Extended TPB and Product Selection Decisions of Business Customers in the Lighting Equipment Industry

Nguyen Quang Huy, Nguyen Thi Van Anh*

Faculty of Management - School of Economics - Hanoi University of Industry

***Corresponding Author**

DOI: https://doi.org/10.47772/IJRISS.2026.100500744

Received: 20 May 2026; Accepted: 25 May 2026; Published: 12 June 2026

ABSTRACT

This study aims to examine the factors influencing product selection decisions of business customers in the lighting equipment industry in the context of the transition toward energy-efficient solutions. Based on the Theory of Planned Behavior (TPB), the study proposes an extended model by incorporating two industry-specific factors—technical performance and after-sales service—to better capture the decision-making process in a business-to-business (B2B) environment.

Data were collected from 224 business customers in Vietnam and analyzed using quantitative techniques, including Cronbach's Alpha, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM). The results indicate that technical performance is the most influential factor affecting product selection intention, surpassing traditional psychological and social factors. After-sales service and subjective norms also show significant positive effects, whereas perceived behavioral control is not statistically significant.

The study contributes to the literature by highlighting the critical role of functional factors in B2B purchasing behavior and by identifying the limitations of TPB when applied to high-technology product contexts. In addition, it provides managerial implications for firms in developing competitive strategies based on technical efficiency and service support.

Keywords: Theory of Planned Behavior (TPB); business-to-business (B2B) purchasing behavior; product selection intention; technical performance; after-sales service; lighting equipment.

INTRODUCTION

In the context of a global economy increasingly shifting toward sustainability and energy efficiency, the lighting equipment industry—particularly LED technology—has emerged as one of the fastest-growing sectors. The transition to energy-efficient lighting systems not only enhances economic performance but also contributes to reducing environmental impacts (Chinh et al., 2021); Ganeshalingam et al., 2022). This transformation has not only driven technological innovation but has also significantly altered product selection behavior across various industrial sectors.

However, existing research on lighting product selection behavior has predominantly focused on individual consumers (B2C), emphasizing psychological and social factors such as attitudes, perceptions, and social influence (Apipuchayakul & Vassanadumrongdee, 2020; Mohan & Kinslin, 2022). In contrast, the business-to-business (B2B) context exhibits fundamentally different characteristics. According to Webster and Wind (1972) and Sheth (1973), organizational buying behavior is inherently complex, involving multiple stakeholders and being strongly influenced by technical standards, project requirements, and long-term operational efficiency. As a result, decision-making in B2B settings tends to be more rational and performance-oriented compared to individual consumer behavior.

In particular, within the industrial lighting sector, factors such as technical performance and after-sales service play a critical role in the decision-making process. Recent studies have emphasized that, for high-technology products, functional attributes and performance efficiency can directly influence customer choice behavior

(Rathod, 2023). Nevertheless, these factors have not been systematically integrated or empirically examined within the context of business customers.

From a theoretical perspective, the Theory of Planned Behavior (TPB), proposed by Ajzen (1991), is one of the most widely applied frameworks for explaining intentional behavior. According to TPB, behavior is predicted by behavioral intention, which in turn is influenced by attitude, subjective norm, and perceived behavioral control (Ajzen, 1991; Armitage & Conner, 2001). Although TPB has demonstrated strong explanatory power across various consumption contexts, it primarily focuses on psychological and social factors and does not fully capture the role of functional attributes, particularly in organizational and performance-driven purchasing decisions. This suggests that TPB may be insufficient to fully explain product selection behavior in contexts characterized by organizational complexity and high performance requirements. Treating industry-specific factors such as technical performance and after-sales service as independent variables enables a more direct assessment of their roles in shaping behavioral intention, rather than capturing them indirectly through TPB's psychological constructs.

Accordingly, a significant research gap exists regarding the integration of technical and service-related factors into the TPB framework to enhance its explanatory power in the context of business customers. Addressing this gap is not only theoretically important but also practically valuable in helping firms develop product and service strategies aligned with the specific characteristics of B2B markets.

Motivated by these considerations, this study aims to examine the factors influencing product selection decisions of business customers in the lighting equipment industry based on an extended TPB model. Specifically, the study incorporates two industry-specific factors—technical performance and after-sales service—as independent variables directly influencing product selection intention, thereby providing a more comprehensive representation of the decision-making process in a B2B context.

This study offers several important contributions to both theory and practice. First, it extends the TPB framework in the context of business customers by integrating industry-specific factors, thereby highlighting the importance of operational efficiency, long-term cost considerations, and technical reliability in product selection behavior. Second, the findings provide empirical evidence that technical performance exerts a stronger influence than traditional psychological and social factors, thereby clarifying the limitations of TPB when applied to high-technology product contexts. Third, the study contributes to the limited body of literature on organizational buying behavior in emerging markets and provides practical insights for firms in developing competitive strategies based on technical value and service support.

LITERATURE REVIEW AND HYPOTHESES

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB), proposed by Ajzen (1991), is one of the most widely used theoretical frameworks for explaining intentional behavior across various contexts, including consumer behavior and organizational behavior. According to TPB, an individual's behavior is directly predicted by behavioral intention, which in turn is influenced by three core components: attitude toward the behavior (ATT), subjective norm (SN), and perceived behavioral control (PBC) (Ajzen, 1991; Armitage & Conner, 2001).

Attitude reflects the degree to which an individual evaluates a behavior positively or negatively. When individuals perceive that a behavior yields high value or benefits, they are more likely to develop a favorable attitude, thereby increasing their intention to perform that behavior. Subjective norm refers to the influence of social factors, including expectations and pressures from relevant others such as colleagues, partners, or superiors. Meanwhile, perceived behavioral control reflects the extent to which individuals believe they possess sufficient resources, capabilities, and opportunities to perform the behavior, thereby influencing both behavioral intention and actual behavior.

TPB has been extensively validated in empirical studies and is considered a robust model for explaining behavioral intention in various consumption contexts, particularly for products and services characterized by high involvement or complexity (Ajzen, 1991; Armitage & Conner, 2001). However, most applications of TPB

have focused on individual consumers, where behavior is primarily driven by personal perceptions and psychological factors (Khoa et al., 2024; Minh et al., 2025).

In the context of business customers (B2B), the purchasing decision-making process is typically collective, involving multiple stakeholders and being closely associated with technical, economic, and long-term operational considerations (Webster & Wind, 1972; Sheth, 1973). As a result, relying solely on psychological and social factors within TPB may not fully capture the nature of product selection behavior in such environments. In particular, for high-technology products such as industrial lighting equipment, criteria related to technical performance and service quality may play a significant role in shaping behavioral intention.

From this perspective, although TPB provides a solid theoretical foundation, it may not be sufficient to fully explain product selection behavior in organizational contexts characterized by high performance requirements. This limitation highlights the need to extend the TPB framework by incorporating additional factors related to product characteristics and contextual conditions in order to enhance its explanatory power in B2B environments (Minh & Cuong, 2026).

Extending the TPB Model in the Research Context

Despite its strong explanatory power across various contexts, recent studies suggest that TPB still exhibits certain limitations when applied to complex environments that are heavily influenced by functional factors (Ajzen, 1991; Armitage & Conner, 2001). Specifically, TPB primarily focuses on psychological and social factors at the individual level, while it does not sufficiently account for the role of product characteristics and contextual factors in the decision-making process.

In studies of high-technology and technical products, substantial empirical evidence indicates that factors related to performance, quality, and reliability can directly influence customers' selection behavior (Ganeshalingam et al., 2022; Rathod, 2023; (Dang et al., 2021)). However, within the traditional TPB framework, these factors are typically treated as indirect cognitive beliefs and are reflected through the attitude construct, rather than being modeled as independent determinants of behavioral intention.

This limitation becomes more evident in the context of business customers (B2B), where purchasing decisions are collective in nature, involve multiple stakeholders, and are closely associated with quantitative criteria such as operational efficiency, long-term cost, and product reliability (Webster & Wind, 1972; Sheth, 1973). In such cases, functional factors may exert a direct influence on selection intention without necessarily being mediated by overall attitudinal evaluations.

In particular, within the industrial lighting sector, factors such as technical performance and after-sales service not only influence initial product selection decisions but also affect long-term operational efficiency and cost outcomes. Nevertheless, these factors have not been systematically incorporated as independent variables in traditional behavioral models, including TPB.

From a theoretical perspective, incorporating factors such as technical performance and after-sales service into the attitude construct may reduce the model's ability to accurately capture the role of functional criteria in the decision-making process. This is because such factors may directly influence behavioral intention, rather than indirectly through subjective evaluations. Therefore, treating these industry-specific factors as independent variables allows for a clearer assessment of their direct effects within the research model.

Based on this rationale, the present study proposes an extension of the TPB framework by integrating two industry-specific factors—technical performance and after-sales service—as independent variables directly influencing product selection intention. This approach enables the integration of TPB's psychological and social components with functional and service-related factors, thereby enhancing the model's explanatory power in the context of business customer behavior.

Research Hypotheses

Based on the proposed extended TPB model, this study examines the factors influencing product selection

intention and product selection decisions of business customers in the lighting equipment industry. The research hypotheses are developed by integrating the theoretical foundations of TPB with the specific characteristics of purchasing behavior in a B2B context.

Attitude and product selection intention: According to TPB, attitude reflects the degree to which an individual evaluates a behavior positively or negatively, thereby directly influencing behavioral intention (Ajzen, 1991; Armitage & Conner, 2001). In the context of business customers, attitudes toward products are not only shaped by subjective perceptions but are also associated with evaluations of functional value and operational efficiency. For industrial lighting equipment, positive attitudes may be driven by perceptions of lighting effectiveness, energy efficiency, and compatibility with project requirements. Therefore, a favorable attitude is expected to increase product selection intention.

H1: Attitude (ATT) has a positive effect on product selection intention.

Subjective norm and product selection intention: Subjective norm refers to the influence of social factors on individual behavior, particularly pressures from relevant individuals or groups (Ajzen, 1991). In B2B environments, purchasing decisions are typically not made individually but result from collective evaluation processes involving multiple stakeholders such as managers, colleagues, and technical experts (Webster & Wind, 1972; Sheth, 1973). Therefore, agreement and support from these actors can play a crucial role in shaping product selection intention.

H2: Subjective norm (SN) has a positive effect on product selection intention.

Perceived behavioral control and product selection intention: Perceived behavioral control reflects the extent to which individuals believe they possess sufficient resources and capabilities to perform a behavior (Ajzen, 1991). In B2B contexts, this may relate to factors such as budget availability, technical capability, and project implementation capacity. When business customers perceive that selecting and using a product is within their control, they are more likely to develop stronger selection intentions.

However, in organizational settings, purchasing decisions are often governed by formal approval processes and institutional constraints. As a result, the influence of perceived behavioral control may be weaker compared to individual consumer contexts .

H3: Perceived behavioral control (PBC) has a positive effect on product selection intention.

Technical performance and product selection intention: In high-technology and technical products, technical performance is considered a critical determinant of product selection decisions. Attributes such as lighting efficiency, energy consumption, and technical reliability can directly influence business customers' evaluations (Ganeshalingam et al., 2022; Rathod, 2023). In B2B contexts, these criteria are often prioritized over subjective perceptions due to their direct impact on operational efficiency and long-term costs. Therefore, technical performance is expected to exert a strong influence on product selection intention.

H4: Technical performance (TP) has a positive effect on product selection intention.

After-sales service and product selection intention: After-sales service, including warranty, maintenance, and technical support, plays an important role in reducing risk and increasing customer trust. In long-term purchasing decisions, the quality of after-sales service can significantly influence supplier selection (Sheth, 1973). Although it may not be as critical as technical performance, after-sales service can support product value by reinforcing reliability and strengthening customer commitment.

H5: After-sales service (AS) has a positive effect on product selection intention.

Product selection intention and decision: According to TPB, behavioral intention is the most immediate predictor of actual behavior (Ajzen, 1991). In the context of business customers, product selection intention is formed through a multi-criteria evaluation process and may be translated into actual purchase decisions through internal approval mechanisms. Therefore, stronger selection intention is expected to lead to a higher likelihood of making a product selection decision.

H6: Product selection intention (INT) has a positive effect on product selection decision (PD)

Proposed Research Model

Building upon the theoretical foundation of the Theory of Planned Behavior (TPB) and the identified limitations of the model in the context of business customers, this study proposes an extended TPB model to explain product selection behavior in the lighting equipment industry.

In the traditional TPB framework, product attributes are typically conceptualized as cognitive beliefs, which indirectly influence behavioral intention through the attitude construct. However, in the context of high-technology products requiring objective and quantifiable evaluation—particularly in B2B environments—this approach may not fully capture the actual role of functional factors in the decision-making process.

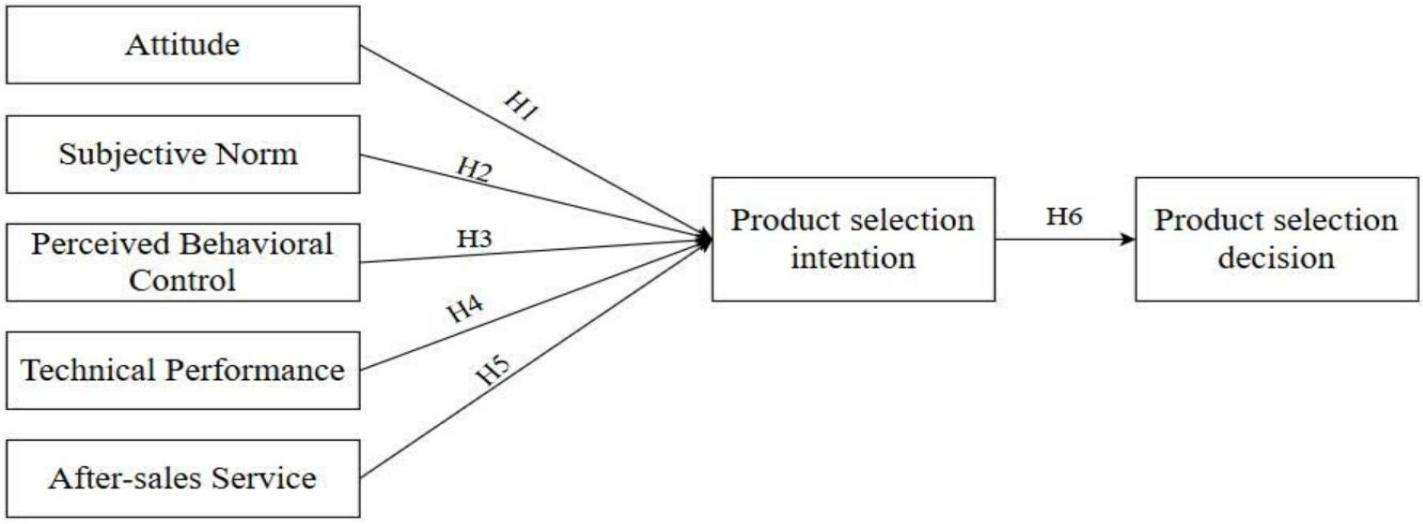
In the industrial lighting sector, product selection decisions are not solely based on subjective evaluations but are strongly influenced by criteria such as operational performance, energy efficiency, technical reliability, and long-term service commitments. These factors may exert a direct impact on product selection intention, rather than being mediated through the psychological and social components of TPB.

From this perspective, incorporating factors such as technical performance and after-sales service into the attitude construct may limit the model's ability to accurately reflect the underlying decision-making mechanism of business customers. Therefore, this study proposes to treat industry-specific factors—namely technical performance (TP) and after-sales service (AS)—as independent variables directly influencing product selection intention.

This approach allows for the integration of TPB's psychological and social components with functional and service-related factors, thereby providing a more comprehensive representation of the multidimensional decision-making process of business customers. Furthermore, modeling TP and AS as independent constructs enables a clearer assessment of the relative importance of technical and service criteria compared to traditional cognitive determinants in shaping behavioral intention.

Specifically, the proposed research model includes the three core components of TPB—attitude (ATT), subjective norm (SN), and perceived behavioral control (PBC)—along with two additional constructs, technical performance (TP) and after-sales service (AS). These variables are hypothesized to directly influence product selection intention (INT), which in turn affects product selection decision (PD).

The proposed research model is illustrated in Figure 1, which depicts the relationships among independent variables, the mediating variable, and the dependent variable in the study.



Sources: a research model is proposed by the author

Figure 1. Research Model

RESEARCH METHODOLOGY

Research Design

This study adopts a mixed-method approach, combining both qualitative and quantitative methods, to examine the factors influencing product selection decisions of business customers in the lighting equipment industry. The research process is conducted in two main stages.

In the qualitative stage, a comprehensive literature review and expert consultations were carried out to identify the key constructs, refine measurement scales, and develop a research model appropriate to the study context. The outcomes of this stage provided the foundation for formulating the research model and the corresponding hypotheses.

In the quantitative stage, data were collected through a structured questionnaire survey targeting business customers. The collected data were subsequently coded, cleaned, and analyzed using statistical techniques to test the proposed research model and hypotheses.

Measurement Scales and Questionnaire Design

The measurement scales used in this study were adapted and refined from prior research to ensure validity and reliability within the context of business customers in the lighting equipment industry.

The research model includes the following constructs: attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), technical performance (TP), after-sales service (AS), product selection intention (INT), and product selection decision (PD). These constructs were developed based on the theoretical foundation of TPB and prior studies on product selection behavior in technology and industrial marketing contexts.

All observed variables were measured using a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The use of the Likert scale enables the capture of respondents’ levels of agreement with each statement and is widely adopted in quantitative studies of customer behavior.

The questionnaire development process consisted of two stages. First, the measurement scales were refined through a review of the literature and expert consultation to ensure their relevance to the research context. Second, the questionnaire was designed and pre-tested prior to the main survey to ensure clarity and comprehensibility for respondents.

The final questionnaire consisted of two main sections: (i) general information about the respondents and (ii) items measuring the constructs in the research model. This structure ensured the collection of comprehensive data for subsequent statistical analysis and hypothesis testing..

Sampling and Data Collection

he target population of this study consists of business customers who have used or intend to use lighting equipment products, including contractors, distributors, and project investors.

Data were collected through an online survey using a structured questionnaire. A total of 250 responses were obtained, of which 224 valid responses were retained for analysis after excluding incomplete or invalid questionnaires.

The research model includes 28 observed variables. Following the recommended minimum sample size ratio of 5:1 for multivariate analysis, at least 140 observations are required (Hair et al., 2019). Therefore, the final sample size of 224 is considered adequate for conducting statistical analyses such as exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM), ensuring the reliability of the research findings..

Data Analysis Methods

The collected data were processed using SPSS and AMOS software following a two-step analytical procedure. Structural equation modeling (SEM) was estimated using a covariance-based approach (CB-SEM) through AMOS.

In the first step, the measurement model was assessed to evaluate the reliability and validity of the constructs. Cronbach's Alpha was used to examine the internal consistency of the measurement scales, followed by exploratory factor analysis (EFA) to identify the underlying factor structure and assess initial convergent validity.

Subsequently, confirmatory factor analysis (CFA) was conducted to evaluate the overall fit of the measurement model and to test convergent and discriminant validity. These were assessed using indicators such as composite reliability (CR) and average variance extracted (AVE).

In the final step, structural equation modeling (SEM) was employed to test the research hypotheses and examine the relationships among the constructs in the proposed model (Hair et al., 2019). In addition, the bootstrap method was applied to assess the statistical significance of indirect effects and to examine the mediating role of product selection intention.

Model fit was evaluated using multiple fit indices, including Chi-square/df, Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA), following the recommendations of Hair et al. (2019).

The results indicate that the proposed model demonstrates an acceptable level of fit with the data and is suitable for hypothesis testing.

RESEARCH RESULTS

Sample Characteristics

The sample consists of 224 business customers who participated in the survey. In terms of gender distribution, males account for 75% of the respondents, while females represent 25%, reflecting the male-dominated nature of technical and purchasing roles in the industrial lighting sector.

In addition, the sample includes key customer groups such as contractors, distributors, and project investors, indicating the diversity of roles involved in the B2B purchasing decision process. This suggests that product selection decisions in this industry are not made individually but are influenced by multiple stakeholders within organizations.

Overall, the sample structure is consistent with the characteristics of the B2B market in the lighting equipment industry, thereby supporting the representativeness and reliability of the collected data.

Measurement Reliability and Exploratory Factor Analysis (EFA)

The reliability of the measurement scales was assessed using Cronbach's Alpha. As shown in Table 1, all constructs demonstrate satisfactory reliability, with Cronbach's Alpha values exceeding the recommended threshold of 0.7, indicating strong internal consistency. These results suggest that the measurement scales are reliable and that all observed variables are retained for subsequent analyses.

Table 1. Results of Reliability Analysis

Construct	Cronbach's Alpha
Attitude (ATT)	0.891
Subjective Norm (SN)	0.876
Perceived Behavioral Control (PBC)	0.876

Technical Performance (TP)	0.915
After-sales Service (AS)	0.893
Product selection intention (INT)	0.887
Product selection decision (PD).	0.885

Source: Compiled by the author based on the study results

Subsequently, exploratory factor analysis (EFA) was conducted to examine the underlying factor structure of the measurement scales. The results indicate that the data are suitable for factor analysis, with a Kaiser–Meyer–Olkin (KMO) value of 0.825 (greater than 0.5) and a statistically significant Bartlett's Test of Sphericity (Sig. = 0.000 < 0.05), confirming sufficient correlations among the observed variables.

The factor extraction results show that all factor loadings exceed 0.5 and are appropriately grouped according to the proposed theoretical model. In addition, the EFA results yield seven factors with a total variance explained of 70.548%, indicating that these factors account for a substantial proportion of the variance in the dataset.

Overall, the reliability and EFA results confirm that the measurement scales exhibit satisfactory convergent validity and an appropriate factor structure, providing a solid foundation for subsequent analyses, including confirmatory factor analysis (CFA) and structural equation modeling (SEM)..

Confirmatory Factor Analysis (CFA) and Model Fit Assessment

Confirmatory factor analysis (CFA) was conducted to assess the goodness-of-fit of the measurement model and to evaluate the convergent and discriminant validity of the constructs. The results indicate that all standardized factor loadings exceed 0.7, suggesting strong relationships between the observed variables and their corresponding latent constructs. In addition, composite reliability (CR) values are above 0.7 and the average variance extracted (AVE) values exceed 0.5, confirming satisfactory convergent validity.

Discriminant validity is established as the square root of the AVE for each construct is greater than the correlations between that construct and the others, indicating that the constructs are empirically distinct.

The overall fit of the measurement model was evaluated using multiple fit indices, as presented in Table 2. The results show that all indices meet the recommended thresholds, indicating a good fit between the measurement model and the empirical data.

Table 2. Rotated Factor Matrix

Fit Index	Value	Recommended Threshold	Assessment
Chi-square/df	1.295	< 3	Acceptable
CFI	0.977	> 0.90	Acceptable
TLI	0.974	> 0.90	Acceptable
RMSEA	0.036	< 0.08	Acceptable

Source: Compiled by the author based on the study results

Overall, the results demonstrate that the measurement model exhibits a good level of fit with the data, and that the constructs achieve satisfactory reliability and validity. This provides a solid foundation for subsequent structural model analysis and hypothesis testing

Structural Equation Modeling (SEM) Results

The results of the structural equation modeling (SEM) analysis are presented in Table 3. Overall, most of the proposed hypotheses are supported at a statistically significant level.

Table 3. Composite Reliability and Average Variance Extracted

Hypothesis	Relationship	Coefficient (β)	P-value	Result
H1	ATT → INT	0.173	0.013	Supported
H2	SN → INT	0.188	0.007	Supported
H3	PBC → INT	0.069	0.301	Not supported
H4	TP → INT	0.364	<0.001	Supported
H5	AS → INT	0.145	0.035	Supported
H6	INT → PD	0.475	<0.001	Supported

Source: Compiled by the author based on the study results

The results indicate that technical performance (TP) has the strongest effect on product selection intention, followed by subjective norm (SN), attitude (ATT), and after-sales service (AS). In contrast, perceived behavioral control (PBC) does not show a statistically significant effect in the model.

Furthermore, product selection intention (INT) has a strong and significant impact on product selection decision (PD), confirming the mediating role of intention in the proposed research model.

DISCUSSION OF FINDINGS

The findings of this study provide several important insights into the product selection behavior of business customers in the lighting equipment industry, while also clarifying the role of functional factors within the extended TPB framework.

First, the results indicate that technical performance (TP) is the most influential factor affecting product selection intention. This finding reflects the rational nature of decision-making among business customers, where criteria such as operational efficiency, life-cycle cost, and technical reliability are prioritized over affective considerations. This result is consistent with prior studies on high-technology products (Ganeshalingam et al., 2022; Rathod, 2023), which suggest that functional attributes may play a central role in shaping selection behavior. However, this finding also reveals a notable difference from many studies conducted in B2C contexts, where attitude is often identified as the dominant predictor of behavioral intention (Ajzen, 1991; Armitage & Conner, 2001). This suggests that, in B2B environments, technical factors may directly influence behavioral intention rather than indirectly through attitude, as traditionally proposed in TPB.

The findings also demonstrate similarities with studies conducted in other high-technology B2B sectors such as industrial machinery, renewable energy, and construction technology, where operational efficiency and technical reliability are often prioritized over emotional evaluations. In addition, studies conducted in developing countries indicate that, in environments characterized by high investment levels and strong pressure for cost optimization, functional factors tend to play a more prominent role in decision-making processes. This contributes to enhancing the generalizability of the extended TPB framework in high-technology industries.

Second, subjective norm (SN) has a positive effect on product selection intention, reflecting the collective nature of organizational buying behavior, where decisions are typically influenced by multiple stakeholders. This finding is consistent with organizational buying behavior studies (Webster & Wind, 1972; Sheth, 1973), reinforcing the role of social influence in shaping behavioral intention even in technically oriented purchasing decisions. However, the weaker influence of SN compared to TP indicates that social factors primarily play a supportive role, while functional criteria remain the dominant drivers of decision-making.

Third, attitude (ATT) positively influences product selection intention, although the effect size is relatively modest. This suggests that, in B2B contexts, the influence of affective perceptions is reduced compared to technical and functional considerations. The finding contributes to prior research by indicating that TPB may operate differently in highly involved and performance-oriented environments, where rational evaluations are prioritized over emotional factors.

Regarding after-sales service (AS), the results indicate that this factor positively affects product selection intention, although its influence is weaker than that of technical performance. This suggests that after-sales service functions as a mechanism for reducing perceived risk and enhancing trust rather than serving as a core determinant of product choice. The finding is consistent with service marketing literature, in which after-sales support is viewed as a tool for reinforcing product value and maintaining long-term customer relationships.

Notably, perceived behavioral control (PBC) does not have a statistically significant effect in the proposed model. This result contrasts with many studies conducted in consumer contexts, where PBC is often found to significantly influence behavioral intention (Ajzen, 1991). A plausible explanation is that, in B2B environments, product selection behavior is not primarily driven by individual perceptions of control but is instead constrained by organizational procedures, technical standards, and financial considerations. This finding suggests that TPB may require contextual adaptation when applied to organizational settings, particularly for highly technical products.

Finally, the relationship between product selection intention (INT) and product selection decision (PD) is confirmed with a strong effect, supporting the core TPB mechanism linking intention and actual behavior. This finding indicates that although the determinants of behavioral intention may differ between B2B and B2C contexts, TPB still serves as a fundamental theoretical framework for explaining the relationship between intention and actual behavior.

In addition, the findings suggest that product selection intention may function as a mechanism through which organizational evaluations are translated into actual selection decisions. Specifically, factors such as technical performance and after-sales service may influence product selection decisions through the formation of expectations regarding operational efficiency, technical reliability, and long-term risk reduction. This implies that business customers often undergo a process of cognitive evaluation and value assessment before making final product selection decisions.

From a theoretical perspective, this study demonstrates that functional factors such as technical performance and after-sales service can operate as independent predictors directly influencing behavioral intention rather than merely serving as antecedents of attitude within the traditional TPB framework. This finding suggests that extending TPB by integrating product-specific factors is necessary to improve its explanatory power in B2B contexts.

Overall, the findings indicate that product selection behavior among business customers in the lighting equipment industry is driven more by operational efficiency and value-oriented considerations than by emotional factors. The dominance of functional attributes over traditional psychological factors suggests that, in high-technology B2B environments, product selection decisions are typically formed based on strategic, long-term evaluations directly related to organizational performance. This contributes to clarifying the distinction between organizational buying behavior and individual consumer behavior, while also reinforcing the need to contextualize traditional behavioral models when applying them to B2B settings.

CONCLUSION AND MANAGERIAL IMPLICATIONS

Conclusion

This study examines the factors influencing product selection decisions of business customers in the lighting equipment industry based on an extended TPB framework. The findings indicate that, in a B2B context, product selection behavior is driven not only by traditional psychological and social factors but also—more prominently—by functional and performance-related criteria.

Specifically, technical performance emerges as the most influential determinant of product selection intention, reflecting a rational and performance-oriented decision-making process in organizational settings. Criteria such as operational efficiency, total cost of ownership, and technical reliability play a decisive role, outweighing affective considerations. In addition, subjective norm and after-sales service exert positive effects on intention, suggesting that social influence and service support function as complementary drivers in the decision process.

In contrast, perceived behavioral control does not have a statistically significant effect, highlighting a key difference between organizational and individual purchasing behavior. In B2B environments, product selection is less dependent on individuals' perceived control and more constrained by organizational procedures, technical standards, and financial considerations.

From a theoretical standpoint, the study contributes by demonstrating that functional factors—such as technical performance and after-sales service—can act as direct predictors of behavioral intention rather than merely antecedents of attitude in the traditional TPB framework. This finding suggests that extending TPB by incorporating product-specific factors is essential for improving its explanatory power in B2B contexts, particularly for high-technology products.

Managerial implication

Based on the findings, several managerial implications are proposed to help firms enhance their competitiveness in the lighting equipment industry.

First, firms should prioritize improving the technical performance of their products, particularly measurable attributes such as lighting efficiency, energy consumption, and durability. Enhancing these attributes not only increases product value but also enables business customers to reduce long-term operational costs, thereby strengthening purchase intention.

Second, firms should develop a professional after-sales service system, including warranty, maintenance, and technical support. Although not the primary determinant of choice, after-sales service plays a critical role in reducing perceived risk and building customer trust, especially in long-term purchasing decisions.

Third, firms should strengthen relationships with key stakeholders involved in the decision-making process, including contractors, technical experts, and business partners. Leveraging the influence of these actors can facilitate product selection in B2B environments.

Finally, marketing efforts should emphasize technical value and performance efficiency rather than focusing solely on affective appeals. This approach aligns with the characteristics of business customers, whose decisions are typically based on objective criteria and operational outcomes.

Limitations and Future Research

Despite its contributions, this study has several limitations. First, the sample was collected using a convenience sampling method, which may limit the generalizability of the findings. Second, the study focuses on a specific industry, and thus the results may not fully capture other contexts. Third, the use of cross-sectional data does not allow for the examination of behavioral changes over time.

Future research may extend this study by examining different industries to enhance the generalizability of the model. In addition, longitudinal data could be employed to better capture dynamic changes in behavior. Further studies may also consider incorporating moderating variables such as firm size, competitive intensity, or project complexity to provide deeper insights into the underlying mechanisms of the proposed model.

Furthermore, product selection intention plays a crucial mediating role and significantly impacts product selection decisions, aligning with TPB theory. Conversely, perceived behavioral control was not statistically significant within the research context.

The study contributes to the expansion of TPB theory in a business customer context and provides a practical basis for enterprises in formulating product and service development strategies.

REFERENCES

1. 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

2. Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. Journal of Applied Social Psychology, 32(4), 665–683.
3. Apipuchayakul, N., & Vassanadumrongdee, S. (2020). Factors affecting the adoption of LED lighting technology. Energy Policy, 136, 111054. https://doi.org/10.1016/j.enpol.2019.111054
4. Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. British Journal of Social Psychology, 40(4), 471–499. https://doi.org/10.1348/014466601164939
5. Byrne, B. M. (2016). Structural equation modeling with AMOS: Basic concepts, applications, and programming (3rd ed.). Routledge.
6. Ganeshalingam, K., Kumar, V., & Ramesh, S. (2022). Determinants of green product purchase intention: Evidence from emerging markets. Sustainability, 14(5), 2567. https://doi.org/10.3390/su14052567
7. Chinh, T., Cuong, T., Bac, C., & Chen, J. (2021). Value-added distribution among stakeholders tea value Chain: a case study in Thai Nguyen Province, Viet Nam. Open Access Library Journal, 8(6), 1-18.
8. Grönroos, C. (2007). Service management and marketing: Customer management in service competition (3rd ed.). Wiley.
9. Dang, T., Caihong, Z., Nguyen, T., Nguyen, N., & Tran, C. (2021). The volatility characteristics of Vietnamese coffee export price and transmission mechanism of influencing factors: a Markov switching approach. Journal of Asia Business Studies, 15(5), 784-803.
10. Khoa, V. D., Anh, N. T. M., Chinh, T. T. Q., Cuong, T., & Nga, N. V. (2024). Impact of green logistics practices on sustainable performance: A comprehensive analysis. International Journal of Religion, 5(11), 8302-8312.
11. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis (8th ed.). Cengage Learning.
12. Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). SAGE Publications.
13. Homburg, C., Wieseke, J., & Hoyer, W. D. (2009). Social identity and the service-profit chain. Journal of Marketing, 73(2), 38–54. https://doi.org/10.1509/jmkg.73.2.38
14. Johnston, W. J., & Lewin, J. E. (1996). Organizational buying behavior: Toward an integrative framework. Journal of Business Research, 35(1), 1–15. https://doi.org/10.1016/0148-2963(95)00074-7
15. Kline, R. B. (2015). Principles and practice of structural equation modeling (4th ed.). Guilford Press.
16. Kotler, P., & Keller, K. L. (2016). Marketing management (15th ed.). Pearson Education.
17. Mohan, V., & Kinslin, D. (2022). Factors influencing purchase intention in technology products: An empirical study. International Journal of Consumer Studies, 46(3), 789–802. https://doi.org/10.1111/ijcs.12706
18. Minh, D. H., & Cuong, T. (2026). The link between sustainable entrepreneurial attitude, intention, and behavior: moderating role of circular economy entrepreneurship. Strategy & Leadership, 54(2), 181-203.
19. Minh, D. H., Huong, H. T., Hoang, T. V., & Cuong, T. (2025). Exploring the relationship between circular tourism and tourist satisfaction: Empirical evidence. Journal of Tourism Management Research, 12(1), 59-76.
20. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12–40.
21. Rathod, K. (2023). Consumer perception towards technological products: A behavioral analysis. Journal of Business Research, 156, 113492. https://doi.org/10.1016/j.jbusres.2022.113492
22. Schiffman, L. G., & Kanuk, L. L. (2010). Consumer behavior (10th ed.). Pearson Education.
23. Sheth, J. N. (1973). A model of industrial buyer behavior. Journal of Marketing, 37(4), 50–56. https://doi.org/10.1177/002224297303700408
24. Ulaga, W., & Eggert, A. (2006). Value-based differentiation in business relationships: Gaining and sustaining key supplier status. Journal of Marketing, 70(1), 119–136. https://doi.org/10.1509/jmkg.70.1.119.qxd
25. Webster, F. E., Jr., & Wind, Y. (1972). A general model for understanding organizational buying behavior. Journal of Marketing, 36(2), 12–19. https://doi.org/10.1177/002224297203600204