Developing a Security Services Selection Model for Facilities Management Organisations: A Transaction Cost Economics–Grounded Sequential Explanatory Mixed-Methods Framework

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ABSTRACT

Selecting outsourced security service providers is a consequential facilities management (FM) decision because provider capability, governance quality and service reliability can affect operational continuity, risk exposure and user safety. However, selection practice can become fragmented when regulatory, financial, performance, experience and technology criteria are treated as isolated procurement checks rather than as theoretically interpretable dimensions of a coherent decision model. This methodological paper presents a Transaction Cost Economics (TCE)-grounded sequential explanatory mixed-methods framework for developing and validating a Security Services Selection Model for FM organisations. The construct-development process specifies the decision domain, derives candidate dimensions from literature and industry practice, generates an initial item pool and uses expert review to retain, revise, merge or remove items based on relevance, clarity, non-redundancy and domain coverage. A 30-participant pilot preceded the main survey, which yielded 408 usable responses. Because the objective is latent construct discovery, the revised analytical protocol specifies common-factor exploratory factor analysis using principal axis factoring with oblique rotation. Factor retention will be guided by parallel analysis, scree evidence, theoretical interpretability and item coherence rather than the eigenvalue-greater-than-one rule alone. Confirmatory factor analysis will compare theoretically meaningful alternative measurement models and evaluate reliability, convergent validity and discriminant validity using multiple diagnostics, including factor correlations, the Fornell-Larcker criterion and the heterotrait-monotrait ratio. The qualitative phase uses purposive maximum-variation selection of FM, procurement, security and governance experts, with anticipated participation of approximately 6-8 focus-group participants and 10-15 interviewees, subject to information power. Qualitative analysis follows a transparent coding and credibility protocol, while integration is demonstrated through a joint display that classifies evidence as confirming, explaining, contradicting or modifying the quantitative model. The methodology is presented as a model-development protocol; no claim is made that the final model or its factor structure has already been established.

Keywords: facilities management, security services, supplier selection, Transaction Cost Economics, mixed methods

INTRODUCTION

Security services are a core component of facilities management (FM) because they contribute to the protection of people, property, information, and organisational operations [1]. In outsourced settings, the decision to appoint a security service provider extends beyond price comparison: the procuring organisation must consider regulatory legitimacy, financial resilience, demonstrated service performance, relevant experience, and technological capability [2]. The quality of this selection decision can influence subsequent contract performance, governance burden and service reliability.

Despite its practical importance, security service-provider selection may become inconsistent when criteria are treated as isolated procurement checks rather than as dimensions of an integrated decision model. A methodologically robust selection model therefore needs two forms of evidence. First, it requires empirical validation to establish whether the proposed dimensions and measurement items form a reliable and valid measurement structure. Second, it requires practitioner validation to determine whether the statistically supported model is understandable, usable and implementable within real procurement and FM environments.

This study addresses that methodological requirement through a sequential explanatory mixed-methods design grounded in Transaction Cost Economics (TCE). The design combines a quantitative phase comprising questionnaire development, pilot testing, reliability analysis, exploratory analysis and confirmatory factor analysis (CFA) with a subsequent qualitative phase involving focus group discussions (FGDs) and semi-structured interviews. The qualitative phase is explicitly connected to the quantitative results so that expert judgement can explain, test and refine the preliminary model.

Accordingly, the purpose of this methodological paper is to specify the research design used to develop and evaluate a Security Services Selection Model for FM organisations. Although the 30-participant pilot study and main survey yielding 408 usable responses have been completed, the proposed dimensions and final decision-support model are treated as candidate structures pending exploratory factor analysis, confirmatory factor analysis and qualitative integration. The paper therefore distinguishes the proposed methodological pathway from validated empirical findings and does not claim that the final model has already been established.

THEORETICAL FOUNDATION AND MODEL LOGIC

Transaction Cost Economics provides the principal theoretical lens for the study. TCE explains organisational decisions about market exchange, contracting and governance by emphasising transaction costs, uncertainty, opportunism, bounded rationality and asset specificity [3]. These concepts are especially pertinent to outsourced service environments in which service quality is difficult to observe fully before contract award and where contractual incompleteness may create governance and monitoring challenges [4].

The literature review underpinning the study identified five dimensions for security service selection: licensing, financial stability, performance, experience and technology capability. These dimensions were not treated merely as administrative criteria; they were theoretically mapped to TCE mechanisms. Licensing was associated with opportunism control and contractual risk reduction. Financial stability was linked to uncertainty reduction and governance efficiency. Performance was connected with bounded rationality and the predictability of service delivery. Experience and technology capability were associated with asset specificity because they reflect specialised knowledge and dedicated technological investment that may be difficult to substitute quickly.

TCE is used here as an explanatory lens rather than as a direct measurement taxonomy. The observable selection dimensions are provider attributes assessed during procurement; they are not assumed to be identical to TCE constructs. Instead, TCE explains the mechanisms through which information about those attributes may reduce search, verification, contracting, monitoring, adaptation, enforcement and switching costs. This distinction also recognises dual effects: for example, technology capability may reduce monitoring costs through better visibility while increasing switching costs when proprietary systems create lock-in.

Table 1: Theoretical mapping of security service selection dimensions to TCE constructs

Selection dimension	Observable provider attribute	TCE mechanism	Link to transaction costs	Expected implication
Licensing	Legal eligibility, permits,	Opportunism; information	Reduces ex ante verification and adverse-	Lower search, verification and

	certifications and compliance readiness	asymmetry; contractual safeguarding	selection risk and lowers compliance-related enforcement or replacement costs.	enforcement costs
Financial stability	Liquidity, solvency and ability to sustain payroll and operations	Environmental and behavioural uncertainty; continuity risk	Reduces uncertainty regarding service continuity and the probability of disruption, emergency replacement and renegotiation.	Lower continuity, adaptation and emergency-contracting costs
Performance	KPI history, references, incident response and service outcomes	Bounded rationality; information asymmetry; opportunism	Provides performance signals that improve pre-award prediction and reduce post-award monitoring and corrective enforcement.	Lower information, monitoring and enforcement costs
Experience	Sector-, site-, contract- and service-specific experience	Human-asset specificity; adaptation requirements; bounded rationality	Accumulated tacit knowledge may shorten mobilisation, reduce coordination errors and support adaptation to site-specific requirements.	Lower learning, coordination and adaptation costs, while recognising dependence effects
Technology capability	Security technologies, reporting systems, monitoring platforms and integration competence	Technological asset specificity; measurability; monitoring uncertainty	Technology can improve visibility and traceability, but proprietary systems may create lock-in and higher switching costs.	Potentially lower monitoring costs balanced against lock-in risk

RESEARCH DESIGN

Research Philosophy and Logic of Inquiry

The study is guided primarily by pragmatism. Pragmatism is appropriate where the research problem requires the combined use of quantitative and qualitative evidence rather than adherence to a single methodological tradition [10]. In this study, quantitative measurement is used to test and validate the structure of the proposed selection dimensions, while qualitative inquiry is used to examine practical meaning, applicability and implementation.

The logic of inquiry is therefore both deductive and inductive. The quantitative phase is deductive because it begins with theory and literature-derived constructs that are translated into measurable items and tested empirically. The qualitative phase is inductive because expert discussion and interviews are used to identify contextual interpretations, implementation concerns and refinements that may not be fully represented by the statistical model.

Sequential Explanatory Mixed-Methods Design

A sequential explanatory mixed-methods design was adopted in which quantitative data collection and analysis precede qualitative exploration. This design is suitable for model development because the first

phase is designed to assess the empirical measurement structure, after which the second phase examines and refines its professional relevance.

The connection between phases is purposeful. Quantitative findings are used to define the preliminary model and to focus the subsequent expert inquiry. The qualitative phase then evaluates whether the statistical structure reflects industry practice and whether the model can be implemented within FM procurement and governance processes. The final model is intended to be produced through integration rather than by treating the two evidence streams as independent studies. Figure 1 summarises the sequence and connection between the two phases.

Figure 1: Sequential explanatory mixed-methods design

PHASE	PROCEDURE
PHASE 1	**QUANTITATIVE** Questionnaire survey → data screening → reliability analysis → EFA → CFA.
CONNECT	Quantitative findings define the preliminary model and issues for expert validation.
PHASE 2	**QUALITATIVE** Focus group discussion with semi-structured expert interviews → thematic analysis
INTEGRATE	Triangulate statistical evidence with professional judgement and operational insight
OUTCOME	Refined Security Services Selection Model for FM organisations

Quantitative Phase

Instrument development and content validation

Questionnaire development was separated conceptually from factor-analytic validation. The literature review was used to define the content domain of security-service provider selection rather than to assert a final latent structure. Recurring criteria from FM, procurement, security-management and outsourcing literature and relevant industry practice were consolidated into five candidate domains: licensing, financial stability, performance, experience and technology capability. Each domain was translated deductively into observable questionnaire statements, with attention to clarity, single-issue wording and separation between provider attributes and expected outcomes.

Before full deployment, academics and industry practitioners reviewed the item pool for relevance to provider selection, clarity, professional appropriateness, non-redundancy and coverage of the intended domain. Items were retained when relevant and clear, reworded when the content was appropriate but ambiguous, merged or removed when duplicative and supplemented when reviewers identified a material content gap. Numerical content-validity indices are not claimed because they were not documented in the source research record. The bilingual English-Bahasa Melayu instrument used a five-point importance scale ranging from 'Not Very Important' to 'Very Important'.

Table 2: Construct-development and item-development protocol

Step	Purpose And Procedure	Evidence/Input	Decision/Output
1. Domain specification	Define pre-award selection of outsourced security-service providers within FM	TCE, FM outsourcing and security procurement	Measurement-domain boundaries

	organisations.		
2. Candidate extraction	Identify recurring provider-selection considerations from literature and industry practice.	Literature-derived and practice-based criteria	Long list of candidate attributes
3. Semantic consolidation	Group similar criteria, remove duplicates and separate attributes from outcomes.	Conceptual definitions and TCE mechanism check	Five candidate dimensions
4. Item generation	Translate each dimension into observable, single-issue statements.	Dimension definitions and criterion list	Initial multi-item questionnaire pool
5. Expert review	Assess relevance, clarity, non-redundancy, terminology and domain coverage.	Academic and industry review	Items retained, revised, merged, removed or added
6. Pilot check	Assess wording, response process, questionnaire flow and initial consistency.	30-participant pilot	Refined main-survey instrument
7. Empirical evaluation	Use EFA and CFA without assuming that the five-domain structure must be retained.	408-response dataset	Supported or revised construct structure

Measurement items used a five-point Likert scale ranging from ‘Not Very Important’ to ‘Very Important’. The instrument was prepared in English and Bahasa Melayu to improve accessibility and respondent comprehension [11]. Before full deployment, academics and industry practitioners reviewed the items for suitability, clarity and relevance, providing a content-validity checkpoint before pilot testing.

Pilot study

A pilot study involving 30 respondents with relevant FM and security-services expertise was conducted to identify ambiguous wording, assess questionnaire structure and evaluate internal consistency. Pilot feedback was used to refine wording, sentence structure and response format before the main survey. Cronbach’s alpha was used as the principal internal-consistency statistic, with values of 0.70 or above treated as acceptable [12].

The pilot phase functions as more than a reliability check. It reduces avoidable measurement error before large-scale data collection and provides early evidence that respondents interpret the instrument as intended [13].

Population, Sampling and Data Collection

The target population comprised individuals involved in security service procurement and selection, including FM practitioners, procurement officers, security service providers and security management personnel. A hybrid non-probability sampling strategy was used. Purposive sampling enabled the inclusion of participants with relevant knowledge and practical experience, while convenience sampling facilitated access to respondents across organisations in Malaysia [14].

The electronic questionnaire was distributed through Google Forms using email, professional networking platforms and outreach to relevant FM organisations and security service companies. Respondents were provided approximately one to two weeks to complete the survey, and follow-up reminders were used to support participation. The study generated 408 usable responses, a sample size that exceeds commonly cited minimums for covariance-based structural equation modelling and supports stable parameter estimation [15].

Data Screening and Preliminary Analysis

Before factor analysis, the dataset was screened for incomplete responses, duplicate entries, missing values, outliers and distributional characteristics. Skewness and kurtosis were examined as indicators of univariate normality, and the cleaned dataset was then used for reliability and factor analyses [16]. Descriptive statistics, including frequencies, percentages, means and standard deviations, were usedt o summarise respondent profiles, organisational characteristics and perceived importance of the service-selection criteria. These analyses provide transparency about the empirical base used for subsequent measurement validation.

Exploratory and Confirmatory Factor Analysis

The revised protocol uses common-factor exploratory factor analysis because the objective is latent construct discovery rather than simple data reduction. Principal axis factoring with an oblique rotation such as Promax will be used to explain shared variance among indicators while allowing theoretically plausible factor correlations [26], [27]. Factor retention will be based on converging evidence from parallel analysis, the scree plot, theoretical interpretability, factor simplicity and item coherence. The eigenvalue-greater-than-one rule may be reported descriptively but will not operate as the sole criterion. Item decisions will consider primary loading, communality, cross-loading magnitude, conceptual redundancy, content coverage and the need for at least three coherent indicators per retained factor where feasible.

Confirmatory factor analysis will be conducted in AMOS on the measurement structure emerging from EFA. The focal correlated-factor model will be compared with theoretically meaningful alternatives, including a one-factor model, plausible merged-factor models and a higher-order model only where factor correlations and theory justify it. Nested models will be compared using chi-square difference testing where appropriate, while information criteria such as AIC will support non-nested comparisons. Measurement quality will be evaluated using standardised loadings, composite reliability and average variance extracted, and model fit will be assessed through chi-square and degrees of freedom, CFI, TLI, RMSEA with confidence intervals and SRMR where available. Discriminant validity will draw on factor correlations and confidence intervals, the Fornell-Larcker criterion, the heterotrait-monotrait ratio and alternative-model evidence rather than any single statistic [20], [28].

Table 3: Quantitative analysis sequence and decision criteria

Stage	Evidence / Procedure	Decision Principle
Data quality	Missingness, duplicates, response patterns, outliers, distributions and item correlations	Document decisions and establish an analytically credible dataset
Internal consistency	Cronbach's alpha and composite reliability	Use reliability as supporting evidence; do not infer unidimensionality from alpha alone
Factorability	KMO, Bartlett's test, correlation matrix and communalities	Establish substantive and statistical suitability for common-factor analysis
EFA extraction and rotation	Principal axis factoring with Promax or another oblique rotation [26], [27]	Discover correlated latent common factors rather than reduce total variance
Number of factors	Parallel analysis, scree plot, interpretability and simple/coherent structure	Avoid sole reliance on eigenvalue > 1
Item retention	Loading, communality, cross-loading, conceptual fit, redundancy and domain coverage	Use converging statistical and substantive evidence
CFA alternatives	Correlated-factor, one-factor, plausible	Test the focal structure against credible

	merged-factor and justified higher-order models	alternatives
Validity	Loadings, CR, AVE, factor correlations, Fornell-Larcker and HTMT [20], [28]	Use multiple diagnostics for convergent and discriminant validity
Model fit	Chi-square/df, CFI, TLI, RMSEA with CI, SRMR, residuals and AIC	Interpret the overall pattern with theory rather than rigid cutoffs alone

Qualitative Explanatory Phase

Focus Group Discussion

The qualitative phase will use purposive maximum-variation sampling to obtain informed explanations from participants representing different professional positions. Eligibility requires direct experience in FM service management, procurement or contract management, security operations or service provision, organisational governance or risk, or relevant academic/professional expertise. Both client-side and provider-side perspectives will be included. The planned focus group will comprise approximately 6-8 participants across these groups. The discussion will examine the relevance, interpretation, practicality and implementation feasibility of the emerging quantitative structure.

The discussion focuses on five issues: relevance of the identified dimensions, practical applicability of the model, industry suitability, implementation feasibility, and potential refinements. The group format is useful because participants can challenge and elaborate on each other's interpretations, thereby revealing implementation concerns that may not emerge from isolated questionnaire responses [21].

Semi-Structured Expert Interviews

Semi-structured interviews will initially target approximately 10-15 experts, with the final number guided by information power rather than a fixed quota [29]. Fewer interviews may be sufficient when participants are highly specific to the research aim, the study is strongly theory-informed, dialogue quality is high and the analysis is focused; additional interviews will be conducted if important professional perspectives or contradictory explanations remain underdeveloped. Quantitative findings will shape the interview prompts so that experts can explain ambiguous loadings, strong factor correlations, unexpected item behaviour and implementation constraints.

This stage is intended to identify whether the model is understandable and usable in practice, what organisational conditions are required for implementation, and what refinements may strengthen decision quality. The interviews also provide an opportunity to examine issues that are difficult to capture

quantitatively, such as tacit professional judgement, governance expectations and organisational readiness.

Thematic analysis

FGD and interview data will be analysed using the six phases of thematic analysis described by Braun and Clarke [22]: familiarisation, initial coding, theme development, theme review, theme definition and reporting. A structured codebook will record code definitions, inclusion and exclusion boundaries and links to quantitative findings.

Credibility will be supported through an audit trail, comparison across professional groups, deliberate examination of divergent cases and peer review of coding and interpretations. Participants may be invited to clarify material ambiguities, but routine member checking will not be claimed unless it is undertaken and documented.

Table 4: Planned qualitative participant composition and contribution

Professional Group	Indicative Eligibility	Expected Contribution
Facilities management	Responsibility for outsourced services, assets or performance management	Operational applicability and client-side implementation
Procurement / contracts	Tendering, evaluation, appointment, administration or vendor governance	Selection feasibility, evidence requirements and controls
Security management / provider	Security operations, service design, technology or contract delivery	Capability indicators and provider-side feasibility
Governance / risk	Risk, compliance, audit, legal or organisational assurance	Accountability, safeguards and implementation risk
Academic / professional expert	Recognised expertise in FM, outsourcing, procurement or security management	Conceptual challenge, terminology and transferability

The analytic focus is model validation rather than open-ended theory generation. Coding therefore attends particularly to evidence about practicality, usability, suitability, implementation feasibility, governance alignment and recommended refinements. Recurrent themes will be interpreted in relation to the quantitative model so that qualitative evidence can confirm, explain, qualify or extend the quantitatively assessed dimensions.

Integration and Model Refinement

The defining feature of the design is its planned integration of quantitative and qualitative evidence at the model validation and refinement stage. The quantitative phase provides empirical evidence regarding the dimensional structure and psychometric adequacy of the proposed selection criteria. The qualitative phase is designed to add professional interpretation and assess whether the model reflects procurement realities and operational requirements. Integration will be implemented through an explicit joint display rather than through general comparison alone [23].

For each quantitatively supported, ambiguous or weak dimension and item pattern, the display will place the statistical evidence alongside qualitative explanations, classify the relationship as confirming, explaining, contradicting/qualifying or modifying/extending, and record the resulting model decision. This structure makes mixed-method meta-inferences auditable and prevents practitioner feedback from being incorporated without a visible evidential basis.

Table 5: Planned joint display for integration and model decisions

Quantitative evidence	Qualitative evidence	Relationship	Integrated inference / model decision
Dimension or item retained strongly	Experts identify the same criterion as essential and implementable	Confirm	Retain definition and operationalisation
Distinct factor but unclear practical meaning	Experts explain the governance mechanism or contextual conditions	Explain	Retain factor and strengthen definition or guidance
Statistically supported but operationally difficult	Experts identify infeasible evidence requirements or procurement constraints	Contradict / qualify	Modify implementation rule, evidence source or scope
Cross-loading or	Experts describe criteria as inseparable in tender	Explain /	Compare alternative model; merge or reassign only if theory

weak distinction	evaluation	modify	and data agree
Weak item but critical risk-control value	Experts identify a high-consequence screening requirement	Contradict / preserve	Consider a gating criterion outside the reflective scale
New contextual issue	Qualitative evidence identifies an unmeasured implementation condition	Extend	Add guidance or future-research proposition without claiming quantitative validation

The intended final output is not simply a CFA measurement model. It is a decision-support framework in which quantitatively supported dimensions are contextualised by expert knowledge and linked back to TCE governance mechanisms. This combination is intended to support structured, transparent and systematic security-service selection in FM organisations. Table 3 summarises the eight-stage model-development process.

Table 6: Eight-stage model-development process

Stage	Activity	Key output / tool
1	Literature review	FM, security management, procurement, outsourcing and TCE
2	Questionnaire development	Bilingual instrument; five-point Likert scale
3	Pilot study	30 respondents; clarity and reliability assessment
4	Main survey	408 usable electronic responses
5	Common-factor EFA and CFA	SPSS: screening, reliability and EFA; AMOS: CFA and model fit
6	Preliminary model	Preliminary measurement model based on five proposed dimensions
7	Qualitative explanation	FGD, semi-structured interviews, and thematic analysis
8	Model finalisation	Joint-display-informed decision-support framework

Methodological Rigour and Quality Assurance

Several design features strengthen methodological rigour. Construct development is documented separately from empirical validation; provider attributes are distinguished from their underlying TCE mechanisms; and the bilingual instrument underwent expert review and pilot testing. Common-factor EFA uses oblique rotation and multiple factor-retention criteria, while CFA requires theoretically meaningful alternative-model comparisons and multiple forms of convergent and discriminant-validity evidence. The qualitative phase specifies maximum-variation selection, an information-power rationale, transparent coding and credibility checks. Finally, the joint display creates an auditable link between quantitative evidence, professional explanation and each model-refinement decision.

The sampling strategy also reflects the applied nature of the research. Because meaningful responses require direct or closely related experience with security procurement and FM practice, purposive inclusion of knowledgeable participants is methodologically defensible. The complementary use of convenience sampling improves access across organisations, although this choice limits statistical generalisability beyond the achieved sample. The study therefore emphasises measurement validity and practical applicability rather than population-level prevalence estimation.

For transparency in final reporting, the empirical article arising from this study should report the full item pool, item deletions, reliability coefficients, KMO and Bartlett statistics, EFA loadings and cross-loadings, CFA standardised loadings, CR, AVE, the discriminant validity matrix and final model-fit indices. The

qualitative report should describe expert selection criteria, the number and profile of participants, coding procedures and the specific refinements made to the model after integration. These detailed results are outside the scope of the present methodological paper.

Ethical Considerations

Participants are informed of the purpose of the study, the voluntary nature of participation, confidentiality protections and the academic use of the data. Participation in the questionnaire, FGD and interviews is voluntary, and respondents may withdraw without consequence. The study maintains respondent anonymity and confidentiality and requires collected information to be stored securely and accessed only for authorised research purposes.

Methodological Contribution and Applicability

The principal contribution of the methodology is the integration of governance theory, psychometric validation and industry-based model refinement within one coherent sequence. In security-services procurement, a purely statistical model may establish construct validity without showing how decision makers should interpret or apply the dimensions. Conversely, expert-only frameworks may be practical but lack empirical evidence that the criteria form a stable measurement structure. The sequential explanatory design is structured to address both concerns by treating statistical validation and practitioner validation as complementary rather than competing forms of evidence.

The design also creates a replicable pathway for adjacent FM outsourcing decisions. With appropriate construct redevelopment and contextual validation, the same logic can be adapted to other outsourced FM services in which provider selection involves regulatory compliance, financial capability, performance history, specialist experience and technology-dependent delivery. Transfer to other contexts, however, should involve renewed content validation and empirical testing rather than direct adoption of the final security-services model.

METHODOLOGICAL LIMITATIONS

The methodology has several limitations that should be acknowledged. The use of purposive and convenience sampling supports access to knowledgeable participants but limits claims of statistical representativeness [24]. The five-point importance scale captures respondent perceptions and therefore may be affected by common-method and self-report biases [25]. The quantitative design validates the measurement structure of selection criteria but, by itself, does not establish causal effects on contract outcomes. The expert-validation phase strengthens contextual relevance, yet its conclusions remain dependent on the composition and experience of the participants.

Because this article focuses on research design rather than empirical results, it does not report the completed EFA/CFA outcomes, final qualitative sample, coding results or final model refinements. Claims regarding the robustness, replicability and final dimensional structure of the model therefore remain prospective. Exact item-level expert-review records, the qualitative sample actually achieved and empirical results must be reported from the completed project record and should not be reconstructed retrospectively.

CONCLUSION

This paper specifies a TCE-grounded sequential explanatory mixed-methods protocol for developing a Security Services Selection Model for FM organisations. The revised design makes construct development explicit, distinguishes observable provider attributes from TCE mechanisms, aligns EFA with latent construct discovery, strengthens factor-retention logic, requires alternative CFA models and contemporary discriminant-validity evidence, and provides a transparent qualitative and joint-display integration process.

The model must be established through sequential evidence rather than assumed in advance. Literature and theory define candidate domains; EFA explores their common-factor structure; CFA tests the resulting

measurement model against credible alternatives; expert inquiry explains and challenges that structure; and joint-display integration determines whether the decision-support model should be confirmed, qualified or modified. Accordingly, this methodological paper does not claim that a final five-dimension model has already been validated.

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REFERENCES

1. Codinhoto, R., Donato, V., Comlay, J., Adeyeye, K., & Kiviniemi, A. (2018). BIM FM: An international call for action. In B. Kumar (Ed.), Contemporary strategies and approaches in 3-D information modeling (pp. 83-114). IGI Global. https://doi.org/10.4018/978-1-5225-5625-1.ch004
2. Rofii, N. D. M., Omar, A. J., Aliasak, M. H. H., & Manaf, A. A. (2026). Selection factors for security service companies in strata schemes in Malaysia. International Journal of Research and Innovation in Social Science, 10(1), 6698-6706. https://doi.org/10.47772/ijriss.2026.10100517
3. Williamson, O. E. (1985). The economic institutions of capitalism. Free Press.
4. Zou, W., Brax, S., Vuori, M., & Rajala, R. (2019). The influences of contract structure, contracting process, and service complexity on supplier performance. International Journal of Operations & Production Management, 39(4), 525-549. https://doi.org/10.1108/IJOPM-12-2016-0756
5. Tate, W. L., Dooley, K., & Ellram, L. M. (2011). Transaction cost and institutional drivers of supplier adoption of environmental practices. Journal of Business Logistics, 32(1), 6-16. https://doi.org/10.1111/j.2158-1592.2011.01001.x
6. Pongsiri, N. (2002). Regulation and public-private partnerships. International Journal of Public Sector Management, 15(6), 487-495. https://doi.org/10.1108/09513550210439634
7. Long, M. (2022). Copyright governance for online short videos: Perspective of Transaction Cost Economics. Frontiers in Psychology, 13, 916670. https://doi.org/10.3389/fpsyg.2022.916670
8. Anderson, E., & Gatignon, H. (1986). Modes of foreign entry: A transaction cost analysis and propositions. Journal of International Business Studies, 17(3), 1-26. https://doi.org/10.1057/palgrave.jibs.8490432
9. Thouin, M. F., Hoffman, J. J., & Ford, E. W. (2009). IT outsourcing and firm-level performance: A transaction cost perspective. Information & Management, 46(8), 463-469. https://doi.org/10.1016/j.im.2009.08.006
10. Creswell, J. W., & Plano Clark, V. L. (2018). Designing and conducting mixed methods research (3rd ed.). Sage.
11. Manuel, L., Contreras, L. M., Lee, L., Fernandez, B. M., Vanicek, J., Gonsahn, M., Salinas, E., & Graf, E. R. (2025). Development of a practical translation approach for survey research projects. Survey Practice, 19(Special Issue), 1-13. https://doi.org/10.29115/sp-2024-0033
12. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis (8th ed.). Cengage Learning.
13. Dikko, M. (2016). Establishing construct validity and reliability: Pilot testing of a qualitative interview for research in Takaful (Islamic insurance). The Qualitative Report, 21(3), 521-528. https://doi.org/10.46743/2160-3715/2016.2243
14. Etikan, I., Musa, S. A., & Alkassim, R. S. (2015). Comparison of convenience sampling and purposive sampling. American Journal of Theoretical and Applied Statistics, 5(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11
15. Kline, R. B. (2016). Principles and practice of structural equation modeling (4th ed.). Guilford Press.
16. Tabachnick, B. G., & Fidell, L. S. (2019). Using multivariate statistics (7th ed.). Pearson.
17. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1), 39-50. https://doi.org/10.1177/002224378101800104

18. Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), 1-55. https://doi.org/10.1080/10705519909540118
19. Ahmed, R. R., Štreimikienė, D., Štreimikis, J., & Šikšnelytė-Butkienė, I. (2024). A comparative analysis of multivariate approaches for data analysis in management sciences. E+M Ekonomie a Management, 27(1), 192-210. https://doi.org/10.15240/tul/001/2024-5-001
20. Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2024). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. Asia Pacific Journal of Management, 41(2), 745-783. https://doi.org/10.1007/s10490-023-09871-y
21. Krueger, R. A., & Casey, M. A. (2015). Focus groups: A practical guide for applied research (5th ed.). Sage.
22. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77-101. https://doi.org/10.1191/1478088706qp063oa
23. Guetterman, T. C., Fetters, M. D., & Creswell, J. W. (2015). Integrating quantitative and qualitative results in health science mixed methods research through joint displays. The Annals of Family Medicine, 13(6), 554-561. https://doi.org/10.1370/afm.1865
24. Andrade, C. (2021). The inconvenient truth about convenience and purposive samples. Indian Journal of Psychological Medicine, 43(1), 86-88. https://doi.org/10.1177/0253717620977000
25. Podsakoff, P. M., Podsakoff, N. P., Williams, L. J., Huang, C., & Yang, J. (2024). Common method bias: It's bad, it's complex, it's widespread, and it's not easy to fix. Annual Review of Organizational Psychology and Organizational Behavior, 11(1), 17-61. https://doi.org/10.1146/annurev-orgpsych-110721-040030
26. Fabrigar, L. R., & Wegener, D. T. (2012). Exploratory factor analysis. Oxford University Press. https://doi.org/10.1093/acprof:osobl/9780199734177.001.0001
27. Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. Journal of Black Psychology, 44(3), 219-246. https://doi.org/10.1177/0095798418771807
28. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43, 115-135. https://doi.org/10.1007/s11747-014-0403-
29. Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: Guided by information power. Qualitative Health Research, 26(13), 1753-1760. https://doi.org/10.1177/1049732315617444