

DIGITAL TRANSFORMATION AND PRE-DIGITAL RELATIONSHIP QUALITY IN RURAL BANKS: INNOVATION AS A DOUBLE-EDGED SWORD EXPLAINED BY PARADOX THEORY

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ABSTRACT

Digital transformation in the banking industry, including Bank Perekonomian Rakyat (BPR) has become a strategic necessity to improve service efficiency and maintain customer loyalty amidst changing consumer behavior. However, digitalization also has the potential to reduce the quality of interpersonal relationship, which has long been a key strength of BPRs. Therefore this study examines how digital transformation and pre-digital relationship quality influence perceived usefulness, perceived interaction loss and customer loyalty. This research uses a quantitative approach with a survey of BPR customers who use digital services. Data are analyzed using SEM-PLS. The result show that digital transformation and pre-digital relationship quality influence perceived usefulness, perceived interaction loss and customer loyalty, although several relationship are not significant. The novelty of this study lies in the integration of digital transformation and relationship quality in the context of rural banks by positioning pre-digital relationship quality as an important factor in explaining the customer loyalty. This study expands the literature on digital transformation in relationship-based financial institutions. The finding suggest that BPR need to focus on increasing the benefits of digital services while maintaining the quality of personal relationships with customers. A hybrid service approach that combines digital technology and interpersonal interaction remains a relevant strategy for sustaining customer loyalty.

Keywords: Digital Transformation, Innovation, Paradox Theory, Rural Bank, Relationship Quality

ABSTRAK

Transformasi digital dalam industri perbankan, termasuk Bank Perekonomian Rakyat (BPR), telah menjadi kebutuhan strategis untuk meningkatkan efisiensi layanan dan mempertahankan loyalitas nasabah di tengah perubahan perilaku konsumen. Namun, digitalisasi juga berpotensi mengurangi kualitas hubungan interpersonal yang selama ini menjadi salah satu kekuatan utama BPR. Oleh karena itu, penelitian ini mengkaji bagaimana transformasi digital dan kualitas hubungan pra-digital memengaruhi persepsi kegunaan, persepsi kehilangan interaksi, dan loyalitas nasabah. Penelitian ini menggunakan pendekatan kuantitatif dengan metode survei terhadap nasabah BPR yang menggunakan layanan digital. Data dianalisis menggunakan Structural Equation Modeling-Partial Least Squares (SEM-PLS). Hasil penelitian menunjukkan bahwa transformasi digital dan kualitas hubungan pra-digital memengaruhi persepsi kegunaan, persepsi kehilangan interaksi, dan loyalitas nasabah, meskipun beberapa hubungan antarvariabel tidak signifikan. Kebaruan penelitian ini terletak pada integrasi transformasi digital dan kualitas hubungan dalam konteks bank perekonomian rakyat dengan menempatkan kualitas hubungan pra-digital sebagai faktor penting dalam menjelaskan loyalitas nasabah. Penelitian ini memperluas literatur mengenai transformasi digital pada lembaga keuangan yang berbasis hubungan. Temuan penelitian menunjukkan bahwa BPR perlu berfokus pada peningkatan manfaat layanan digital sekaligus mempertahankan kualitas hubungan personal dengan nasabah. Pendekatan layanan hibrida yang menggabungkan teknologi digital dan interaksi interpersonal tetap menjadi strategi yang relevan untuk mempertahankan loyalitas nasabah.

Kata Kunci: Digital Transformation, Innovation, Paradox Theory, Rural Bank, Relationship Quality

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INTRODUCTION

Bank Perekonomian Rakyat an entity within the financial and banking industry, plays a strategic role in the Indonesian financial system, particularly in promoting financial inclusion in rural areas and serving segments of society not yet fully reached by commercial banks. Bank Perekonomian Rakyat focus on financing micro, small and medium enterprises and foster close relationship with local communities. However, Bank Perekonomian Rakyat still faces various structural challenges, such as limited working capital, relatively low operational efficiency, and increasing regulatory pressure. Furthermore, the consolidation trend in recent years indicates increasing competitive pressure in the financial and banking industry, particularly within Bank Perekonomian Rakyat.

The competitive landscape for Bank Perekonomian Rakyat is also increasingly complex and challenging, as commercial banks, with significantly greater technological capacity and resources, also serve the micro, small and medium sector. Conventional banks are now actively and massively expanding their service reach to segments that are previously the primary market for Bank Perekonomian Rakyat. Meanwhile, development in financial technology, and digital banking services have directly changed the customer expectation for faster, easier, and more flexible financial services. This situation means that rural banks can no longer compete solely on the basis of geographic proximity and personal relationships, but are also require to provide efficient, and technology-based services.

In response to these dynamics, digital transformation has become a necessity for Bank Perekonomian Rakyat. However, compared to the commercial banks, the digitalization process in BPR tends to be slower. This is due to the various limitations such as low technology investment capacity, limited infrastructure, and lack of competent human resources. Although some BPR have begun adopting the digital services, their implementation is often not optimally integrated. This situation creates a paradox: on the one hand, digitalization is expected to improve efficiency and service quality, but on the other hand, it has the potential to disrupt the personal relationship model that has long been a key strength of Bank Perekonomian Rakyat.

Digital transformation has become a major focus on management and information system research in recent years. Studies by Vial (2019) and Verhoef et al. (2021) emphasize that digital transformation is a strategic process that enables organizations to increase efficiency, create new value, and improve the customer experience. In the financial and banking industries, digital transformation is often associated with increased service convenience and perceived usefulness, which ultimately drives technology adoption by customers. Management research based on the Technology Acceptance Model show that perceived usefulness is a key determinant in shaping attitudes and behaviors regarding technology use ((Marangunić & Granić, 2015; Sharma & Sharma, 2019).

However, most of this research emphasizes the positive impacts of digitalization, focusing on efficiency, convinience and improved service quality. This perspective tends to overlook the negative consequence of technology use in various business sectors that emphasize relationship-based services between business organizations and customers. In the service management literatures, Larivière et al. (2017) and Hennig-Thurau, Hofacker, and Bloching (2018) have emphasized that the adoption of technology in service interactions can reduce interpersonal contact between customers and service providers. Although technology increases efficiency, reduced human interaction can impact the quality of relationship and the emotional experiences which experienced by customers. Even though, research explicitly conceptualizing this phenomenon as perceived interaction loss is still very limited, particularly within the banking industry.

Conversely, literature on relationship marketing confirms that the quality of the relationship between customers and companies is a key determinant of loyalty. The classic study by Morgan and Hunt (1994) and subsequent development demonstrate that trust and commitment formed through long – term interactions form the basis of sustainable relationships. In this context, the quality of relationships formed before technology adoption (pre-digital relationship quality) has the potential to influence how customers respond to the change in digital-based services. However, most previous research has not considered these initial relationship conditions as factors influencing perceptions of digitalization. Furthermore, customer loyalty as a dependent variable has been extensively researched in various context Oliver (1999) and Rather, Tehseen, Itoo, and Parrey (2019) but studies on loyalty in situation of technological disruption are still relatively

limited. In particular, there are few studies that simultaneously integrate technological and relationship perspective to explain customer loyalty. Most studies tend to use positive mediators, such as satisfaction or trust, while negative mediators reflecting potential relational loss due to digitalization are rarely explored.

Based on these various reviews, it can be revealed that are identifiable research gaps. First, the dominance of positive perspective in digitalization studies ignores the potential negative impacts on customer relationships. The second research gaps are that research examining digital transformation in the context of relationship-based banking such as rural banks, is still limited. Third, the role of perceived interaction loss as a negative mediator has not been widely tested empirically. Therefore, this study seeks to fill this gap by developing a model that integrates positive (perceived usefulness) and negative (perceived interaction loss) mechanism to explain the influence of digital transformation on customer loyalty, taking into account the context of pre-existing relationship among Bank Perekonomian Rakyat customers.

LITERATURE REVIEW

Paradox Theory

Paradox theory is a grand theory developed in various management and organizational research studies, aiming to explain the existence of seemingly contradictory but actually interrelated and simultaneous elements. Paradox as contradictory yet interrelated elements that exist simultaneously and persist over time. In this context, organizations and individuals are not faced with a choice between two opposing perspectives, but rather with the need to manage the contradictions that arise from the simultaneous existence of both elements. This theory has been further developed in various modern management studies, particularly in addressing the dynamics of more complex change and innovation (Schad, Lewis, Raisch, & Smith, 2016). In line with the development of internet-based digital technology, Paradox Theory is increasingly relevant in explaining the various digital transformation phenomena faced by various industries, including the banking sector.

Digital transformation not only brings benefits in the form of increased efficiency, speed and ease of service, but also gives rise to negative consequences that have the potential to cause losses, especially in the context of the relationship between companies and customers. Gregory, Kaganer, Henfridsson, and Ruch (2018) research has shown that technology-driven transformation often creates a conflict between the need for efficiency and the need to maintain flexibility and relational closeness. In a similar context, Miron-Spektor, Ingram, Keller, Smith, and Lewis (2018) also emphasized that individuals and organizations need to develop their respective capabilities to understand and manage this contradiction, rather than eliminate it.

In the service industry, particularly banking, this tension becomes even more pronounced because the services provided are not only functional but also relational. The digitalization of banking services allows for increased perceived usefulness, namely customers' perception of the benefits and convenience gained from using the technology. However, on the other hand, digitalization also has the potential to reduce the intensity of direct interactions between customers and service providers, which in this study is conceptualized as perceived interaction loss. The reduction in personal interaction can result in a weakening of the emotional closeness and quality of relationships that have long been the basis of customer loyalty, especially in the context of relationship-based banking such as Bank Perekonomian Rakyat.

Using the paradox theory perspective, this phenomenon is not viewed as a linear cause-and-effect relationship, but rather as two contradictory but simultaneously operating mechanism. On the one hand, digital transformation creates value through increased efficiency and ease of service. On the other hand, the same transformation can undermine the interpersonal dimension of relationships. Jarvenpaa and Vălikangas (2020) define this as part of the paradox of digital transformation, where increased control and efficiency can actually reduce flexibility and closeness in relationships.

Furthermore, most previous research tends to frame the impact of digital transformation within a predominantly positive framework, emphasizing improved performance and customer experience. However, this approach fails to fully explain the complexity of customer responses, particularly in context that rely heavily on interpersonal relationships. Paradox Theory offers a more comprehensive approach by recognizing that both sides, the benefits and the negative consequences must be understood simultaneously.

Thus, customer loyalty is determined not only by the perceived level of benefit from technology, but also by the extent to which the transformation impacts the quality of previously established interactions and relationships.

In the context of this research, Paradox Theory is used as a conceptual foundation to explain how digital transformation in Bank Perekonomian Rakyat produces two main mechanism which is perceived usefulness as the represent of value creation, and perceived interaction loss as the representation of relationship erosion. These two mechanisms simultaneously influence perceived customer loyalty in the digital era. Thus, this research not only extends the application of Paradox Theory to the level of customer behavior but also contributes to explaining the implications of digital transformation in relationship-based financial institutions.

Digital Transformation and Perceived Usefulness

Digital transformation in the services sector, including the financial and banking industries, fundamentally aims to improve the operational efficiency and service quality through the use of technology. From the Technology Acceptance Model perspective, perceived usefulness is defined as an individual's level of belief that using a system will improve the performance or provide certain benefits (Davis, 1989). Despite technological advancements, this concept remains as a fundamental theory in explaining how individuals evaluate the value of digital innovations.

In the context of digital transformation, the implementation of technologies such as mobile banking, internet banking, chatbots, cash deposit machine, and other automated services system allow customers to access the services more quickly, flexibly, and efficiently. Therefore, the higher the level of digital transformation undertaken by a bank, the more likely customers are more experience the benefits of those services. A study by Verhoef et al. (2021) reaffirms that digital transformation plays a role in creating value through improved customer experience, including ease of access and service efficiency. This finding aligns with the research of Sharma and Sharma (2019), which showed that digital system quality significantly improves perceived usefulness in the context of mobile banking.

While Verhoef et al. (2021) and Sharma and Sharma (2019) argue that digital transformation generally increases perceived usefulness through greater efficiency and convenience, Vial (2019) suggest that these benefits depend on user readiness and capability to adopt digital services. This inconsistency indicates that the relationship may be context-dependent, particularly in rural banking environment where customer digital literacy varies. Furthermore, in the relationship-based banking industry, such as rural bank, perceived usefulness is determined not only by functional aspects but also by how the technology can replace or complement the existing personal interaction. From a Paradox Theory perspective, this situation reflects the tension between value creation through technology and the potential loss of the relational dimension. Although technology has been proven to increase the efficiency, not all customers directly perceive this as an increased benefit, especially if the technology is perceived as reducing customer convenience in interacting with the bank.

Several other empirical studies have also shown mixed result. Research by Sharma and Sharma (2019) and Rahi, Ghani, and Ngah (2019) found that digital service quality has a positive influence on perceived usefulness. However, other studies indicate that factors such as system complexity and low digital literacy can reduce user's perceived usefulness (Marangunić & Granić, 2015). This suggests that the relationship between digital transformation and perceived usefulness is contextual and influenced by users' characteristics. Based on this description, it can be concluded that digital transformation generally has the potential to increase perceived usefulness. However, this relationship is not universal and can be influenced by various contextual factors, particularly in Bank Perekonomian Rakyat environments. Therefore, the hypothesis proposed in this study is:

H₁: Digital transformation has significant impact on perceived usefulness

Pre-Digital Relationship Quality and Perceived Usefulness

The quality of the relationship between customers and banks before technology adoption (pre-digital relationship quality) is another important factor in shaping customer perception of digital innovation. In the context of relationship-based marketing, relationship quality not only reflects trust and commitment but also

shapes customer's expectation and interpretation of services changes (Huang & Rust, 2018). A strong relationship creates an evaluative framework that influences how customer assess the benefits of the technology introduced by the bank.

In the context of adopting new technology, customers do not evaluate the system entirely rationally but also influenced by various experiences with the service provider, in this case, the bank. A study by McLean and Osei-Frimpong (2019) previously showed that positive experiences with service providers significantly increased the perceived value and usefulness of the adopted digital technology. This indicates that pre-established relationship can strengthen the perception that digital innovation is beneficial. Furthermore, research by Singh and Srivastava (2018) and Santoso, Nurcholis, and Kartika (2020) in the context of mobile banking found that trust developed from prior relationship contributed to increased perceived usefulness.

Furthermore, in the financial services and banking environment, relational closeness can create a sense of security and foster confidence in changes implemented by the institution. Customers who have a good relationship with their bank tend to interpret digital innovation as an effort to improve service, rather than a threat. A study by Tam and Oliveira (2019) shows that trust in an institution significantly strengthen the perceived benefits of using digital services. Thus, the quality of the relationship prior to digitalization can be a factor accelerating the acceptance of the value of technology.

However, this relationship is not always positive. In some circumstance, high relationship quality can actually create resistance to digital innovation. Customers accustomed to personal interaction may struggle to assess the benefits of technology because it reduces direct interaction. A study by Mahr and Lievens (2012) shows that customers with a strong relational orientation tend to value human interaction more than technological efficiency. Furthermore, research by Blut and Wang (2020) indicates that a preference for traditional services can reduce the perceived benefit of technology-based services, especially among customer segments with a strong emotional attachment to the service provider.

From a paradox theory perspective, this situation reflects the tension between the stability of existing relationship and the changes brought about by digital innovation. Strong relationship can serve as enablers, increasing perceived benefits, but at the same time they can also become a source of resistance if the technology is perceived as disrupting established interaction patterns. Therefore, the influence of pre-digital relationship on perceived usefulness is ambivalent and contextual. Nevertheless, considering that trust and positive experience generally lead to more favorable evaluation of innovation, this study assumes that pre-digital relationship quality tends to increase customers' perceived usefulness. Thus, our proposed hypothesis is:

H₂: Pre-digital relationship quality has significant impact on perceived usefulness

Digital Transformation and Perceived Interaction Loss

Digital transformation in the service sector is fundamentally changed the way the bank interacts with customers. The use of technologies such as mobile banking, automated services, and digital platforms allows for more efficient and scalable service process. However, this change also shifts the interaction pattern from face-to-face to technology-based ones. In this context, human interaction, previously the core of the service experience, has the potential to decline, which conceptualized in this research as perceived interaction loss. Judging from various literature on service management, the interaction between customers and providers is a crucial component in creating experience and value. Research conducted by Becker and Jaakkola (2020) emphasize that direct interaction plays a key role in building meaning, emotion, and customer engagement in the service. When technology takes over part or all of the interaction process, the social dimension of service can be drastically reduced, thus affecting customers' perception about their relationship with the bank.

Furthermore, the development of self-service and automation technologies has reduced the need for direct contact between customers and bank. Research conducted by Wirtz et al. (2018), previously showed that the adoption of services technologies, including artificial intelligence and self-service technologies, significantly reduce human involvement in the service process. While this increases efficiency, customers often perceive lack of closeness and personalization in each interaction. This research's finding is further reinforced by a study conducted by Marinova et al. (2017), which underscored that reduced interpersonal

interaction can reduce the quality of customer relationship.

In the context of digital banking, this phenomenon becomes increasingly relevant as service that previously relied heavily on personal relationships are now shifting to digital platforms. A study by Breidbach and Maglio (2016), suggest that service digitalization can shift the structure of interaction from human-to-human to human-to-technology, potentially diminishing the customers' social experience. Furthermore, research by Keiningham et al. (2020) found that increased use of digital channels is often accompanied by a decrease in the frequency of face-to-face interactions, which can impact the customers' perception of closeness with the service providers.

However, not all previous research consistently finds negative impacts. In some cases, the adoption of technology can actually create new forms of interaction that maintain the customer engagement. A study by Hollebeek, Srivastava, and Chen (2019) shows that digital-based interactions, such as through applications or online platforms, can still create the engagement if designed interactively and responsively. This suggest that the impact of digital transformation on interactions is not entirely negative, but rather depends on how the technology is implemented,

However, in relationship-based banking industries such as rural banks, where personal interaction is a key element in building customer relationships, the shift to digital services tends to increase the risk of perceived interaction loss. From a Paradox Theory perspective, this situation reflects the tension between the efficiencies afforded by technology and the loss of the social dimension of service. While digital transformation increases efficiency, it can simultaneously reduce the quality of interactions perceived by customers. Based on this description, it can be concluded that digital transformation has the potential to increase the perception of interaction loss, particularly in service context that previously relied heavily on interpersonal relationships. Therefore, the hypothesis proposed in this study is:

H₃: Digital transformation has significant impact on perceived interaction loss

Pre-Digital Relationship Quality and Perceived Interaction Loss

The quality of the relationship between a client and the bank before technology adoption is also a crucial element in shaping client perception of innovative changes in service processes. In the banking industry, strong relationship is characterized by emotional closeness, trust, and a high level of interaction between the client and the bank. This relationship not only fosters loyalty but also shapes client expectation regarding how services should be delivered.

In the context of digital transformation, the shift from face-to-face interaction to technology-based interaction has the potential to influence the client perception of the quality of this relationship. Clients previously accustomed to personal interaction tend to have higher expectation for the relational aspect of service. When digitalization reduces the frequency or quality of face-to-face interaction, clients with strong initial relationship are more likely to perceive a loss of interaction. Research which conducted by Pagani and Pardo (2017) showed that in strong business relationship, change in communication pattern can trigger a perceived loss of relational value.

Previously, research conducted by Kannan & Li (2017) reaffirmed that digitalization can significantly alter the client journey, including reducing the interpersonal touchpoints. Under these conditions, clients who previously have strong relational attachment tend to be more sensitive to these changes. This finding further reinforced by the research conducted by Grewal, Hulland, Kopalle, and Karahanna (2020), which showed that client with stronger relationship with companies have higher expectation for personalization and human interaction, making them more susceptible to perceive decline in interaction quality when services become automated.

Previous studies provide conflicting evidence regarding the effect of relationship quality on perception of interaction loss. Pagani and Pardo (2017) suggest that customer with stronger prior relationship is more sensitive to reduce interpersonal contact. In contrast, Ameen, Tarhini, Reppel, and Anand (2021) argue that trust developed through the strong relationship can buffer the negative reaction to service digitalization. These contradictory findings indicate a need for further investigation in relationship-based financial institutions such as BPR.

From a Paradox Theory, these findings reflect an inherent tension in relationship between pre-digital

relationship quality and perceived interaction loss. On the one hand, strong relationship increase expectation for personal interaction, thus increasing the likelihood of perceived interaction loss when digitalization occurs. On the other hand, the same relationship can also create trust and tolerance that mitigate the negative impact of such changes. Although this relationship is ambivalent, in the context of Bank Perekonomian Rakyat where personal interaction is at the core of service, clients with high relationship quality tend to be more sensitive to the reduction in direct interaction. Therefore, this research proposes the following hypothesis:

H₄: Pre-digital relationship quality has significant impact on perceived interaction loss

Perceived Usefulness and Perceived Customer Loyalty

Perceived usefulness is a key construct in the technology adoption literature, reflecting the extent to which individuals believe that using a system will provide benefits which improve their performance of effectiveness. In the context of digital services, perceived usefulness relates not only to efficiency but also to the technology's ability to provide added value which relevant to the customer needs. As the adoption of digital services in the banking sector increases, perception of technology's usefulness becomes a crucial factor in shaping customer attitudes and behavior, including loyalty.

From a consumer behavior perspective, client loyalty is shaped not only by satisfaction but also by the perception of the value received from a service. A previous study by Oliveira, Thomas, Baptista, and Campos (2016) showed that perceived usefulness has a significant impact on continuance intention to use mobile banking services, which is an indicator of loyalty. This finding is further supported by research by Giovanis, Athanasopoulou, Assimakopoulos, and Sarmaniotis (2019), which highlights the direct impact of perceived benefits from digital services on increasing client commitment to the bank providing the service. Furthermore, in the context of digital service, perceived usefulness plays a key role in creating a positive customer experience. When customer experience tangible benefits from technology, they tend to develop a preference and attachment to that service. This aligns with the research by Sharma and Sharma (2019), which found that perceived usefulness significantly increases customer loyalty by increasing trust and satisfaction in using digital services.

However, previous studies suggest that the relationship between perceived usefulness and customer loyalty is not always direct or uniformly strong. While some research emphasizes that perceived usefulness encourages the customers to continue using digital service, other studies indicate that the functional benefits alone may be insufficient to create long-term loyalty. For instance, Kaur, Dhir, Bodhi, Singh, and Almotairi (2020) found that perceived usefulness is more influential in the early stage of technology adoption, whereas sustained loyalty is more strongly shaped by emotional factors and overall customer experience. Similarly, Thakur (2018) demonstrated that emotional engagement and experience quality may play a more dominant role than purely functional benefits in digital service context. These contrasting findings imply that perceived usefulness can support loyalty, but its effect may depend on whether digital service also provide positive emotional and relational experiences for customers.

In the context of relationship-based banking, such as rural banks, this situation becomes even more complex. Clients evaluate service not only based on practical benefits, but also on the quality of the relationships they build. From the Paradox Theory, perceived usefulness represents the rational and functional side of digital services, while loyalty is also influenced by emotional and relational dimensions. Therefore, while perceived usefulness has the potential to increase the loyalty, its influence can vary depending on the extent to which the relational aspect is maintained. Based on this synthesis, it can be concluded that perceived usefulness generally plays an important role in increasing customer loyalty, although its influence can be influenced by other emotional and contextual factors. Therefore, the hypothesis proposed in this study is

H₅: Perceived usefulness has significant impact on perceived customer loyalty

Perceived Interaction Loss and Perceived Customer Loyalty

In the service industry, especially in banking, clients' loyalty is not solely built through functional benefits but also through the quality of the interpersonal relationships established between the client and the bank as the service provider. Consistent, personal and trusting interactions are the primary foundation for long-term client commitment to banking institution. Therefore, when clients perceive a decrease in the

intensity or quality of interactions are as a result of the implementation of service digitalization, this situation has the potential to degrade their level of loyalty.

The concept of perceived interaction loss in this research refers to the client's perception that digital transformation has resulted in reduction in the quality, frequency, or closeness of interactions with the bank. In this context of service relationship, reduced interpersonal interaction can decrease the emotional closeness and a sense of connectedness between clients and the banks. Lemon and Verhoef (2016) emphasized that the quality of the customer experience throughout the customer journey is significantly impacted by the touchpoints, including the human interaction. When these touchpoints are reduced, the client experience can become more impersonal, ultimately impacting loyalty.

Furthermore, research conducted by Voorhees et al. (2017), highlighted that the quality-of-service interaction is a crucial determinant in shaping repurchase intention and customer loyalty. In the context of financial services, customers often rely on interpersonal relationships for a sense of security, clarity of information and confidence in their financial transactions. When these interactions diminish, clients may perceive a decline in relationship quality, ultimately leading to lower loyalty. Previous research by De Keyser, Verleye, Lemon, Keiningham, and Klaus (2020) also showed that service experiences lacking the human touch tend to result in lower emotional engagement. Many clients still view the personal interaction as a core component of the service value they receive from the banks. Therefore, the greater the perceived loss of interaction, the greater the likelihood of decreased customer loyalty.

However, the assumption that perceived interaction loss invariably weakens customer loyalty remains debatable. Several studies suggest that the erosion of human contact does not automatically lead to customer defection when digital services are carefully designed. Hoyer, Kroschke, Schmitt, Kraume, and Shankar (2020), for instance, found that customers may remain loyal when technology offers a seamless, personalized, and responsive service experience. This view implies that loyalty is not governed solely by the presence of face-to-face interaction, but also by the customer's broader evaluation of convenience, reliability, and experiential quality in digital encounters. In a similar vein, Klaus and Zaichkowsky (2020) argue that customers with a more efficiency-oriented disposition may not interpret reduced human interaction as a relational loss. For these customers, speed, accessibility, and service practicality may outweigh the need for interpersonal closeness.

Nevertheless, this interpretation may not fully apply to relationship-based financial institutions such as Bank Perekonomian Rakyat. BPR customers often develop loyalty not merely from transactional efficiency, but from trust, familiarity, and the reassuring presence of bank officers. From a human perspective, financial services are not only economic exchanges but also relational encounters in which customers seek recognition, certainty, and personal reassurance. Thus, when digitalization reduces direct interaction, customers who place high value on interpersonal warmth may experience a subtle form of relational detachment. This contrast reveals an important tension in the literature: while digital services can preserve loyalty through convenience and responsiveness, they may also unsettle the relational foundations that sustain loyalty in trust-based banking contexts. Viewed through Paradox Theory, digital transformation embodies a dual and ambivalent logic. It enhances efficiency and service accessibility, yet at the same time may attenuate the interpersonal closeness that has traditionally anchored customer loyalty in BPRs. Based on this description, this research proposes the following hypothesis

H₆: Perceived interaction loss has significant impact on perceived customer loyalty

RESEARCH METHODS

This research uses a quantitative approach using Partial Least Square SEM to test the causal relationships between constructs in the research model. According to Sarstedt, Ringle, and Hair (2021), PLS-SEM is highly appropriate when the research objectives are theory development, prediction and testing of complex models with multiple latent constructs and mediating pathways. PLS-SEM is also more robust to relatively moderate sample size than covariance-based SEM. With 165 respondents, this method is considered adequate for estimating structural models involving multiple latent variables (Sarstedt et al., 2021). Furthermore, PLS-SEM does not require strict multivariate normality assumptions, making it more flexible for field survey-based research in the context of heterogeneous rural banking clients.

Samples

This research is conducted at several Bank Perekonomian Rakyat across Central Java Province. The selection of Central Java as the research location is based on empirical and scientific considerations. Empirically, Central Java is one of the provinces with a relatively large distribution of BPR in Indonesia, both in terms of the number of institution and the reach of the services to the community, particularly in semi-urban and rural areas. According to data from OJK, Central Java is one of the regions with high BPR activity and plays a strategic role in financial inclusion in local communities.

Scientifically, the selection of Bank Perekonomian Rakyat in Central Java is relevant to the research focus on digital transformation and customer loyalty. BPR in this region still rely heavily on interpersonal relationships and social closeness with customers, making it an ideal context to examine the paradox between the benefits of digitalization and the perceived loss of interaction. In the context of relationship-based banking, the shift to digital services is expected to produce more pronounced perceptual dynamics than in established commercial banks. This aligns with the arguments of De Keyser et al. (2020) and Voorhees et al. (2017), which emphasize the importance of service in shaping the customer experience and loyalty.

The sampling technique used in this research is purposive sampling, with respondents being BPR client in Central Java who has used and interacted with digital services provided by each Bank Perekonomian Rakyat, such as mobile banking or other digital communication channels from January to May 2026. This purposive sampling approach is used because this research specifically required respondents with relevant experience with the digital transformation phenomenon being studied. The number of questionnaires collected and eligible for processing are 165 respondents. With a response rate of 80%, approximately 206 questionnaires are distributed in the initial phase. This response rate is considered high for field-based survey research and indicates adequate data collection quality.

Measurement Evaluation Parameter

The questionnaires are developed based on established constructs from digital transformation, technology acceptance, relationship marketing, service interaction and customer loyalty literature. All constructs are measured reflectively because the indicators are designed to represent customers' perception of each latent variable. The measurement items are adapted from previous studies and contextualized to BPR customers. Digital transformation was measured using indicators related to the availability of digital services, transaction speed, service accessibility, perceived change toward digital banking, and the integration of digital technology into BPR services. These indicators were developed by adapting the conceptual understanding of digital transformation as a process through which digital technologies change service delivery, customer interaction, and value creation (Verhoef et al., 2021; Vial, 2019). Digital transformation has been described as a process that changes organizational value creation through digital technologies and affects customer expectations and service processes.

Pre-digital relationship quality is measured using indicators reflecting the quality of the customer-bank relationship before the implementation of digital service. The indicators included previous relationship quality, personal closeness with BPR staff, trust in BPR service, intensity of previous interaction, and the perception that BPR understood the customers' needs. These items are adapted from relationship marketing literature, particularly the view that trust and commitment are central elements in successful long-term relationship (Morgan & Hunt, 1994). Relationship marketing theory emphasize that trust and commitment are key mechanism in maintaining successful relational exchange.

Perceived usefulness is measured using indicators related to faster transaction, efficiency, easier access to account information, usefulness for customer needs, and effectiveness of banking activities. These indicators are adapted from the Technology Acceptance Model, which defines perceived usefulness as the extent to which users believe that using a system enhances their performance or provides practical benefits (Davis, 1989). In TAM, perceived usefulness is one of the primary determinants of technology acceptance because users are more likely to adopt when they perceive it as beneficial and performance-enhancing.

Perceived interaction loss was measured using indicators reflecting customers' perceptions that digital services reduce direct interaction with BPR officers, make the relationship less personal, reduce direct communication, weaken closeness with the bank, and create a more impersonal service experience. These

indicators were developed by adapting service encounter and customer experience literature, which explains that technology may alter or substitute human interaction in service delivery (Larivière et al., 2017). Customer experience literature also emphasizes that customer evaluations are shaped by multiple touchpoints, including human and digital interactions throughout the customer journey (Lemon & Verhoef, 2016).

Perceived customer loyalty was measured using indicators related to intention to remain a long-term customer, willingness to continue using BPR services, recommendation intention, commitment to continued use, and emotional loyalty. These indicators were adapted from customer loyalty literature, which conceptualizes loyalty as a combination of repeat patronage, commitment, recommendation behavior, and emotional attachment (Oliver, 1999). Oliver's loyalty framework explains that loyalty is not merely based on satisfaction but also involves commitment, social bonding, and long-term attachment.

The analysis process is conducted through two main stages which are the evaluation of the measurement model and the evaluation of the structural model. The evaluation of the measurement model aimed to ensure that all indicators used in this research are able to represent the latent constructs. Construct validity in this research is tested through convergent and discriminant validity. Convergent validity is evaluated based on the outer loading and Average Variance Extracted values. According to Sarstedt et al. (2021), an indicator is considered valid if it has an outer loading value of at least 0.70, although in development model research, values between 0.60 and 0.70 are acceptable. Furthermore, the required AVE value is at least 0.50, indicating that the latent construct is able to explain more than 50% of the variance in the indicators used (Fornell & Larcker, 1981). Furthermore, discriminant validity is used to ensure that each latent construct has distinct characteristics from the others. This testing is conducted using Heterotrait-Monotrait Ratio. The recommended HTMT value is below 0.85 or a maximum of 0.90, indicating adequate discrimination (Henseler, Ringle, & Sarstedt, 2015).

Construct reliability is tested to ensure the internal consistency of the indicators in measuring the latent construct. The parameter used are Cronbach's Alpha and Composite Reliability. An acceptable Cronbach Alpha value is at least 0.70, although a value of 0.60 is still tolerable in early-stage research. Meanwhile, Composite Reliability is considered more representative in PLS-SEM because it considers the contribution of each indicator, with a recommended minimum value of 0.70 (Sarstedt et al., 2021). Besides, discriminant validity is assessed to ensure that each latent construct in the research model represented a conceptual distinct phenomenon and not merely echo the meaning of other constructs. In this research, discriminant validity is examined using the Heterotrait-Monotrait Ratio. The use of HTMT is considered appropriate because it provides a more stringent and refined assessment of construct distinctiveness in variance-based structural equation modeling. Henseler et al. (2015) argued that traditional procedures such as the Fornell-Larcker criterion and cross loading may not always detect discriminant validity problems adequately, whereas HTMT offers a more sensitive criterion for identifying conceptual overlap among latent constructs.

Structural Model Evaluation Parameter

Structural model evaluation is conducted after the measurement model meets the validity and reliability criteria. This stage aims to assess the model's ability to explain causal relationship between latent constructs and test the research model's predictive power. In the PLS-SEM approach, structural model evaluation is generally conducted using several key parameters such as the path coefficient, the coefficient of determination and significance testing through bootstrapping (Sarstedt et al., 2021).

The first parameter, used is the path coefficient, which indicates the direction and strength of the relationship between the latent constructs. The larger the absolute value of the coefficient, the stronger the influence between the latent variables. However, the strength of this relationship needs to be confirmed through statistical significance testing. Significance testing is conducted using the bootstrapping procedure, a non-parametric resampling technique which highly recommended in PLS-SEM. Through this procedure, t-statistic and p-values are obtained for each relationship path. The relationship between construct is considered significant if the t-statistic is greater than 1.96 and the p-value is less than 0.05 at the 5% significance level (Sarstedt et al., 2021). This procedure is crucial for testing whether the proposed hypothesis is empirically supported.

RESULTS AND DISCUSSION

Characteristics of Respondents

The characteristics of the respondents in this study are compiled to provide a general overview of the profile of the Bank Perekonomian Rakyat customers who served as the research sample. A total of 165 questionnaires is deemed suitable for analysis, drawn from BPR customers in various region of Central Java. Respondents profile is classified based on gender, age, education level, occupation, length of customer service, and intensity of use of BPR digital services. In general, the gender composition of respondents showed a relatively balanced distribution 78 are male, while 87 are female. This distribution indicates that BPR services in Central Java are used proportionally by both genders, with a slight predominance of female customers.

In terms of age, the majority of the respondents in this research are in the productive age group, namely 52 aged 31-40. This is followed by 44 aged 41-50, 38 aged 21-30, 21 aged over than 50, and 10 aged under 21. This composition indicates that the majority of BPR customers participating in this research are economically active adults and are assumed to have a high need for financial services. Judging from the type of work held, respondents are dominated by entrepreneur actors as many as 61 people, then private employees as many as 39 people, farmers and traditional traders as many as 27 people, civil servants a teacher as many as 18 people, and other categories as many as 20 people. The dominance of respondents from the self-employed group is very relevant to the characteristics of BPR as a financial institution that mostly serves the micro business sector and local communities.

Judging from the length of time they have been customers, the majority of respondents have been customers for more than 3 years, namely 72 people, followed by 1-3 years as many as 49 people, and less than 1 year as many as 44 people. This shows that the majority of respondents have quite a long experience in interacting with BPR, so they are able to provide a more in-depth assessment of service change due to digital transformation. Furthermore, based on the use of BPR digital service, 96 respondents stated that they often use digital services, such as mobile banking, digital transfers, or application-based notifications, while 69 respondents admitted to using digital service occasionally, this profile is important because all research constructs such as perceived usefulness and perceived interaction loss, are very dependent on respondents' experience in using digital services. Overall, these demographic characteristics shows that the respondents in this research are representative enough to describe the profile of BPR customers in Central Java, especially in the context of digital transformation and customer loyalty.

Measurement Test Result

Based on the result of the measurement model test, the Digital Transformation construct is evaluated through five reflective indicators. The test result showed an Average Variance Extracted value of 0.548, which exceeded the minimum threshold of 0.50 recommended by Fornel & Larcker (1981). this indicates that the Digital Transformation has adequate convergent validity, as it is able to explain more than 50% of the variance in the indicators it reflects.

Table 1. Digital Transformation

No	Item	Indicator	Loading	AVE
1	My BPR has provided digital-based services that facilitate transactions	Trans1	0.501	0.548
2	The service process at the BPR has become faster due to the use of digital technology	Trans2	0.631	
3	I feel that BPR services have changed towards a more digital direction	Trans3	0.83	
4	The digital services provided by the BPR are easily accessible at any time	Trans4	0.77	
5	Digital technology has become an important part of BPR services	Trans5	0.555	

Source: Data Processed (2026)

Referring to the outer loading values, there is variation in contribution between indicators. Indicator Trans3 has the highest loading value of 0.830, followed by Trans4 at 0.770, indicating that these two indicators are the strongest representation of the digital transformation construct. Substantively, this indicates that customer perceptions regarding the shift toward digital services in Bank Perekonomian Rakyat and the ease of access to digital service are key dimensions in shaping perception of digital transformation. Meanwhile, the Trans2 indicator showed a loading value of 0.631 which is acceptable for exploratory and model development research, particularly in the context of social science and consumer behavior (Sarstedt et al., 2021). This value indicates that the perception of accelerated service process due to the use of digital technology also contributes significantly to the construct.

On the other hand, the Trans1 and Trans5 indicators had loading value of 0.501 and 0.555 respectively, which are below the ideal threshold. However, both indicators can be retained because they are still above the 0.50 and the construct's overall AVE value still meet the convergent validity standard. Substantively these findings indicate that for BPR clients, the shift toward digital service (Trans3) and service accessibility (Trans4) are the most visible manifestation of digital transformation. Conversely the perception of digitalization as an essential part of BPR core service (Trans5) remains relatively weak, which may reflect that some clients still view technology as a complement, rather than a core element of service.

Overall, these results indicate that the Digital Transformation construct meet convergent validity requirement, thus suitable for use in further structural model analysis. However, indicator with relatively low loading, may warrant attention in subsequent instrument development, particularly to improve measurement precision. The result of the measurement also show that Pre-Digital Relationship Quality also has adequate convergent validity with the Average Variance Extracted value of 0.601. Regarding the outer loading value, most indicators demonstrate a strong contribution to the construct. Indicator Rel1 has a loading value of 0.828 indicating that a good relationship with the BPR before the introduction of digital service is a very strong proxy for pre-digital relationship quality. Furthermore, indicator Rel4 and Rel5 have loading of 0.803 and 0.805 respectively, confirming that the intensity of previous interactions and the perception that BPR will understand the clients' need are important dimension in shaping the quality of these relationships.

Table 2. Pre-Digital Relationship Quality

No	Item	Indicator	Loading	AVE
1	Before digital service are available, I had a good relationship with the BPR	Rel1	0.828	0.601
2	I felt personally close to the BPR staff or officer	Rel2	0.654	
3	I fully trust the services provided by the BPR	Rel3	0.773	
4	My previous interactions with the BPR are intensive	Rel4	0.803	
5	I felt the BPR understood my needs as a customer	Rel5	0.805	

Source: Data Processed (2026)

Indicator Rel3 also shows a high loading of 0.773, making it a valid indicator reflecting the level of clients trust in BPR services. Meanwhile, the Rel2 indicator had a loading value of 0.654, which although below the ideal threshold, is still accepted in the context of social research. This value indicates that personal closeness with BPR staff or officers continues to contribute significantly to the construct. Substantively, these findings demonstrate that BPR clients still place a high emphasis on interpersonal relationships, understanding customer needs, and intensive interaction as the primary foundations of relationship quality before the digitalization process. This is highly relevant to the characteristic of BPR as financial institution based on social closeness and trust.

The result of the measurement model evaluation also show that Perceived Usefulness construct has very good measurement quality. The Average Variance Extracted value of 0.746 far exceeds the minimum threshold, so it can be stated to have very strong convergent validity. If viewed from the outer loading value, all indicators show value above the ideal standard. The Use2 indicator has the highest loading value of 0.936, which indicates that customer perceptions regarding increasing the efficiency or usefulness of digital service are the most dominant representation of the Perceived Usefulness construct. Furthermore, the Use1 indicator also shows a very high loading of 0.844, followed by Use5 with 0.821, Use3 with 0.804 and Use4 with the value of 0.795

Table 3. Perceived Usefulness

No	Item	Indicator	Loading	AVE
1	BPR's digital service help me conduct transaction faster	Use1	0.762	0.582
2	Using digital service increases the efficiency of my banking activities	Use2	0.735	
3	BPR's digital service make it easier for me to access account information	Use3	0.825	
4	I find BPR's digital services very useful for my needs	Use4	0.802	
5	Digital technology makes my banking activities more effective	Use5	0.682	

Source: Data Processed (2026)

The consistency of high loading values for all indicators show that the items used have a very good ability to reflect the perceived benefits of BPR digital services. According to Sarstedt et al. (2021), loading above 0.70 indicates that the indicator has a substantial contribution to the latent construct and does not require indicator elimination. Overall, the Perceived Usefulness construct meets all convergent validity requirements very well and is suitable for use in structural model analysis. These results also indicate that BPR clients relatively have clear and consistent perceptions regarding the benefits obtained from digitizing services, especially in the aspect of efficiency, convenience, and effectiveness of transactions.

Based on the analysis result in Table 4 below, the Perceived Interaction Loss construct is measured

through five indicators. The loading factor values for all indicators are above the recommended threshold indicating that all items are deemed convergently valid. This indicates that each indicator adequately reflects the Perceived Interaction Loss construct. The indicator with the highest loading value is Int1 (0.782). This means that respondents' primary perception of interaction loss lies in the reduction in direct interaction with BPR officers since the implementation of digital services. In other words, the digitalization of services has significantly shifted the communication patterns from face-to-face to more technology-based.

Furthermore, indicators Int2 (0.742) and Int5 (0.735) also demonstrated strong contributions to the construct. This indicates that respondents not only felt a reduction in personal relationship with BPR staff but also perceived BPR services to be more impersonal than before. These conditions align with the characteristic of digital services, which tend to emphasize efficiency and ease of transactions, but can reduce the personal touch that is typically as a key strength of local financial institution like Bank Perkonomian Rakyat. Indicator Int3 (0.732) show that respondents also perceived a loss of communication with BPR staff, reinforcing the suspicion that digitalization is affecting the quality of social relationships between clients and bank as service providers.

Table 4. Perceived Interaction Loss

No	Item	Indicator	Loading	AVE
1	I feel that direct interaction with BPR officers has decreased since the introduction of digital service	Int1	0.782	0.526
2	Digital services have made my relationship with BPR less personal	Int2	0.742	
3	I feel like I have lost direct communication with BPR staff	Int3	0.732	
4	The use of digital technology has reduced my closeness with BPR	Int4	0.627	
5	BPR services now feel more impersonal than before	Int5	0.735	

Source: Data Processed (2026)

Meanwhile, the indicator with the lowest loading is Int4 (0.627) which is "The use of digital technology has reduced my closeness with BPR". Although this value is the lowest compared to other indicators, it is still above the acceptable threshold and therefore worth maintaining. This indicates that while the sense of emotional closeness with BPR has decreased, this perception is not as strong as the perception of decreased direct interaction. The AVE value of 0.562 indicates that the construct is able to explain more than 50% of the variance in its indicators, thus meet the criteria for convergent validity, and can be declared valid and suitable for use in further analysis. Substantively, these results indicate that digital transformation in rural banks has resulted in a decline in the quality of interpersonal interactions, particularly in direct communication and personal relationships between clients and banks' officers.

Based on the analysis result in Table 5, the Perceived Customer Loyalty construct is measured through five indicators and all adequately represent the customer loyalty construct. The indicator with the highest loading value is Loy5 (0.797) which indicates that perceived emotional loyalty is the strongest dimension in shaping the perceived customer loyalty construct. This means that clients have a fairly high sense of attachments and loyalty to the BPR as the financial institution they use. Furthermore, indicators Loy4 (0.773) and Loy3 (0.760) also made strong contributions to this variable. This indicates that customer loyalty is reflected not only in feelings of loyalty but also through a commitment to continue using BPR service and a willingness to recommend the BPR to others. This willingness to provide recommendation is an important form of behavioral loyalty, as it reflects customer satisfaction and trust in the quality of service received

Table 5. Perceived Customer Loyalty

No	Item	Indicator	Loading	AVE
1	I intend to remain a long-term customer of this BPR	Loy1	0.675	0.553
2	I will continue to use this BPR's service even if other options are available	Loy2	0.706	
3	I am willing to recommend this BPR to others.	Loy3	0.760	
4	I am committed to continuing to use this BPR's service	Loy4	0.773	
5	I feel loyal to this BPR	Loy5	0.797	

Source: Data Processed (2026)

The Loy2 indicator (0.706) indicates that respondents tend to continue using BPR services even when other options are available. This finding reflects a strong preference for BPRs over other financial institutions, which could be driven by trust, service convenience or previous positive experiences. Meanwhile, the indicator with the lowest loading value is Loy1 (0.675), which although it has the lowest value among the other indicators, is still above the minimum acceptable limit. This indicates that the intention to remain an important component of loyalty, although its strength is slightly lower than the emotional aspects and commitment to service use. The Average Variance Extracted value of 0.553 indicates that the Perceived Customer Loyalty construct is able to explain more than 55.3% of the variance of its indicators, thus fulfilling the convergent validity requirements. Thus, this variable is declared valid and suitable for use in next phase analysis.

Structural Model Test Result

Based on the result of the hypothesis testing, it is found that not all relationship between variables in the research model showed a significant effect. The relationship between digital transformation and perceived usefulness showed a t-statistic of 0.952 with p-value of 0.341. This value indicates that the effect of digital transformation on perceived service usefulness is not significant, as the p-value greater than 0.05. Therefore, the hypothesis stating that digital transformation influences perceived usefulness is rejected. This indicates that the implementation of digitalization in rural banks has not directly improved customer perception of the benefits of the services provided.

Furthermore, the relationship between Pre-Digital Relationship Quality and Perceived Usefulness showed a significant result with t-statistic of 3.136 and p-value of 0.002. Because the p-value is less than 0.05, the hypothesis is accepted. These results indicate that the quality of the relationship that existed between clients and Bank Perekonomian Rakyat before digital transformation has a positive influence on the perceived usefulness of digital service. In other words, the better the pre-digital relationship, the higher the customer's perception of the benefits of using digital services.

The relationship between Digital Transformation and Perceived Interaction Loss yielded a t-statistic of 0.219 and a p-value of 0.826. These results indicate that the effect is not significant, thus rejecting the hypothesis. This finding indicates that the digital transformation has not significantly caused clients to perceive a loss of interaction with the Bank Perekonomian Rakyat. Meanwhile, the relationship between Pre-Digital Relationship Quality and Perceived Interaction Loss showed a t-statistic of 1.809, and p-value of 0.071. At the 5% significance level, this result is declared insignificant because the p-value is still greater than 0.05 therefore rejecting the hypothesis. However, this value approached the limit of significance, indicating a tendency for Pre-Digital Relationship Quality to influence Perceived Interaction Loss, although the effect is not yet statistically strong.

The most significance relationship in this study is seen in the influence of Perceived Usefulness on Perceived Interaction Customer Loyalty, with t-statistic of 5.875 and p-value of 0.000. These results indicate that the hypothesis is accepted. This means that the higher a client's perception of the benefits of digital services, the higher their loyalty to the BPR. This finding also confirms that the perceived benefits of digital service are a key factor in forming and maintaining the clients' loyalty.

On the other hand, the relationship between Perceived Interaction Loss and Perceived Customer Loyalty shows a t-statistic value of 0.832 and p-value of 0.406, so it is declared insignificant. Therefore, the hypothesis is rejected. These results indicate that customer perception regarding the reduced direct interaction with BPR do not have a significant impact on their loyalty. Overall, the study result indicate that customer loyalty is more influenced by the perceived benefits of digital services than by the perceived loss of interpersonal interaction. This underscores the importance of improving the quality and convenience of digital services as a primary strategy in maintaining BPR customer loyalty.

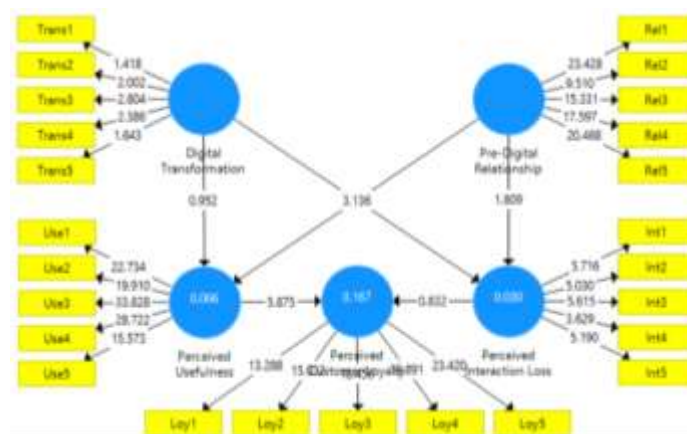


Figure 1. Structural Model Test Result

Table 6. Path Coefficients

Path	T Statistics ($ O/STDEV $)	P Values
Digital Transformation --> Perceived Usefulness	0.952	0.341
Pre-Digital Relationship Quality --> Perceived Usefulness	3.136	0.002
Digital Transformation --> Perceived Interaction Loss	0.219	0.826
Pre-Digital Relationship Quality --> Perceived interaction Loss	1.809	0.071
Perceived Usefulness --> Perceived Customer Loyalty	5.875	0.000

Discussion

The findings of this study reveal that digital transformation in BPR does not operate in simple, linear manner. Rather than directly producing customer loyalty or perceived usefulness, digital transformation appears to work through customers' interpretation of service benefits and their prior relational experience with the bank. This finding is important because BPR customer are not merely technology users but also relational customers whose perception are shaped by trust, familiarity, and previous interpersonal encounters with bank officers.

The first hypothesis, which proposed that digital transformation has a significant effect on perceived usefulness, is not supported. This result indicates that the availability of digital services alone does not automatically lead customers to perceive those services as useful. From the perspective of the Technology Acceptance Model, perceived usefulness emerges when users believe that technology improves their performance, efficiency, or task accomplishment (Davis, 1989). However, in the context of BPR, customers may not immediately recognize the usefulness of digital transformation if the services remain limited, fragmented, or insufficiently embedded in their daily banking routines. This finding is consistent with Vial (2019), who argues that the outcomes of digital transformation depend not only on the adoption of technology but also on organizational readiness, user capability, and the surrounding implementation context. Therefore, the rejection of this hypothesis suggests that digital transformation in BPRs may still be in a transitional stage, where technology is available but has not yet become a fully meaningful source of customer value.

The second hypothesis is supported, showing that pre-digital relationship quality significantly influences perceived usefulness. This finding suggests that customer who previously had good relationship with BPR are more likely to interpret digital service are useful. In relationship-based banking, customer often rely on trust and familiarity when evaluating services changes. Morgan and Hunt (1994) explain that trust and commitment are central elements in successful relationship marketing, particularly in long-term relational exchange. In this research, pre-digital relationship quality seems to function as a relational lens through which customers evaluate digital innovation. Customers who already trust the BPR may assume that digital service are introduced to improve service quality rather than to distance the bank from its customers. Thus, the finding extends the Technology Acceptance Model by showing that perceived usefulness is not only shaped by technological attributes but also by relational antecedents formed before digitalization.

The third hypothesis, which proposed that digital transformation significantly influences perceived interaction loss, is not supported. This finding indicates that digitalization has not significantly increased customers' perception of losing interpersonal interaction with BPR officers. From the perspective of Paradox Theory, digital transformation can create contradictory outcomes which is may improve efficiency while also weakening the relational intimacy. however, the insignificant result suggest that this paradox is not fully perceived by BPR customers. One possible explanation is that digital services in BPR do not completely replace face to face services. Instead, they may operate alongside conventional channels, allowing customer to continue receiving personal assistance when needed. Larivière et al. (2017) argue that technology in service encounter may either substitute, complement or augment human roles. In the BPR context, digital technology appears to complement rather than entirely substitute interpersonal service. As a result, customers may not feel a severe loss of interaction because the human touch remains available through hybrid service practices.

The fourth hypothesis, which proposed that pre-digital relationship quality significantly influences perceived interaction loss, is also not supported at the 5 percent significance level. Although the statistical result approaches significance, the relationship is not strong enough to confirm the hypothesis. This finding offers an interesting theoretical nuance. Customers with strong prior relationships could be expected to feel more sensitive to reduced interpersonal contact because they are accustomed to personal service. However, strong prior relationships may also create trust and tolerance toward service changes. In this study, the latter explanation appears more suitable. Customers who already have confidence in the BPR may not immediately interpret digitalization as relational abandonment. Instead, they may perceive digital services as an additional facility while assuming that personal support remains accessible. This finding enriches relationship marketing theory by showing that relationship quality does not always intensify perceived loss. In some cases, it can cushion customers from the uneasiness of technological change.

The fifth hypothesis is supported, indicating that perceived usefulness has a significant effect on perceived customer loyalty. This is the strongest relationship in the model and confirms that customers are more likely to remain loyal when they experience digital services as beneficial, efficient, and relevant to their banking needs. Davis (1989) has argued that perceived usefulness is a central determinant of technology

acceptance because users value systems that improve task performance. This research extends that logic by showing that perceived usefulness is not only important for technology adoption but also for loyalty formation. In the BPR context, customers may remain loyal when digital service help them conduct transaction faster, access the information more easily, and manage banking activities more effectively. This result also align with Oliver (1999) view that loyalty is built not only through satisfaction but also through perceived superiority, commitment and continued value. Therefore, usefulness becomes a practical bridge between digital service experience and long-term customer attachment.

The sixth hypothesis, which proposed that perceived interaction loss significantly influences perceived customer loyalty, is not supported. This result suggests that reduced interpersonal interaction does not automatically weaken customer loyalty in BPRs. Although BPRs are traditionally associated with personal relationships, customers may tolerate a certain reduction in direct interaction as long as digital services provide convenience, speed, and reliability. Lemon and Verhoef (2016) emphasize that customer experience is shaped by multiple touchpoints throughout the customer journey, not only by one type of interaction. Therefore, loyalty may still be preserved when digital touchpoints offer acceptable service quality and when customers continue to trust the institution. This finding challenges the assumption that relational loss always leads to customer defection. In the BPR context, loyalty appears to depend on a balance between functional benefits and relational assurance. Customers may not require constant face-to-face interaction if they still feel that the bank remains dependable, accessible, and responsive.

CONCLUSIONS

This study advances the understanding of digital transformation in relationship-based financial institutions by showing that digitalization in Bank Perekonomian Rakyat (BPR) should not be viewed merely as a technological shift, but as a relational transition. The main contribution of this study lies in demonstrating that the success of digital transformation in BPRs depends not only on the availability of digital services, but also on how customers interpret those services through their prior relationship with the bank. In this context, pre-digital relationship quality becomes a crucial relational asset that helps customers perceive digital services as useful.

Theoretically, this study contributes to Paradox Theory by showing that digital transformation does not always produce a straightforward positive or negative effect. Although digitalization is often expected to improve service efficiency and customer value, the findings indicate that its impact is more complex in BPRs. Digital transformation does not directly increase perceived usefulness or perceived interaction loss. Instead, customer perception is shaped more strongly by relational conditions that existed before digitalization. This suggests that the paradox of digital transformation in BPRs is not simply a tension between technology and human interaction, but a more delicate interaction between digital service benefits, customer readiness, and established trust.

This study also extends the Technology Acceptance Model by showing that perceived usefulness is not only relevant for explaining technology adoption, but also for explaining customer loyalty. In the BPR context, customers remain loyal when digital services provide clear and practical benefits, such as faster transactions, easier access, and greater service efficiency. However, these benefits are not automatically produced by digital transformation itself. They need to be supported by customer trust, service familiarity, and effective communication from the bank. From the perspective of relationship marketing, this study highlights the strategic value of pre-digital relationship quality. The findings show that strong prior relationships can help customers accept digital services more positively. Therefore, relationship quality should not be treated as an outdated element in the digital era. Instead, it functions as a foundation that allows BPRs to modernize their services without losing their relational identity.

Practically, the findings suggest that BPRs should adopt a hybrid service strategy. Digital services need to be improved in terms of accessibility, simplicity, reliability, and usefulness, but personal interaction should remain available for customers who need assistance, reassurance, or consultation. BPRs should not position digitalization as a replacement for interpersonal service. Rather, digital technology should be used to complement personal relationships and strengthen customer loyalty. Overall, this study contributes to the literature by explaining how digital transformation operates in a banking context where trust, familiarity, and interpersonal closeness remain central to customer relationships. The findings indicate that successful digital transformation in BPRs requires more than technological adoption. It requires the careful integration of digital efficiency and relational continuity. Future studies may extend this model by examining customer digital literacy, service readiness, and demographic differences to provide a deeper understanding of customer responses to digital transformation in rural banking institutions.

This research contributes to theory development in digital transformation, relationship marketing, and

customer loyalty within relationship-based banking industries such as Bank Perekonomian Rakyat. First, it strengthens the relevance of Paradox Theory by showing that digital transformation may produce both positive and limited effects, as its benefits depend on pre-established relational conditions. Second, this study extends the Technology Acceptance Model by demonstrating that perceived usefulness influences not only usage intention but also customer loyalty formation. Third, it contributes to relationship marketing literature by highlighting that pre-digital relationship quality plays a more important role than digitalization alone in shaping customers' perceptions of service benefits.

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