Digital Customer Experience and After-Sales Service Quality as Drivers of Customer Loyalty: A Conceptual Framework Based on Expectation Confirmation Theory.

Disya Aisya, Erwansyah, Pipit Buana Sari

Abstract

The rapid growth of digital technology has shifted business competition from product-oriented strategies to customer experience-oriented approaches. However, studies integrating Digital Customer Experience and After-Sales Service Quality in explaining Customer Loyalty remain limited, particularly within the industrial tools sector. This conceptual paper proposes a research framework based on Expectation Confirmation Theory (ECT) to explain the role of Customer Satisfaction as a mediating variable between Digital Customer Experience, After-Sales Service Quality, and Customer Loyalty. The framework is developed through a review of recent marketing and consumer behavior literature and proposes seven hypotheses describing the direct and indirect relationships among the constructs. The proposed model contributes to extending Expectation Confirmation Theory within digital marketing and relationship marketing literature while providing practical insights for organizations seeking to strengthen customer loyalty through enhanced digital experiences and responsive after-sales services. Future empirical studies are recommended to validate the proposed conceptual framework using Partial Least Squares Structural Equation Modeling (PLS-SEM).

***Keywords**:* Digital Customer Experience; After-Sales Service Quality; Customer Satisfaction; Customer Loyalty; Expectation Confirmation Theory.

Disya Aisya[1]
[1]Management, Universitas Pembangunan Panca Budi, Indonesia
e-mail: aisyadisya99@gmail.com[1]

Erwansyah[2], Pipit Buana Sari[3]
[2,3]Management, Universitas Pembangunan Panca Budi, Indonesia
e-mail: erwansyah@dosen.pancabudi.ac.id[2], pipitbuana@dosen.pancabudi.ac.id[3]
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Introduction

Digital transformation has fundamentally changed how organizations create value and maintain customer relationships. The rapid adoption of digital technologies, mobile commerce, social media, and artificial intelligence has shifted customer expectations from merely obtaining high-quality products to experiencing seamless interactions throughout the entire customer journey. Consequently, firms are no longer competing solely through product quality but increasingly through their ability to deliver superior customer experiences that create sustainable competitive advantage [1], [2].

The importance of customer experience has become more evident in today's highly competitive digital marketplace. Customers expect organizations to provide accurate information, personalized communication, responsive services, secure transactions, and convenient digital interactions before making purchasing decisions. According to [3], [4], customer experience represents customers' cognitive, emotional, behavioral, sensory, and social responses generated throughout their interactions with organizations. More recent studies have confirmed that digital customer experience positively influences customer satisfaction, trust, customer engagement, and long-term loyalty [5], [6],[7].

Although digital interaction plays a crucial role in attracting customers, customer relationships continue beyond the purchasing stage. For durable products, customers evaluate organizations based on the quality of services received after product acquisition. Therefore, After-Sales Service Quality (ASSQ) has become an essential component of relationship marketing. Effective warranty services, complaint handling, technical assistance, maintenance support, and spare parts availability reduce customers' perceived risk and strengthen confidence in the purchased products. [8] demonstrated that high-quality after-sales services significantly improve customer satisfaction, customer retention, and customer loyalty. Similarly, recent studies by [9] and [10] confirmed that responsive after-sales services create positive post-purchase experiences that encourage long-term customer relationships.

These issues are increasingly relevant in the industrial tools industry, where purchasing decisions involve relatively high customer involvement and long-term product utilization. Customers typically search for detailed product specifications, compare alternatives through digital platforms, and evaluate user reviews before purchasing. After purchasing, they expect warranty protection, technical consultation, maintenance services, and readily available spare parts. Consequently, customer loyalty in this industry is determined not only by product quality but also by customers' cumulative experiences before and after purchase.

Indonesia has experienced substantial growth in the industrial tools market due to rapid infrastructure development, manufacturing expansion, construction projects, and increasing numbers of small and medium-sized enterprises (SMEs). Simultaneously, the widespread adoption of digital commerce has changed purchasing behavior, making digital interactions an important determinant of purchasing decisions. However, preliminary observations within the proposed research context indicate several challenges affecting customer experience, including delayed responses to customer inquiries, incomplete digital product information, relatively slow warranty claim processes, inconsistent spare parts availability, and limited accessibility to technical support services. These practical issues indicate that organizations continue to face challenges in delivering consistent customer experiences throughout the customer journey.

From a theoretical perspective, Expectation Confirmation Theory (ECT) proposed by [11] provides a comprehensive explanation of how customer satisfaction and loyalty are developed. According to ECT, customers compare their initial expectations with the actual performance experienced after product usage. Positive confirmation occurs when perceived performance meets or exceeds expectations, resulting in customer satisfaction that subsequently strengthens customer loyalty [12]. Within this framework, Digital Customer Experience and After-Sales Service Quality represent important sources of customers' perceived performance that contribute to the formation of Customer Satisfaction, which ultimately leads to Customer Loyalty.

Despite extensive studies on customer loyalty, several important research gaps remain. First, previous studies have primarily investigated Digital Customer Experience and After-Sales Service Quality separately rather than integrating both constructs into a comprehensive conceptual framework. Second, most empirical evidence has focused on e-commerce, banking, hospitality, and retail industries, whereas research within the industrial tools sector remains limited. Third, although customer satisfaction has frequently been investigated as an outcome variable, relatively few studies have explicitly positioned it as the mediating mechanism linking Digital Customer Experience and After-Sales Service Quality to Customer Loyalty based on Expectation Confirmation Theory. These gaps highlight the need for a more comprehensive framework that explains customer loyalty formation in industrial product markets.

Accordingly, this conceptual paper proposes an integrated research framework that examines the influence of Digital Customer Experience and After-Sales Service Quality on Customer Loyalty through the mediating role of Customer Satisfaction, grounded in Expectation Confirmation Theory. The proposed framework contributes to digital marketing and relationship marketing literature by extending the application of ECT within the industrial tools industry. Furthermore, it provides strategic insights for organizations seeking to strengthen customer loyalty through integrated digital experiences and high-quality after-sales service strategies.

Literature Review

2.1 Digital Customer Experience and Customer Loyalty

Expectation Confirmation Theory (ECT), proposed by [11], explains that customer satisfaction and subsequent behavioral intentions are determined by the comparison between customers' initial expectations and their perceived performance after experiencing a product or service. When customers perceive that organizational performance meets or exceeds their expectations, positive confirmation occurs, resulting in favorable evaluations and stronger intentions to maintain relationships with the organization.

Within digital business environments, one of the primary sources of customer evaluation is Digital Customer Experience (DCX). [13] and [14] define Digital Customer Experience as customers' perceptions of their interactions with organizations through digital platforms, including websites, mobile applications, social media, and online marketplaces throughout the customer journey. High-quality digital experiences are characterized by ease of navigation, reliable information, attractive interface design, secure transactions, and responsive communication.

From the perspective of Expectation Confirmation Theory, positive digital interactions represent organizational performance that fulfills customer expectations. Customers experiencing seamless digital interactions are more likely to develop positive perceptions, trust the organization, and establish stronger emotional attachment, ultimately leading to customer loyalty. Previous empirical studies consistently reported that Digital Customer Experience significantly enhances Customer Loyalty by improving customers' overall experiences during digital interactions [15], [16]. Accordingly, the following hypothesis is proposed:
H1: Digital Customer Experience positively influences Customer Loyalty.

2.2 After-Sales Service Quality and Customer Loyalty

Expectation Confirmation Theory also explains that customer evaluations continue after product acquisition. Customers continuously compare the services received after purchasing with their prior expectations. When organizations provide responsive warranty services, effective complaint handling, technical assistance, maintenance support, and adequate spare parts availability, customers perceive that organizational performance fulfills their expectations.

After-Sales Service Quality (ASSQ) refers to the quality of services provided after customers complete purchasing activities [8]. Unlike transactional marketing, after-sales

services emphasize maintaining customer relationships throughout product utilization. Particularly for durable products, effective after-sales services reduce customers' perceived risk while increasing confidence in product performance [17].

Previous studies demonstrate that organizations capable of delivering reliable after-sales services successfully improve customer trust and customer loyalty because customers perceive greater organizational commitment after purchasing [18], [19]. Therefore, the following hypothesis is proposed:

H2: After-Sales Service Quality positively influences Customer Loyalty.

2.3 Customer Satisfaction and Customer Loyalty

Customer Satisfaction represents one of the central constructs of Expectation Confirmation Theory. According to [20], customer satisfaction emerges when perceived performance confirms or exceeds customers' expectations. Satisfaction subsequently influences customers' future behavioral intentions, including repurchase intention, recommendation behavior, and long-term loyalty. Customer Satisfaction refers to customers' overall evaluation of products and services after consumption. Customers experiencing higher satisfaction are more likely to continue purchasing, recommend products to others, and maintain long-term relationships with organizations [11]. Numerous empirical studies have consistently demonstrated that Customer Satisfaction serves as one of the strongest predictors of Customer Loyalty across various industries [21], [22]. Therefore,

H3: Customer Satisfaction positively influences Customer Loyalty.

2.4 Digital Customer Experience and Customer Satisfaction

Expectation Confirmation Theory proposes that customer satisfaction results from positive evaluations of organizational performance. Digital Customer Experience constitutes one of the earliest interactions between customers and organizations, making it an important determinant of customer satisfaction.

Customers expect digital platforms to provide accurate information, convenient navigation, secure transactions, responsive communication, and attractive visual interfaces. When these expectations are fulfilled, customers experience confirmation, which subsequently generates satisfaction.

[23] argue that customer experience encompasses the cumulative perceptions developed throughout customers' interactions with organizations. Recent studies also indicate that organizations providing superior digital experiences achieve significantly higher customer satisfaction than organizations offering less interactive digital environments [5], [7]. Therefore,

H4: Digital Customer Experience positively influences Customer Satisfaction.

2.5 After-Sales Service Quality and Customer Satisfaction

According to Expectation Confirmation Theory, customers continuously evaluate organizational performance after product acquisition. Consequently, satisfaction is not determined solely during purchasing activities but also through post-purchase experiences.

After-Sales Service Quality reflects organizational commitment to supporting customers through warranty services, complaint resolution, technical assistance, maintenance, and spare parts availability. High-quality after-sales services reduce uncertainty and increase customers' confidence, thereby strengthening satisfaction.

Previous studies consistently reported that responsive after-sales services significantly improve customer satisfaction because customers perceive that organizations remain committed even after transactions have been completed [24], [19]. Therefore,

H5: After-Sales Service Quality positively influences Customer Satisfaction.

2.6 The Mediating Role of Customer Satisfaction

Expectation Confirmation Theory explicitly explains that customer experiences do not directly create customer loyalty. Instead, customers first evaluate organizational performance

through cognitive confirmation processes that generate customer satisfaction before developing future behavioral intentions.

Within this framework, Customer Satisfaction functions as the psychological mechanism linking organizational experiences with Customer Loyalty. Positive Digital Customer Experience increases Customer Satisfaction because customers perceive that digital interactions fulfill their expectations. Likewise, responsive After-Sales Service Quality enhances Customer Satisfaction by demonstrating organizational commitment after product acquisition.

Several empirical studies have also demonstrated that Customer Satisfaction significantly mediates the relationships between customer experience, service quality, and customer loyalty [23], [25], [26], [8]. Therefore, integrating Customer Satisfaction as a mediating variable provides a more comprehensive explanation of customer loyalty formation within the industrial tools industry. Accordingly, the following hypotheses are proposed:

H6: Customer Satisfaction mediates the relationship between Digital Customer Experience and Customer Loyalty.

H7: Customer Satisfaction mediates the relationship between After-Sales Service Quality and Customer Loyalty.

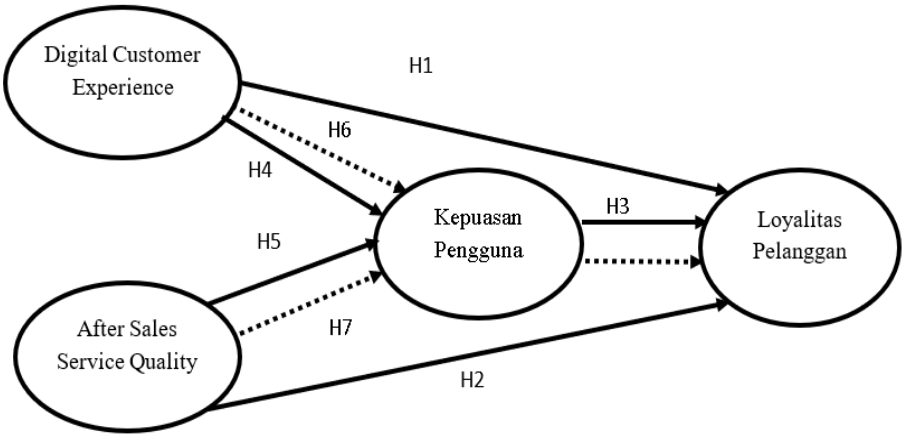

Figure 1. Conceptual Framework

Research Methodology

This study adopts a quantitative research approach employing an explanatory research design to examine the proposed relationships among Digital Customer Experience, After-Sales Service Quality, Customer Satisfaction, and Customer Loyalty. The conceptual framework developed in this study is grounded in Expectation Confirmation Theory (ECT) and is intended to explain how customers evaluate digital interactions and post-purchase services before developing loyalty toward a brand (Oliver, 1980).

The empirical setting of the proposed study focuses on customers of INGCO, one of the rapidly growing industrial tools brands in Indonesia. The target population comprises customers who have purchased and used INGCO products and have experienced both digital interaction channels and after-sales services. These respondents are considered appropriate because they possess sufficient experience to evaluate all constructs included in the conceptual model.

A purposive sampling technique is proposed to select respondents who meet specific criteria, namely customers who have purchased INGCO products, have used the products for at least three months, are at least 17 years old, and are willing to participate voluntarily in the survey. According to [27], purposive sampling is appropriate when respondents possess specific characteristics relevant to the research objectives.

Primary data will be collected using a structured questionnaire consisting of closed-ended questions measured on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire items are adapted from well-established measurement scales in previous studies to ensure content validity. Specifically, Digital Customer Experience is measured using the dimensions proposed by [5] and [15], After-Sales Service Quality is

adapted from[28], Customer Satisfaction is based on [11] and [20], while Customer Loyalty is measured using indicators developed by [22]Oliver and [8].

The proposed conceptual model will be empirically tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS software. PLS-SEM is considered appropriate because the proposed model includes multiple latent constructs and mediating relationships while emphasizing prediction and theory development [29]. The analysis consists of two stages. The first stage evaluates the measurement model (outer model) by examining indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. The second stage assesses the structural model (inner model) by evaluating path coefficients, coefficients of determination (R^2), predictive relevance (Q^2), and hypothesis testing using the bootstrapping procedure.

Furthermore, the mediating role of Customer Satisfaction will be examined through the indirect effect analysis using bootstrapping techniques. According to [29], mediation exists when indirect effects are statistically significant, indicating that Customer Satisfaction functions as an important mechanism linking Digital Customer Experience and After-Sales Service Quality with Customer Loyalty.

Overall, the proposed methodology is expected to provide a comprehensive empirical approach for validating the conceptual framework and extending the application of Expectation Confirmation Theory within the context of the industrial tools industry.

Results

This study develops a conceptual framework integrating Digital Customer Experience, After-Sales Service Quality, Customer Satisfaction, and Customer Loyalty within the theoretical perspective of Expectation Confirmation Theory (ECT). Unlike empirical studies that primarily examine direct relationships among marketing constructs, the proposed framework explains the cognitive mechanism through which customers evaluate organizational performance before developing long-term loyalty.

Based on Expectation Confirmation Theory, customers continuously compare their expectations with the actual performance experienced throughout the customer journey. In the proposed model, Digital Customer Experience and After-Sales Service Quality represent two important sources of perceived organizational performance. When organizations provide seamless digital interactions and responsive post-purchase services that meet or exceed customer expectations, customers experience positive confirmation, leading to higher levels of Customer Satisfaction.

Furthermore, the conceptual model proposes that Customer Satisfaction serves as a mediating mechanism between organizational performance and Customer Loyalty. Rather than assuming that superior digital experiences or after-sales services directly generate customer loyalty, the framework suggests that customers first develop positive evaluations toward organizational performance before demonstrating behavioral loyalty. Consequently, Customer Satisfaction explains how customer experiences are translated into long-term customer commitment.

The proposed framework also suggests that Digital Customer Experience and After-Sales Service Quality complement each other throughout the customer journey. Digital Customer Experience primarily influences customers before and during purchasing decisions by facilitating information search, communication, and transaction convenience. Conversely, After-Sales Service Quality strengthens customer relationships after purchasing through warranty services, complaint handling, technical assistance, and product support. Together, these constructs create a holistic customer experience that enhances Customer Satisfaction and ultimately strengthens Customer Loyalty.

Conceptually, the framework extends the application of Expectation Confirmation Theory beyond information systems and electronic commerce by incorporating post-purchase service quality within the industrial tools industry. This extension broadens the explanatory power of

ECT by demonstrating that customer loyalty is influenced not only by digital interactions but also by organizations' commitment to supporting customers after product acquisition.

The proposed conceptual framework therefore provides a comprehensive explanation of customer loyalty formation by integrating pre-purchase digital experience, post-purchase service quality, customer satisfaction, and long-term behavioral outcomes within a single theoretical model. Future empirical studies are recommended to validate the proposed framework using Structural Equation Modeling (PLS-SEM) across different industrial contexts.

Research Contribution

This study contributes to both theory and practice. Theoretically, it extends Expectation Confirmation Theory (ECT) by integrating Digital Customer Experience, After-Sales Service Quality, Customer Satisfaction, and Customer Loyalty into a unified conceptual framework within the industrial tools industry. Practically, the proposed framework provides managerial insights for organizations to strengthen customer loyalty by improving digital customer experiences and delivering responsive after-sales services that enhance customer satisfaction.

Conclusion

This conceptual paper proposes an integrated research framework based on Expectation Confirmation Theory (ECT) to explain the relationships among Digital Customer Experience, After-Sales Service Quality, Customer Satisfaction, and Customer Loyalty. The proposed model suggests that superior digital customer experiences and responsive after-sales services contribute to customer satisfaction, which subsequently strengthens customer loyalty. By positioning Customer Satisfaction as a mediating mechanism, the framework provides a more comprehensive understanding of how organizations can develop long-term customer relationships in the industrial tools industry.

The study contributes to the marketing literature by extending the application of Expectation Confirmation Theory to the context of digital customer experience and post-purchase services. Furthermore, the proposed framework offers practical insights for organizations seeking to improve customer loyalty through integrated digital interactions and high-quality after-sales services. Future empirical research is recommended to validate the proposed conceptual framework using Partial Least Squares Structural Equation Modeling (PLS-SEM) across different industries and organizational settings.

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