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Strategic Sustainable Safety Balanced Scorecard for Shopping Mall Operations

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Abstract: Shopping malls are public-facing commercial assets where visitor density, tenant diversity, ageing infrastructure, and outsourced operations create a complex safety governance challenge. This study develops a Strategic Sustainable Safety Balanced Scorecard for shopping mall operations, using Lippo Malls Indonesia as the case context. The model extends the conventional Balanced Scorecard by adding Safety and Sustainability as a fifth perspective to capture public safety, emergency resilience, critical system reliability, and social sustainability. A mixed-method design was applied through KPI dictionary validation, Analytic Hierarchy Process weighting, and Objective Matrix scoring. Eight head-office experts validated a 20-indicator KPI dictionary, while eight head-office and mall operation respondents provided weighting judgments. The validation result showed broad acceptance, with an overall mean of 3.275 and an agreement rate of 87.08%. Safety and Sustainability received the highest weight, followed by Internal Process. The Lippo Mall Kemang pilot produced a Safety Performance Index of 8.155, categorized as Green. The framework offers a practical portfolio-level tool for improving mall safety governance and prioritizing safety investment.

Keywords: Balanced Scorecard, Shopping Mall Safety, Sustainable Safety Performance, AHP, OMAX.

INTRODUCTION

Shopping malls have evolved from retail premises into public spaces that combine commerce, leisure, food services, events, transportation interfaces, and social interaction. This transformation increases the strategic importance of safety management. A major incident in a mall rarely remains a purely technical event. It can disrupt trading activity, damage tenant confidence, expose management to legal scrutiny, and weaken the reputation of the broader mall network. In Indonesia, these risks are intensified by the rapid growth of retail property, diverse building ages, high daily footfall, and the frequent involvement of outsourced service providers and tenant-operated activities.

For large operators, the problem is not only whether individual malls perform safety activities. The more difficult managerial question is whether those activities are measured with the same definitions, evidence standards, and strategic priorities across the portfolio. A mall

may have inspection routines, fire drills, engineering logs, tenant circulars, and incident reports, yet still lack a portfolio-level mechanism that converts these activities into comparable performance insight. Without such a mechanism, senior management may receive fragmented information and may find it difficult to prioritize safety investment based on risk, readiness, and performance gaps.

The Balanced Scorecard provides a useful logic for this problem because it links financial outcomes with the operational, customer, and learning drivers that shape future performance (Kaplan & Norton, 1992; Kaplan, 2010). Recent studies also show that Balanced Scorecard research has moved beyond a static measurement dashboard toward strategy communication, sustainability integration, and control-process alignment (Faraji et al., 2022; Lee et al., 2021; Suarez-Gargallo & Zaragoza-Saez, 2023; Tawse & Tabesh, 2023). In public-facing facilities such as malls, safety should not be treated merely as an internal process. It is a social sustainability capability that protects visitors, tenants, workers, contractors, and assets.

Sustainability Balanced Scorecard research allows sustainability concerns to be embedded inside the original four perspectives, arranged as a separate scorecard, or added as an explicit additional perspective (Kalender & Vayvay, 2016). Hansen and Schaltegger (2018) argue that the value of a Sustainability Balanced Scorecard lies in making sustainability priorities visible in strategy-making and implementation. This study adopts the fifth-perspective approach because public safety in shopping malls requires direct strategic visibility.

Safety performance measurement also requires a balance between lagging and leading indicators. Lagging indicators, such as incident frequency, injury severity, claims, or losses, capture realized consequences. Leading indicators monitor preventive activities and capacities such as inspection completion, preventive maintenance, training, emergency drills, corrective action closure, and hazard reporting. The use of leading indicators is important because low incident numbers may reflect good control, but may also reflect under-reporting (Occupational Safety and Health Administration, 2019; Pawlowska, 2015).

Shopping centres contain several risk features: high visitor density, complex evacuation routes, food and beverage tenants, electrical loads, combustible displays, parking interfaces, contractor activity, and extensive mechanical, electrical, and plumbing systems. Fire and life safety in such buildings depends on prevention, detection, alarms, suppression, emergency routes, training, maintenance, and emergency planning (International Finance Corporation, 2007a, 2007b; Marantika et al., 2020). Safety leadership and worker participation also influence whether such systems are used consistently in daily operations (Global Sustainability Standards Board, 2018; Payne et al., 2025).

This study addresses three questions. First, which objectives and KPIs can represent proactive and comparable safety performance in shopping mall operations? Second, how can an extended safety scorecard connect operational controls with stakeholder trust, resilience, and financial protection? Third, how can Analytic Hierarchy Process and Objective Matrix methods be integrated to produce a weighted Safety Performance Index for portfolio benchmarking? The contribution is practical and methodological because the article translates a case-based mall safety problem into a structured, weighted, and score-based management system.

METHOD

This study used a pragmatic mixed-method design. The research problem was managerial and applied: Lippo Malls Indonesia needed a safety performance architecture that could be used across a diverse mall portfolio. Pragmatism was appropriate because it allows expert judgement, quantitative weighting, and operational scoring to be combined in pursuit of a workable solution.

The research was implemented in three sequential stages. The first stage developed and validated a KPI dictionary. Candidate KPIs were derived from Balanced Scorecard and Sustainability Balanced Scorecard literature, safety performance measurement concepts, public-building and fire-safety guidance, relevant regulatory expectations, and the operating realities of shopping malls. The second stage used Analytic Hierarchy Process to establish perspective and KPI weights after the KPI dictionary had been refined. The third stage used Objective Matrix scoring to demonstrate how weighted KPI performance can be converted into a Safety Performance Index.

The KPI validation stage used an agreement-based rule. A score of 3 or 4 on a four-point scale was treated as acceptable. A KPI was retained when the main validation dimensions met the minimum standard and agreement reached at least 75%. This threshold is consistent with common consensus practice in expert validation studies (Diamond et al., 2014) and with content-validity logic in which higher relevance ratings are treated as evidence of item acceptability (Polit & Beck, 2006).

For the weighting stage, pairwise comparisons were aggregated by using the geometric mean because the respondents were treated as a collective decision panel and AHP judgements are ratio-scale comparisons (Forman & Peniwati, 1998; Saaty, 1987; Vaidya & Kumar, 2006). The OMAX pilot was applied to Lippo Mall Kemang using actual internal HSE audit recap and follow-up evidence. Since the available evidence was audit-based and not yet a complete 20-KPI operational database, several KPI values were converted through documented proxy mapping.

Table 1. Research design and evidence base

Stage	Data source	Analytical treatment	Main output
KPI dictionary validation	Eight head-office respondents from operations, facility management, MEP engineering, HSE, legal/permit, business process, and sustainability	Four-point ratings on relevance, measurability, and clarity; acceptance defined as scores of 3 or 4	Validated and refined 20-KPI dictionary
AHP weighting	Eight respondents consisting of two head-office anchors and six mall operation representatives from different mall categories	Pairwise comparisons using Saaty scale; aggregation of individual judgements by geometric mean; CR threshold <= 0.10	Perspective weights, local KPI weights, and global KPI weights
OMAX pilot demonstration	Lippo Mall Kemang (LMK) actual internal HSE audit recap and follow-up evidence	KPI scores normalized to a 0-10 scale; unavailable full-KPI fields converted through documented proxy mapping; AHP global weights applied	Safety Performance Index, traffic-light interpretation, and calibrated pilot improvement priorities

Source: Research data, 2026

RESULTS AND DISCUSSION

Final Scorecard Structure

The final Strategic Sustainable Safety Balanced Scorecard retained five perspectives and 20 KPIs, with four indicators under each perspective. The structure intentionally balances leading and lagging indicators. Financial indicators capture cost and budget discipline; customer indicators reflect tenant and visitor-facing safety performance; internal process

indicators capture inspection, maintenance, audit, and corrective action discipline; learning and growth indicators measure competence and participation; and the Safety and Sustainability perspective captures direct safety outcomes, emergency readiness, and critical system reliability.

This structure is more suitable for a public retail environment than a narrow incident-rate dashboard because it addresses both the causes and consequences of safety performance. It also reflects the wider stakeholder scope of mall operations, where the exposed population includes visitors, tenants, workers, contractors, and outsourced personnel.

Table 2. Strategic Sustainable Safety Balanced Scorecard structure

Perspective	Strategic focus	Key performance indicators
Financial	Financial resilience and risk-control budget discipline	Safety Loss Cost Rate; Risk Control Budget Utilization; Safety-Critical PM Cost Ratio; Safety-Related Insurance Claim Frequency
Customer	Tenant and visitor-facing safety performance	Customer Safety Complaint Rate; Safety Complaint Closure Rate; Tenant Safety Compliance Rate; Safety Communication Reach to Tenants
Internal Process	Operational control, inspection, maintenance, audit, and CAPA discipline	Safety-Critical PM On-time Compliance; Fire and Life Safety Audit Score; Corrective Action Closure On-time; Safety Inspection Plan Completion Rate
Learning and Growth	Competence, certification, reporting culture, and emergency participation	Mandatory Safety Training Coverage; Key Role Certification Rate; Validated Near-Miss/Hazard Reporting Rate; Emergency Drill Participation Coverage
Safety and Sustainability	Direct safety outcomes, emergency readiness, and critical system reliability	TRIR / Recordable Incident Rate; Incident Severity Index; Emergency Readiness Index; Critical Safety System Function Test Pass Rate

Source: Research data, 2026

KPI Dictionary Validation

The validation results indicate that the KPI structure was generally accepted by the expert panel. Across all 20 KPIs, the overall mean was 3.275 on a four-point scale and the overall agreement rate was 87.08%. Relevance was the strongest dimension, while measurability was the weakest. This pattern is important because it shows that experts largely agreed on what should be measured, but several indicators needed sharper evidence rules, denominator definitions, data ownership, and implementation guidance.

Customer-related indicators and several Safety and Sustainability indicators required the most refinement. Customer Safety Complaint Rate, Safety Complaint Closure Rate, Tenant Safety Compliance Rate, Safety Communication Reach to Tenants, Incident Severity Index, Emergency Readiness Index, and Critical Safety System Function Test Pass Rate were clarified before AHP weighting. The main refinements included standard complaint coding, SLA-based closure logic, tenant checklist criteria, documented communication evidence, worker or

contractor scope for severity, a composite emergency readiness definition, and a standardized list of critical safety systems.

Table 3. Round 1 KPI validation summary by perspective

Perspective	KPIs	Relevance mean	Measurability mean	Clarity mean	Overall mean	Agreement	Decision logic
Financial	4	3.375	3.094	3.469	3.312	93.75%	3 retain; 1 review/revise
Customer	4	3.125	2.750	3.188	3.021	77.08%	2 retain with revision; 2 review/revise
Internal Process	4	3.563	3.375	3.188	3.375	91.67%	3 retain; 1 retain with revision
Learning and Growth	4	3.563	3.406	3.406	3.458	93.75%	3 retain; 1 retain with revision
Safety and Sustainability	4	3.406	2.938	3.281	3.208	79.17%	1 retain; 1 retain with revision; 2 review/revise
Overall	20	3.406	3.113	3.306	3.275	87.08%	All retained after refinement

Source: Research data, 2026

AHP Weighting Results

The AHP results show a clear managerial priority. Safety and Sustainability received the highest weight at 40.32%, followed by Internal Process at 21.94%. Customer and Learning and Growth were relatively close, while Financial received the lowest weight. This result suggests that respondents viewed financial consequences as important but secondary to direct safety outcomes, emergency resilience, and the internal controls that prevent incidents.

The four highest-ranked KPIs were all located in the Safety and Sustainability perspective. Emergency Readiness Index ranked first, indicating that respondents prioritized preparedness, response capability, and system readiness over purely financial or administrative measures. Internal process indicators followed closely, particularly inspection completion and safety-critical preventive maintenance. This hierarchy supports the argument that mall safety performance depends on the reliability of preventive controls before it appears in financial loss or customer complaint indicators.

Table 4. AHP perspective weights and group consistency

Rank	Perspective / matrix	Weight	Consistency status
1	Safety and Sustainability	40.32%	0.090 for KPI matrix; acceptable
2	Internal Process	21.94%	0.044 for KPI matrix; acceptable
3	Customer	13.45%	0.082 for KPI matrix; acceptable

4	Learning and Growth	13.11%	0.070 for KPI matrix; acceptable
5	Financial	11.18%	0.088 for KPI matrix; acceptable
-	Perspective matrix	-	CR = 0.010; acceptable

Source: Research data, 2026

Table 5. Top 10 global KPI ranking from AHP

Rank	Perspective	KPI	Local weight	Global weight
1	Safety and Sustainability	Emergency Readiness Index	35.53%	14.32%
2	Safety and Sustainability	TRIR / Recordable Incident Rate	24.59%	9.91%
3	Safety and Sustainability	Critical Safety System Function Test Pass Rate	20.49%	8.26%
4	Safety and Sustainability	Incident Severity Index	19.39%	7.82%
5	Internal Process	Safety Inspection Plan Completion Rate	29.81%	6.54%
6	Internal Process	Safety-Critical PM On-time Compliance	27.23%	5.97%
7	Financial	Risk Control Budget Utilization	50.24%	5.61%
8	Internal Process	Fire and Life Safety Audit Score	25.58%	5.61%
9	Learning and Growth	Emergency Drill Participation Coverage	40.07%	5.26%
10	Customer	Safety Communication Reach to Tenants	34.22%	4.60%

Source: Research data, 2026

OMAX Pilot Demonstration

The OMAX model was applied to Lippo Mall Kemang as a calibrated pilot using actual internal HSE audit recap and follow-up evidence. The LMK audit recorded 22 findings, classified the Fire Risk Category as LOW, and showed 95% follow-up closure progress by May 2026. Since the available evidence was audit-based and not yet a complete 20-KPI operational performance database, several KPI values were converted through documented proxy mapping. The purpose of the pilot was to test the scoring mechanics, demonstrate how different KPI units can be converted into one Safety Performance Index, and show how audit evidence can support management prioritization.

The LMK pilot produced a Safety Performance Index of 8.155, categorized as Green. The result is consistent with the LOW fire risk category and strong follow-up closure progress. Nevertheless, a Green category should not be read as perfect performance. Several KPI-level

results remain Light Green, especially near-miss and hazard reporting, key role certification, emergency drill participation, safety-critical cost classification, and fire and life safety follow-up. This pattern is useful because it shows that a favorable overall result can still produce practical improvement priorities.

Table 6. OMAX pilot result by perspective - Lippo Mall Kemang (LMK)

Perspective	AHP weight	Perspective score	Weighted contribution	Category
Safety and Sustainability	40.32%	8.695	3.505	Green
Internal Process	21.94%	8.127	1.782	Green
Customer	13.45%	7.911	1.064	Light Green
Learning and Growth	13.11%	7.309	0.959	Light Green
Financial	11.18%	7.564	0.845	Light Green
Overall Safety Performance Index	100.00%	-	8.155	Green

Source: Research data, 2026

Table 7. Priority actions indicated by the OMAX pilot

KPI	Perspective	OMAX score	Signal	Managerial response
Validated Near-Miss / Hazard Reporting Rate	Learning and Growth	6.800	Light Green	Keep strengthening reporting channels, validation rules, feedback loops, and non-punitive reporting culture.
Key Role Certification Rate	Learning and Growth	7.200	Light Green	Close certification gaps for safety-critical roles and maintain renewal discipline.
Safety-Critical PM Cost Ratio	Financial	7.200	Light Green	Separate safety-critical PM expenditure from general maintenance cost coding.
Emergency Drill Participation Coverage	Learning and Growth	7.400	Light Green	Improve tenant, outsourcing, security, engineering, housekeeping, and customer-service participation.
Fire and Life Safety Audit Score	Internal Process	7.800	Light Green	Maintain control over handrail, STP, and fire/life-safety follow-up items despite the LOW fire risk category.

Source: Research data, 2026

Theoretical and Managerial Interpretation

The results support the proposition that safety performance in shopping malls should be managed as a strategic capability rather than as an activity-based compliance checklist. The high weight assigned to Safety and Sustainability is theoretically consistent with the social role of shopping malls. Unlike closed industrial settings, malls expose diverse public groups to the condition of the building, the behavior of tenants, emergency response arrangements, and the quality of maintenance. A single weakness in evacuation routes, alarm systems, sprinkler performance, electrical controls, or tenant housekeeping may have consequences for people who are not employees and who have limited ability to assess or avoid the risk.

The AHP results also confirm the importance of internal processes. Inspection completion, safety-critical preventive maintenance, audit discipline, and corrective action closure are the mechanisms through which management reduces risk before incidents occur. In this sense, Internal Process functions as the operational engine of the scorecard. Learning and Growth indicators, such as training, certification, drill participation, and hazard reporting, provide the organizational capability required to sustain those processes.

The study also reveals a common implementation challenge in safety performance systems: measurability often lags behind strategic relevance. Respondents recognized the importance of customer complaints, severity classification, safety-critical cost allocation, near-miss reporting, and critical system testing. However, these indicators require standard coding rules, auditable evidence, and cross-functional ownership. The SSSBSC is therefore not only a scoring instrument. It is also a data governance tool that forces the organization to define what counts, who records it, when it is reviewed, and how it is interpreted.

For mall operators, the proposed SSSBSC provides a structured way to move from reactive safety management toward proactive portfolio governance. Head office can use the Safety Performance Index to compare malls, identify high-risk gaps, prioritize budget, and monitor improvement trends. Mall managers can use the KPI-level dashboard to translate weak scores into specific corrective and preventive actions. Engineering teams can strengthen evidence for preventive maintenance and critical system function tests, while tenant relations and customer service teams can improve complaint classification, tenant compliance, and communication reach.

Implementation should be staged. In the first year, the scorecard should be used primarily for baseline formation, learning, and evidence improvement rather than punitive ranking. This is especially important for near-miss and hazard reporting. If a new reporting system is treated as punishment, malls may under-report. If it is treated as visibility-building, an initial increase in validated reports can become a positive indicator of maturing safety culture.

CONCLUSION

This study developed a Strategic Sustainable Safety Balanced Scorecard for shopping mall operations by integrating KPI validation, AHP weighting, and OMAX scoring. The final framework contains five perspectives and 20 KPIs that cover financial resilience, tenant and visitor-facing safety, internal operational control, organizational learning, and direct safety and sustainability outcomes. The validation result showed broad expert acceptance of the KPI structure, while the AHP result placed Safety and Sustainability as the most important perspective. The LMK OMAX pilot demonstrated that weighted indicators can be translated into a Safety Performance Index with traffic-light interpretation, actual audit-based evidence, and actionable improvement priorities.

The main contribution of the study is the transformation of mall safety measurement from fragmented activities into a strategy-linked portfolio management system. By combining leading and lagging indicators, cross-functional ownership, weighted priorities, and standardized scoring, the SSSBSC helps management understand not only whether incidents

have occurred, but whether the organization is building the capability to prevent them. For mall operators facing public-safety exposure, tenant complexity, and sustainability governance expectations, this measurement architecture can support safer operations, more defensible investment decisions, and stronger stakeholder trust.

This study has several limitations. The case context is one large shopping mall operator in Indonesia, and the AHP weighting relied on expert judgement from a relatively small panel. The OMAX pilot used actual LMK internal HSE audit and follow-up evidence, but the available records were audit-based rather than a complete 20-KPI operational database. Several KPI values therefore required evidence-based proxy mapping. Future research should apply the model to complete and repeated KPI records across multiple malls, test the fairness of targets and traffic-light categories across mall types, and include tenant, visitor, contractor, and vendor perspectives to enrich the customer and learning dimensions.

REFERENCES

Dağidir, B. D., & Özkan, B. (2024). A comprehensive evaluation of a company performance using sustainability balanced scorecard based on picture fuzzy AHP. Journal of Cleaner Production, 435, Article 140519. https://doi.org/10.1016/j.jclepro.2023.140519

Diamond, I. R., Grant, R. C., Feldman, B. M., Pencharz, P. B., Ling, S. C., Moore, A. M., & Wales, P. W. (2014). Defining consensus: A systematic review recommends methodologic criteria for reporting of Delphi studies. Journal of Clinical Epidemiology, 67(4), 401-409. https://doi.org/10.1016/j.jclinepi.2013.12.002

Faraji, O., Ezadpour, M., Rahrovi Dastjerdi, A., & Dolatzarei, E. (2022). Conceptual structure of balanced scorecard research: A co-word analysis. Evaluation and Program Planning, 94, Article 102128. https://doi.org/10.1016/j.evalprogplan.2022.102128

Forman, E., & Peniwati, K. (1998). Aggregating individual judgments and priorities with the Analytic Hierarchy Process. European Journal of Operational Research, 108(1), 165-169.

Global Sustainability Standards Board. (2018). GRI 403: Occupational health and safety 2018. Global Reporting Initiative.

GRESB. (2024). 2024 Real Estate Standard and Reference Guide. GRESB.

Hansen, E. G., & Schaltegger, S. (2018). Sustainability balanced scorecards and their architectures: Irrelevant or misunderstood? Journal of Business Ethics, 150, 937-952. https://doi.org/10.1007/s10551-017-3531-5

IFRS Foundation. (2023). IFRS S1: General requirements for disclosure of sustainability-related financial information. International Sustainability Standards Board.

International Finance Corporation. (2007a). Environmental, health, and safety guidelines: General EHS guidelines. World Bank Group.

International Finance Corporation. (2007b). Environmental, health, and safety guidelines: Community health and safety. World Bank Group.

Kalender, Z. T., & Vayvay, O. (2016). The fifth pillar of the balanced scorecard: Sustainability. Procedia - Social and Behavioral Sciences, 235, 76-83. https://doi.org/10.1016/j.sbspro.2016.11.027

Kam, S. H., Lan, T., Sun, K., & Goh, Y. M. (2025). Feature weights in contractor safety performance assessment: Comparative study of expert-driven and analytics-based approaches. Automation in Construction, 174, Article 106142. https://doi.org/10.1016/j.autcon.2025.106142

Kaplan, R. S. (2010). Conceptual foundations of the balanced scorecard (Working Paper No. 10-074). Harvard Business School.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance. Harvard Business Review, 70(1), 71-79.

Lee, S., Costello, F. J., & Lee, K. C. (2021). Hierarchical balanced scorecard-based organizational goals and the efficiency of controls processes. Journal of Business Research, 132, 270-288. https://doi.org/10.1016/j.jbusres.2021.04.038

Marantika, G. F., Rohman, M. A., Rachmawati, F., & Wiguna, I. P. A. (2020). Identification of fire safety indicators for shopping centre buildings in Surabaya. IOP Conference Series: Materials Science and Engineering, 930, Article 012009. https://doi.org/10.1088/1757-899X/930/1/012009

Mayo-Alvarez, L., Del-Aguila-Arcentales, S., & Alvarez-Risco, A. (2024). Innovation using dynamic balanced scorecard design as an industrial safety management system in a company in the mining metallurgical sector. Journal of Open Innovation: Technology, Market, and Complexity, 10(3), Article 100362. https://doi.org/10.1016/j.joitmc.2024.100362

Occupational Safety and Health Administration. (2019). Using leading indicators to improve safety and health outcomes (OSHA 3970). U.S. Department of Labor.

Pawlowska, Z. (2015). Using lagging and leading indicators for the evaluation of occupational safety and health performance in industry. International Journal of Occupational Safety and Ergonomics, 21(3), 284-290. https://doi.org/10.1080/10803548.2015.1081769

Payne, M., Roache, D., Subero, J., & Zhang, G. P. (2025). How safety leadership styles impact safety performance: A case study. Journal of Safety Research, 93, 214-228. https://doi.org/10.1016/j.jsr.2025.02.006

Polit, D. F., & Beck, C. T. (2006). The Content Validity Index: Are you sure you know what is being reported? Critique and recommendations. Research in Nursing & Health, 29(5), 489-497. https://doi.org/10.1002/nur.20147

Saaty, R. W. (1987). The Analytic Hierarchy Process - What it is and how it is used. Mathematical Modelling, 9(3-5), 161-176.

Santos, A. S. S., Moreira, M. R. A., & Sousa, P. S. A. (2025). Environmental sustainability balanced scorecard: A strategic map for joint action by municipalities. Sustainability Accounting, Management and Policy Journal, 16(4), 984-1015. https://doi.org/10.1108/SAMPJ-11-2022-0588

Singapore Exchange Regulation. (2026a). Mainboard rules: Rule 711B: Sustainability report. SGX Group.

Singapore Exchange Regulation. (2026b). Practice Note 7.6 Sustainability Reporting Guide. SGX Group.

Suarez-Gargallo, C., & Zaragoza-Saez, P. (2023). A comprehensive bibliometric study of the balanced scorecard. Evaluation and Program Planning, 97, Article 102256. https://doi.org/10.1016/j.evalprogplan.2023.102256

Tawse, A., & Tabesh, P. (2023). Thirty years with the balanced scorecard: What we have learned. Business Horizons, 66(1), 123-132. https://doi.org/10.1016/j.bushor.2022.03.005

Vaidya, O. S., & Kumar, S. (2006). Analytic hierarchy process: An overview of applications. European Journal of Operational Research, 169(1), 1-29. https://doi.org/10.1016/j.ejor.2004.04.028