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BEYOND VISUALIZATION: AUGMENTED REALITY AS A CATALYST FOR CONSUMER PURCHASE DECISION-MAKING

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Abstract

This study examines how the stakeholder purchase decision-making process influences purchase intention within Pakistan's real estate construction sector. Specifically, it investigates the mediating role of stakeholder involvement in explaining the relationship between the stakeholder purchase decision-making process and purchase intention. In addition, the research extends the proposed framework by assessing the moderating effect of augmented reality implementation success on the relationship between the stakeholder purchase decision-making process and stakeholder involvement.

A quantitative research design was adopted, and data were collected from 222 respondents representing various organizations in Pakistan's construction industry using a convenience sampling approach. The proposed model was evaluated using SPSS 26.0 for preliminary statistical analysis and SmartPLS 4.0 for structural equation modelling.

The empirical findings reveal that the stakeholder purchase decision-making process has a significant positive influence on purchase intention, both directly and indirectly through stakeholder involvement. Furthermore, successful implementation of augmented reality strengthens the positive relationship between the stakeholder purchase decision-making process and stakeholder involvement, highlighting the strategic value of emerging digital technologies in construction-related purchasing decisions.

Keywords: Stakeholder Purchase Decision-Making Process; Stakeholder Involvement; Augmented Reality Implementation Success; Purchase Intention; Construction Industry; Pakistan.

1. Introduction

Consumer purchase behavior has become increasingly complex due to rapid advancements in communication technologies and the widespread influence of digital media. Modern consumers are continuously exposed to information from multiple channels, shaping their preferences, perceptions, and purchase decisions through a combination of emotional, cognitive, and social influences (Hewei & Youngsook, 2022). Consequently, organizations devote considerable effort to understanding the factors that influence consumer decision-making, as such knowledge enables them to develop effective marketing strategies and strengthen long-term relationships with customers.

Within project-based industries, particularly real estate, understanding purchase behavior has become even more important because investment decisions involve substantial financial commitment and perceived risk (Thapa, 2012). Pakistan's real estate and construction industry represents one of the country's most significant economic sectors, contributing to employment generation, infrastructure development, and overall economic growth. Despite its importance, the industry faces intense competition as developers strive to attract investors and property buyers in an increasingly crowded marketplace. Traditional promotional activities are no longer sufficient to influence prospective buyers, who now demand greater transparency, richer information, and more engaging experiences before making investment decisions. Therefore, identifying the determinants of purchase intention has become a strategic priority for developers seeking to establish sustainable competitive advantages.

The emergence of digital technologies has transformed the manner in which construction firms communicate with potential investors. Among these technologies, Augmented Reality (AR) has attracted considerable attention because it enables users to visualize projects before construction is completed, thereby reducing uncertainty associated with property investment. Unlike conventional promotional methods, AR overlays virtual information onto the physical environment, allowing potential buyers to experience architectural layouts, interior designs, and project features in an interactive manner. Such immersive experiences facilitate better understanding of property attributes and contribute to more informed purchasing decisions (Loh et al., 2021).

Beyond enhancing customer experience, the successful implementation of AR also influences project stakeholders involved in procurement and investment decisions. Stakeholders such as project managers, clients, consultants, contractors, and suppliers increasingly rely on digital visualization technologies to improve communication, coordinate project activities, and evaluate available alternatives. The effective integration of AR into project environments supports collaborative decision-making by enabling stakeholders to visualize project outcomes, anticipate challenges, and minimize misunderstandings during project execution. Consequently, successful AR implementation has the potential to strengthen stakeholder engagement while improving both project efficiency and investment outcomes (Loh et al., 2021).

Investment decisions within the real estate sector are inherently complex because prospective buyers evaluate numerous tangible and intangible factors before committing financial resources. Variables such as project location, pricing strategy, developer reputation, accessibility, expected returns, legal compliance, and available amenities collectively shape purchase decisions. The availability of multiple competing housing projects further complicates the evaluation process, making it increasingly difficult for consumers to differentiate among alternatives. Consequently, developers must design marketing strategies that effectively capture consumer attention while reducing uncertainty associated with high-value investments (Loh et al., 2021).

In Pakistan's dynamic property market, changing economic conditions further influence investment behavior. Inflation, fluctuations in purchasing power, and varying regional market conditions continuously alter consumer expectations and buying capabilities. Under such circumstances, maintaining investor confidence requires organizations to understand the underlying psychological and behavioral mechanisms that influence purchase intention. Previous research suggests that marketers should continuously adapt their strategies to evolving market conditions to encourage stronger customer commitment and long-term relationships (Brown et al., 2003). Therefore, investigating consumer behavior within Pakistan's construction industry provides valuable insights into the factors that drive investment intentions in an uncertain economic environment.

The purchase decision-making process extends beyond rational evaluation of available alternatives. Although individuals generally perceive themselves as making carefully reasoned decisions, psychological research demonstrates that unconscious cognitive processes substantially influence human judgment (Dijksterhuis, 2004). Consumers frequently rely on intuition, previous experiences, emotions, and subconscious evaluations when making important life decisions, including property investments. Such unconscious processing often enables individuals to integrate complex information more effectively than deliberate analytical reasoning, particularly when confronted with multiple alternatives and considerable uncertainty (Ahmed & Ting, 2023).

This perspective challenges the traditional assumption that rational analysis alone determines purchasing behavior. Instead, decision-making should be viewed as a multidimensional process involving both conscious deliberation and subconscious cognitive mechanisms. According to Dijksterhuis (2004), unconscious thought can generate superior decisions in highly complex situations because it allows individuals to process extensive information without overloading conscious cognitive capacity. Similarly, Latour (2005) argues that major decisions frequently deviate from purely rational evaluation because individuals possess limited resources for systematically analyzing every available alternative.

Within the real estate context, consumers typically have access to numerous decision-support mechanisms, including property prices, developer reputation, geographical location, infrastructure availability, project specifications, advertisements, and financial comparisons (Ahmed & Ting, 2023). While these resources facilitate informed decision-making, they cannot entirely eliminate uncertainty associated with long-term investments. Construction projects often exhibit characteristics of "wicked problems," where incomplete information, changing circumstances, and multiple stakeholder interests complicate the decision-making process (Van Bueren et al., 2003). Consequently, stakeholder interactions, discussions, and collaborative evaluations become increasingly important throughout the investment journey.

Stakeholder involvement plays a central role in project-related purchasing decisions because construction investments rarely depend upon a single individual's judgment. Instead, investment decisions emerge through continuous interaction among multiple stakeholders whose priorities, expertise, and expectations differ. Informal discussions, professional consultations, and collaborative evaluations shape collective understanding of project value and associated risks. As argued by Stacey et al. (2000), organizational and project environments continuously evolve through ongoing interactions among stakeholders, creating new interpretations and influencing future decisions. Accordingly, stakeholder involvement represents an important mechanism through which purchase decision-making processes ultimately translate into investment intentions.

Although previous studies have examined consumer behavior, purchase intention, and technology adoption independently, limited empirical evidence exists regarding the combined influence of stakeholder purchase decision-making processes, stakeholder involvement, and AR implementation within Pakistan's construction industry. Moreover, few studies have investigated how successful implementation of AR strengthens stakeholder engagement during project evaluation and subsequently influences purchase intention. Addressing this research gap is particularly important given the increasing adoption of immersive technologies across the global construction sector.

Accordingly, the present study develops and empirically tests a framework that examines the direct relationship between stakeholder purchase decision-making processes and purchase intention. It further investigates the mediating role of stakeholder involvement while evaluating the moderating effect of Augmented Reality implementation success on the relationship between stakeholder purchase decision-making processes and stakeholder involvement. By focusing on Pakistan's construction and real estate industry, this study contributes to the growing literature on digital transformation, stakeholder management, and consumer decision-making while offering practical implications for developers, marketers, and policymakers seeking to leverage immersive technologies to improve investment outcomes.

2. Literature Review

Strategic Decision Dynamics in Construction Projects

Decision-making is a fundamental component of construction project management, requiring project managers and other stakeholders to evaluate multiple, often competing, project objectives. Successful project outcomes depend on balancing critical factors such as cost, schedule, quality, safety, and resource utilization while responding to the dynamic nature of construction environments. Because construction projects involve significant financial investments, technical complexity, and multiple stakeholder interests, effective decision-making becomes essential throughout the project lifecycle.

The increasing adoption of digital technologies has transformed how decisions are made within construction projects. Among these technologies, Augmented Reality (AR) has emerged as an innovative tool that enhances decision-making by providing interactive visualizations, real-time project information, and immersive simulations. Within Pakistan's construction industry, AR enables project managers and stakeholders to visualize project components before implementation, assess potential risks, and evaluate alternative solutions with greater confidence. Access to accurate, real-time information supports more informed planning, improves coordination among project participants, and facilitates better execution of construction activities.

Decision-making in construction projects encompasses both planned and unplanned situations. Planned decisions are made during project initiation and execution based on predefined objectives, available information, and strategic planning. In these situations, AR assists managers by offering detailed three-dimensional visualizations, design simulations, and real-time project data that improve the accuracy of planning and resource allocation. These capabilities enable project teams to identify potential issues at an early stage, thereby reducing uncertainty and improving overall project performance.

Unplanned decisions, however, arise when unexpected events disrupt normal project activities. Such situations may include design modifications, structural defects, material shortages, safety concerns, or unforeseen site conditions that require immediate managerial intervention. In these circumstances, AR provides project teams with instant visual feedback and contextual information, enabling them to assess problems quickly and identify appropriate corrective actions. For example, when an unexpected structural issue occurs, AR can overlay digital information onto the physical environment, allowing project managers to evaluate the affected area, analyze possible solutions, and implement corrective measures without significant delays (Irizarry et al., 2012). This capability not only minimizes project downtime but also helps maintain safety, quality, and operational efficiency.

Beyond supporting individual decision-making, AR also strengthens communication and collaboration among project stakeholders. By providing a shared visual representation of project information, the technology facilitates collective understanding, reduces misunderstandings, and enables stakeholders to evaluate alternatives more effectively. Improved collaboration leads to faster consensus, greater transparency, and higher-quality decisions, particularly in complex projects involving multiple disciplines and organizations.

The integration of AR into construction project management therefore enhances both strategic planning and operational decision-making. Its ability to support informed decisions under routine conditions while simultaneously improving responsiveness during unforeseen events makes it a valuable technological resource for modern construction management. As Pakistan's construction industry continues to embrace digital transformation, the effective implementation of AR has the potential to improve project performance, strengthen stakeholder collaboration, increase operational efficiency, and ultimately contribute to higher project success rates.

Theoretical Framework

Decision-making within Pakistan's construction industry is shaped by a complex interaction of individual judgment, stakeholder collaboration, and technological innovation. Investment and project-related decisions are rarely based solely on objective evaluation; instead, they emerge from a combination of personal beliefs, social influence, organizational dynamics, and contextual factors.

The Theory of Planned Behavior (TPB**)** provides a robust theoretical foundation for explaining these behavioral intentions by proposing that individuals' actions are influenced by their attitudes toward a behavior, perceived social expectations, and their confidence in their ability to perform that behavior (Ajzen, 1991). Within construction projects, these behavioral drivers operate in an environment where multiple stakeholders contribute to decision formulation. Project managers, clients, consultants, investors, contractors, and suppliers collectively shape project outcomes through continuous communication, negotiation, and information exchange. Consequently, stakeholder involvement extends beyond simple participation and becomes a critical mechanism through which individual evaluations are transformed into collective project decisions. Greater

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stakeholder engagement encourages information sharing, strengthens trust, reduces uncertainty, and promotes consensus, ultimately enhancing the quality of purchase and investment decisions.

As the construction industry embraces digital transformation, technological capabilities further redefine how decisions are developed and implemented. Among emerging technologies, **Augmented Reality (AR)** has become an important enabler of collaborative decision-making by providing immersive visualizations, real-time project information, and interactive simulations. These capabilities allow stakeholders to better understand project alternatives, identify potential risks, and evaluate design options before implementation. However, the benefits of AR depend not merely on its adoption but on the success of its implementation within organizational processes.

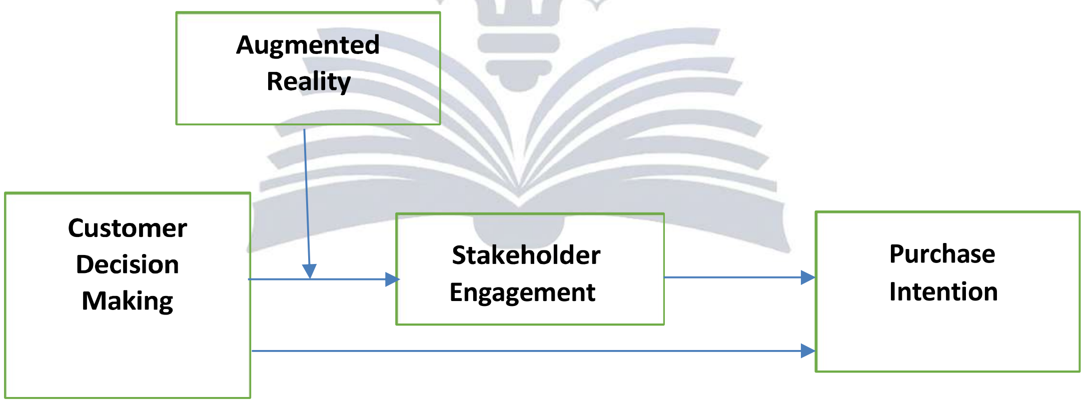
Accordingly, this study conceptualizes Augmented Reality Implementation **Success** as a moderating mechanism that strengthens the relationship between stakeholder purchase decision-making and stakeholder involvement. When AR is effectively implemented, stakeholders have greater access to timely and accurate information, facilitating meaningful collaboration and improving confidence in project-related decisions. Conversely, ineffective implementation may limit the technology's ability to support communication and coordinated decision-making.

Integrating these perspectives, the proposed framework suggests that stakeholder purchase decision-making influences purchase intention both directly and indirectly through stakeholder involvement. Simultaneously, the successful implementation of Augmented Reality enhances the effectiveness of stakeholder interactions, reinforcing collaborative decision-making and supporting more informed investment choices. This integrated perspective offers a comprehensive understanding of how behavioral factors, stakeholder engagement, and digital technologies collectively influence purchasing decisions within Pakistan's evolving construction industry.

Conceptual Framework

Figure 1

Conceptual Framework



The conceptual framework of this study explains the proposed relationships among the stakeholder purchase decision-making process, stakeholder involvement, augmented reality implementation success, and purchase intention. Stakeholder purchase decision-making is treated as the independent variable and consists of both planned and unplanned purchase decisions. The framework proposes that these decision-making processes directly shape purchase intention by influencing how stakeholders evaluate construction-related purchasing options, assess project value, and develop confidence in investment decisions. At the same time, stakeholder involvement is positioned as a mediating variable, suggesting that purchase decision-making affects purchase intention not only directly but also indirectly through the degree to which stakeholders participate, exchange information, and engage in collaborative evaluation.

Augmented reality implementation success is included as the moderating variable because the effectiveness of AR can strengthen the relationship between stakeholder purchase decision-making and

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stakeholder involvement. When AR is successfully implemented, stakeholders are better able to visualize project features, understand alternatives, reduce uncertainty, and participate more meaningfully in the decision-making process. The study therefore argues that stakeholder purchase decision-making influences purchase intention, stakeholder involvement mediates this relationship, and AR implementation success enhances stakeholder involvement by improving communication and decision quality. Methodologically, the study adopted a positivist research philosophy and a deductive quantitative mono-method approach. Primary data were collected through self-administered questionnaires from project managers, contractors, subcontractors, and suppliers in Pakistan's construction industry, and 222 usable responses were analyzed through SPSS and SmartPLS using PLS-SEM to test the proposed relationships and hypotheses.

Hypotheses Development

Based on the theoretical framework and literature review, the following hypotheses were developed:

H1: Stakeholder decision-making has a positive and significant effect on purchase intention.

H2: Stakeholder decision-making has a positive and significant effect on stakeholder involvement.

H3: Stakeholder involvement has a positive and significant effect on purchase intention.

H4: Stakeholder involvement mediates the relationship between the stakeholder decision-making process and purchase intention.

H5: AR implementation success positively moderates the relationship between the stakeholder decision-making process and stakeholder involvement, such that the relationship becomes stronger when the level of AR implementation success is high.

3. Methodology

Research Philosophy and Design

The study adopted a positivist research philosophy and a deductive quantitative mono-method approach. This philosophical stance assumes that social reality is objective and can be measured through observable phenomena, making it appropriate for examining relationships among variables in a structured manner (Saunders et al., 2003). The deductive approach involved testing hypotheses derived from existing theories through empirical data collection and analysis.

Data Collection

Primary data were collected through self-administered questionnaires from project managers, contractors, subcontractors, and suppliers in Pakistan's construction industry. Using convenience sampling, data were obtained from 222 respondents representing various organizations in the construction sector. The questionnaire was designed based on established measurement scales adapted from prior research to ensure reliability and validity.

Measures

The questionnaire comprised multiple sections measuring the following constructs:

- Stakeholder Purchase Decision-Making Process
- Stakeholder Involvement
- Augmented Reality Implementation Success
- Purchase Intention

All items were measured using a Likert scale format, allowing respondents to indicate their level of agreement with each statement.

Data Analysis

The collected data were analyzed through a two-stage approach. First, SPSS 26.0 was used for preliminary statistical analysis, including descriptive statistics, correlation analysis, and assessment of normality assumptions. Second, SmartPLS 4.0 was employed for structural equation modeling (PLS-SEM) to assess the proposed relationships and test the research hypotheses. PLS-SEM was chosen due to its suitability for complex models with mediating and moderating effects, as well as its robustness with relatively smaller sample sizes (Hair et al., 2019).

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4. Data Analysis

Descriptive statistics

The results of descriptive analysis are presented in Table 1.

Table 1

Descriptive Statistics

Variable	N	Mean	Std. Deviation
Stakeholder Purchase Decision Making	222	3.2495	1.06948
Stakeholder Involvement	222	2.6982	1.20686
AR Implementation Success	222	2.6532	1.26496
Purchase Intention	222	3.1811	1.23134
Valid N (listwise)	222		

As shown in Table 1, the descriptive statistics of all variables indicate that Purchase Decision had the highest mean value (M = 3.24, SD = 1.06), followed by Purchase Intention (M = 3.18, SD = 1.23), Stakeholder Involvement (M = 2.69, SD = 1.20), and AR Implementation Success (M = 2.65, SD = 1.26).

Multicollinearity Assessment

To check for multicollinearity, Variance Inflation Factor (VIF) and tolerance values were examined. If the VIF value is less than 5 and tolerance is greater than 0.2, it can be concluded that there is no problem of multicollinearity (Ho, 2013).

Table 2

Collinearity Statistics

Sr. No.	Variables	VIF	Tolerance
1	Stakeholder Purchase Decision Making	1.575	0.634
2	Stakeholder Involvement	1.575	0.634

As shown in Table 2, VIF values for all variables are less than 5, and tolerance values are above the standard range of 0.2, indicating no multicollinearity issues in the data.

Normality Assessment

Skewness and kurtosis values for all variables were examined to assess normality.

Table 3

Skewness and Kurtosis Statistics

Items	Skewness	Kurtosis
PPD1	-.565	-1.005
PPD2	-.342	-1.074
PPD3	-.079	-1.129
PPD4	-.149	-1.408
PPD5	-.066	-1.541
UPD1	-.129	-1.332
UPD2	-.593	-.653
UPD3	-.994	.014
UPD4	.204	-1.335
UPD5	-.129	-1.332
SI1	.366	-1.069
SI2	.390	-1.265
SI3	-.035	-1.457
IS1	.505	-1.093
IS2	.107	-1.215
IS3	.185	-1.511
PI1	-.163	-1.337

Journal of Business Insight and Innovation
Volume 5 Issue 7, 2026
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https://insightfuljournals.com/

PI2	-.254	-1.158
PI3	-.394	-1.244
PI4	-.435	-1.123
PI5	-.055	-1.289

Note: PPD = Planned Purchase Decision, UPD = Unplanned Purchase Decision, SI = Stakeholder Involvement, IS = Augmented Reality Implementation Success, PI = Purchase Intention.

The skewness and kurtosis values for all variables are within the acceptable range of -2 to +2, as recommended by Hair et al. (2019). This indicates that the data do not show any serious departure from normality.

Correlation Analysis

Table 4

Correlation Matrix

	PD	SI	IS	PI
PD	1			
SI	.596**	1		
IS	.546**	.805**	1	
PI	.670**	.517**	.409**	1

Note: PD = Purchase Decision, SI = Stakeholder Involvement, IS = Augmented Reality Implementation Success, PI = Purchase Intention.
** Correlation is significant at the 0.01 level (2-tailed).

Table 4 presents the correlation matrix for the study variables. The results indicate that Purchase Decision is positively and significantly correlated with Stakeholder Involvement ($r = .596$, $p = 0.000$), AR Implementation Success ($r = .546$, $p = 0.000$), and Purchase Intention ($r = .670$, $p = 0.000$). Stakeholder Involvement shows a strong positive and significant relationship with AR Implementation Success ($r = .805$, $p = 0.000$) and Purchase Intention ($r = .517$, $p = 0.000$). AR Implementation Success is positively and significantly related to Purchase Intention ($r = .409$, $p = 0.000$).

Measurement Model Assessment

Table 5

Construct Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
AR Implementation Success	0.896	0.900	0.828
Stakeholder Purchase Decision Making	0.940	0.948	0.653
Purchase Intention	0.936	0.948	0.796
Stakeholder Involvement	0.859	0.866	0.780

To evaluate the measurement model, Confirmatory Factor Analysis (CFA) was performed. The findings indicate that the values of Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) all meet the recommended thresholds. Both Cronbach's alpha and Composite Reliability exceed the minimum acceptable value of 0.70, indicating good internal consistency and reliability. Similarly, the AVE values are greater than 0.50, suggesting that each construct explains more than half of the variance in its indicators.

Table 6

Factor Loadings

Items	Loading Values
PPD1	0.793
PPD2	0.818

Journal of Business Insight and Innovation
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https://insightfuljournals.com/

Items	Loading Values
PPD3	0.719
PPD4	0.876
PPD5	0.829
UPD1	0.898
UPD2	0.696
UPD3	0.658
UPD4	0.861
UPD5	0.891
SI1	0.894
SI2	0.909
SI3	0.845
IS1	0.923
IS2	0.873
IS3	0.933
PI1	0.890
PI2	0.883
PI3	0.914
PI4	0.855
PI5	0.918

Note: PPD = Planned Purchase Decision, UPD = Unplanned Purchase Decision, SI = Stakeholder Involvement, IS = Augmented Reality Implementation Success, PI = Purchase Intention.

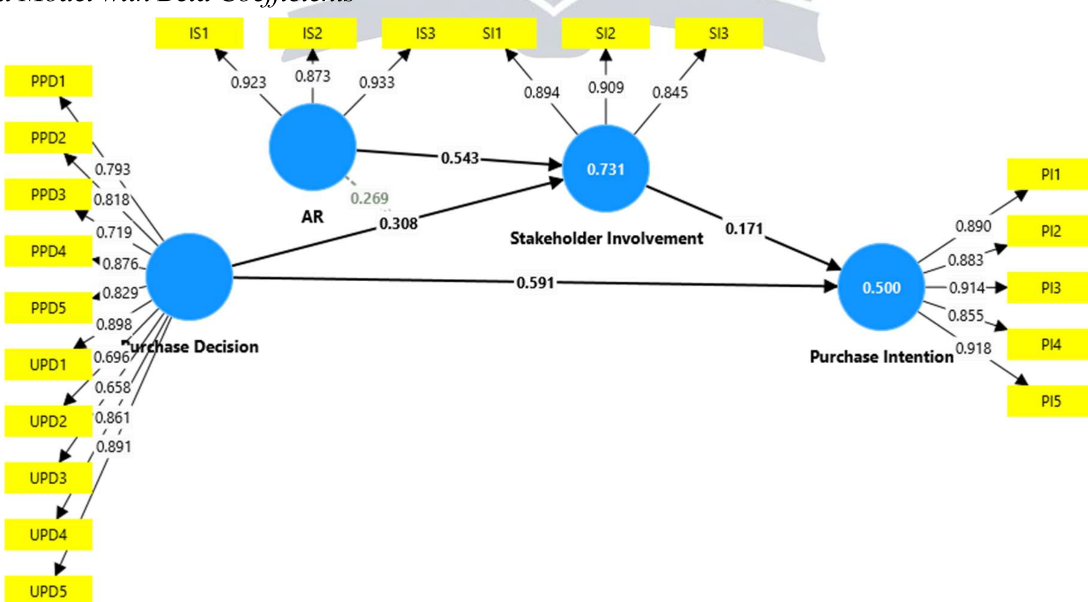
The results show that the factor loadings of almost all measurement items are above the recommended threshold of 0.70, indicating that the indicators adequately represent their respective constructs. According to Hair et al. (2011), indicators with factor loadings as low as 0.60 may be retained if the construct demonstrates satisfactory convergent validity, as reflected by an AVE exceeding 0.50.

Structural Model Assessment

The structural model results indicate the direction and strength of the relationships among the study variables.

Figure 1

Structural Model with Beta Coefficients



Note: PPD = Planned Purchase Decision, UPD = Unplanned Purchase Decision, SI = Stakeholder Involvement, IS = Augmented Reality Implementation Success, PI = Purchase Intention.

Table 7

Path Coefficients (Bootstrapping Results)

Relationship	Coefficient	T Statistics	P Values
IS -> SI	0.543	10.785	0.000
PD -> PI	0.591	10.505	0.000
PD -> SI	0.308	5.994	0.000
SI -> PI	0.171	3.261	0.001

Note: PD = Stakeholder Purchase Decision Making, SI = Stakeholder Involvement, IS = Augmented Reality Implementation Success, PI = Purchase Intention.

The bootstrapping results are presented in Table 7. In SmartPLS, bootstrapping is performed to assess the significance and stability of the estimated path coefficients by repeatedly drawing samples from the original dataset. In this study, 5,000 bootstrap samples were generated to obtain reliable estimates of the model parameters.

According to the recommended criteria, a p-value should be less than 0.05 and the t-value should be greater than 1.96 to indicate statistical significance. The results show that AR Implementation Success has a positive and significant effect on Stakeholder Involvement ($p = 0.000$, $t = 10.785$). Similarly, Purchase Decision has a significant positive effect on Purchase Intention ($p = 0.000$, $t = 10.505$) as well as on Stakeholder Involvement ($p = 0.000$, $t = 5.994$). In addition, Stakeholder Involvement significantly and positively influences Purchase Intention ($p = 0.001$, $t = 3.261$).

Table 8

Specific Indirect Effects (Mediation)

Relationship	Indirect Effect	T Statistics	P Values
PD -> SI -> PI	0.053	2.703	0.007

Note: PD = Stakeholder Purchase Decision Making, SI = Stakeholder Involvement, PI = Purchase Intention.

The specific indirect effects results are shown in Table 8. For the mediation link of Purchase Decision with Purchase Intention through Stakeholder Involvement, the T-value was 2.703 and p-value was 0.007, indicating that the mediation effect is positive and significant.

Table 9

Moderating Effect

Relationship	Path Coefficient	T Statistics	P Values
IS*PD -> SI	0.269	5.997	0.000

Note: PD = Stakeholder Purchase Decision Making, SI = Stakeholder Involvement, IS = Augmented Reality Implementation Success.

As shown in Table 9, the interaction term of Purchase Decision and AR Implementation Success successfully moderates the relationship between Purchase Decision and Stakeholder Involvement, with $p = 0.000$ and $t = 5.997$.

Summary of Hypotheses

Hypothesis	Decision
H1: Stakeholder decision-making has a positive and significant effect on purchase intention.	Accepted
H2: Stakeholder decision-making has a positive and significant effect on stakeholder involvement.	Accepted
H3: Stakeholder involvement has a positive and significant effect on purchase intention.	Accepted
H4: Stakeholder involvement mediates the relationship between the stakeholder decision-making process and purchase intention.	Accepted
H5: AR implementation success positively moderates the relationship between the stakeholder decision-making process and stakeholder involvement.	Accepted

5. Discussion

This study examined the relationships among the Stakeholder Purchase Decision-Making Process, Stakeholder Involvement, AR Implementation Success, and Purchase Intention in Pakistan's real estate construction industry. Data were collected from 222 respondents working in real estate organizations in Rawalpindi and Islamabad using a convenience sampling technique, and the data were analyzed using SPSS 26.0 and SmartPLS 4.0. The findings indicate that the Stakeholder Purchase Decision-Making Process has a positive and significant effect on Purchase Intention, suggesting that stakeholders who make informed and effective decisions are more likely to invest in real estate projects. This finding is consistent with the study of Sohn and Ko (2021b). The results also show that the Stakeholder Purchase Decision-Making Process positively influences Stakeholder Involvement, while Stakeholder Involvement itself has a significant positive effect on Purchase Intention, indicating that active stakeholder participation enhances investors' confidence and willingness to purchase. Furthermore, the mediation analysis confirms that Stakeholder Involvement significantly mediates the relationship between the Stakeholder Purchase Decision-Making Process and Purchase Intention, supporting the argument of Leluschko and Tholen (2023) that stakeholder participation is essential for successful project outcomes. In addition, the findings reveal that AR Implementation Success positively moderates the relationship between the Stakeholder Purchase Decision-Making Process and Stakeholder Involvement, implying that successful implementation of AR strengthens stakeholder collaboration and improves decision-making by providing better visualization and communication throughout the project (Hajirasouli & Banihashemi, 2022). Overall, the results provide empirical support for all five proposed hypotheses and demonstrate that effective stakeholder decision-making, greater stakeholder involvement, and successful AR implementation collectively contribute to higher purchase intention in Pakistan's real estate construction industry.

6. Theoretical Implications

This study makes several meaningful contributions to the literature on stakeholder decision-making and technology adoption in the construction industry. It expands the application of the Theory of Planned Behaviour (TPB) by proposing a more comprehensive framework that explains how stakeholder decision-making influences purchase intention. A key contribution of this research is the inclusion of stakeholder involvement as a mediating variable, demonstrating that stakeholder participation serves as an important pathway through which decision-making translates into purchase intentions. This perspective provides a richer understanding of stakeholder behaviour than models that examine only direct relationships. In addition, the study introduces AR implementation success as a moderating factor, showing that the effective implementation of augmented reality strengthens the relationship between stakeholder decision-making and stakeholder involvement. By integrating stakeholder involvement and AR implementation success into a single conceptual framework, this research broadens the theoretical scope of TPB and contributes to the growing body of knowledge on digital technologies, stakeholder engagement, and purchase behaviour in Pakistan's real estate construction industry.

7. Conclusion

The findings of this study indicate that the stakeholder decision-making process plays a significant role in increasing purchase intention in Pakistan's real estate construction industry. The results show that effective stakeholder decision-making not only directly influences purchase intention but also enhances stakeholder involvement, which further strengthens consumers' intention to purchase property. In addition, AR implementation success was found to positively moderate the relationship between stakeholder decision-making and stakeholder involvement, highlighting the importance of successfully implementing digital technologies to improve stakeholder collaboration and project outcomes. The study employed a convenience sampling technique to collect data from 222 respondents, and the proposed measurement and structural models were validated using SmartPLS 4. The empirical analysis supported all five proposed hypotheses, confirming the robustness of the research model. Overall, this study contributes to a better understanding of stakeholder behaviour in the construction industry and provides useful insights for developers, project managers, marketers, and decision-makers. By encouraging effective stakeholder engagement and adopting innovative technologies such as augmented reality, organizations can improve purchase intentions, strengthen customer confidence, and enhance the overall success of real estate projects.

Contribution of Authors

All the authors participated in the ideation, development, and final approval of the manuscript, making significant contributions to the work reported.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this article.

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Informed Consent

Informed consent was obtained from all participants.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

References

Adebowale, O. J., & Agumba, J. N. (2022). Applications of augmented reality for construction productivity improvement: A systematic review. *Smart and Sustainable Built Environment, 11*(6), 1421–1442. https://doi.org/10.1108/SASBE-04-2021-0065

Ahmed, S., & Ting, D. H. (2023). Anticipated emotion in planned versus unplanned purchase: Scale development and validation. *The Service Industries Journal, 43*(1–2), 104–123. https://doi.org/10.1080/02642069.2021.2013060

Ahmed, S., Ting, D. H., Sharif, T., & Abedin, M. Z. (2023). Implication of the "camera eats first" construct: Unraveling the potentials of digital images in social media on information sharing. *Electronic Commerce Research*. Advance online publication. https://doi.org/10.1007/s10660-023-09708-4

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Amos, C., Holmes, G. R., & Keneson, W. C. (2014). A meta-analysis of consumer impulse buying. *Journal of Retailing and Consumer Services, 21*(2), 86–97. https://doi.org/10.1016/j.jretconser.2013.11.004

Arowoiya, V. A., Oke, A. E., Akanni, P. O., Kwofie, T. E., & Enih, P. I. (2023). Augmented reality for construction revolution: Analysis of critical success factors. *International Journal of Construction Management, 23*(11), 1867–1874. https://doi.org/10.1080/15623599.2022.2038327

Atkin, B., & Skitmore, M. (2008). Stakeholder management in construction. *Construction Management and Economics, 26*(6), 549–552. https://doi.org/10.1080/01446190802071114

Barker, C., Martin, B., & Zournazi, M. (2008). Emotional self-management for activists. *Reflective Practice, 9*(4), 423–435. https://doi.org/10.1080/14623940802431424

Bischoff, R., & Kazi, A. (2004). Perspectives on augmented reality-based human–robot interaction with industrial robots. In *Proceedings of the 2004 IEEE/RSJ International Conference on Intelligent Robots and Systems* (Vol. 4, pp. 3226–3231). IEEE. https://doi.org/10.1109/IROS.2004.1389842

Bosnjak, M., Ajzen, I., & Schmidt, P. (2020). The theory of planned behavior: Selected recent advances and applications. *Europe's Journal of Psychology, 16*(3), 352–356. https://doi.org/10.5964/ejop.v16i3.3107

Brown, S. D., Cromby, J., Harper, D. J., Johnson, K., & Reavey, P. (2011). Researching "experience": Embodiment, methodology, process. *Theory & Psychology, 21*(4), 493–515. https://doi.org/10.1177/0959354310377542

Brown, S., Kozinets, R. V., & Sherry, J. F., Jr. (2003). Teaching old brands new tricks: Retro branding and the revival of brand meaning. *Journal of Marketing, 67*(3), 19–33. https://doi.org/10.1509/jmkg.67.3.19.18657

Bryman, A., & Cramer, D. (2012). *Quantitative data analysis with IBM SPSS 17, 18 & 19: A guide for social scientists* (1st ed.). Routledge.

Bryson, J. M. (2004). What to do when stakeholders matter: Stakeholder identification and analysis techniques. *Public Management Review, 6*(1), 21–53. https://doi.org/10.1080/14719030410001675722

Burnes, B. (2005). Complexity theories and organizational change. *International Journal of Management Reviews, 7*(2), 73–90. https://doi.org/10.1111/j.1468-2370.2005.00107.x

Calinon, S., Guenter, F., & Billard, A. (2007). On learning, representing, and generalizing a task in a humanoid robot. *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics), 37*(2), 286–298. https://doi.org/10.1109/TSMCB.2006.886952

Checheleva, K., & Kucheryavenko, T. (2017). Consumers' preferences towards eco-labeled products and purchase intention: The moderating effect of national culture.

Chen, K., & Xue, F. (2022). The renaissance of augmented reality in construction: History, present status, and future directions. *Smart and Sustainable Built Environment, 11*(3), 575–592. https://doi.org/10.1108/SASBE-05-2021-0083

Chen, Y., & Barnes, S. (2007). Initial trust and online buyer behaviour. *Industrial Management & Data Systems, 107*(1), 21–36. https://doi.org/10.1108/02635570710719034

Chintamani, K., Cao, A., Ellis, R. D., & Pandya, A. K. (2010). Improved telemanipulator navigation during display-control misalignments using augmented reality cues. *IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans, 40*(1), 29–39. https://doi.org/10.1109/TSMCA.2009.2034925

Chong, J. W. S., Ong, S. K., Nee, A. Y. C., & Youcef-Toumi, K. (2009). Robot programming using augmented reality: An interactive method for planning collision-free paths. *Robotics and Computer-Integrated Manufacturing, 25*(3), 689–701. https://doi.org/10.1016/j.rcim.2008.05.002

Conner, M. (2020). Theory of planned behavior. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of Sport Psychology* (4th ed., pp. 1–18). Wiley. https://doi.org/10.1002/9781119568124.ch1

Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology, 28*(15), 1429–1464. https://doi.org/10.1111/j.1559-1816.1998.tb01685.x

Dell'Anna, F., & Dell'Ovo, M. (2022). A stakeholder-based approach managing conflictual values in urban design processes: The case of an open prison in Barcelona. *Land Use Policy, 114*, Article 105934. https://doi.org/10.1016/j.landusepol.2021.105934

Dhar, R., & Kim, E. Y. (2007). Seeing the forest or the trees: Implications of construal level theory for consumer choice. *Journal of Consumer Psychology, 17*(2), 96–100. https://doi.org/10.1016/S1057-7408(07)70015-2

Dijksterhuis, A. (2004). Think different: The merits of unconscious thought in preference development and decision making. *Journal of Personality and Social Psychology, 87*(5), 586–598. https://doi.org/10.1037/0022-3514.87.5.586

Ding, Z., Nie, W., & Wu, H. (2022). Investigating the connection between stakeholders' purchase intention and perceived value of construction and demolition waste recycled products. *Environment, Development and Sustainability*. Advance online publication. https://doi.org/10.1007/s10668-022-02814-3

Ehrenmann, M., Ambela, D., Steinaus, P., & Dillmann, R. (2000). A comparison of four fast vision-based object recognition methods for programming by demonstration applications. In *Proceedings of the 2000 IEEE International Conference on Robotics and Automation* (Vol. 2, pp. 1862–1867). IEEE. https://doi.org/10.1109/ROBOT.2000.844832

Fang, H. C., Ong, S. K., & Nee, A. Y. C. (2014). A novel augmented reality-based interface for robot path planning. *International Journal on Interactive Design and Manufacturing, 8*(1), 33–42. https://doi.org/10.1007/s12008-013-0181-y

Felix, R. (2014). Multi-brand loyalty: When one brand is not enough. *Qualitative Market Research: An International Journal, 17*(4), 464–480. https://doi.org/10.1108/QMR-06-2012-0024

Fischer, C., Parry, I. W. H., & Pizer, W. A. (2003). Instrument choice for environmental protection when technological innovation is endogenous. *Journal of Environmental Economics and Management, 45*(3), 523–545. https://doi.org/10.1016/S0095-0696(02)00089-7

Giovanis, A. N., Tomaras, P., & Zondiros, D. (2013). Suppliers' logistics service quality performance and its effect on retailers' behavioral intentions. *Procedia - Social and Behavioral Sciences, 73*, 302–309. https://doi.org/10.1016/j.sbspro.2013.02.056

Godin, G., & Kok, G. (1996). The theory of planned behavior: A review of its applications to health-related behaviors. *American Journal of Health Promotion, 11*(2), 87–98. https://doi.org/10.4278/0890-1171-11.2.87

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). Sage Publications.

Hajirasouli, A., & Banihashemi, S. (2022). Augmented reality in architecture and construction education: State of the field and opportunities. *International Journal of Educational Technology in Higher Education, 19*(1), Article 39. https://doi.org/10.1186/s41239-022-00343-3

Hajirasouli, A., Banihashemi, S., Drogemuller, R., Fazeli, A., & Mohandes, S. R. (2022). Augmented reality in design and construction: Thematic analysis and conceptual frameworks. *Construction Innovation, 22*(3), 412–443. https://doi.org/10.1108/CI-01-2021-0011

Han, B.-O., Kim, Y.-H., Cho, K., & Yang, H. S. (2010). Museum tour guide robot with augmented reality. In *2010 16th International Conference on Virtual Systems and Multimedia* (pp. 223–229). IEEE. https://doi.org/10.1109/VSMM.2010.5665952

Heravi, A., Coffey, V., & Trigunarsyah, B. (2015). Evaluating the level of stakeholder involvement during the project planning processes of building projects. *International Journal of Project Management, 33*(5), 985–997. https://doi.org/10.1016/j.ijproman.2014.12.007

Hewei, T., & Youngsook, L. (2022). Factors affecting continuous purchase intention of fashion products on social e-commerce: SOR model and the mediating effect. *Entertainment Computing, 41*, Article 100474. https://doi.org/10.1016/j.entcom.2021.100474

Hodge, G. A., & Greve, C. (2010). Public–private partnerships: Governance scheme or language game? *Australian Journal of Public Administration, 69*(S1), S8–S22. https://doi.org/10.1111/j.1467-8500.2009.00659.x

Hossain, M. A., Dwivedi, Y. K., Chan, C., Standing, C., & Olanrewaju, A.-S. (2018). Sharing political content in online social media: A planned and unplanned behaviour approach. *Information Systems Frontiers, 20*(3), 485–501. https://doi.org/10.1007/s10796-017-9820-9

Hyde, K. F. (2000). Recognising deductive processes in qualitative research. *Qualitative Market Research: An International Journal, 3*(2), 82–90. https://doi.org/10.1108/13522750010322089

Iyer, E. S. (1989). Unplanned purchasing: Knowledge of shopping environment and time pressure. *Journal of Retailing, 65*(1), 40–57.

J. Dickson, T., Benson, A. M., & Terwiel, F. A. (2014). Mega-event volunteers, similar or different? Vancouver 2010 vs. London 2012. *International Journal of Event and Festival Management, 5*(2), 164–179. https://doi.org/10.1108/IJEFM-08-2013-0022

Jaafar, S. N., Lalp, P. E., & Naba, M. M. (2012). Consumers' perceptions, attitudes, and purchase intention towards private label food products in Malaysia. *Asian Journal of Business and Management Sciences, 2*(8), 73–90.

Jahn, G., Newnham, C., & van den Berg, N. (2022). Augmented reality for construction from steam-bent timber. In *POST-CARBON: Proceedings of the 27th International Conference of the Association for Computer-Aided Architectural Design Research in Asia (CAADRIA)* (Vol. 2, pp. 191–200).

Jarzabkowski, P. (2005). *Strategy as practice: An activity-based approach.* Sage Publications. https://doi.org/10.4135/9781446215494

Jia, Q., Guo, Y., & Barnes, S. J. (2017). Enterprise 2.0 post-adoption: Extending the information system continuance model based on the technology–organization–environment framework. *Computers in Human Behavior, 67*, 95–105. https://doi.org/10.1016/j.chb.2016.10.022

Kettlewell, J., Phillips, J., Radford, K., & Dasnair, R. (2018). Informing evaluation of a smartphone application for people with acquired brain injury: A stakeholder engagement study. *BMC Medical Informatics and Decision Making, 18*(1), Article 33. https://doi.org/10.1186/s12911-018-0610-3

Klijn, E. H., & Koppenjan, J. (2016). The impact of contract characteristics on the performance of public–private partnerships (PPPs). *Public Money & Management, 36*(6), 455–462. https://doi.org/10.1080/09540962.2016.1206756

Kolaei, A. Z., Hedayati, E., Khanzadi, M., & Amiri, G. G. (2022). Challenges and opportunities of augmented reality during the construction phase. *Automation in Construction, 143*, Article 104586. https://doi.org/10.1016/j.autcon.2022.104586

Kollat, D. T., & Willett, R. P. (1967). Customer impulse purchasing behavior. *Journal of Marketing Research, 4*(1), 21–31. https://doi.org/10.1177/002224376700400103

Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory.* Oxford University Press.

Leluschko, C., & Tholen, C. (2023). Goals and stakeholder involvement in XAI for remote sensing: A structured literature review. In *International Conference on Innovative Techniques and Applications of Artificial Intelligence* (pp. 519–525). Springer. https://doi.org/10.1007/978-3-031-43499-1_39

Leung, M., Yu, J., & Liang, Q. (2013). Improving public engagement in construction development projects from a stakeholder's perspective. *Journal of Construction Engineering and Management, 139*(11), Article 04013019. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000752

Loh, E. G. Y., Stephenson, M. L., & Nezakati, H. (2021). Constructing a methodological approach to examine the determinants affecting purchase intention through perceived risk in the hotel context. *Journal of Marketing Management and Consumer Behavior, 3*(2), 17–34.

Mackenzie, N., & Knipe, S. (2006). Research dilemmas: Paradigms, methods and methodology. *Issues in Educational Research, 16*(2), 193–205.

Marín, R., Sanz, P. J., Nebot, P., & Wirz, R. (2005). A multimodal interface to control a robot arm via the web: A case study on remote programming. *IEEE Transactions on Industrial Electronics, 52*(6), 1506–1520. https://doi.org/10.1109/TIE.2005.858733

Masood, T., & Egger, J. (2019). Augmented reality in support of Industry 4.0: Implementation challenges and success factors. *Robotics and Computer-Integrated Manufacturing, 58*, 181–195. https://doi.org/10.1016/j.rcim.2019.02.003

Mirabi, V., Akbariyeh, H., & Tahmasebifard, H. (2015). A study of factors affecting customers' purchase intention. *Journal of Multidisciplinary Engineering Science and Technology (JMEST), 2*(1), 267–273.

Molla, A., & Licker, P. S. (2001). E-commerce systems success: An attempt to extend and respecify the DeLone and McLean model of IS success. *Journal of Electronic Commerce Research, 2*(4), 131–141.

Nederhand, J., & Klijn, E. H. (2019). Stakeholder involvement in public–private partnerships: Its influence on the innovative character of projects and on project performance. *Administration & Society, 51*(8), 1200–1226. https://doi.org/10.1177/0095399716684887

Ogwueleka, A. C. (2013). A review of safety and quality issues in the construction industry. *Journal of Construction Engineering and Project Management, 3*(3), 42–48. https://doi.org/10.6106/JCEPM.2013.3.3.042

Olander, S. (2007). Stakeholder impact analysis in construction project management. *Construction Management and Economics, 25*(3), 277–287. https://doi.org/10.1080/01446190600879125

Phillips, R., Freeman, R. E., & Wicks, A. C. (2003). What stakeholder theory is not. *Business Ethics Quarterly, 13*(4), 479–502. https://doi.org/10.5840/beq200313434

Ponterotto, J. G., & Grieger, I. (1999). Merging qualitative and quantitative perspectives in a research identity. In *Counseling psychologists in a multicultural world* (book chapter).

Porter, M. E., & Heppelmann, J. E. (2017). Why every organization needs an augmented reality strategy. In *HBR's 10 Must Reads 2017* (pp. 85–100). Harvard Business Review Press.

Rasco, R. W., Tennyson, R. D., & Boutwell, R. C. (1975). Imagery instructions and drawings in learning prose. *Journal of Educational Psychology, 67*(2), 188–192. https://doi.org/10.1037/h0077018

Reichardt, C. S., & Cook, T. D. (1979). Beyond qualitative versus quantitative methods. In T. D. Cook & C. S. Reichardt (Eds.), *Qualitative and quantitative methods in evaluation research* (pp. 7–32). Sage Publications.

Reinhart, G., Munzert, U., & Vogl, W. (2008). A programming system for robot-based remote-laser-welding with conventional optics. *CIRP Annals, 57*(1), 37–40. https://doi.org/10.1016/j.cirp.2008.03.090

Rook, D. W. (1987). The buying impulse. *Journal of Consumer Research, 14*(2), 189–199. https://doi.org/10.1086/209105

Saunders, M., Lewis, P., & Thornhill, A. (2003). *Research methods for business students* (3rd ed.). Pearson Education.

Sebastian, T., Yammiyavar, P. G., & Jones, S. (2018). Brand selection in planned purchasing: An analysis of Asian user behavior. *IAFOR Journal of Psychology & the Behavioral Sciences, 4*(2), 3–14. https://doi.org/10.22492/ijpbs.4.2.01

Shah, S. S. H., Aziz, J., Jaffari, A. R., Waris, S., Ejaz, W., Fatima, M., & Sherazi, S. K. (2012). The impact of brands on consumer purchase intentions. *Asian Journal of Business Management, 4*(2), 105–110.

Sohn, Y. S., & Ko, M. T. (2021). The impact of planned vs. unplanned purchases on subsequent purchase decision making in sequential buying situations. *Journal of Retailing and Consumer Services, 59*, Article 102419. https://doi.org/10.1016/j.jretconser.2020.102419

Stacey, R. D., Griffin, D., & Shaw, P. (2000). *Complexity and management: Fad or radical challenge to systems thinking?* Routledge.

Tang, X., Zhao, D., Yamada, H., & Ni, T. (2009). Haptic interaction in tele-operation control system of construction robot based on virtual reality. In *Proceedings of the 2009 International Conference on Mechatronics and Automation* (pp. 78–83). IEEE. https://doi.org/10.1109/ICMA.2009.5246303

Thapa, A. (2012). Consumer switching behaviour: A study of shampoo brands.

Tirmizi, M. A., Rehman, K.-U., & Saif, M. I. (2009). An empirical study of consumer impulse buying behavior in local markets. *European Journal of Scientific Research, 28*(4), 522–532.

Tsetserukou, D., Sato, K., Kawakami, N., & Tachi, S. (2009). Teleoperation system with haptic feedback for physical interaction with remote environment. In *Proceedings of the 2009 ICCAS-SICE* (pp. 3353–3358). IEEE.

Valentini, P. P. (2009). Interactive virtual assembling in augmented reality. *International Journal on Interactive Design and Manufacturing, 3*(2), 109–119. https://doi.org/10.1007/s12008-009-0060-2

Van Bueren, E. M., Klijn, E. H., & Koppenjan, J. F. M. (2003). Dealing with wicked problems in networks: Analyzing an environmental debate from a network perspective. *Journal of Public Administration Research and Theory, 13*(2), 193–212. https://doi.org/10.1093/jpart/mug017

Van Woerkum, C. M. J., & Aarts, M. N. C. (2008). The orientation of organizations to their environments: Functions of the unconscious mind. *Journal of Public Relations Research, 20*(2), 180–206. https://doi.org/10.1080/10627260701826933

Verbeke, A., & Tung, V. (2013). The future of stakeholder management theory: A temporal perspective. *Journal of Business Ethics, 112*(3), 529–543. https://doi.org/10.1007/s10551-012-1276-3

Waldherr, S., Romero, R., & Thrun, S. (2000). A gesture-based interface for human–robot interaction. *Autonomous Robots, 9*(2), 151–173. https://doi.org/10.1023/A:1008987621250

Walker, D. H. T., & Bourne, L. (2007). Stakeholders and the supply chain. In P. E. D. Love, D. H. T. Walker, & P. S. Brandon (Eds.), *Procurement systems: A cross-industry project management perspective* (pp. 94–124). Routledge.

Yin, X., & Zhu, X. (2006). Hand posture recognition in gesture-based human–robot interaction. In *Proceedings of the 2006 IEEE Conference on Industrial Electronics and Applications* (Vol. 1, pp. 1–6). IEEE. https://doi.org/10.1109/ICIEA.2006.257103

Yuqian, D., Xiaogang, L., & Chenhui, Y. (2021). Model construction and empirical study on the influencing factors of purchasing intention of sustainable brand clothing. *Wool Textile Journal, 49*(10), 1–8.

Zhu, Y., Li, Y., Wang, W., & Chen, J. (2010). What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry. *International Journal of Information Management, 30*(3), 265–276. https://doi.org/10.1016/j.ijinfomgt.2009.09.007

Zid, C., Kasim, N., & Soomro, A. R. (2020). Effective project management approach to attain project success, based on cost–time–quality. *International Journal of Project Organisation and Management, 12*(2), 149–163. https://doi.org/10.1504/IJPOM.2020.106339