companies use AI technology, such as online motorcycle taxi applications.

In addition, AI innovation is also used to improve safety for users and drivers. AI detects sudden stops, sends alerts to passengers to ensure their safety and that of the driver, and offers assistance if needed. In other areas of safety, Gojek has launched safety features such as an emergency button, ride-sharing, and phone number masking to protect users. The emergency button in particular allows users to immediately contact Gojek's ambulance service and emergency unit which are ready to serve 24 hours in an emergency (Siahaan, 2023).

The problem in this study is the dissatisfaction of online motorcycle taxi users due to online motorcycle taxi services and the increasingly competitive offers provided by online motorcycle taxis. The novelty of this study compared to previous studies that conducted research dominated by Qualitative Research Methodology: This study was conducted using quantitative methods to measure Gojek customer satisfaction with the AI technology used in its application, focusing on two main aspects: AI Usage and Customer Engagement.

REVIEW OF LITERATURE

Artificial Intelligence

Artificial intelligence is the science of creating smart machines, as well as smart computer programs and applications. Artificial intelligence can also be interpreted as a step towards creating programs that are considered to work intelligently, like humans in general. (Khutami, at.al., 2024) Artificial intelligence can change business processes by analyzing data in real time, allowing businesses to respond instantly to customer needs and increase satisfaction, customer engagement (Verma, et.al., 2021).

AI can be measured through interaction, information, accessibility, customization. Interaction is measured by the ability of AI to understand customer needs and provide quick responses; Information contains value based on the accuracy and relevance of information provided by artificial intelligence in real-time; accessibility is measured by the ability of AI to operate 24/7 and handle multiple customers at once; customization is measured by the ability of AI to provide personalized services based on client information, including

preferences and past purchases, is a measure of customization capabilities (Ho & Chow, 2024).

Customer Engagement

Customer engagement is the communication or interaction that exists between external stakeholders such as customers and producers or companies through various channels (Patwayati & Zaid; 2021). Customer Engagement not only reflects customers' mental activities, such as attention to the brand, but also includes emotional engagement involving a sense of enthusiasm as well as real behavior, such as sharing experiences or buying products. (Lim, et al., 2022).

Five metrics measure customer engagement: enthusiasm, attention, understanding, interaction and identification. Enthusiasm indicates a person's excitement and strong interest in a particular topic, such as a brand, while attention indicates a consumer's concern for a brand. Comprehension is a positive state in which the customer is fully engaged, satisfied, and interested as a consumer of the brand. Interaction includes both online and offline engagement with the brand, other customers, or outside the buying process. (So, et. al., 2016).

Customer Satisfaction

Customer satisfaction is a performance assessment of what they feel about a product or service compared to their expectations. Consumer satisfaction or dissatisfaction results from comparing perceived product performance and consumer expectations or expectations (Fatimah, 2023) Customer satisfaction is an indicator of service success and has a positive impact on customer engagement. (Majeed, et. al., 2022).

Customer satisfaction depends on service quality, perceived value, brand reputation, and trust. Service quality reflects customer-provider interactions, perceived value weighs benefits against costs, and brand reputation shapes customer perceptions. Trust influences satisfaction and loyalty, leading customers to choose products or services that meet their needs (Kahwaji, et.al., 2016).

HYPOTHESIS DEVELOPMENT

Relationship between Artificial Intelligence and Customer Satisfaction

Applying AI technology can be an effective strategy for increasing customer satisfaction. A system that supports service interaction by providing customers with media and service tools. By the view of (Chen, et.al., 2021), customer perception can be improved by giving cognitive value to customers. In addition, these systems collect customer data and information, help them determine preferences, and generate insights into customer trends and decisions that lead to positive changes in productivity. Therefore, implementing AI-based services has become essential for large enterprises to increase customer satisfaction and maintain a competitive advantage (Mandal Jain et al., 2022).

The implementation of Artificial Intelligence can help businesses better understand and fulfill customer needs, which in turn improves the overall customer experience. Artificial Intelligence is essential in improving customer satisfaction in global business organizations. AI can facilitate the collection and analysis of customer data, allowing the development of products and services better aligned with customer preferences (Mandal Jain, et.al., 2022). In addition, according to (Al-Araj, et al., 2022), (Hargyatni, et al., 2022), AI positively impacts customer satisfaction. AI enables businesses to identify customer needs and wants

and respond more effectively to market changes. From this description, the authors propose a hypothesis:

H1: The application of artificial intelligence and customer satisfaction are related.

Relationship between Customer Engagement and Customer Satisfaction

Customer engagement and customer satisfaction have a close relationship in building company performance. This is as stated by (Hargyatni, et.al., 2022) that "consumers will feel satisfied shopping if their expectations are maximally met," and this satisfaction can lead them to engage further with the company through direct and indirect contributions. Satisfying relationships create emotional involvement, thereby making customers loyal, and they act as brand ambassadors through referrals, feedback, and other social interactions. Therefore, satisfaction should be prioritized to realize loyalty and build long-term engagement that benefits the company.

Customer engagement directly and indirectly impacts customer satisfaction and brand confidence. This confirms that building strong customer relationships is a strategy to maintain and increase customer satisfaction (Tuti & Sulistia, 2022). Previous research studies have shown that consumers who are actively involved in the engagement process interact with online brand communities, contentment, loyalty, connection, empowerment, emotional connection, trust, and commitment. From this description, the author proposes a hypothesis
H2: Customer engagement affects customer satisfaction.

Relationship between Artificial Intelligence and Customer Engagement with Customer Satisfaction

Integrating modern technology like artificial intelligence (AI) has become essential to establishing and preserving client loyalty, engagement, and satisfaction in the modern business environment. The detailed analysis shows that AI convergence is revolutionizing how companies approach customer engagement, satisfaction, and loyalty, making customer-centric strategies a necessity rather than a luxury. Businesses can use AI models and technology to predict client demands, make personalized recommendations, give timely support, and improve reliability (Rane, 2023).

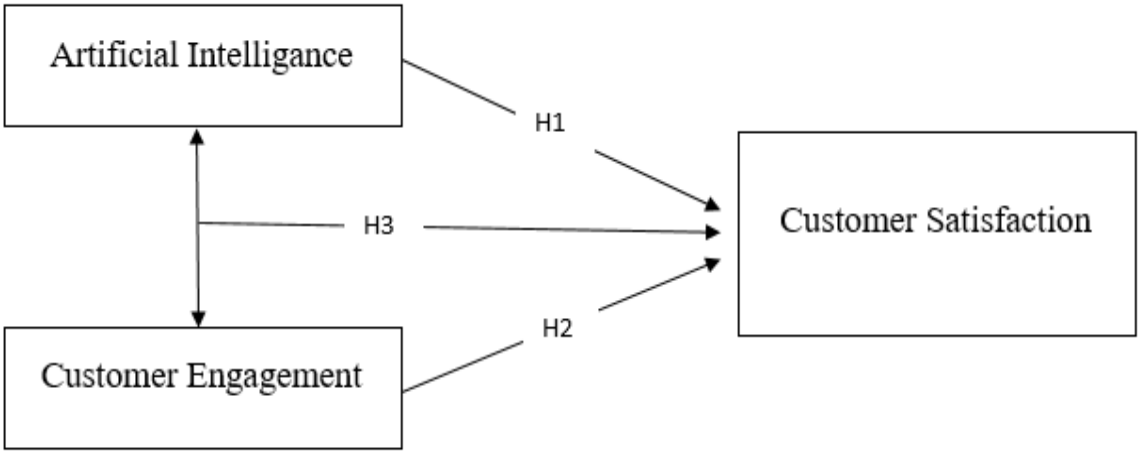
Artificial intelligence (AI) plays an essential role in improving customer engagement. AI enables companies to thoroughly analyze consumer data to comprehend their wants, preferences, and behavior patterns. AI can offer more precise, personalized product recommendations and faster, more responsive customer service utilizing machine learning algorithms and natural language processing. Artificial Intelligence powered customer behavior analysis allows businesses to develop more targeted marketing strategies and make customer-centric decisions. Therefore, technologies like Artificial Intelligence through personalization and deep data analysis will improve customer engagement, satisfaction, loyalty, and experience by leaps and bounds. (Rane, 2023). From this description, the author proposes a hypothesis:

H3: There is an influence between AI and customer engagement with customer satisfaction.

Conceptual Framework

From the previous description, the framework of thought can be illustrated as follows:

Figure 2. Conceptual Framework



H1: Variabel artificial intelligence is suspected to have a positive and significant influence on the Variable customer satisfaction

H2: Variabel customer engagement is suspected to have a significant and positive influence on Variabel customer satisfaction

H3: Variabel customer engagement and artificial intelligence is suspected to have a significant and positive influence on Variabel customer satisfaction

RESEARCH METHOD

Population and Sample

The research method employed in this study is quantitative, focusing on primary data collection and analysis methods. According to (Kothari, 2004). Quantitative research employs numerical data and statistical methods to evaluate hypotheses and identify patterns and relationships between variables. This strategy allows researchers to obtain reliable data that can be generalized to a larger population.

This study involved a population of 67,058 residents of Cirebon City aged 18-30 (BPS Cirebon City, 2024). The sample size determined by the Slovin formula presented 398 respondents. The method applied for the sampling was an accidental sampling procedure in which samples are selected because of their availability or accessibility (Kumar Singh, 2006).

Data Analysis Method

The technique used Structural Equation Modeling-Partial Least Squares (SEM-PLS) to analyze this data. Regression models that predict dependent variables from one or more independent variables can be developed using the Partial Least Squares (PLS) approach. Additionally, PLS can serve as a path model to analyze causal relationships between predictor variables and the connections between predictor and outcome variables. (Garson G, 2016). This method was chosen. It is suitable for research-oriented theory development

and prediction because it uses the entire variance of the indicators to calculate the relationships in the model (Hair, et.al., 2022).

Measurement Variables

The variables used in this study were measured using a survey questionnaire and a Likert scale. The survey questionnaire was designed in a narrative format. Furthermore, all participants' responses were categorized into a five-point scale of Strongly Disagree (1), Disagree (2), Moderately Agree (3), Agree (4), and Strongly Agree (5). The following dimensions and indicators were used to measure the variables: 1) Artificial Intelligence: Artificial intelligence (AI) can be measured through interaction, information, accessibility, customization, and entertainment (Ho & Chow, 2024). The indicators were developed into 10 questions; 2) Customer Engagement: Customer Engagement can be measured using five indicators: Enthusiasm, attention, absorption, interaction, and identification. (So, et al., 2016). These indicators were developed into 10 questions; 3) Customer Satisfaction:Customer Satisfaction has several indicators, including Service Quality, Customer Expectations, Emotional Connection, and Value Perception (Kahwaji, et.al., 2016). These indicators were developed into eight questions.

RESULTS AND DISCUSSION

Descriptive Analysis

There were 401 respondents that completed the questionnaire, and the findings are:

Table 1
Demographic Respondent

Category	Possible Answer	F	%
Gander	Famale	233	58,1
	Male	168	41,9
Age	18-20 years old	78	19,5
	21-23 years old	199	49,6
	24-26 years old	37	9,2
	27-29 years old	43	10,7
	>30 years old	44	11
Job	Student	23	5,7
	Colleger	217	54,1
	Employee	64	16
	Civil Servant	21	5,2
	Entrepreneur	28	7
	Other	48	12
User	Yes	395	98,5
	No	6	1,5
Long Time User	<1 years	64	16
	1 year	47	11,7
	2 years	54	13,5
	3 years	50	12,5
	>3 years	186	46,4

Source: Data processing (2025)

It can be seen in the results of Table 1 with 401 respondents, in which 395 users of the Gojek application are dominated by female respondents, namely 233 people aged 21-23 years with the type of work of students with more than 3 years of use. Women use online ojek because of its convenience, comfort, and security. Gojek services allow travel, delivery orders, and delivery of goods without worrying about outside conditions. Clear driver identity and route tracking features increase the sense of security. In addition, time flexibility is an advantage that allows users to organize trips as needed. This is why using Gojek benefits the community, especially for women.

Outcomes of the Measurement Model

Outer model analysis confirms the evaluation model's appropriateness and allows for assessing its validity and reliability. This aims to guarantee the validity and reliability of the research data. This study used some analysis tests, such as outer loadings, average variance extracted (AVE), Cronbach's alpha, construct reliability, etc., to validate that the research data were valid and reliable. The results are reported in Table 3.

Table 3
Measurement Model

Variable	Indicator	Outer Loading	AVE	Cronbach's Alpha	Composite Reliability
Artificial Intelligence	X1.1	0.862	0.719	0.956	0.962
	X1.2	0.886			
	X1.3	0.839			
	X1.4	0.853			
	X1.5	0.843			
	X1.6	0.848			
	X1.7	0.850			
	X1.8	0.860			
	X1.9	0.762			
	X1.10	0.869			
Customer Engagement	X2.1	0.837	0.731	0.959	0.964
	X2.2	0.859			
	X2.3	0.802			
	X2.4	0.877			
	X2.5	0.875			
	X2.6	0.874			
	X2.7	0.887			
	X2.8	0.859			
	X2.9	0.843			
	X2.10	0.831			
Customer Satisfaction	Y1	0.875	0.768	0.957	0.964
	Y2	0.884			
	Y3	0.884			
	Y4	0.859			
	Y5	0.876			
	Y6	0.898			

	Y7	0.896			
	Y8	0.838			

Source: Data Processing 2025

From Table 3, the outer loading of each element had to be more than 0.7 and the AVE value more than 0.5. Based on the facts, all the indicators in the research are valid. The reliability value can be stated as reliable using the criteria of Cronbach's Alpha because the value is above 0.7 on the composite reliability value. The reliability calculation results in this study indicate that the composite variables and Cronbach's alpha meet the criteria, indicating that the items in this research are reliable. Thus, the data from this research are valid and reliable for the subsequent analysis process.

Analysis Model Structure

Model analysis involves evaluating structural models used to predict latent variables or causal interactions between variables that cannot be directly assessed. Internal model analysis is conducted using R-squared and F-squared. The outcomes of the data processing using R-squared and adjusted R-squared are:

Table 4
Display R-squared and adjusted R-squared values

Model	R Square	R Square Adjusted
X1 and X2 to Y	0.743	0.742

Sumber: Data Processing 2025

There are three classes of R-squared values. According to (Hair, et.al., 2011), values can be grouped into three: above 0.75 are considered strong 0.50-0.74 as moderate and values from 0.25 to 0.49 are considered weak. Because the R Square and Adjusted R Square of the artificial intelligence model X1 and customer engagement X2, concerning customer satisfaction Y, are 0.74 less than 0.75, independent variables can therefore control a dependent variable at a moderate level.

Table 5
Output f square

Variable	Customer Satisfaction
Artificial Intelligence	0.286
Customer Engagement	0.272

Source: Data Processing 2025

Table 5 The effect size, or f-square value, for each research variable shows that the Artificial Intelligence variable moderately influences customer satisfaction, while the Customer Engagement variable exerts a moderate effect on customer satisfaction.

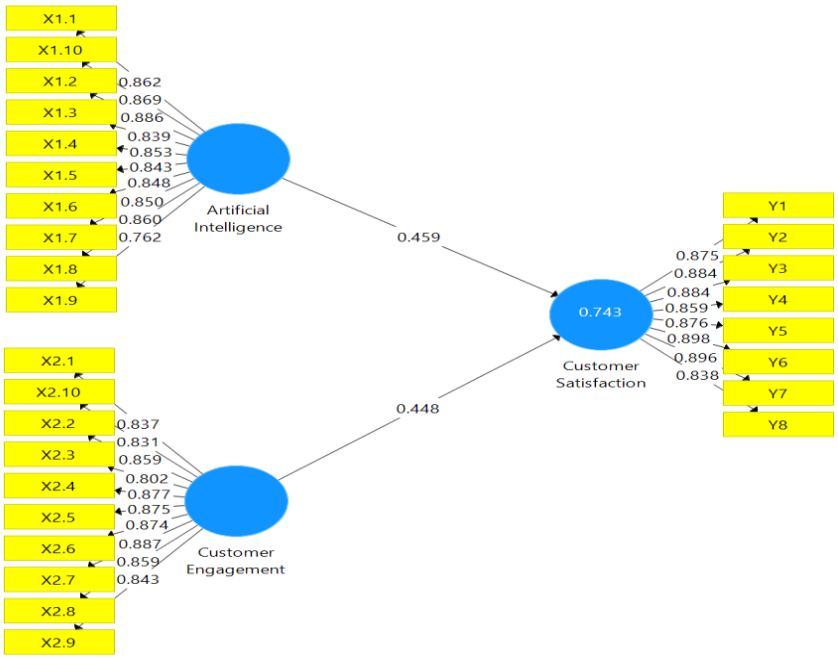


Figure 3.
Output Path Analysis

Hypothesis Testing

For direct and indirect hypothesis testing in this research, please refer to Table 6:

Table 1
Summary of Hypotesis Testing

Hypothesis	Variable Independent	Path Analysis	T Values	P Values
H1	Artificial Intelligence -> Customer Satisfaction	0.459	8.014	0.000
H2	Customer Engagement -> Customer Satisfaction	0.448	7.873	0.000
H3	Artificial intelligence -> Customer Engagement -> Customer Satisfaction	0.743	-	-

Source: Data processing (2025)

Table 6 above indicates that artificial intelligence directly impacts customer satisfaction, with a path coefficient of 0.459. The customer engagement variable has a direct influence of 0.448 on customers satisfaction. Thus, the Artificial Intelligence variable has the strongest direct impact on customers statistics. The path coefficient for artificial intelligence and customer loyalty has a direct effect of 0.743 on customer statistics, indicating that all independent variables influence the dependent variable. The t-value for all variable

relationships is more significant than 1.966 on the t-table. Therefore, all hypothesized relationships in this study are accepted directly and indirectly and directly impact the dependent variable.

Discussion

The results of this study confirm the significant role that Artificial Intelligence (AI) and Customer Engagement play in influencing Customer Satisfaction among users of the Gojek application in Cirebon. The path coefficient values demonstrate that both AI and Customer Engagement have a moderate but significant positive effect on customer satisfaction, supporting all three proposed hypotheses.

The first hypothesis (H1), which posited that AI has a positive influence on customer satisfaction, is supported by a path coefficient of 0.459 and a T-value of 8.014. These findings are consistent with previous studies (e.g., Mandal Jain et al., 2022; Al-Araj et al., 2022), which show that AI enhances service interaction, personalization, and convenience. Gojek's use of AI in features such as real-time driver allocation, route tracking, food recommendations, and fraud detection improves accessibility and ease of use, leading to increased satisfaction. The AI system's ability to offer personalized and relevant services aligns with the expectations of today's digitally literate consumers, especially the dominant demographic of young female users (aged 21–23) identified in this study.

The second hypothesis (H2) examined the effect of Customer Engagement on satisfaction, yielding a path coefficient of 0.448 and a T-value of 7.873, again indicating a significant effect. This supports the idea that when users are emotionally and behaviorally involved with the platform—such as through interaction with Gojek's chatbot or feedback systems—they are more likely to feel valued and, therefore, more satisfied. As shown in this study, Gojek successfully fosters engagement through features that promote user interaction, personalization, and a sense of identification with the service, especially over longer usage durations (more than 3 years). This is in line with findings by Tuti & Sulistia (2022) and Lim et al. (2022), which emphasized that customer engagement can deepen emotional connection and trust, leading to satisfaction and loyalty.

The third hypothesis (H3) evaluated the combined effect of AI and Customer Engagement on Customer Satisfaction and found a strong cumulative effect with an R^2 value of 0.743. This means that 74.3% of customer satisfaction can be explained by the two independent variables—AI and customer engagement—demonstrating a synergistic effect. This aligns with the insights of Rane (2023), who argued that AI-driven personalization and real-time data analysis significantly improve both customer engagement and satisfaction.

In summary, AI and customer engagement are not only individually influential but also mutually reinforcing in enhancing customer satisfaction. The results highlight the importance for digital service providers like Gojek to continue investing in intelligent technology while simultaneously building strong engagement strategies. The combination of automation (AI) and emotional involvement (engagement) forms a comprehensive strategy to meet the growing expectations of tech-savvy consumers in Indonesia's competitive ride-hailing industry.

CONCLUSION

Based on the results of a study of 401 respondents who use the Gojek application in Cirebon City, it can be concluded that Artificial Intelligence (AI) and Customer Engagement have a significant influence on Customer Satisfaction. AI has a direct positive impact on customer satisfaction with a coefficient value of 0.459 and a T-value of 8.014, indicating that AI-based features such as service recommendations, trip tracking, and security systems provide convenience and comfort that encourage increased user satisfaction. In addition, Customer Engagement also shows a significant influence with a coefficient of 0.448 and a T-value of 7.873, which means that emotional involvement and customer behavior in using the application play an important role in creating a satisfying experience. Simultaneously, the combination of AI and Customer Engagement is able to explain 74.3% of the customer satisfaction variable, indicating a strong synergistic effect between technology and customer interaction. Thus, it can be concluded that the application of intelligent technology and increasing customer engagement are important strategies that need to be optimized by digital service providers such as Gojek to increase customer satisfaction and loyalty amidst the increasingly tight competition in the application-based transportation industry.

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