| RESEARCH ARTICLE

KPI Tracking and Performance Metrics for Brand Growth Optimization

Md Rahik Redwan[1] ✉ Smarika Niraula[2] and Anjali S. Swamy[3]

[123]M.s in Marketing Emphasis in Analytics, Department of Business, Webster University, St. Louis, Missouri, United States
Corresponding Author: Md Rahik Redwan, **E-mail**: mdrahikredwan@webster.edu

| ABSTRACT

The Key Performance Indicators (KPIs) are an essential aspect of trending brand progression strategies that tie performance measurements to strategic goals. This paper will explore how KPI tracking and measuring performance help to optimize brand equity, operational efficiency and competitiveness in the market. It investigates how to define, align, and track KPIs across multiple business areas such as marketing, supply chain, and the organizing management. Advanced tools like multidimensional dashboards, predictive analytics, and real-time monitoring systems are analyzed in terms of their usefulness in increasing decision-making capabilities and maintaining the competitive advantage. Other issues that the research overcomes are resistance in the organization, fluctuating market, and KPI relevance in the long-term. Results also emphasise that the optimal KPI systems, with an operational approach to match a brand mission, can drive sustainable development, brand agility, and sustainable market positioning.

| KEYWORDS

Key Performance Indicators (KPIs), brand growth optimization, performance metrics, strategic alignment, dashboard monitoring

| ARTICLE INFORMATION

1. Introduction

The important tool that assists in the alignment of business performance related to brand objectives of growth, KPIs are essential in offering quantifiable indicators used to make strategic decisions (Mtau & Rahul, 2024). KPIs allow organizations to track organizational performance, review effectiveness of organizational operations and evaluate performance and effectiveness of brand strategies in line with long-term objectives through creation of tangible goals (Rubinson & Pfeiffer, 2005). Inclusion of KPIs into the brand management practice goes beyond the consistency between strategic aims and operational performance but also instills information-based culture where innovation and flexibility can be pursued (Anand & Grover, 2015). In a more competitive and dynamic market, brands that consistently monitor and optimize KPIs are capable of enhancing equity, customer engagement and CCW (Bojja, 2025; Perez-Alvarez, et al., 2018). In the paper, the value of KPI monitoring and performance measures is discussed with references to how they support the growth of brand, the resiliency of the operations, and the competitiveness of the company.

1.1 An Essay of Performance Metrics as a Strategic Brand Equity Management Tool

Performance measures act as the indispensable tools in assessing managing, and boosting brand equity because they offer measurable information on market, customer perception, and efficiency in the market operations

(Rubinson & Pfeiffer, 2005). Such metrics allow organizations to realize the extent of progress in meeting strategic goals, any performance deficiency, and focus on interventions that enhance brand positioning. The goals of brand equity should be integrated with performance measurement to achieve discrepancy between compensatory actions and want to endorse. Furthermore, the inclusion of the performance measures in the decision-making method helps to establish accountability, drive decisions-based on evidence, and sustain the competitive advantage (Anand & Grover, 2015; Perez-Alvarez et al., 2018).

Table 1: Key Performance Metrics for Brand Equity Management

Metric Category	Description	Brand Impact	Example KPIs
Customer Perception Metrics	Measures how customers perceive brand value, trust, and loyalty	Enhances brand credibility and retention	Net Promoter Score (NPS), Customer Satisfaction (CSAT)
Market Performance Metrics	Tracks brand position and growth in the market	Supports market share expansion	Market Share %, Sales Growth Rate
Engagement Metrics	Measures customer interaction with the brand	Increases brand awareness and loyalty	Social Media Engagement Rate, Website Conversion Rate
Financial Performance Metrics	Evaluates profitability and revenue streams linked to brand strategies	Ensures ROI from brand investments	ROI on Marketing, Revenue per Customer
Operational Efficiency Metrics	Tracks internal processes affecting brand delivery	Improves brand consistency and service quality	Order Fulfillment Time, On-Time Delivery Rate

2. Defining KPIs for Brand Growth

Key Performance Indicators (KPIs) are the measurable values that allow one to assess the efficiency of business activity in reaching business goals that the brand strategy has (Anand & Grover, 2015). When it comes to brand optimization, KPIs present a helpful and systematic framework to evaluate results in the market, customer involvements, and operating effectiveness. Division of KPIs into different areas is relevant because the results allow the organization to focus on a balanced measurement of brand growth in various looks. This segregation makes it possible to develop a specific strategy into which performance is measured, which will correspond to the brand positioning image, the equity requirements, and the long-term development of the market (Kaganski et al., 2017). To create effective KPIs, it is essential to choose indicators that should be specific, measurable, achievable, relevant, time-bound (SMART), but at the same time, be able to adjust to new market conditions (Bojja, 2025).

Table 2: Categories of KPIs Relevant to Brand Optimization

KPI Category	Purpose	Example Indicators
Brand Awareness KPIs	Measure reach and visibility in target markets	Brand Recall Rate, Social Media Reach
Customer Loyalty KPIs	Assess repeat purchase behavior and advocacy	Customer Retention Rate, Repeat Purchase Ratio
Financial KPIs	Monitor revenue generation and profitability from brand initiatives	Gross Margin %, ROI on Branding Campaigns
Market Share KPIs	Evaluate brand position relative to competitors	Market Share %, Sales Volume Growth
Engagement KPIs	Track customer interaction with brand touchpoints	Click-Through Rate (CTR), Engagement Rate
Operational KPIs	Measure efficiency in delivering brand promises	Delivery Accuracy, Service Response Time

2.1 Strategic Objectives and Measurable Indicator relationship

The formulation of brand growth strategies relies on the consistency that there is harmony between strategic goals and quantifiable measures of turning the goals into action (Kaganski et al., 2017). Strategic objectives define long-term results, whether in the form of higher market share, better customer loyalty, or greater brand equity, whereas measurable indicators (KPIs) are used to define such objectives as measurable (Mtau & Rahul, 2024). Such a matching will dismiss the arbitrariness of performance measurement specifically because it can be directly connected to value creation and competitive positioning (Pez-Alvarez et al., 2018). Organizations are able to track brand health, gaps and take appropriate corrective measures within the management staff in time, by stringent measures intended to achieve strategic focus and following through with KPIs. Moreover, properly aligned indicators facilitate the cross-functional cooperation, where marking, operations, and finance cooperate effectively with the purpose of achieving a mutual brand-growth objective (Bojja, 2025).

3. KPIs-Brand Strategic Alignment of KPIs

The process of KPI mapping is one that is systematic, and it aligns each performance indicator with the intended strategic goals, thus measuring activities are directly used to accelerate long-term brand development (Bojja, 2025). This alignment serves as a springboard to sustainable competitive advantage of an organization across several industries as it helps organizations to monitor the critical success factors and proactively respond to performance shortfalls. When KPIs are aligned to brand targets, one can easily have a roadmap to realizing desired results whether it be growing to have a higher market penetration or having greater customer loyalty amongst others. An example could be how to align operational KPIs in manufacturing industry, like production efficiency and defect rates to higher brand reliability and ensuring quality goals and in services industries how customer satisfaction scores can follow retention and advocacy goals. Such focused mapping is not only collaborating in making better decisions but also working on accountability between different departments as each of them knows how they make an impact on the whole brand strategy (Mtau & Rahul, 2024; Perez-Alvarez et al., 2018). In addition, ongoing assessment and adjustment of the KPI mappings would enable brands to anticipate changing market conditions so that they could measure the performance in a way that is still relevant and aligned with the agile strategic priorities (Setiawan & Purba, 2020).

➢ **Incorporation of KPIs in Brand Strategy Decision making Processes:** The implementation of KPIs within the decision-making process of choosing a brand strategy allows one to guarantee that strategic decisions are supported by measurable data that have been discovered, rather than by mere intentions (Perez-Alvarez et al., 2018). The integration will allow the managers to assess how new proposed initiatives may

affect their work, manage resources in a more beneficial way, and focus more on the actions that will bring them the most profit on brand equity. Organizations should consider following a routine strategic review, where KPI monitoring should be incorporated to sound any red flags of rising performance and immediately intervene by enforcing preventative actions before any substantial brand deterioration ensues (Mtau & Rahul, 2024). Besides, cross-functional decision-making and cooperation are encouraged in the decision-making that mostly involves marketing, finance, operations, and supply chain teams depending on common performance data to standardize their activities towards top-level brand objectives (Bojja, 2025). The tactical agility is also facilitated by this approach, that is, enabling the brands to change campaigns, pricing strategies, and market positioning based on real-time performance feedback and hence maintaining the competitive advantage in fast changing business environments (Stefanovic, 2014).

4. Use of technology and KPI Monitoring Methods
Along with the development of dashboard systems, the central component of monitoring and assessing the performance of various brands has become a collective platform that allows visualizing the actual KPI data in real-time (Erkollar & Oberer, 2016). The concentration of performance data of different business units within these systems allows decision-makers to evaluate brand health, compare performance and see the patterns, all in one glance. Dashboards are also especially beneficial to multi-brand organizations since they help to monitor multiple performance aspects (sales growth, customer engagement, the efficiency of operations, etc.) in real-time without barraging managers with scattered reports (Pérez-Álvarez et al., 2018). Dashboards integrate data with marketing analytics, financial systems and customer relationship management (CRM) tools in a unifying view that is used to make high level strategic decisions. Additionally, dashboard displays can also be personalized, thereby enabling the executives to concentrate on brand-level KPIs and simultaneously get a view of corporate-level goals (Mtau & Rahul, 2024). It not only increases transparency and accountability but also allows making timely changes in branding strategies to guarantee that every brand corresponds to the vision of its long-term growth of the organization (Bojja, 2025).

- **Monitoring in Real-Time With Industrial Process Optimization Tools:** Industrial process optimization tools can empower real-time monitoring to help organizations to monitor the KPIs in real time, without which the problem of deviations in performance would be observed but uncorrected (Dominic et al., 2015). These systems employ sophisticated control methods, and automated data gathering to give real-time knowledge upon the effectiveness in operations, quality of production, and consumption of resources. With real-time KPI monitoring, in the context of brand expansion, the problems that may hinder the brand delivery such as delays, differing quality or failure to deliver service can be detected when they can be corrected before it is forced into customer dissatisfaction or a tarnished image (Stefanovic, 2014). The combination of optimization tools and performance dashboards enables the management of companies to connect the data related to the operations to the results of brand performance, forming an uninterrupted cycle of production and its linkage to strategic control (Mtau & Rahul, 2024). Such an ability improves responsiveness by enabling companies to take corrective actions within a moment, adjust marketing operations to operation-readiness parameters, and assure uniform brand promises at the market level (Bojja, 2025). Also, persistent monitoring helps with predictive analytics, so that brands get to predict trends and take proactive steps to maintain competitive advantage.

5. Digital, E-commerce Brand Performance Measures
The KPIs are crucial in the digital marketplace when it comes to monitoring and optimizing brand performance on the digital platforms, ensuring that the marketing campaign is carried according to manner of behavior of the customers and changing market developments (Tsai & Cheng, 2012). Conversion rates, click-through rates, average order value, and customer acquisition costs are some of the essential metrics required in carrying out an assessment on the success of an e-commerce business and internet marketing campaign, as well as brand awareness (Rahman, 2025). These KPIs enable companies to recognize effective paths, improve targeting and personalization of the audience to enhance loyalty. The digital KPIs provide real-time feedback and make it possible to adjust marketing tactics in a relatively short period in response to user activity and consumer behavior patterns compared to the

traditional performance measures (P crez- lvarez et al., 2018). In addition, it is challenging to neglect the incorporation of e-commerce KPIs into more comprehensive metrics of brand development because the online-driven performance should be monitored safely so that success there correlated into long-term equity and share (Mtau & Rahul, 2024).

Fig 1: KPIs for Online Marketing and E-commerce Growth

KPIs for Online Marketing and E-commerce Growth
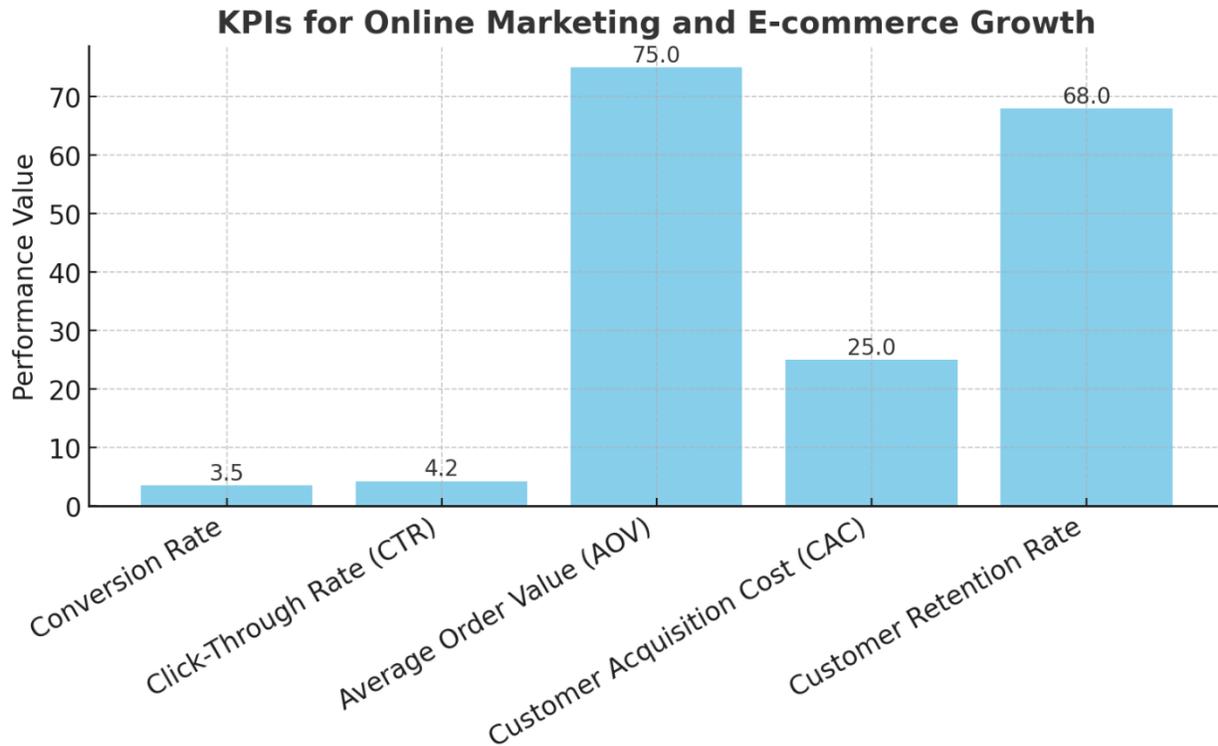
✓ Data Analytics in Optimising Brand Performance

Data analytics is a key that enables better brand performance in digital spaces, as it can take large amounts of customer and market data and analyse it in a manner that creates useful insights (Rahman, 2025). Using these sophisticated methods of analytics, such as predictive modeling, sentiment analysis, and customer segmentation, brands are able to discover new trends, predict needs of its consumers, and optimize marketing processes on a dime (Perez-Alvarez et al., 2018). Such a capability means that a digital campaign will not merely respond to performance indicators, but also can actively influence future results. Implementing analytics in KPI-watching solutions, then, organizations are able to connect online engagement figures to the brand growth goals and make adjustments on targeting, messaging, and channel placement with unprecedented precision (Mtau & Rahul, 2024). Moreover, constant improvement through the use of analytics contributes to personalization whereby customers are provided with personalized offers and material that compounds loyalty towards the organization and sustains repeat purchases (Tsai & Cheng, 2012). As the digital marketplace grows more competitive, data analytics enables an enterprise to shift its KPI tracking to a proactive initiative by which it sustains brand competitiveness.

6. Supply Chain and Operational KPIs Assessment on Brand Growth

➢ **Repeated Achievement of KPI in the Performance of Supply Chain:** The fact that the iterative achievement of KPIs is a defining aspect of supply chain management means that the growth of the brand is rooted in the direct provision of support to operational excellence (Cai et al., 2009). Repeated KPI monitoring implies that rather than considering the results and outcomes of a single measurement, one should follow the indicators of the supply chain processes, monitoring performance continuously and making adjustments to enhance results throughout the processes. Such a cycle helps to avoid having performance goals that remain the same for a long time but instead change to keep up with a changing market, consumer-related expectations, and brand goals (Mtau & Rahul, 2024). As an illustration, systematic

check-in in terms of accuracy or inventory turnover and lead time may expose inefficiency in the area that, once rectified, improves customer satisfaction and builds brand reliability (Waaly et al., 2018). Furthermore, the iterative process of KPI fulfillment allows building resilience in supply chains through their ability to respond to disruptive events nearly in real-time without the loss of quality in services, which contributes to the positive brand image of a company as a whole (Stefanovic, 2014). By correlating brand performance metrics with supply chain KPIs, organizations will be able to give increased credence that the benefits of improvements, in terms of an operational perspective, can be converted into real value both to the brand and the customers.

➢ **Profitability Management Plant Closures in support of Brand Reliability:** Prediction analytics also allows brands to plan ahead of possible disturbances in performances, which could downgrade client satisfaction and sales volume in the market (Stefanovic, 2014). With the help of advanced forecasting models, a company will be able to notice early warning indicators concerning the functioning of its supply chain, including the following: any imminent shortage in the stocks, slowing of the suppliers, or changes in the demand models of the customers (Rahman, 2025). This future focused strategy will reduce the chances of service failures hence ensuring standard product supply and fulfillment rates which are critical elements in building brand trust (Cai et al., 2009). Also, the predictive analytics offerings facilitate agile decisions so that the brands are able to remain competitive in highly dynamic markets (Mtau & Rahul, 2024). Incorporated into KPI tracking systems, such analytical tools will not only advance the staff operating efficiency but also strengthen the brand reputation that is based on the credo of reliability and responsiveness.

Fig 2: Diagram of Supply Chain KPI Cycle
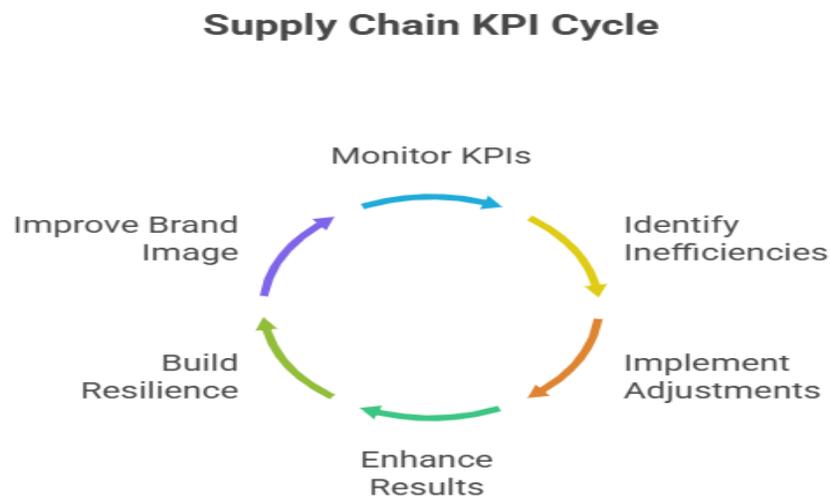
7. Challenges in KPI Implementation

Implementing KPIs for brand growth often encounters obstacles such as organizational resistance and the inherent complexity of measurement systems (Setiawan & Purba, 2020). Resistance can stem from employees who view KPI tracking as an added burden or as a form of micromanagement, leading to reduced cooperation and engagement (Anand & Grover, 2015). Furthermore, measurement complexities arise when defining indicators that accurately capture brand-related performance, particularly in industries where intangible assets like brand perception and loyalty are difficult to quantify (Rubinson & Pfeiffer, 2005). Misalignment between strategic objectives and selected KPIs can further undermine effectiveness, causing organizations to focus on metrics that do not directly contribute to brand growth (Kaganski et al., 2017). Overcoming these challenges requires clear communication, employee buy-in, and the use of well-structured KPI frameworks that balance quantitative data with qualitative insights.

- **The Effect of a Changing Market Dynamics on KPI Relevance:** Relevance and effectiveness of KPIs are dynamic in nature and they keep conforming to the changes in the market dynamics, consumer behaviour and technological changes (Salam et al., 2025). Unstable industries can render KPIs that have hitherto been a perfect measure of brand performance obsolete, and as such, the organization may have to mandate a regular review and update of the measurement systems in such situations (Bojja, 2025). Benchmarks to success may vary due to factors like globalization, emergence of digital platforms, cycling of the economy among others which could make flexibility such an important feature of KPI systems (Rahman, 2025). Stale KPIs that are not updated periodically end up giving wrong signals to the strategic decisions and therefore poor brand growth opportunities or even failure to implement competitive crises. Dynamic KPI management also guarantees that the metrics are consistent with the market conditions as well as long-term brand goals and objectives (Anand & Grover, 2015).

8. Brand Growth Optimizing Systems KPIs

A good KPI system must not only be a measuring system but an initiative to make employees and departments add value to the brand (Peng, 2022). Optimization entails, aligning the individual and team performance appraisals with the overall brand objectives so that all roles deliver a quantifiable contribution to brand equity (Mtau & Rahul, 2024). The KPI systems must continuously be refined through a feedback loop process, benchmarking, and integration of advanced analytics to increment their predictivity in accordance with increasing prescriptivity (Rahman, 2025). When KPIs are directly connected to rewards, recognition programs and career development opportunities, organizations are able to encourage a culture of accountability and brand-centric performance.

- **Sustainable Procurement Monitoring being a part of the delivery of Brand Value:** Sustainable procurement monitoring allows it to ensure that sourcing activities remain in line with environment, social and governance (ESG) standards, which has a direct effect on brand perception as well as the ability to create long term value (Waaly et al., 2018). Monitoring their suppliers on sustainability standards and incorporating the measures into KPI systems, the brands will be able to show the consumers that they are ethically responsible and reduce risks of reputation damage (Cai et al., 2009). The solution builds relations of trust between stakeholders and establishes the brand as an authority in responsible conduct, which is becoming an essential part of successful business in a competitive marketplace based on the conscious consumerism (Salam et al., 2025).

9. Manufacturing Brand Optimization KPI Adoption

KPIs have significantly benefited the manufacturing sector because integrating KPIs strategically has helped enhance the efficiency of operation; quality of products produced and the brand image (Marek et al., 2020). Operational measures including the production curve time, rate of defects, delivery on time, and customer satisfaction will enable the manufacturer to make operating outputs align with the goal of brand expansion. Effective implementations usually include the incorporation of KPIs into lean manufacturing systems and continuous improvement systems; this guarantees the use of data to initiate decisions which in turn promotes reliability of operations as well as market standing.

- **What Construction and Service Sector Branding KPIs can teach:** The building and the service industries provide peculiar views into KPI-based brand management. Project delivery time, cost variance, safety compliance, and stakeholder satisfaction are the KPIs that are important in terms of trust building, as well as supports brand reliability in construction (Anjomshoa, 2024). The metrics assist the organizations in controlling large scale high risks type of projects where the delays or quality problems can easily eat into their brand equity.

Within the service sector market, KPIs pay much attention to the customer experience, the quality of service uptake, staff responsiveness, and staff retention levels (P laza & Pawlik, 2021). The nature of service delivery is intangible and hence in most cases, performance may necessitate a combination of quantitative measures, such as the resolution time, and net promoter scores, and qualitative feedback. Experiences in these industries point towards

the need to customize KPI frameworks to be relevant to issues that are unique to the industry, but at the same time closely aligned with brand growth objectives.
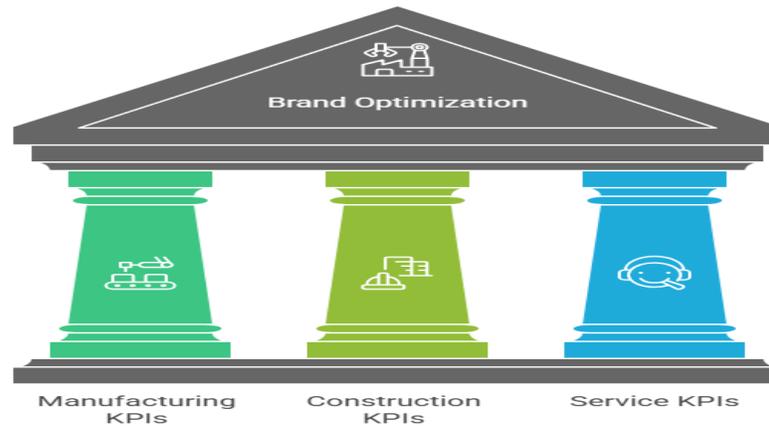

Fig 3:

10. Conclusion

Tracking of KPIs is essential to sustain a long-term growth of a brand by helping the business track their growth and evolution, find areas of improvement, and be strategically aligned with the company operations and the objectives of its brand. A successful KPI management does not only improve the quality of decision-making, but it also improves the competitive positioning with the course of time.Future studies are needed to consider novel AI- and prediction-based approaches when using KPI to manage brands within dynamic markets. Research may also be directed at cross-industry comparisons and establishing more modular KPI profiles to new business patterns.

References

[1] Anand, N., & Grover, N. (2015). Measuring retail supply chain performance: Theoretical model using key performance indicators (KPIs). *Benchmarking: An international journal*, *22*(1), 135-166. https://doi.org/10.1108/BIJ-05-2012-0034

[2] Anjomshoa, E. (2024). Key performance indicators of construction companies in branding products and construction projects for success in a competitive environment in Iran. *Engineering, Construction and Architectural Management*, *31*(5), 2151-2175. https://doi.org/10.1108/ECAM-08-2023-0852

[3] Bojja, S. (2025). KPI mapping for small businesses-sustainable competitive advantage: Electrical engineering sector-electrical equipment. *International Journal of Science and Research Archive*, *14*(2), 999-1009. https://doi.org/10.30574/ijsra.2025.14.2.0417

[4] Cai, J., Liu, X., Xiao, Z., & Liu, J. (2009). Improving supply chain performance management: A systematic approach to analyzing iterative KPI accomplishment. *Decision support systems*, *46*(2), 512-521. https://doi.org/10.1016/j.dss.2008.09.004

[5] Dominic, S., Shardt, Y. A., Ding, S. X., & Luo, H. (2015). An adaptive, advanced control strategy for KPI-based optimization of industrial processes. *IEEE Transactions on Industrial Electronics*, *63*(5), 3252-3260. https://doi.org/10.1109/TIE.2015.2504557

[6] Erkollar, A., & Oberer, B. (2016). Multidimensional dashboards for evaluating strategic brand management processes for multi-brand companies. *Procedia-Social and Behavioral Sciences*, *235*, 505-513. https://doi.org/10.1016/j.sbspro.2016.11.062

[7] Joppen, R., von Enzberg, S., Gundlach, J., Kühn, A., & Dumitrescu, R. (2019). Key performance indicators in the production of the future. *Procedia CIRP*, *81*, 759-764. https://doi.org/10.1016/j.procir.2019.03.190

[8] Kaganski, S., Majak, J., Karjust, K., & Toompalu, S. (2017). Implementation of key performance indicators selection model as part of the Enterprise Analysis Model. *Procedia Cirp*, *63*, 283-288. https://doi.org/10.1016/j.procir.2017.03.143

[9] Marek, S., Schuh, G., & Stich, V. (2020, June). Identification of multidimensional key performance indicators for manufacturing companies. In *2020 IEEE technology & engineering management conference (TEMSCON)* (pp. 1-6). IEEE. https://doi.org/10.1109/TEMSCON47658.2020.9140138

[10] Mtau, T. T., & Rahul, N. A. (2024). Optimizing business performance through KPI alignment: a comprehensive analysis of key performance indicators and strategic objectives. *American Journal of Industrial and Business Management*, *14*(1), 66-82. https://doi.org/10.4236/ajibm.2024.141003

[11] Peng, J. (2022). Performance appraisal system and its optimization method for enterprise management employees based on the KPI index. *Discrete Dynamics in Nature and Society*, *2022*(1), 1937083. https://doi.org/10.1155/2022/1937083b

[12] Pérez-Álvarez, J. M., Maté, A., Gómez-López, M. T., & Trujillo, J. (2018). Tactical business-process-decision support based on KPIs monitoring and validation. *Computers in Industry*, *102*, 23-39. https://doi.org/10.1016/j.compind.2018.08.001

[13] Płaza, M., & Pawlik, Ł. (2021). Influence of the contact center systems development on key performance indicators. *Ieee Access*, *9*, 44580-44591. https://doi.org/10.1109/ACCESS.2021.3066801

[14] Rahman, M. M. (2025). DATA ANALYTICS FOR STRATEGIC BUSINESS DEVELOPMENT: A SYSTEMATIC REVIEW ANALYZING ITS ROLE IN INFORMING DECISIONS, OPTIMIZING PROCESSES, AND DRIVING GROWTH. *Journal of Sustainable Development and Policy*, *1*(01), 285-314. https://doi.org/10.63125/he1tfg25

[15] Rubinson, J., & Pfeiffer, M. (2005). Brand key performance indicators as a force for brand equity management. *Journal of Advertising Research*, *45*(2), 187-197. https://doi.org/10.1017/S0021849905050208

[16] Salam, K. N., Aslim, S., Palinggi, P. P. H., Marsela, I., & Megawaty, M. (2025). Analysis of Effective Marketing Strategies in Facing Tight Competition in the Marketplace Global. *Paradoks: Jurnal Ilmu Ekonomi*, *8*(2), 525-539. https://doi.org/10.57178/paradoks.v8i2.1154

[17] Setiawan, I., & Purba, H. H. (2020). A systematic literature review of key performance indicators (KPIs) implementation. *Journal of Industrial Engineering & Management Research*, *1*(3), 200-208. https://doi.org/10.7777/jiemar.v1i3.79

[18] Stefanovic, N. (2014). Proactive supply chain performance management with predictive analytics. *The Scientific World Journal*, *2014*(1), 528917. https://doi.org/10.1155/2014/528917

[19] Tsai, Y. C., & Cheng, Y. T. (2012). Analyzing key performance indicators (KPIs) for E-commerce and Internet marketing of elderly products: A review. *Archives of gerontology and geriatrics*, *55*(1), 126-132. https://doi.org/10.1016/j.archger.2011.05.024

[20] Waaly, A. N., Ridwan, A. Y., & Akbar, M. D. (2018). Development of sustainable procurement monitoring system performance based on Supply Chain Reference Operation (SCOR) and Analytical Hierarchy Process (AHP) on leather tanning industry. In *MATEC Web of Conferences* (Vol. 204, p. 01008). EDP Sciences. https://doi.org/10.1051/matecconf/201820401008