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Article

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The influence of service quality, Guanxi, value co-creation and corporate image in building developers apartments loyalty toward contractors in apartment construction industry

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ABSTRACT

The aim of this research is to examine the influence of service quality, guanxi, value co-creation and corporate image on customer loyalty of developer in the apartment construction industry. This research used an online survey approach, collecting 316 respondent data from apartment developers. This research uses the structured equation modeling method with SmartPLS to test the hypothesis of the research model. The results of the hypothesis test prove that there is a positive and significant influence of service quality, guanxi, value co-creation and corporate image on customer loyalty. This study is one of the few studies that examines customer loyalty in the context of the apartment construction industry, and moreover, this study examines the influence of service quality, guanxi, value co-creation and corporate image on customer loyalty. This research has managerial implications for building apartment contractor companies on how to build and maintain customer loyalty.

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Customer loyalty; Guanxi; value co-creation; corporate image; service quality; apartment constructions

SUBJECTS

Marketing; Project Management; Consumer Behaviour; Strategic Management

Introduction

The real estate sector is one sector that has the potential for development in recent years. After experiencing the global COVID-19 pandemic, the global real estate market is starting to show an upward trend. The projected trajectory of the global market for apartments and other residential developments indicates a notable expansion, with an anticipated increase from \$64.55 billion in 2022 to \$72.77 billion in 2023, reflecting a compound annual growth rate (CAGR) of 12.7%. The market for apartments and other residential developments is projected to attain a value of \$113.91 billion by the year 2027, exhibiting a compound annual growth rate (CAGR) of 11.9% (Research Markets, 2023). Indonesia is one of the countries with good real estate potential in the Asian region, where Indonesia is one of the best real estate investment destinations in Asia (Deny, 2023). The real estate industry in Indonesia has experienced a decline due to the global COVID-19 pandemic. However, the Indonesian real estate sector is starting to show an increase in demand, especially for demand for high-rise apartment housing in the post-COVID-19 pandemic (Grahadyarini, 2023). The potential growth in demand for high-rise apartments in Indonesia indicates the potential development for high-rise apartment construction. The apartment project is owned by a developer company; in working on an apartment construction project, the developer appoints a contractor company to work on the project.

The business relationship between the developer and the contractor in apartment construction is a business to business or B2B relationship, where the developer is the owner of the apartment, and to work on the apartment construction project, the developer will hire and assign contractors to carry out the apartment construction project. Apartment contractors need to build developer loyalty as the main target in their relationships, because loyal developers will return to use the contractor's services for their

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next project, and loyal developers will also spread good news about the contractor to their colleagues (Wattoo & Iqbal, 2022; C. B. Zhang & Li, 2019). Customer loyalty not just offer repeat purchase but also offer long-term growth and key to survival in today's competitive business environment, hence it is important for contractors to pay attention and build developer loyalty as customers (Sunindijo et al., 2014).

Customer loyalty from developers towards contractors is a vital aspect that must be considered in the contractor company's strategy to increase competitiveness in a competitive market (Hariandja & Vincent, 2022). Customer loyalty is a topic that has received attention in academic research, there are many previous studies have examined customer loyalty in various industries, including the B2B industry (Ali et al., 2021; Hoe & Mansori, 2018; L. W. Y. Lee et al., 2018; Woratschek et al., 2020). However, research on customer loyalty in the construction industry is still relatively small, especially for the apartment construction industry. Thus, this research fills the gap by examines what factors can build customer loyalty from developers towards apartment contractors.

Customer loyalty is the focus of both business strategy and is also the focus of various academic research in various industries including the B2B industry. In its development, academic research in the B2B industry examines various variables that are predictors of customer loyalty, such as service quality (N. J. Slack & Singh, 2020), supply chain agility (Huang, Lee et al., 2019), social bonds (Samudro et al., 2018), perceived value (Gligor et al., 2020), relationship quality (Almomani, 2019), guanxi (Hansopaheluwakan et al., 2023), value co-creation (Opata et al., 2021), brand images (Cassia et al., 2017), corporate social responsibility (Raza et al., 2020). Among the various antecedent variables that influence customer loyalty across industries, this study selects those most relevant to the apartment construction industry, which operates in the service and B2B sectors, with a particular focus on relationship and corporate asset variables. One of the important predictors in building customer loyalty in the B2B industry, especially those related to service, is service quality (Huang, Lee et al., 2019). Considering that the apartment construction industry is related to B2B services, this research proposes service quality as a predictor of apartment developer loyalty. One of the main assets for companies operating in the service industry, especially in B2B, is the company's brand image or corporate image, because corporate image can become a competitive advantage amidst industrial B2B competition (Thi Hoang Yen, 2019). Corporate image has also become a focus in academic research, especially its influence in forming customer loyalty (Balmer et al., 2020; Thi Hoang Yen, 2019). Recognizing the crucial role of corporate image for B2B companies, it becomes equally important for apartment contractor firms to establish a strong corporate image. Therefore, this study proposes corporate image as one of the key predictors. This research proposes the corporate image of the contractor as a predictor of apartment developer loyalty. The relationship between a company and its customers is a crucial factor in maintaining and building customer loyalty to ensure success in competition, and one of the key strategies that plays a significant role is fostering customer engagement through value co-creation strategies (Firdaus et al., 2023). Value co-creation has also received attention in the academic world as one of the antecedents of building customer loyalty (Woratschek et al., 2020). Seeing the importance of co-creation in the industrial and academic worlds, this research uses co-creation as an antecedent to build apartment developer loyalty. Maintaining strong relationships with customer companies is a sustainable competitive advantage for surviving in the B2B industry. One effective strategy for maintaining customer relations, particularly in the Asian industry, is Guanxi (Butt et al., 2020). Guanxi is a form of relationship bond that is based on mutual interest and benefit (Dobrucali, 2020). The industry discussed in this research is the apartment construction industry in Indonesia, where business in Indonesia is influenced by Asian culture, so this research proposes guanxi as one of the antecedents of apartment developer loyalty. Customer loyalty plays a crucial role in the sustainability of a company, and numerous academic studies have investigated various variables that contribute to enhancing customer loyalty in the B2B industry. Building on previous research, this study approaches customer loyalty from a perspective tailored to the B2B industry, focusing on assets and relationships. Accordingly, this study proposes service quality, corporate image, value co-creation, and Guanxi as antecedent variables of customer loyalty.

Many previous academic studies in the various industry have examined the influence of variables of service quality (Huang, Lee et al., 2019; Venkatakrisnan et al., 2023), guanxi (Atmojo et al., 2019; Hansopaheluwakan et al., 2023), value co-creation (Woratschek et al., 2020) and corporate image (E. Aslam et al., 2023; Phan Thanh & Hoang Anh, 2023) on customer loyalty, but not many research have

raised it in the construction industry. Academic research that studies customer loyalty from developers in the construction industry is still relatively small and even fewer have examined the influence of service quality, guanxi, co-creation and corporate image on the formation of customer loyalty from developers in the apartment construction industry, this gap is filled in this research. Therefore, the main aim of this research is to examine the influence of service quality, guanxi, co-creation and corporate image on the formation of customer loyalty from developers in the apartment construction industry.

Literature review

Stimulus organism response theory

The S-O-R theory is a prominent psychological theory, which widely employed in consumer behaviour research (Fiore et al., 2005; Wu & Li, 2018). The S-O-R theory framework posits that various environmental factors play a role in eliciting emotional responses and cognitive states, which then influence the development of specific behaviours (Jacoby, 2002; Kamboj et al., 2018). The S-O-R theory comprises three fundamental components:

1. The stimulus (S). The S-O-R theory posits that stimulus is the initial component. Stimuli are factors that exert effect in arousing customers as people.
2. The organism (O). The second component is the organism, which refers to the emotional and mental state of the consumer. It encompasses all the activities that occur between the first stimulus and the resulting response.
3. The reaction (R). The last element is response, which refers to the outcomes manifested as customer behaviour towards the brand (Kamboj et al., 2018).

SOR theory is a popular psychological theory that has been widely used in several previous studies to explain consumer behavior in various industries (Hsu et al., 2021; Wu & Li, 2018; Yu et al., 2021). Prior study conducted by Wu and Li (2018) employs the SOR framework to examine client loyalty in the context of social commerce, while study conducted by Hsu et al. (2021) applies the SOR theory paradigm to examine consumers behaviors on food festivals. The study conducted by Yu et al. (2021) applies the S-O-R theory to examine the behaviour of Huawei consumers in China. This research uses SOR theory to explain the relationship between guanxi, service quality, corporate image and value co-creation with customer loyalty in the context of apartment construction industry. The customer loyalty variable consists of attitudinal loyalty and behavioural loyalty, where attitudinal loyalty is an organism, and behavioural loyalty is a response in the SOR theory chain. While service quality, corporate image, guanxi and value co-creation are stimuli in the SOR theory chain.

Customer loyalty

Customer loyalty is the basis for developing sustainable competitive advantage which is the goal of the company's marketing strategy (Almomani, 2019). Loyalty is important because loyalty is a deep commitment from customers to repurchase or re-patronize a product or service they like consistently in the future (Oliver, 1999). Meanwhile, another definition of loyalty comes from Youcef, Djelloul and Abderrezak who say that loyalty is a psychological condition formed from sustained satisfaction from customers combined with emotional attachment which results in consistent customer relationships with sellers or providers (Souar et al., 2015). Customer loyalty from a company perspective can be perceived as the customer's attitude (attitudinal loyalty) and customer intentions which give rise to certain behavior (behavioral loyalty) (Oliver, 1997). From a company perspective, attitudinal customer loyalty manifests in the form of positive word of mouth, recommending and encouraging their peers, while behavioral loyalty manifests in the form of repeat purchases (M. Lee et al., 2019).

Service quality

The level of service quality and actualization felt by customers allows companies to differentiate themselves amidst competition by offering quality service and creating competitive advantages (Williams

et al., 2019). In its development, there are several service quality or servqual concepts, and the servqual concept from Parasuraman et al. is a service quality concept that is widely used and often adapted in research for the context of service companies (Parasuraman et al., 1985; Zeithaml et al., 2002). Parasuraman's service quality model is applied to various industrial contexts such as banking, airlines, mobile communications, dental service, health care and others.

Research from Sunindijo et al developed the SERVQUAL concept into the context of the construction industry (Sunindijo et al., 2014b). Research from Sunindijo et al developed 5 dimensions of service quality in the context of the construction industry, namely:

1. Tangibility, related to field conditions, project facilities, physical results, equipment used, and physical condition of personnel and workers.
2. Reliability, related to abilities, skills, methods that can be relied upon in carrying out the project in accordance with the promised quality of work and the accuracy of the specifications achieved.
3. Responsiveness, related to the willingness to help customers and provide fast service. In other words, it is responsiveness, especially in handling unexpected problems that arise or responding quickly to changes in new wishes from customers.
4. Assurance, related to the level of knowledge and professional level of staff and workers from construction service companies/contractors which guarantees the trust of customers that the project is always carried out well according to what has been planned. The staff and workers are very accommodating and polite in their work and provide a comfortable and calm atmosphere for customers.
5. Empathy, related to personal attention and concern from companies towards their customers. This is a form of personal approach that is able to foster mutual trust, mutual respect and equality in achieving jointly planned results.

The relationship between service quality and customer loyalty is a topic that is often raised in academic research in various industries, including the B2B industry. Several previous studies have proven the importance of service quality in building customer loyalty in the B2B industry (Biedenbach et al., 2019; Prentice et al., 2020; N. Slack et al., 2020). Seeing the importance of service quality for companies and the results of previous research, this research proposes the following hypothesis.

H3. Service quality has a positive and significant influence on the formation of developer loyalty.

Guanxi

The concept of guanxi encompasses the establishment of inter-personal connections among groups or people (Fan, 2002). The presence of guanxi can be observed through emotional bonds formed between individuals who have established connections, engaging in social interactions, communication, and the act of sharing. The guanxi is formed within a highly communicative environment. Within this context, the phenomenon of intense communication can be characterised as a mode of contact that arises among individuals who have intimate bonds, such as those found within family ties, friendships, and professional colleagues. Furthermore, the establishment of mutual trust is a direct result of previous experiences. Trust is established as a result of the perception or positive encounter that certain individuals have had with others. The concept of guanxi in business can be defined as an intricate network of emotional connections between individuals who are interlinked, engaging in social interactions, communication, and collaboration in order to collectively achieve a specific objective (Fan, 2002; M. Zhang et al., 2021)

Yen et al. (2011) measures the notion of guanxi by encompassing three distinct dimensions, namely ganqing, renqing, and xinren (Yen et al., 2011)

1. The concept of ganqing dimension can be described as a state of shared comprehension that arises from the emotional bonds between two entities engaged in business, with the aim of cultivating and preserving a viable and enduring commercial association.
2. The concept of the renqing aspect defined as the inherent quality of receptiveness, compassion, and acceptance between the purchaser and the merchant, serving as a manifestation of the transaction of goods within a business association founded on amicability.

3. The Xinren component, as conceptualised in this study, refers to the inherent quality of consumer trust in the performance of vendors, devoid of any elements of scepticism or counterproductive inclinations (Yen et al., 2011). building and maintaining good relationships will help create loyalty from customers. Several previous academic studies provide empirical evidence regarding the influence of guanxi in forming customer loyalty in the context of the e-commerce industry (Atmojo et al., 2019; Hansopaheluwakan et al., 2023). looking at the importance of relationships in the construction industry, and the results of previous research, this research proposes the following hypothesis.

H1. guanxi has a positive and significant influence in forming developer loyalty.

Value co-creation

The establishment of a connection between clientele and the corporation is a crucial encounter that need preservation in order to ensure the company's long-term viability. Value co-creation is a type of relational dynamic that acknowledges that customers are not mere passive recipients of collaboration, but rather active contributors to the jointly created value (Gligor & Maloni, 2022). Value co-creation emerges from the foundation of service dominant logic, often known as S-D logic (Prahalad & Ramaswamy, 2004). The S-D logic perspective conceptualises co-creation as a collaborative and dynamic endeavour encompassing multiple stakeholders, with the resultant value being influenced by their utilisation of resources (Sthapit et al., 2019). Minkiewicz et al. (2014) provide a definition of co-creation as the process by which customers are engaged in activities, cooperate with others, and personalise their experience (Minkiewicz et al., 2014). Furthermore, co-creation offers prospects for collaboration between corporations and consumers, enabling both parties to derive advantages from the endeavour, exhibit a willingness to engage in the undertaking, and acknowledge their respective responsibilities as contributors to the advancement of customer behaviours and procedures (Font et al., 2021; Sthapit et al., 2019)

Value co-creation is a process of social activity through interaction and collaboration between companies and customers, which will produce trust, solidarity and better social ties between companies and customers (Xiao et al., 2020). Previous research provides some empirical evidence regarding how value co-creation is a predictor of customer loyalty in various industry B2B (Iglesias et al., 2020; Raza et al., 2020; Xiao et al., 2020). Looking at previous research and arguments, this study proposes the following hypothesis.

H2, value co-creation has a positive and significant influence as a predictor of developer loyalty.

Corporate image

The notion of corporate image surfaced in the early 1960s, with the research conducted by Boulding (1956) elucidates the significance of image in human psychology and additionally posits that there exists an a priori connection between an individual's perception of an organization's image and the consequent behavior directed towards said organization (Boulding, 1956). As per Gray and Balmer (1998), corporate image pertains to the cognitive representation of an organization by individuals and the associations evoked upon encountering the firm emblem and/or name (Gray & Balmer, 1998). One interpretation of corporate image pertains to the collective viewpoint held by the public over the comprehensive representation of an entity or corporation (Alam & Noor, 2020; C. Y. Lee, 2019). As per Gurlek et al., corporate image is defined as a tangible outcome related to an entity, manifested through diverse emotions, viewpoints, interactions, and perceptions of company stakeholders towards the entity, with customers being one of these stakeholders (Gürlek et al., 2017). Corporate image serves as a key driver of competitive advantage for a company, as it represents an intangible asset that is challenging for rivals to replicate (Alam & Noor, 2020).

Corporate image plays a crucial role for businesses, as it has a significant impact on consumer behavior and the overall performance of the organization (Igbudu et al., 2018). The examination of corporate image's significance and impact as a primary determinant of consumer loyalty in B2B industries has garnered significant interest among scholars in the academic community (Alam & Noor, 2020; Arrivabene et al., 2019; Igbudu et al., 2018). So, taking into account the arguments and prior findings regarding the importance of corporate image on loyalty, the following hypothesis is proposed.

H4. Corporate image has a significant and positive influence in forming loyalty from apartment developers.

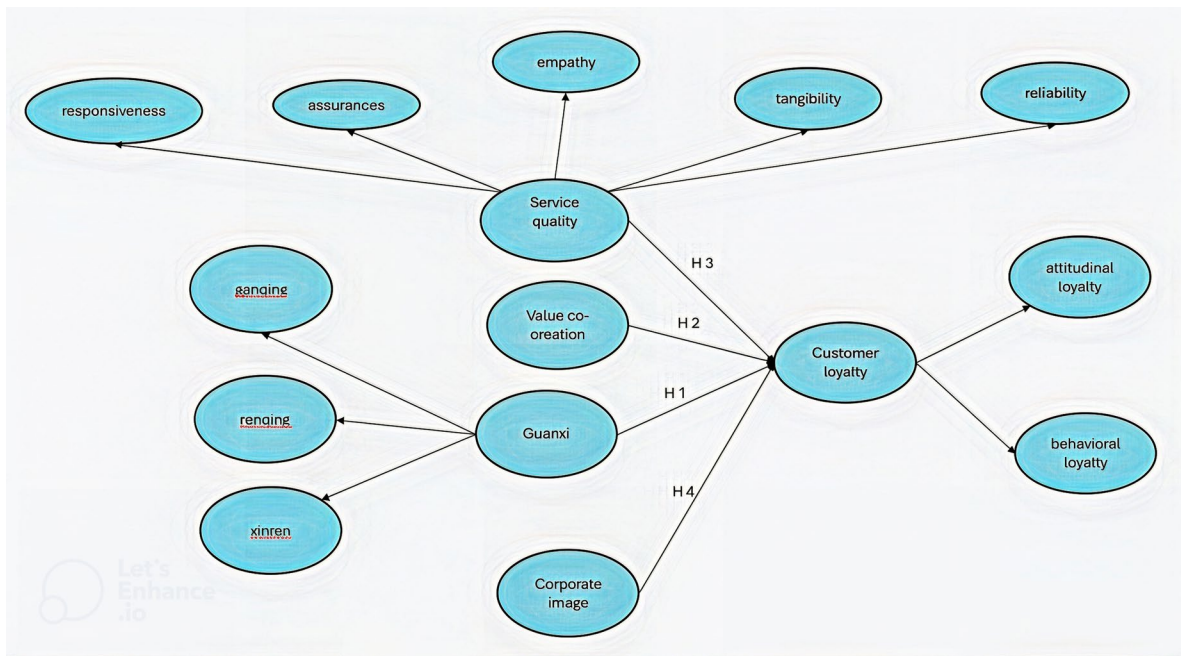


Figure 1. Research model.

Table 1. Demographic.

		numbers
Gender	Male	291
	Female	25
Age	20–30	0
	31–40	17
	41–50	120
	51–60	125
	>61	44

Based on hypotheses formed from the results of previous research and arguments from academic journals, the research model of this research shows in [Figure 1](#).

Research methodology

Data collection

The population for this research consists of developer companies that have built highrise apartment residential buildings in Indonesia. Apartment developers in this research population are represented by project managers, or general managers, directors or owners who have served or are also serving as project managers of apartment projects. This research uses respondents' data, collected using cross-sectional design which conducted between October and December 2023. Collecting respondent data from this research was carried out by sending 350 online questionnaires to respondents, then returning questionnaires with 316 respondent data or 90.2% return rate. Of the 316 respondents' data there was no missing data, so all 316 respondents' data could be used for statistical analysis. An initial pilot study was conducted involving 30 respondents to evaluate their understanding of the questionnaire content. The results of the pilot study indicated that respondents were able to comprehend and answer the questions clearly and consistently, thus validating that the research instrument is ready for data collection (Tran et al., 2021). The respondent data has been analyzed descriptively and is presented in the [Table 1](#) above.

In [Table 1](#), respondents aged 51–60years constitute the largest group in this research at 40.85% (125 respondents), followed by those aged 41–50years at 39.22% (120 respondents), 14.38% of the respondents in this research were above 60years old, totalling 44 respondents. Additionally, 5.56% of the respondents, which is 17 individuals, were within the age range of 31 to 40years. The majority of respondents to this research

are project managers aged between 41 and 60 years. Table 1 also indicates that 291 respondents, accounting for 92% of the total, were men, and 25 respondents, making up 7.91% of the total, were women. The majority of respondents are male project managers, this description is in accordance with field conditions where in project management work the majority are men (Project Management Institute (PMI)), (2023).

Measurements

The research model's variables are measured using indicators derived from prior research, which have been validated and are pertinent to the study. Bearing in mind that the context of this research is the apartment construction industry, which is included in the B2B industry, the previous research used as a reference for measuring adaptations is previous research that researched in the context of the B2B industry. For the service quality variable, this research adopts research from Parasuraman et al. (1985) and also from Huang et al. (2019), because Huang et al. (2019) research examines developing service quality for B2B which is suitable for this research. The customer loyalty variable is measured based on the research conducted by Kittur and Chatterjee (2021), and Zhang and Li (2019) in the B2B industry (Kittur & Chatterjee, 2021; C. B. Zhang & Li, 2019). The corporate image was assessed using indicators from studies conducted by Alam and Noor (2020) and Balmer et al. (2020), which are relevant to the B2B setting (Alam & Noor, 2020; Balmer et al., 2020). The value co-creation assessment is based on previous research conducted by Iglesias et al. (2020), Sales-Vivó et al. (2020), and Sun et al. (2020) (Iglesias et al., 2020; Sales-Vivó et al., 2020; Sun et al., 2020). The measurement of the guanxi variable is based on research by Lee et al. (2018), who adapted the guanxi variable specifically for the B2B setting (L. W. Y. Lee et al., 2018).

Data

The nature of the data used is quantitative data. The unit of analysis for the data used in this research is the project manager of an apartment developer in Indonesia. There are 316 respondents' data that used in this study. This research utilized a cross-sectional design to collect data, which conducted between October and December 2023 (Y. H. Lee et al., 2024; Y. Zhang et al., 2018). Data from respondents was collected via an online questionnaire utilizing Google Forms (W. Aslam et al., 2020; Qalati et al., 2021). In data collection process, each respondent was first asked about their consent in data collection. A written informed consent from participation in the study has been obtained through online questionnaires. The questionnaire for this study was written in Indonesian, considering that the native language of the respondent population is Indonesian. This ensures that the questionnaire content is easier for respondents to understand during data collection. The translation of the questionnaire content between Indonesian and English was carried out with the assistance and guidance of experts. The study was approved by ethics committee of Binus University.

Results

Measurement model

This research employs Partial Least Squares (PLS) or SmartPLS version 3 to perform statistical analysis and hypothesis testing on the model and the collected respondent data. The second order variables in this study such as customer loyalty, service quality, and guanxi are higher-order constructs with a reflective-reflective type, as described by Sarstedt et al. (2019).

According to Hair et al. (2017), the use of PLS-SEM for analysis and reporting can be categorized into two main components, which are measurement model and structural model or inner model (Hair et al., 2019). This research utilizes a reflective approach in the formation of the research model, hence the measurement model adopted is a reflective measurement model. The first step in the reflective measurement analysis is the analysis of the loading factor, which is used to assess the validity of each indicator within the latent variable by examining the correlation between the indicator items and the latent variables in the research model. (Hair et al., 2017). The Loading Factor indicator should be set at 0.7. If the

indicator drops below this suggested value, it indicates a lack of validity in the indicators. The next step in the reflective measurement procedure is to evaluate the level of convergent validity which explaining the validity of the relationship of the indicators in describing their latent variables. Convergent validity was calculated through the average variance (AVE) metric and the rule of thumb for adequate convergent validity is 0.5 (Ketchen, 2013). The follows up phase is internal consistency reliability. The adequate rule of thumb in composite reliability analysis, often known as CR is 0.7 which typically considered satisfactory based on specific criteria. Table 2 and Figure 2 below shows the results of the reflective measurement statistical analysis.

The results of the loading factor calculations from this research as shown in the Table 2 and Figure 2 above revealed that all indicators have loading factors above 0.7, thus confirming the validity of all variables in the research model. The validity of the variables in the model is also supported by the AVE value of the research model which is above 0.5. Then the results of the research model analysis also show that all of the research variables have good reliability by looking at all the CR values of the variables which are above 0.7.

The next stage of the reflective measurement is discriminant validity evaluation, which evaluates the degree to which each underlying variable in the research model different from one another through empirical evidence. The rule of thumb for discriminant validity is deemed satisfactory in an

Table 2. Reflective measurement results.

		Items	Loading factor	AVE	CR
Service Quality -	responsiveness	SQ1	0.949	0.862	0.961
		SQ2	0.96		
		SQ3	0.903		
		SQ4	0.901		
	assurances	SQ5	0.932	0.864	0.962
		SQ6	0.925		
		SQ7	0.928		
		SQ8	0.933		
	empathy	SQ9	0.964	0.933	0.982
		SQ10	0.968		
		SQ11	0.971		
		SQ12	0.961		
	tangibility	SQ13	0.967	0.909	0.976
		SQ14	0.966		
		SQ15	0.923		
		SQ16	0.958		
	reliability	SQ17	0.92	0.974	0.904
		SQ18	0.96		
		SQ19	0.96		
		SQ20	0.96		
Value Co Creation		VCC1	0.926	0.848	0.965
		VCC2	0.943		
		VCC3	0.951		
		VCC4	0.940		
		VCC5	0.840		
Customer Loyalty	Attitudinal loyalty	CL1	0.881	0.723	0.886
		CL2	0.772		
		CL3	0.894		
	Behavioral loyalty	CL4	0.933	0.882	0.957
		CL5	0.927		
		CL6	0.957		
Corporate Image		CI1	0.945	0.862	0.962
		CI2	0.916		
		CI3	0.944		
		CI4	0.902		
		CI5	0.936		
Guanxi	Ganqing	GX1	0.887	0.8777	0.955
		GX3	0.926		
		GX4	0.912		
	Renqing	GX5	0.929	0.840	0.963
		GX6	0.921		
		GX7	0.918		
		GX8	0.932		
		GX9	0.856		
	Xinren	GX10	0.894	0.903	0.965
		GX11	0.921		
		GX12	0.905		

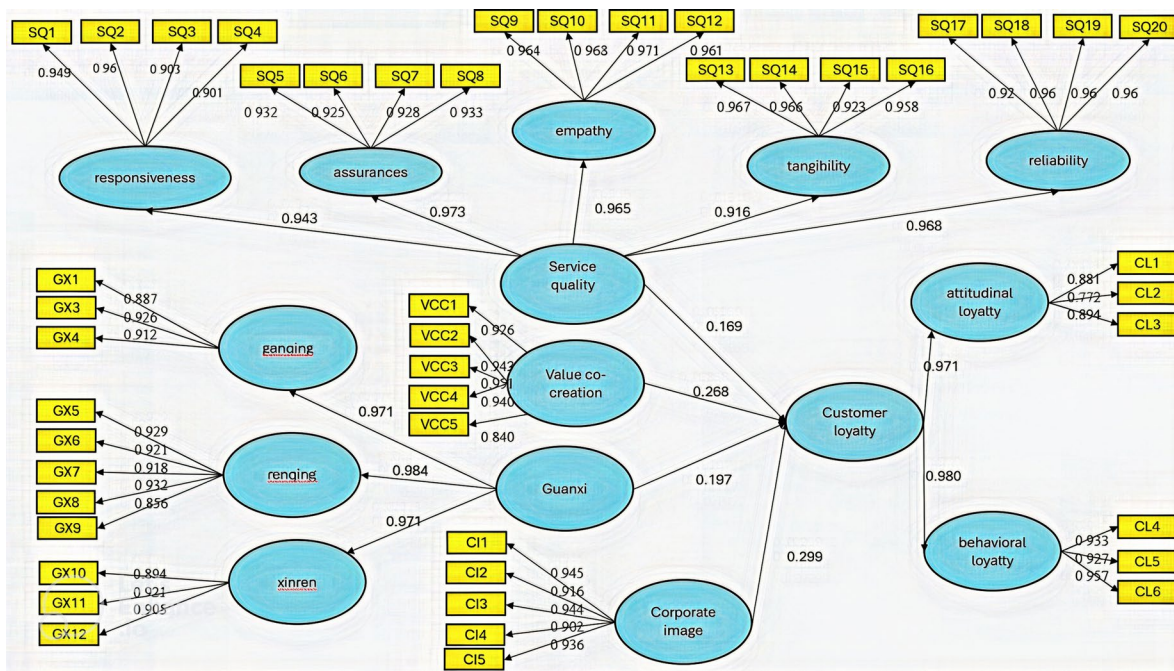


Figure 2. Research model reflective measurement.

Table 3. Discriminant validity.

	asr	atl	btl	cri	emp	gan	Rlb	Ren	rsp	tgb	vcc	xnr
Asr	00.930											
Atl	00.642	0,850										
Btl	00.623	00.904	00.939									
Cri	00.662	00.678	00.679	00.929								
Emp	00.923	00.636	00.626	00.641	00.966							
Gan	00.552	00.595	00.604	00.533	00.574	00.936						
Rlb	00.922	00.645	00.634	00.662	00.944	00.555	00.951					
Ren	00.561	00.593	00.595	00.540	00.589	00.932	00.570	00.916				
Rsp	00.913	00.598	00.587	00.623	00.888	00.520	00.894	00.521	00.928			
Tgb	00.878	00.621	00.615	00.660	00.835	00.544	00.849	00.549	00.807	00.954		
Vcc	00.651	00.693	00.671	00.647	00.645	00.613	00.647	00.623	00.619	00.629	00.921	
Xnr	00.574	00.616	00.606	00.539	00.573	00.922	00.572	00.931	00.537	00.541	00.595	00.950

Asr	assurances
Atl	attitudinal loyalty
Btl	behavioral loyalty
Cri	corporate image
Emp	empathy
Gan	ganqing
Rlb	reliability
Ren	renqing
Rsp	responsiveness
Tgb	tangibility
Vcc	value co-creation
Xnr	xinren

analysis if the square root of the average variance extracted from the variable exceeds the correlation with other latent variables (Fornell & Larcker, 1981). The findings of this analysis can be displayed in Table 3.

Table 3 above shows the results of the discriminant validity analysis, which shows that the correlation for each variable has the greatest value, so it can be said that each variable in the research is empirically different from one another, or that the research model has good discriminant validity's.

Structural model analysis

The structural model or inner model evaluates the structural paths between latent constructs in a research model, as well as the indicators of these latent variables, thus enabling the understanding of relationships between latent variables within the research model.

The next step is to evaluate the R square value of the latent construct. R square represents the explanatory power of the model (Ketchen, 2013). Expected R square values range from 0 to 1, with higher R square values indicating higher predictive power of the latent construct in the research model. As a guideline, R square values of 0.75, 0.50, and 0.25 can be considered substantial, moderate, and weak (Hair et al., 2017). The R square calculation results are in Table 4.

The variable customer loyalty has an R-squared value of 0.632 in Table 4, indicating that 64.2% of the variability in the customer loyalty can be explained by the influencing variables (service quality, corporate image, value co-creation and guanxi).

The next step in the structural test is calculating the significance test of the research model. This step is carried out in Smart PLS starting using bootstrapping with 5,000 resamples. The inner model calculations results shows in Table 5 and Figure 3.

This significance test stage tests the hypothesis relationship based on the calculation and analysis of the t value and P value as shown in Table 4 and Figure 3. The t value that is used as the threshold for a hypothesis to be called statistically significant is 1.96. Therefore, to show a substantial and significant

Table 4. The R square results.

Dependent Variables	R ²
Customer loyalty	0.632

Table 5. Inner model testing.

Hypothesized	Path coefficient (β)	T-values	P-Values
H1. Guanxi \rightarrow customer loyalty	0.197	3.816	0.00
H2. Value co-creation \rightarrow customer loyalty	0.268	5.311	0.00
H3. Service quality \rightarrow customer loyalty	0.169	3.291	0.001
H4. Corporate image \rightarrow customer loyalty	0.299	4.998	0.00

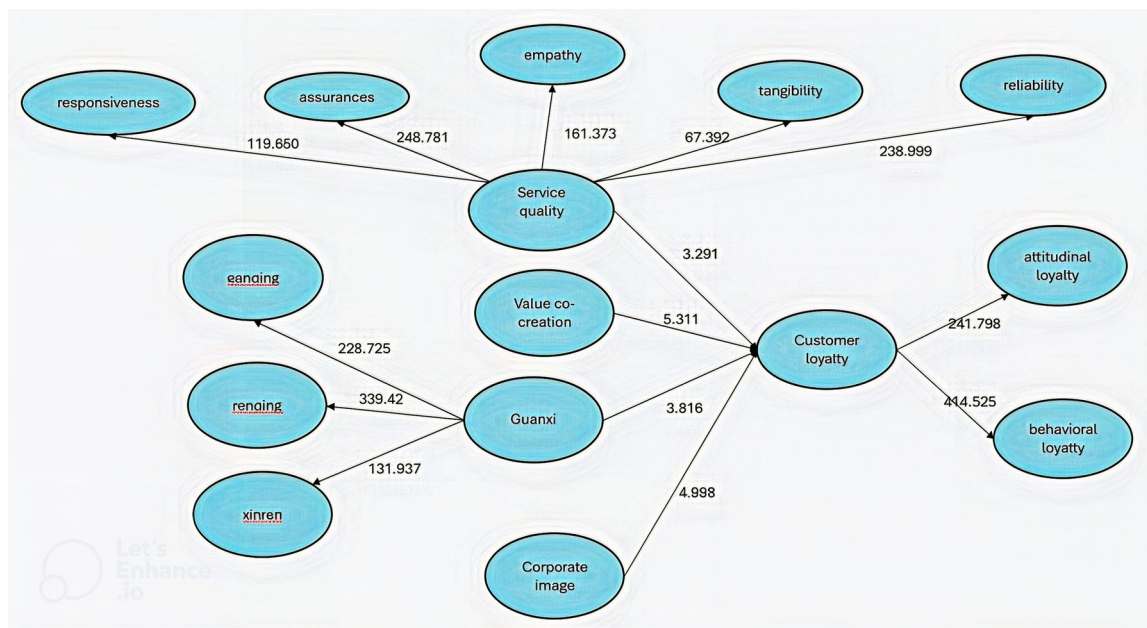


Figure 3. Structural testing.

correlation, the hypothesized t value must exceed 1.96. Apart from the t value, the p value of the hypothesis is below 0.05 as the threshold for the hypothesis to be said to be statistically significant.

Figure 3 and Table 5 present the result of the structural model statistic calculation which revealed that the impact of guanxi (t -value = 3.816, p -value = 0.0), service quality (t -value = 3.291, p -value = 0.001), and corporate image (t -value = 4.998, p -value = 0.0), as well as value co-creation (t -value = 5.311; p value = 0.00), on customer loyalty, all exhibit an outcome that the t -value above 1.96 as the recommended value, and the p -value less than 0.005 as the recommended value. Thus, the structural test revealed that all the hypotheses 1 until 4 are accepted.

Discussion

Research regarding customer loyalty in the apartment construction industry is still relatively small. This study is one of the few studies that examines the influence of service quality, corporate image, guanxi and value co-creation on the formation of customer loyalty from developers to apartment contractors in the apartment construction industry. This research used a quantitative approach, with 316 respondents consisting of project managers from various apartment developers in Indonesia.

This study result shows a positive and significant influence of guanxi on customer loyalty. These results confirms with previous research such as research from Atmojo et al. (2019) and Hansopaheluwakan et al. (2023) which proves the influence of Guanxi in forming customer loyalty in e-commerce. The current conducted research shows that guanxi has a significant positive impact on customer loyalty not only in the e-commerce industry but also in the apartment construction industry. The current study also shows results that apartment developers' loyalty to contractors can be formed through social relations based on friendship and mutual assistance. This guanxi relationship between developers and contractors can be formed by establishing mutual bonds of friendship (ganqing), then maintaining social norms in the relationships formed (renqing) and maintaining trust (xinren) (Yen et al., 2011).

This study also shows that value co-creation significantly influences on the customer loyalty of apartment developer. The results confirms with the results of previous research related with the influence of value co-creation on customer loyalty in the B2B industry (Opata et al., 2021; Sales-Vivó et al., 2020; Xiao et al., 2020). The results of this hypothesis test provide empirical evidence that value co-creation has a significant and positive impact on the formation of developer loyalty in apartment contractors in the apartment construction industry. Based on the beta value in the Table 5, the beta value of value co-creation is one of the highest, so value co-creation is an important antecedent in forming developer loyalty. The results of this hypothesis test indicate that apartment developers will be loyal to contractors who carry out value co-creation, where contractors invite developers to actively participate in working together and resolving problems that occur during project work.

This study also reveals that there is a positive and significant relationship between service quality and customer loyalty. This findings is consistent with earlier study that proved the influence of service quality on customer loyalty (Anser et al., 2023; Huang, Wu, et al., 2019; S. W. Lee et al., 2019; Venkatakrishnan et al., 2023). The results of this hypothesis test indicate that apartment developers see and analyze the performance of apartment contractor workmanship services and tend to reuse apartment contractors with good service quality.

The corporate image also has a positive and significant influence in forming customer loyalty from developers to apartment contractors. These study findings align with earlier study that proved empirical evidence of the impact of corporate image on customer loyalty in both the banking and airline industries. (E. Aslam et al., 2023; Phan Thanh & Hoang Anh, 2023). These findings are also confirms with several previous studies that demonstrate the significant impact of corporate image on customer loyalty in the B2B industry (Alam & Noor, 2020; Arrivabene et al., 2019; Igbudu et al., 2018). The beta value in Table 5 shows that corporate image has the largest beta value in the research model, which indicates that the influence of corporate image in forming loyalty from developers to contractors is the greatest influence compared to value co-creation, guanxi and service quality. Apartment developers are positive about using contractors for their next project if the contractor company has a good corporate image.

Previous academic studies in various industries have examined the influence of service quality, guanxi, value co-creation, and corporate image on customer loyalty (E. Aslam et al., 2023; Gligor & Maloni, 2022;

Opata et al., 2021; Sales-Vivó et al., 2020). However, limited research has addressed this in the construction industry, even fewer discuss it in the apartment construction industry. The results of the hypothesis test from this research findings proves the positive and significant influence of service quality, corporate image, value co-creation and guanxi on the formation of customer loyalty from developers to apartment contractors in the apartment construction industry. This finding in this research addresses the limited academic studies on customer loyalty among developers in the construction industry.

The results of the statistical tests in Table 5, in addition to showing the significant influence of the four antecedent variables—service quality, corporate image, guanxi, and value co-creation—on customer loyalty, also reveal that among these variables, two have the most substantial impact on customer loyalty, as indicated by the Beta values in Table 5. The variable with the greatest impact on developing customer loyalty is corporate image, as shown by the Beta value in Table 5, followed by the impact of value co-creation. These findings suggest that to enhance and build customer loyalty among apartment developers, contractors should prioritize their strategies on corporate image and value co-creation. After focusing on these two variables, they should then consider developing guanxi and service quality to develop an effective and efficient strategy for apartment contractors.

Conclusions

The primary objective of this study is to investigate the influence of service quality, guanxi, co-creation, and corporate image on the development of customer loyalty among developers in the apartment construction industry. To address the primary research objective, the study formulates four hypotheses. The findings from the hypothesis testing indicate that service quality, corporate image, value co-creation, and guanxi positively and significantly influence customer loyalty from developers towards apartment contractors within the apartment construction industry. These results indicate that customer loyalty from apartment developers to apartment contractors is influenced by corporate image factors of the contractor, then the quality of service from the contractor, value co-creation built by the contractor and guanxi relationships built between contractors.

Limitations and future research recommendations

Despite yielding several results, this study also has several limitations. The research was conducted in the apartment construction industry in Indonesia; thus, the respondents were apartment developers in Indonesia. Subsequent research could apply this research model to the apartment construction industry in other countries. The second limitation of this study is the cross-sectional data collection approach utilized. Future research could employ a longitudinal approach to data collection using this research model. The third limitation of this study lies in its focus on analyzing the impact of service quality, corporate image, guanxi, and value co-creation as antecedents of customer loyalty. There are still many other variables that could be analyzed as predictors of customer loyalty among developers. For instance, one variable that has been extensively studied as a predictor of loyalty is customer satisfaction. Future research could explore the impact of customer satisfaction as a predictor of customer loyalty. The fourth limitation of this study lies in the moderation aspect, as the analysis focuses on the influence of each variable on the formation of loyalty towards developers. Future research could utilize the research model framework and enhance it by analysing the moderating effects of other variables, such as age and work experience, on the influence of the variables within this research model.

Theoretical implications

This research has several implications for academic literature. The first implication of this study pertains to research on customer loyalty as applied in the apartment construction industry. There is a plethora of academic research in the B2B industry focusing on customer loyalty; however, research specifically examining the formation of customer loyalty from developers in the apartment construction industry remains relatively scarce. The second implication of this research also concerns customer loyalty, where it investigates the influence of service quality, corporate image, value co-creation, and guanxi as antecedents of

customer loyalty. Previous studies have examined the effects of service quality, corporate image, value co-creation, and guanxi on customer loyalty separately (E. Aslam et al., 2023; Gligor & Maloni, 2022; Opata et al., 2021; Sales-Vivó et al., 2020); however, there are few studies that have investigated the impact of these variables on customer loyalty within a single research model, especially in the apartment construction industry. Furthermore, this research also has a third implication for the development of the service-dominant logic theory, where it examines and provides empirical evidence that value co-creation indeed has a significant and positive influence on customer loyalty in the apartment construction industry.

Managerial implications

In addition to theoretical implications, this research also carries managerial implications, particularly for apartment construction contractor management. Developer loyalty is a crucial asset for contractors because developers with high loyalty are more likely to reuse contractor services and recommend them to their colleagues, thus making developer loyalty essential for the contractor's sustainability.

The managerial implications of this study are useful for apartment contractor companies to enhance their success in building and maintaining developer loyalty. Management should focus on several key strategies based on the findings of this research to build developer loyalty. First, to enhance customer loyalty among apartment developers, contractors need to incorporate four key factors into their strategies: corporate image, value co-creation, service quality, and guanxi. These factors should be prioritized differently in their implementation. Second, among these four factors, apartment contractors should prioritize building and maintaining a strong corporate brand, as a positive brand image is the primary consideration for developer loyalty. Third, almost equally important is the factor of value co-creation. Apartment contractors must establish strong communication and relationships with developers by actively involving them in every stage of the apartment project. Fourth related with the service quality, contractor companies need to develop ongoing training and development programs for staff and project managers to ensure high-quality services for apartment developers. Fifth, building long-term relationships with developers through open communication and mutual assistance is crucial for maintaining loyalty.

The corresponding author will agree to share, upon reasonable request, the research protocol and all data collected and statistically analyzed and related to the research, except for the identity of the participants, which will be kept confidential.

Authors contributions

Augustinus Setijanto, Idris Gautama So, Firdaus Alamsjah, Viany Utami Tjhin developed the theoretical formalism, performed the analytic calculations. Idris Gautama So, Firdaus Alamsjah, Viany Utami Tjhin verified the analytical methods. Augustinus Setijanto, Idris Gautama So, Firdaus Alamsjah, Viany Utami Tjhin investigate and supervised the findings of this research. All authors discussed the results and contributed to the final manuscript.

The data that support the findings of this study are openly available in figshare at <http://doi.org/10.6084/m9.figshare.25376383>.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix A. Measurement scales

		Item
Service Quality -	responsiveness	I am satisfied with the ease of contacting this contractor when needed. (SQ-1) This contractor company is quick in providing services to its customers. (SQ-2) The Project Manager and staff of this contractor company are always ready to assist their customers. (SQ-3)
	assurances	This contractor company is always timely in responding to urgent customer requests. (SQ-4) I have confidence when this contractor company handles project implementation. (SQ-5) I feel safe when this contractor company handles project implementation. (SQ-6) I am satisfied with the quality of work from the project manager and staff of this contractor company. (SQ-7)
	empathy	I am satisfied with the knowledge of the project manager and staff of this contractor company. (SQ-8) This contractor company specifically pays attention to my needs. (SQ-9) This contractor company provides special services to each customer. (SQ-10) This contractor company understands the needs of its customers. (SQ-11)
	tangibility	This contractor company prioritizes my interests. (SQ-12) The site facilities of this contractor company's projects are very good. (SQ-13) The equipment supporting the project implementation needs of this contractor company is in very good condition. (SQ-14) The staff of this contractor company have a neat appearance. (SQ-15) The support of site facilities, equipment, and services from this contractor company complements each other well in project implementation. (SQ-16)
	reliability	This contractor company is committed to completing the project within the agreed timeframe. (SQ-17) The work of this contractor can be trusted by its customers. (SQ-18) This contractor company can assist me at the right time. (SQ-19) This contractor company helps me when I need assistance. (SQ-20)
	Value Co Creation	I actively participate in developing solutions with this contractor during the project. (VCC-1) This contractor encourages developers to jointly develop solutions. (VCC-2) When unexpected problems arise in the project, this contractor and my company can reach a new agreement. (VCC-3) This contractor is flexible in responding to changes that occur during the project process. (VCC-4) I often express my personal opinions to representatives of this contractor company. (VCC-5)
	Customer Loyalty	I will say positive things about this contractor company. (CL-1) I will continue to use this contractor company even if their prices are higher than their competitors. (CL-2)
		I will consider using this contractor again for future projects. (CL-3)
	Behavioral loyalty	I recommend this contractor company to my colleagues. (CL-4) I am a loyal customer of this contractor. (CL-5)
		In my opinion, this contractor company is the best choice. (CL-6)
	Corporate Image	In my opinion, this contractor company has a good image in the eyes of its customers. (CI-1) In my opinion, this contractor company has a better image than its competitors. (CI-2) In my opinion, this contractor company is one of the best in the construction industry. (CI-3)
		I am confident that this contractor company looks after the interests of its customers well. (CI-4) I am confident that this contractor company keeps its promises well. (CI-5)
		I and this contractor company have a good relationship as if we are friends. (GX-1)
	Guanxi	I will consider the feelings and interests of this contractor when making any important decisions. (GX-3) I will try to help this contractor when they need assistance because they are like a friend to me. (GX-4)
		I feel obligated to help this contractor when they need assistance. (GX-6)
	Renqing	In my opinion, mutual help between me and this contractor is the key to our relationship. (GX-7) In my opinion, asking for help is part of doing business with this contractor. (GX-8) I will provide assistance to this contractor because this contractor has helped me. (GX-9) We are willing to assist this contractor because we owe our company's growth to them. (GX-10) This contractor does not only consider their own interests but also considers my interests. (GX-11)
		My colleagues believe that this contractor can be trusted. (GX-12)
		I am confident that this contractor company can be relied upon. (GX-13)