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Ai-Powered E-Commerce: Elevating E-Service Quality Through Utilitarian And Hedonic With E-Satisfaction As The Bridge To E-Loyalty

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ABSTRACT

The advent of artificial intelligence (AI) has ushered in a new era in e-commerce, fundamentally transforming business operations and customer interactions. This study investigates the impact of AI on e-service quality, focusing on both utilitarian and hedonic dimensions, and examines the mediating role of e-satisfaction in fostering e-loyalty within the Indonesian e-commerce context. The primary research question addresses how AI-enhanced e-service quality influences e-satisfaction and, subsequently, e-loyalty. Despite the growing importance of AI in e-commerce, there has been limited research on its dual role in enhancing both functional and emotional aspects of e-service quality. This study employs a quantitative approach, utilizing Structural Equation Modeling (SEM) to analyze data collected through purposive sampling from consumers of major Indonesian e-commerce platforms. The findings reveal that AI significantly improves e-service quality by enhancing efficiency, reliability, and personalization, which in turn boosts customer satisfaction. Both utilitarian and hedonic improvements facilitated by AI contribute to higher levels of e-satisfaction, which strongly correlates with increased e-loyalty. Conclusively, this research highlights the pivotal role of AI in elevating e-commerce service quality, demonstrating that AI-driven enhancements in both functional and experiential aspects lead to greater customer satisfaction and loyalty. The implications for e-commerce businesses include the strategic use of AI to optimize customer experiences through personalized and efficient service delivery. As AI technologies continue to evolve, their potential to further enhance e-service quality and foster sustained customer loyalty presents significant opportunities for the future of e-commerce. This study provides valuable insights into the integration of AI in e-commerce, offering a roadmap for leveraging AI to achieve competitive advantage and customer retention.

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INTRODUCTION

The advent of artificial intelligence (AI) has signed a new era in the e-commerce industry, fundamentally transforming how businesses operate and interact with customers. As e-

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commerce platforms strive to differentiate themselves in an increasingly competitive market, the quality of e-services has emerged as a critical factor in attracting and retaining customers. E-service quality, encompassing both utilitarian and hedonic dimensions, plays a pivotal role in shaping customer experiences and satisfaction. Utilitarian dimensions focus on the functional aspects of e-commerce, such as efficiency, reliability, security, and functionality, which are essential for the seamless operation of online services. In contrast, hedonic dimensions emphasize the experiential and emotional facets, including aesthetic appeal, enjoyment, personalization, and interactivity, which enhance the overall user experience and engagement.

AI technologies, such as machine learning, natural language processing, and computer vision, have enabled e-commerce platforms to significantly enhance these dimensions of e-service quality. For instance, AI-driven recommendation systems improve efficiency by providing personalized product suggestions, while AI-powered chatbots enhance interactivity and enjoyment through engaging customer support. As these technologies continue to evolve, their potential to simultaneously elevate both utilitarian and hedonic dimensions becomes increasingly apparent.

A critical aspect of this transformation is the role of e-satisfaction as a mediator between e-service quality and e-loyalty. E-satisfaction, defined as the customer's overall contentment with their online shopping experience, is influenced by both the functional efficiency and the experiential enjoyment provided by AI-enhanced services. High levels of e-satisfaction, in turn, drive e-loyalty, which is characterized by repeat purchases and sustained customer engagement. Understanding the interplay between these variables is essential for e-commerce platforms aiming to leverage AI to boost customer satisfaction and loyalty.

In this context, Indonesia's e-commerce market presents a particularly compelling case study. As one of the fastest-growing e-commerce markets in the world, driven by a young, tech-savvy population, increasing internet penetration, and a growing middle class, Indonesia showcases both significant opportunities and challenges. Major platforms such as Tokopedia, Shopee, and Lazada dominate the market, offering a wide range of products and services that cater to diverse consumer needs. However, the Indonesian e-commerce market also faces logistical challenges due to the country's archipelagic geography, varied infrastructure quality across regions, and concerns regarding payment security and fraud. Moreover, customer expectations are evolving, with increasing demand for both functional efficiency and enjoyable, personalized shopping experiences.

In this dynamic environment, AI presents a promising solution to many of the challenges faced by Indonesian e-commerce platforms. By enhancing both utilitarian and hedonic dimensions of e-service quality, AI can significantly improve customer satisfaction and loyalty in this burgeoning market. AI-driven logistics solutions can optimize delivery routes, reducing transit times and costs, while AI-powered inventory management systems ensure better stock availability and quicker fulfillment. AI algorithms provide accurate and real-time updates on product availability, order status, and delivery tracking, enhancing trust and reliability. Additionally, AI-based fraud detection systems improve payment security, and features such

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as AI-enabled voice search and automated customer service streamline navigation and support, making the shopping experience smoother and more efficient.

On the hedonic side, AI-powered design tools create visually appealing and user-friendly interfaces tailored to Indonesian cultural aesthetics, while gamification and interactive elements make shopping more engaging and enjoyable. AI-driven personalized recommendations and marketing offer customized experiences, enhancing customer satisfaction and retention. Furthermore, AI chatbots and virtual assistants provide personalized and interactive customer service, addressing queries and issues in real-time.

E-satisfaction in the Indonesian e-commerce context is influenced by the combined effects of AI-enhanced utilitarian and hedonic dimensions. The convenience, reliability, and security provided by AI tools contribute to functional satisfaction, while the enjoyment, personalization, and aesthetic appeal foster emotional satisfaction. This dual satisfaction mediates the relationship between e-service quality and e-loyalty, leading to higher customer retention rates and repeat purchases. E-loyalty, characterized by repeat purchases and long-term engagement, is the ultimate goal for e-commerce platforms. In Indonesia, where competition is fierce and consumer loyalty is critical, AI-enhanced e-service quality can play a pivotal role in achieving this goal. By continuously improving both functional and experiential aspects of the customer journey, AI technologies help build strong, loyal customer bases.

The integration of AI into Indonesian e-commerce offers significant opportunities to enhance e-service quality by balancing utilitarian and hedonic dimensions. This, in turn, drives e-satisfaction, which acts as a crucial mediator in fostering e-loyalty. As the Indonesian e-commerce market continues to grow, leveraging AI to improve service quality will be essential for platforms aiming to differentiate themselves and build lasting customer relationships.

This study aims to explore the innovative applications of AI in enhancing both utilitarian and hedonic dimensions of e-service quality, and to examine the mediating role of e-satisfaction in fostering e-loyalty in Indoneia. By analyzing recent trends, consumer feedback, and case studies, this research seeks to provide a comprehensive understanding of AI's impact on e-commerce service quality and its potential to cultivate long-term customer loyalty. Through this exploration, we aim to fill a gap in the current academic literature and offer valuable insights for e-commerce businesses looking to optimize their service offerings in the age of AI.

Literature Review

AI-Powered E-Commerce

The integration of artificial intelligence (AI) in e-commerce has revolutionized the industry, enabling platforms to enhance service quality and customer experiences significantly. Key AI technologies that drive these advancements include machine learning, natural language processing (NLP), and computer vision.

Technologies such as machine learning algorithms enable e-commerce platforms to analyze vast amounts of data to identify patterns and make predictions. For example, recommendation systems use machine learning to suggest products based on past consumer behavior, thereby improving shopping efficiency and personalization (Kumar & Rajan, 2018).

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Other technologhy such as Natural Language Processing (NLP) is used to understand and interpret human language, facilitating better customer interactions. AI-powered chatbots and virtual assistants, which rely on NLP, provide instant customer support, answer queries, and help users navigate the website, enhancing the overall customer experience (Luo, Tong, Fang, & Qu, 2019).

AI also allows computers to interpret and process visual data. In e-commerce, computer vision is used for various purposes, such as visual search, where customers can search for products using images rather than text, and for quality control in warehousing and logistics (Liu, Dong, & Zhang, 2020).

The integration of AI technologies has significantly impacted the landscape of e-service quality, which encompasses both utilitarian and hedonic dimensions. In Utilitarian Dimensions, AI refers to the functional aspects of e-service quality, including efficiency, reliability, security, and functionality. AI enhances these dimensions by improving operational processes. For instance, AI-driven inventory management ensures products are in stock and accurately tracked, while AI-based security measures protect customer data and transactions (Yang, Sun, Zhang, & Wang, 2021).

In hedonic dimensions, these focus on the experiential and emotional aspects of e-commerce. AI contributes to hedonic quality through personalization and interactive features. Personalized recommendations and marketing, powered by AI, create a unique shopping experience for each user. Interactive AI elements, such as gamified features and engaging interfaces, enhance the enjoyment and aesthetic appeal of the shopping process (Huang & Benyoucef, 2013).

Balancing these dimensions is crucial for achieving high e-service quality. While utilitarian aspects ensure the platform functions smoothly and meets basic customer needs, hedonic aspects make the shopping experience enjoyable and memorable. E-commerce platforms must integrate AI in a way that optimally enhances both dimensions to maintain customer satisfaction and loyalty (Nandankar, Sachen, Mukherjee, & Adhikari, 2023; Mamakou, Zaharias, & Milesi, 2024).

Utilitarian Dimensions Enhanced by AI in Indonesia e-Commerce

Artificial intelligence (AI) is playing a transformative role in enhancing the utilitarian dimensions of e-service quality in e-commerce, which is especially pertinent in Indonesia's rapidly growing market. The key utilitarian dimensions improved by AI include efficiency, reliability, security, and functionality.

Efficiency in e-commerce is significantly boosted by AI through various mechanisms. AI-driven recommendations utilize algorithms to analyze customer data and behavior, providing personalized product suggestions that streamline the shopping experience and reduce the time customers spend searching for products. This not only enhances user satisfaction but also drives sales by aligning product offerings with customer preferences (Kumar & Rajan, 2018). Additionally, AI optimizes inventory management by predicting demand trends and adjusting stock levels accordingly, ensuring that popular items are readily available and reducing both stockouts and excess inventory (Choi, Wallace, & Wang, 2018). Furthermore, AI enhances supply chain optimization by leveraging predictive analytics and

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real-time data processing, which allows for more accurate demand forecasting and efficient logistics management, ultimately leading to faster delivery times and improved customer satisfaction (Tiwari, Wee, & Daryanto, 2018).

Reliability is another critical dimension enhanced by AI. Accurate product information is maintained through AI algorithms that continuously update product descriptions, prices, and availability, thereby minimizing the risk of misinformation and fostering customer trust (Wang, Wang, & Liu, 2016). AI also improves order tracking by providing precise, real-time updates that allow customers to monitor their orders accurately, enhancing transparency and reliability (Ren, Chan, & Ram, 2017). In terms of customer support, AI-powered chatbots and virtual assistants offer reliable, 24/7 assistance by efficiently handling inquiries and resolving issues, thereby reducing wait times and improving overall service reliability (Luo, Tong, Fang, & Qu, 2019).

Security in e-commerce is greatly fortified by AI through advanced fraud detection and cybersecurity measures. AI-based systems analyze transaction patterns and detect anomalies, preventing fraudulent activities and protecting both businesses and customers (Ngai, Hu, Wong, Chen, & Sun, 2015). AI also enhances cybersecurity by monitoring network traffic and identifying potential threats in real-time, learning from past incidents to predict and prevent cyber attacks, thus ensuring the protection of customer data (Buczak & Guven, 2016).

Functionality of e-commerce platforms is significantly improved by AI-enabled features. Voice search capabilities allow customers to use natural language to find products, making the shopping process more intuitive and user-friendly (Guha, Kumar, & Sukthankar, 2015). Automated customer service through AI-driven chatbots and virtual assistants handles a wide range of queries and issues without human intervention, leading to faster response times and higher customer satisfaction (Huang & Rust, Artificial intelligence in service, 2018). Additionally, AI personalizes website navigation by tailoring the user interface to individual preferences and behaviors, making it easier for customers to find what they need quickly and efficiently, thereby enhancing overall functionality (Grewal, Roggeveen, & Nordfalt, 2017).

In Indonesia, where the e-commerce market is one of the fastest-growing in Southeast Asia, these AI-enhanced utilitarian dimensions are particularly relevant. The country's young, tech-savvy population and increasing internet penetration are driving rapid adoption of AI technologies in e-commerce, with local giants like Tokopedia and Bukalapak leveraging AI to improve customer experiences through personalized recommendations, efficient logistics, and robust customer support systems. As AI continues to evolve, its impact on e-service quality in Indonesia's e-commerce sector is likely to grow, further enhancing efficiency, reliability, security, and functionality.

Hedonic Dimensions Enhanced by AI in Indoneia e-Commerce

Artificial intelligence (AI) has profoundly transformed the hedonic dimensions of e-commerce in Indonesia, enhancing the overall user experience through aesthetic appeal, enjoyment, personalization, and interactivity. Aesthetic Appeal in Indonesian e-commerce platforms is significantly improved through AI-powered design tools that enable personalized interface customization. These tools analyze user preferences and behaviors to create visually

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appealing and user-friendly interfaces that cater to individual tastes. By enhancing the visual appeal, AI ensures that users have a more engaging and aesthetically pleasing shopping experience (Chiu, Wang, Fang, & Huang, Understanding customers' repeat purchase intentions in B2C e-commerce: The roles of utilitarian value, hedonic value and perceived risk, 2014; Kim, Kim, & Wachter, 2016).

Enjoyment is another crucial aspect where AI makes a substantial impact. E-commerce platforms in Indonesia are incorporating AI-driven gamification elements and interactive features to make the shopping experience more enjoyable. Gamification involves integrating game-like elements such as rewards, challenges, and leaderboards, which AI optimizes by personalizing these elements based on user preferences. Additionally, interactive features powered by AI, such as virtual try-ons and augmented reality, provide immersive experiences that enhance user enjoyment (Hamari, Koivisto, & Sarsa, 2014; Huang & Rust, 2021). (Hamari, Koivisto, & Sarsa, 2014) (Huang & Rust, Engaged to a robot? The role of AI in service, 2021)

Personalization is perhaps one of the most significant contributions of AI to the e-commerce sector in Indonesia. AI-driven personalized recommendations are based on extensive data analysis of individual browsing and purchasing behaviors. This allows for the delivery of tailored content and individualized marketing strategies, ensuring that customers receive product suggestions and advertisements that are most relevant to their interests. This high level of personalization creates a unique and satisfying shopping experience for each user (Linden, Smith, & York , 2017; Smith, Rupp, & Wright, 2020).

Interactivity is enhanced through the deployment of AI chatbots and virtual assistants on e-commerce platforms. These AI systems provide engaging and responsive interactions by understanding and processing natural language. They can handle a wide range of queries and issues efficiently, making the shopping process more interactive and satisfying. The ability of AI chatbots to operate 24/7 also ensures that customers receive timely support, further enhancing the overall user experience (Folstad & Branstzaeg, 2017; Rese, Ganster , & Baier , 2020).

In Indonesia, where the e-commerce market is experiencing rapid growth, the integration of AI into these hedonic dimensions is particularly impactful. Local e-commerce giants like Tokopedia leveraging AI technologies to enhance aesthetic appeal, enjoyment, personalization, and interactivity, thus providing superior shopping experiences that cater to the diverse needs and preferences of Indonesian consumers.

Synergies Between Utilitarian and Hedonic Dimensions

In Indonesia's dynamic e-commerce landscape, the integration of AI technologies has created significant synergies between utilitarian and hedonic dimensions, enhancing the overall customer experience. This balance is crucial as it ensures that e-commerce platforms are not only functional but also enjoyable to use.

Balancing efficiency and enjoyment in the customer experience is a central focus for Indonesian e-commerce platforms. Efficiency, a utilitarian dimension, is achieved through AI-driven technologies such as personalized recommendations, optimized inventory management, and streamlined logistics. These improvements ensure that customers receive timely and accurate service. Meanwhile, hedonic dimensions like enjoyment are enhanced

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through AI-driven gamification and interactive features that make shopping more engaging and fun (Huang & Rust, 2018; Hamari, Koivisto, & Sarsa, 2014). By integrating these dimensions, platforms can provide a seamless and pleasurable shopping experience, encouraging repeat usage and fostering customer loyalty. (Huang & Rust, Artificial intelligence in service, 2018; Hamari, Koivisto, & Sarsa, 2014).

For instance, e-commerce platforms successfully integrating AI to enhance both dimensions can be seen in Indonesia's leading marketplaces like Tokopedia. Tokopedia uses AI to personalize the shopping experience through tailored product recommendations and dynamic interface customization. This not only improves the efficiency of product discovery but also makes the platform visually appealing and enjoyable to navigate (Lim, 2019; Rese, Ganster , & Baier , 2020).

Potential trade-offs and synergies between functional and experiential improvements are inherent in the development of AI-enhanced e-commerce platforms. A potential trade-off exists when focusing too heavily on utilitarian aspects like efficiency and security, which might lead to a less engaging user experience if hedonic elements are neglected. Conversely, an overemphasis on enjoyment and aesthetic appeal might compromise functional aspects such as speed and reliability (Huang & Rust, 2021). However, synergies are achieved when both dimensions are balanced, as seen with AI-powered personalization that enhances both the efficiency of finding relevant products and the enjoyment of receiving tailored recommendations (Linden, Smith, & York , 2017). (Huang & Rust, Engaged to a robot? The role of AI in service, 2021)

In summaries, the successful integration of AI technologies in Indonesian e-commerce platforms demonstrates the importance of balancing utilitarian and hedonic dimensions. By leveraging AI to enhance both efficiency and enjoyment, these platforms can create a comprehensive and satisfying shopping experience that meets the diverse needs of their users.

E-Satisfaction in Indonesia e-Commerce

E-satisfaction refers to the contentment of customers with their online shopping experiences, encompassing both the process and the outcome of purchasing from an e-commerce platform. In Indonesia, e-satisfaction is crucial for the success of e-commerce businesses as it directly influences customer retention and word-of-mouth promotion. High levels of e-satisfaction result from a seamless, enjoyable, and efficient online shopping experience, which encourages customers to return to the same platform for future purchases (Mutinga, Moorman, & Smit, 2015).

AI-enhanced utilitarian and hedonic dimensions significantly impact e-satisfaction by improving both the functional and experiential aspects of online shopping. Utilitarian dimensions, such as efficiency, reliability, security, and functionality, are enhanced by AI technologies that streamline operations, ensure accurate product information, and provide secure transactions. These improvements lead to a smoother and more reliable shopping process, increasing customer satisfaction (Chiu, Wang, Fang, & Huang, Understanding customers' repeat purchase intentions in B2C e-commerce: The roles of utilitarian value, hedonic value and perceived risk, 2014). On the other hand, hedonic dimensions like aesthetic

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appeal, enjoyment, personalization, and interactivity are also bolstered by AI. AI-driven personalized interfaces, gamification, tailored recommendations, and interactive chatbots create an engaging and enjoyable shopping environment, further boosting e-satisfaction (Hamari et al., 2014; Huang & Rust, 2021). (Hamari, Koivisto, & Sarsa, 2014; Huang & Rust, Engaged to a robot? The role of AI in service, 2021)

E-satisfaction plays a mediating role in the relationship between e-service quality and e-loyalty. High-quality e-services enhance customer satisfaction, which in turn fosters customer loyalty. When customers have satisfying online shopping experiences, they are more likely to develop a sense of loyalty to the platform, leading to repeat purchases and positive referrals. This mediating effect of e-satisfaction underscores its importance in translating e-service quality into e-loyalty, making it a critical focus for e-commerce platforms in Indonesia (Yoon, 2016).

E-Loyalty as the Ultimate Goal in Indonesia e-Commerce

E-loyalty is defined as the customer's commitment to repeatedly purchase from a particular e-commerce platform, often despite attractive offers from competitors. E-loyalty is vital for the long-term success of e-commerce businesses because it reduces marketing costs, increases customer lifetime value, and generates positive word-of-mouth. For Indonesian e-commerce platforms, cultivating e-loyalty is particularly important given the competitive market and the diverse preferences of consumers (Anderson & Srinivasan, 2003).

The impact of AI-enhanced e-service quality on e-loyalty is mediated through e-satisfaction. High e-service quality, achieved through AI improvements in both utilitarian and hedonic dimensions, leads to higher e-satisfaction. When customers are satisfied with their online shopping experiences, they are more likely to remain loyal to the platform. AI technologies contribute to this by ensuring efficient service delivery, providing personalized and engaging shopping experiences, and maintaining high security standards (Kim, Kim, & Wachter, 2016; Khan, Zubair, & Malik, 2019).

Impact on Customer Satisfaction and Purchase Behavior in Indonesia e-commerce

The integration of AI-enhanced features in Indonesian e-commerce significantly impacts customer satisfaction and purchasing behavior. Customer feedback consistently highlights the positive effects of AI-driven improvements on their shopping experience. For instance, AI technologies that personalize recommendations and streamline navigation are frequently cited as factors that enhance user satisfaction. These features contribute to a more efficient and enjoyable shopping process, leading to higher levels of customer satisfaction (Dwivedi, et al., 2021).

The correlation between AI-driven enhancements in e-service quality and increased customer loyalty and sales is well-documented. Improved efficiency, reliability, and personalization foster e-satisfaction, which acts as a mediator in boosting e-loyalty. Satisfied customers are more likely to make repeat purchases and exhibit loyalty to the platform, resulting in increased sales. AI's role in providing accurate product recommendations and seamless customer service has been crucial in achieving satisfcation (Prashar et al., 2018; Chiu et al., 2020). (Prashar, Vijay, Parsad, & Tata, 2021; Chiu, Wang, Fang, & Huang,

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Understanding customers' repeat purchase intentions in B2C e-commerce: The roles of utilitarian value, hedonic value, and perceived risk, 2020).

Behavioral insights indicate that AI influences customer decision-making by creating a more tailored and engaging shopping experience. AI algorithms analyze user behavior and preferences to offer customized shopping suggestions, enhancing the likelihood of purchase. Moreover, AI-powered interactive features, such as chatbots and virtual assistants, provide immediate support and personalized interactions, which can encourage repeat purchases and build long-term customer relationships (Huang & Rust, 2021). (Huang

METHODS

This study employs a quantitative approach, focusing on testing several hypotheses to predict outcomes based on empirical data. Quantitative research is suitable here due to its systematic investigation of relationships among measurable variables (Creswell & Creswell, 2018). Hypotheses in this study are tentative statements that can be tested and are formulated to predict the relationship between AI-enhanced e-service quality and customer satisfaction, as well as their impact on e-loyalty (Sekaran & Bougie, 2016).

Data collection is conducted using a non-probability sampling method, specifically purposive sampling. This approach targets individuals who can provide the necessary information, ensuring that the sample includes only those who meet specific criteria set by the researchers. In this case, the criteria focus on consumers who have made online transactions through major Indonesian e-commerce platforms such as Bukalapak, Tokopedia, Shopee, and Blibli (Etikan, Musa, & Alkassim, 2016).

Data analysis is performed using Structural Equation Modeling (SEM) to evaluate the relationships between variables. SEM is chosen for its ability to assess complex models and provide insights into the causal relationships within the data. Hypothesis testing is conducted using the T-test, where a t-value greater than 1.96 indicates that the alternative hypothesis is accepted (Hair, Black, Babin, Anderson, & Tatham, 2014). This statistical approach ensures the robustness and reliability of the findings, offering a comprehensive understanding of how AI-driven e-service quality influences e-satisfaction and e-loyalty in the Indonesian e-commerce context.

RESULTS AND DISCUSSION

Based on the respondent data, the researcher gain 450 respondents who were 57% women and 43% man, with 255 and 195 respectively. Mostly the recipients came from millennials who 20-39 years old with 64% (288), Then Gen X who 40-54 years old with 27%(121) and baby boomer with 9% (40) and pre baby boomer above 70 years old with 1 respondent. Mostly the respondent living in Jabodatebake with 348 respondents (77%), followed by West Java and Banten with 46 respondents (10%).

Talking about the results of the analysis, Convergent validity testing is performed on each construct indicator. According to Chin (2015), an indicator is considered valid if its value is greater than 0.70, while a loading factor between 0.50 and 0.60 can be considered

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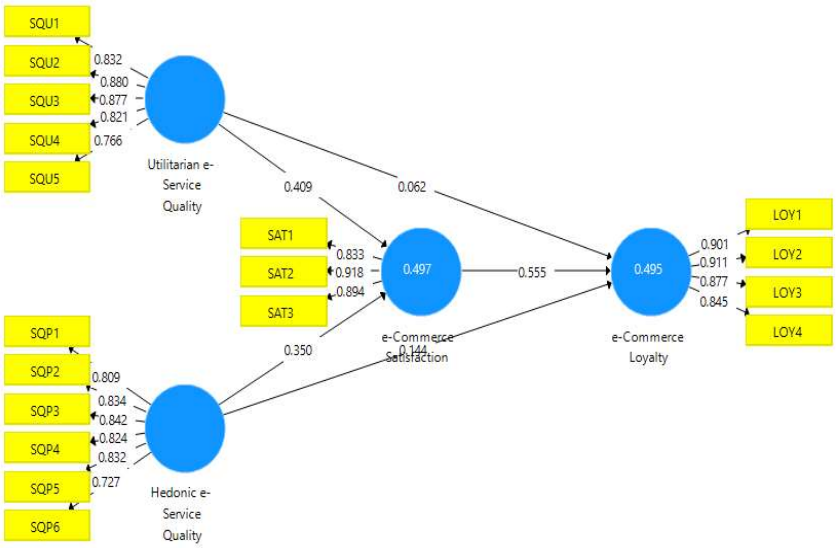
adequate. Based on this criterion, if there is a loading factor below 0.50, it will be dropped from the model.



Source: Output from smartPLS 3.0

Figure 1. Result of Algorithm smartPLS 3.0

Based on the table above, it can be seen that all the indicators of the research variables are declared valid, because the Outer Loadings values of each indicator are greater than 0.7. Thus, the questionnaire items can be used in subsequent analyses. To ensure that there are no measurement-related issues, the final step in evaluating the outer model is to test the reliability of the model. Reliability testing is conducted using the Composite Reliability and Cronbach's Alpha indicators.

The estimated values for path effects in the structural model should be significant. This significance value can be obtained through bootstrapping procedures. Assessing significance in hypotheses involves examining the coefficient parameter values and the significance of t-statistics in the bootstrapping algorithm report. To determine significance, we compare the t-Table value at alpha 0.05 (5%) = 1.96 with the calculated t-value (t-statistic).

Table 1. Hypothesis Testing Result

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Hedonic e-Service Quality -> e-Commerce Loyalty	0,144	0,143	0,054	2,662	0,008
Hedonic e-Service Quality -> e-Commerce Satisfaction	0,350	0,353	0,060	5,822	0,000
Utilitarian e-Service Quality -> e-Commerce Loyalty	0,062	0,064	0,053	1,166	0,244

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	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Utilitarian e-Service Quality -> e-Commerce Satisfaction	0,409	0,408	0,061	6,764	0,000
e-Commerce Satisfaction -> e-Commerce Loyalty	0,555	0,554	0,045	12,300	0,000

1. Hedonic e-Service Quality -> e-Commerce Loyalty

The original sample value of 0.144 indicates a positive influence between "Hedonic e-Service Quality" and "e-Commerce Loyalty". With a T-Statistics of 2.662 and P-Value of 0.008, this influence is statistically significant. This means that enhancing hedonic service quality, such as pleasant and aesthetic experiences on e-commerce platforms, can increase customer loyalty. This loyalty is crucial for maintaining a solid and repeat customer base.

2. Hedonic e-Service Quality -> e-Commerce Satisfaction

The original sample value of 0.350 indicates a strong positive influence between "Hedonic e-Service Quality" and "e-Commerce Satisfaction". With a T-Statistics of 5.822 and P-Value of 0.000, this influence is highly statistically significant. This indicates that enjoyable and emotionally satisfying services have a significant impact on enhancing customer satisfaction. High satisfaction typically leads to increased loyalty and positive recommendations from customers.

3. Utilitarian e-Service Quality -> e-Commerce Loyalty

The original sample value of 0.062 indicates a weak positive influence between "Utilitarian e-Service Quality" and "e-Commerce Loyalty". However, with a T-Statistics of 1.166 and P-Value of 0.244, this influence is not statistically significant. This indicates that while efficient and functional service quality is important, it may not be sufficient to significantly enhance customer loyalty without the support of the emotional or hedonic aspects of the service.

4. Utilitarian e-Service Quality -> e-Commerce Satisfaction

The original sample value of 0.409 indicates a strong positive influence between "Utilitarian e-Service Quality" and "e-Commerce Satisfaction". With a T-Statistics of 6.764 and P-Value of 0.000, this influence is highly statistically significant. This means that efficient, user-friendly, and functional services significantly increase customer satisfaction. This satisfaction is important as it directly contributes to customer loyalty and retention.

5. e-Commerce Satisfaction -> e-Commerce Loyalty

The original sample value of 0.555 indicates a very strong positive influence between "e-Commerce Satisfaction" and "e-Commerce Loyalty". With a T-Statistics of 12.300 and P-Value of 0.000, this influence is highly statistically significant. This indicates that customer satisfaction has a significant impact on their loyalty. Satisfied customers are more likely to return, recommend to others, and become loyal advocates for the e-commerce platform. Below are the results of the indirect influence analysis:

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Table 2. Results of the indirect influence analysis

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Hedonic e-Service Quality -> e-Commerce Satisfaction -> e-Commerce Loyalty	0,194	0,195	0,036	5,333	0,000
Utilitarian e-Service Quality -> e-Commerce Satisfaction -> e-Commerce Loyalty	0,227	0,226	0,040	5,676	0,000

1. Hedonic e-Service Quality -> e-Commerce Satisfaction -> e-Commerce Loyalty

The original sample value of 0.194 indicates a positive indirect influence from "Hedonic e-Service Quality" to "e-Commerce Loyalty" through "e-Commerce Satisfaction." With a T-Statistics of 5.333 and P-Value of 0.000, this influence is highly statistically significant. This means that emotionally satisfying hedonic services not only directly enhance customer satisfaction but also indirectly boost their loyalty through perceived satisfaction. Customers who feel satisfied with the emotional and aesthetic aspects of e-commerce services tend to be more loyal to the platform.

2. Utilitarian e-Service Quality -> e-Commerce Satisfaction -> e-Commerce Loyalty

The original sample value of 0.227 indicates a positive indirect influence from "Utilitarian e-Service Quality" to "e-Commerce Loyalty" through "e-Commerce Satisfaction." With a T-Statistics of 5.676 and P-Value of 0.000, this influence is highly statistically significant. This indicates that efficient and functional services, when making customers satisfied, have a significant positive impact on their loyalty. In other words, good service quality in terms of utility enhances customer satisfaction, which in turn strengthens their loyalty to the e-commerce platform.

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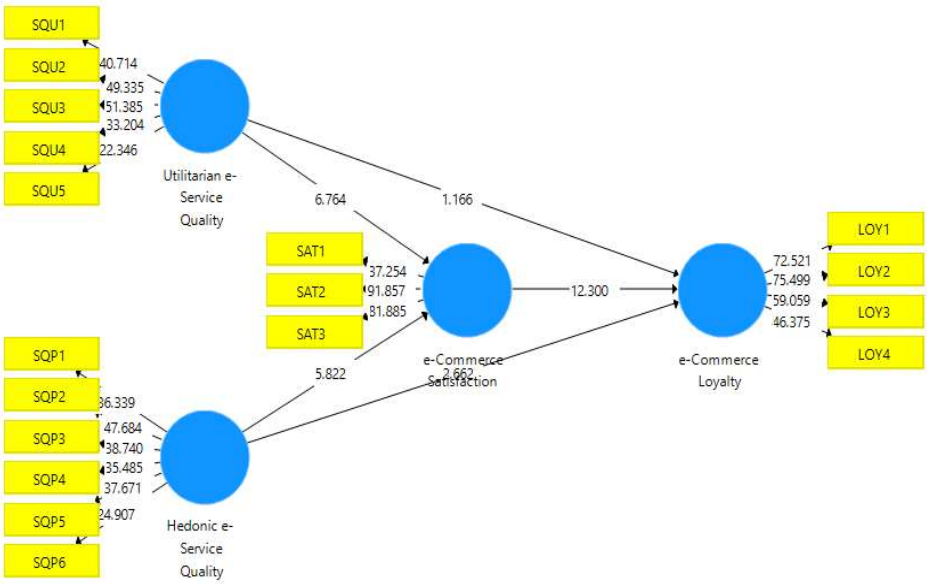

Figure 2. Result of Bootstrapping Test

CONCLUSION

This study explored the impact of hedonic and utilitarian e-service quality on e-commerce satisfaction and loyalty. Key findings revealed that hedonic e-service quality significantly enhances customer satisfaction and has a positive, though less strong, influence on loyalty. Utilitarian e-service quality significantly boosts satisfaction but does not directly affect loyalty. However, both qualities indirectly enhance loyalty through increased satisfaction. These results underscore the importance of balancing hedonic and utilitarian elements in Indonesia e-commerce to optimize customer satisfaction and loyalty. To leverage AI in optimizing these dimensions, e-commerce businesses should focus on personalization and efficiency. AI can analyze customer data for personalized recommendations and streamlined services, such as automated checkouts and chatbots. For hedonic improvements, incorporating AI technologies like augmented reality and virtual reality can create immersive and engaging shopping experiences. AI can also help understand and respond to customer emotions, enhancing emotional engagement. Looking ahead, AI integration in e-commerce promises significant improvements in service quality by addressing both functional and emotional customer needs. Businesses that effectively use AI will be better positioned to offer personalized, efficient, and engaging experiences, fostering sustained customer satisfaction and loyalty. In conclusion, strategic AI deployment is crucial for e-commerce businesses aiming to thrive in a competitive market. The findings reveal that both hedonic and utilitarian dimensions of e-service quality significantly influence e-satisfaction, which in turn has a strong positive effect on e-loyalty. However, the direct effect of utilitarian e-service quality on e-loyalty is not statistically significant, suggesting that while functional aspects are important, they may not be sufficient to foster loyalty without also addressing the emotional aspects of the service. The study

concludes that AI-enhanced e-service quality can lead to higher customer satisfaction and loyalty in the Indonesian e-commerce market. It recommends that e-commerce businesses in Indonesia leverage AI for personalization and efficiency to create engaging and efficient shopping experiences. The paper acknowledges limitations such as potential biases in non-probability sampling and suggests that future studies could explore the impact of AI in other cultural contexts or e-commerce sectors.

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