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Designing a Marketing Intelligence Model Based on New Product Development in the National Lighting Industry

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ABSTRACT

The objective of the present study is to design a marketing intelligence model grounded in new product development within the lighting industry. In terms of purpose, this research is classified as applied, and regarding data collection, it falls under descriptive research with a thematic analysis approach. Data were gathered through open-ended questions via in-depth, semi-structured interviews with experts in the country's lighting industry within the marketing and sales domain. Participants were selected from the statistical population using snowball sampling until theoretical saturation was reached, resulting in a sample size of 10 individuals. For data analysis, open, axial, and selective coding methods were employed. Consequently, 53 basic themes, 13 organizing themes (components), and 5 global themes (dimensions) were identified. The dimensions encompass Market Intelligence, Customer Intelligence, Competitive Intelligence, Technological Intelligence, and Business Intelligence. The dimensions of marketing intelligence based on new product development include: Market Intelligence, Customer Intelligence, Competitive Intelligence, Technological Intelligence, and Business Intelligence. Furthermore, the components of each marketing intelligence dimension are as follows: Market Intelligence (company behavior towards competitors in the market and understanding customer needs); Customer Intelligence (customer feedback regarding products, buying behavior analysis, customer segmentation); Competitive Intelligence (company readiness regarding competitors' market orientations, identifying and covering competitors' market gaps, marketing strategy relative to competitors); Technological Intelligence (new technologies, energy productivity, and standards); and Business Intelligence (profitability analysis of existing products, sales forecasting for new products, and optimal selection of distribution channels).

KEYWORDS: Marketing Intelligence, New Product Development, Lighting Industry

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1. Introduction

Marketing activities constitute the ontological foundation of contemporary human and social existence, extending their influence beyond economic transactions to permeate cultural, political, religious, and artistic domains (Rafiepour, 2019). This pervasive role underscores marketing's function as a primary mechanism through which value is created, communicated, and exchanged within complex socio-technical systems. Contemporary organizations operate within environments characterized by unprecedented volatility, uncertainty, complexity, and ambiguity (VUCA), wherein technological disruption, shifting consumer expectations, and intensified global competition converge to challenge traditional strategic paradigms (Teece, 2020). In such dynamic contexts, organizational survival and sustained competitive advantage increasingly depend upon the capacity to anticipate market shifts, interpret emerging signals, and reconfigure resources with agility and purpose (Yildiz, Fey, & Morschett, 2024).

Marketing intelligence has emerged as a critical strategic capability enabling organizations to systematically acquire, analyze, and deploy market-related knowledge for informed decision-making and value creation (Vishnoi, 2025). Conceptually, marketing intelligence encompasses the structured processes through which firms sense opportunities and threats, interpret market dynamics, and translate insights into actionable strategies (Aripin, Suganda, & Kusumah, 2022). Recent theoretical advancements position marketing intelligence not merely as an informational resource but as a dynamic capability comprising interconnected dimensions: market intelligence (understanding competitive landscapes and customer needs), customer intelligence (analyzing behavioral patterns and segmentation), competitive intelligence (monitoring rival strategies and market gaps), technological intelligence (tracking innovation trajectories and standards), and business intelligence (optimizing resource allocation and performance forecasting) (Falahat, Ramayah, Soto-Acosta, & Lee, 2020). These dimensions collectively enable firms to develop market-sensing mechanisms that enhance strategic responsiveness and innovation capacity (Khan, Zahoor, Tarba, & Makrides, 2022).

New product development (NPD) represents a pivotal organizational process through which firms translate market insights into tangible value propositions, thereby securing differentiation and growth in competitive markets (Chang, Qi, Hao, & Yu, 2025). Theoretical perspectives grounded in dynamic capabilities theory emphasize that successful NPD requires not only technical competencies but also the organizational ability to integrate market knowledge, reconfigure development processes, and adapt to evolving customer preferences (Teece, 2020). However, NPD initiatives entail substantial risks, including technological uncertainty, market acceptance challenges, and resource constraints, which necessitate robust intelligence systems to mitigate failure probabilities and enhance innovation outcomes (Habibi, Rahimi, & Haghshenas Kashani, 2024). Empirical research demonstrates that firms leveraging comprehensive marketing intelligence exhibit superior NPD performance through improved opportunity identification, reduced development cycles, and enhanced market fit (Alsaad, Alharbi, & Dwivedi, 2022).

The intersection of marketing intelligence and new product development constitutes a critical theoretical and practical nexus wherein market-sensing capabilities directly inform innovation

processes. Marketing intelligence facilitates the identification of unmet customer needs, emerging technological opportunities, and competitive whitespace, thereby guiding NPD teams toward high-potential innovation pathways (Wang, Chen, & Chen, 2021). Conversely, NPD processes generate valuable market feedback that refines intelligence systems, creating a recursive learning loop that strengthens organizational adaptability (Kumar & Bagga, 2020). This symbiotic relationship is particularly salient in technology-intensive sectors where rapid innovation cycles and complex customer requirements demand integrated intelligence frameworks capable of supporting both exploratory and exploitative innovation activities (Putri, 2021).

The lighting industry exemplifies a sector undergoing profound transformation driven by technological convergence, sustainability imperatives, and evolving consumer expectations. The transition from conventional illumination to smart, energy-efficient, and connected lighting solutions has redefined competitive dynamics, necessitating novel approaches to product development and market strategy (Technavio, 2024). Within this context, marketing intelligence capabilities enable firms to navigate technological discontinuities, anticipate regulatory shifts, and align product portfolios with emerging sustainability standards and customer preferences (Reyhani, Ghazi Nouri Naeini, & Radfar, 2024). However, existing literature reveals a notable gap regarding comprehensive frameworks that explicitly integrate marketing intelligence dimensions with new product development processes within the lighting industry, particularly in emerging market contexts where institutional and infrastructural factors shape innovation trajectories.

Addressing this theoretical and practical gap, the present study aims to design a marketing intelligence model grounded in new product development within the national lighting industry. Drawing upon thematic analysis of expert insights and grounded in dynamic capabilities theory, this research seeks to elucidate the structural relationships among market intelligence, customer intelligence, competitive intelligence, technological intelligence, and business intelligence as they collectively inform innovation processes. The anticipated contribution is twofold: theoretically, the study extends marketing intelligence frameworks by specifying their application to technology-intensive NPD contexts; practically, the model provides industry practitioners with actionable guidance for enhancing innovation effectiveness through systematic intelligence integration. By advancing understanding of how marketing intelligence capabilities can be orchestrated to support new product development in dynamic industrial settings, this research responds to contemporary calls for contextually grounded, theoretically robust frameworks that bridge the divide between market sensing and innovation execution.

2. Theoretical Foundations and Literature Review

Marketing Intelligence

Marketing intelligence comprises the collection of information from the external environment and the set of internal company activities. A marketing intelligence system consists of a set of processes and resources utilized by managers to obtain daily information regarding business development trends within the environment in which the organization operates. It is a system that provides the essential information required for making marketing decisions. The fundamental objective of

marketing intelligence is to assist marketing managers in making decisions that they encounter daily across various domains of organizational responsibility (Navarro et al., 2010).
To date, various definitions of marketing intelligence have been proposed. Among them, Kotler defines marketing intelligence as information and changes in the marketing environment that assist managers in preparing and adapting marketing programs (Periporas et al., 2005). Jaffe considers marketing intelligence to be the collection of information from the external environment and the set of internal company activities (Asghari, 2021). The characteristics and features of marketing intelligence include (Sakhinia, 2022):

- **Relevance:** Marketing intelligence must provide decision-makers with important information regarding the situation and avoid presenting irrelevant or low-priority information.
- **Usability:** Marketing intelligence must be presented in a suitable, comprehensible, and usable format for managers to generate the necessary motivation and enable them to utilize the information across various domains.
- **Timing:** Marketing intelligence must deliver the necessary information to managers at the appropriate time to facilitate effective decision-making. Furthermore, security must be considered, meaning that information derived from the marketing intelligence system should not fall into the hands of competitors or external individuals (Fahy, 2007).
- **Accuracy:** Marketing intelligence must be genuinely correct; analyses should be conducted accurately and precisely, considering various aspects. The recipient of the information must trust the sender, and ultimately, marketing intelligence must possess the highest quality.
- **Completeness:** Marketing intelligence should, as much as possible, encompass all possible events and scenarios, be analyzed correctly, and be clear and explicit for the decision-maker.
- **Objectivity:** Marketing intelligence must be free from bias and deviation, focusing on organizational goals (Huster, 2005).

New Product Development

New product development (NPD) is a process through which an organization utilizes its resources and capabilities to create a new product or improve an existing one (Najafi Tavana et al., 2021). New product development processes are among the most challenging activities for an organization due to unpredicted or unknown technological barriers. This is often because organizational knowledge continually evolves throughout the NPD project timeline. Therefore, planning such a process is inherently dynamic and requires adaptation to changes in product knowledge as well as other variations. The NPD process includes activities that lead to the production of a new product or redesign in the market (Wang et al., 2017).
Lighting is one of life's necessities that fosters a sense of security and improved quality of life; hence, providing desirable and appropriate services in this field holds special importance. This necessitates having sufficient information regarding lighting networks, including the number of installed lamps, the replacement cycle for each bulb, and other associated costs (Dehbaghi et al., 2014).

Moloud Karim et al. (2025) conducted a study titled "Designing an Interpretive Structural Model of Internal Smart Marketing with an Emphasis on Smartening Organizational Processes." The findings indicate that factors related to internal smart marketing include: smart marketing campaigns, talent management platforms and digital skill development, online performance evaluation, training and online monitoring systems, digital technology infrastructure, online social networks, rules and regulations, and organizational digital culture.

Reyhani et al. (2024) conducted a study titled "New Product Development Model in Iran's Fashion and Clothing Industry" using a mixed-method research approach. Subsequently, using thematic analysis and open and axial coding, they identified 46 concepts and 7 categories. These encompassed stages including: design, product engineering, material sourcing, production, marketing, market launch, and monitoring product success. Ultimately, the model's validity was confirmed.

Habibi et al. (2024), in a study presenting a "Marketing Intelligence Model Based on New Product in the Automotive Industry," employed a mixed exploratory research method. The qualitative phase was based on grounded theory, and the quantitative phase was descriptive-survey. The results of data coding in the qualitative phase led to the creation of a paradigm model including: customer relationship management, marketing research process, managers' need for management dashboards, marketing intelligence, management market orientation, information technology, evaluation of product feature roadmap formulation, customization of products and services based on customer taste, and evaluation of the new product development process. The outcomes included reduced new product development waste, customer satisfaction, and competitiveness. All hypotheses related to the paradigm model were confirmed.

Chang et al. (2025), in a study titled "How and When Collaborative Innovation Networks Influence New Product Development Performance in SMEs: Evidence from China," using multiple regression analysis, found that collaborative innovation networks have positive effects on new product development performance in small and medium-sized enterprises. Furthermore, business model innovation plays a mediating role.

Yu et al. (2025) conducted research titled "A Smart Marketing Platform with Influencer Classification in Social Network Services." The proposed platform fine-tunes a pre-trained language model with text datasets of influencers' social media posts, which can achieve better classification accuracy. The results indicate that the proposed model can provide over 90% classification accuracy for business partners in their product advertisements.

Yalushita et al. (2023), in a study titled "The Impact of Market Intelligence on Marketing Mix Decision Making," using Structural Equation Modeling (SEM) with Smart PLS software, demonstrated that the impact of market intelligence on marketing mix decision-making is positive and significant. Specifically, the impact of market intelligence on product, price, place, and promotion decisions is positive and significant. Thus, market intelligence plays a crucial role in marketing mix decision-making.

Helm (2020) addressed the role of marketing intelligence capability regarding firm performance for product development. Surveying 242 industrial manufacturing companies using structural

equation modeling, the results indicate that the integration of sales and macroeconomic perspective are important features of marketing intelligence capability in industrial markets for gaining additional insights for successful product development. Furthermore, product development capability transforms marketing information activities into the performance of firms in industrial markets.

3. Research Methodology

The present study is classified as applied research in terms of its objective and falls within the category of descriptive research employing a thematic analysis approach for data collection, aimed at addressing the research questions and developing a conceptual model. Data were gathered through open-ended questions administered via in-depth, semi-structured interviews with experts actively engaged in the marketing and sales domains within the national lighting industry.

The statistical population comprised managers and specialists in marketing and sales within the country's lighting industry, holding at least a master's degree and possessing a minimum of 15 years of professional experience in the relevant field. Experts were selected using snowball sampling, wherein each interview was conducted sequentially; following the completion and analysis of one interview, the subsequent interview was initiated. This iterative process continued until theoretical saturation was achieved, ultimately resulting in a sample size of 10 experts.

Subsequently, to address the research questions, the extracted insights from the interviews were systematically categorized through open, axial, and selective coding procedures. The coded data were organized into three hierarchical levels: basic themes, organizing themes (components), and global themes (dimensions). These thematic structures were then synthesized and presented within an integrated conceptual model, providing a comprehensive framework for understanding marketing intelligence grounded in new product development within the lighting industry context.

4. Findings

According to the interviews conducted with experts using thematic analysis, the basic, organizing, and global themes were obtained as presented in the table below:

Table 1. *Basic Themes, Organizing Themes, and Global Themes*

Basic Themes	Organizing Themes	Global Themes
Technology Utilization	Company Behavior Towards Competitors in the Market	**Market Intelligence**
Product Design		
Product Quality		
Price and Discounts		
Distribution Channel		
Advertising		
Product Variety in Residential Environments	Understanding Customer Needs	
Product Variety in Workplaces		

Basic Themes	Organizing Themes	Global Themes
Energy Consumption Level		
Analysis of Customer Opinions	Customer Feedback Regarding Products	**Customer Intelligence**
Informing the Customer		
Creating Trust Among Customers		
Customer Opinions Regarding Price	Buying Behavior Analysis	
Product Selection		
Customer Satisfaction		
Purchase Location		
Market Segmentation by Location	Customer Segmentation	
Market Segmentation by Demographic Characteristics		
Market Segmentation by Customer Behavior		
Development of Novel Technology	Company Readiness Regarding Competitors' Market Orientations	**Competitive Intelligence**
Understanding Customer Needs		
Custom Product Design		
After-Sales Service		
Low Cost Relative to Competitors		
Products with Low Energy Consumption		
Creating Innovative Substitute Products and Services	Identifying and Covering Competitors' Market Gaps	
Covering Gaps in Competitors' Market Segments		
Evaluating Performance of New Products and Services		
Identifying Competitors' Strategies	Marketing Strategy Relative to Competitors	
Creating Competitive Advantage in Production, Sales, and Services		
Attention to Product Quality, Price, Innovation, and Convenience		
Retaining and Attracting Customers		
Creating New Digital Marketing Channels and Targeted Advertising		
Evaluating and Adapting Technology Capabilities to Product Development Needs	New Technologies	**Technological Intelligence**
Investing in R&D Teams to Implement New Technologies		
Creating Creative Teams in Leveraging Customer Data for Novel Product Development		
Continuous Updating of New Requirements and Standards	Energy Productivity and Standards	
Utilizing Smart Systems in Evaluating and Controlling Energy Consumption		

Basic Themes	Organizing Themes	Global Themes
Creating an Information Bank for Educating Customers Related to Energy Productivity		
Providing Standard Certificates in Advertising for Trust and Market Attraction		
Direct and Indirect Costs in Production, Marketing, and Distribution	Profitability Analysis of Existing Products	**Business Intelligence**
Using Novel Technologies in Reducing Production and Logistics Costs		
Dynamic Pricing Strategy Based on Product Value, Competitors, and Market Demand		
Optimizing Distribution Networks to Reduce Costs and Increase Market Access		
Developing Online Sales Channels		
Improving After-Sales Service and Support		
Sales Forecasting Using Quantitative Models to Adjust Strategy	Sales Forecasting for New Products	
Analyzing Marketing Results in Advertising Quantities and Distribution Channels		
Reviewing Various Market Scenarios and Preparing for Appropriate Response		
Identifying Distribution Channels of Interest to Customers	Optimal Selection of Distribution Channels	
Reviewing Active Channels and Their Performance in Terms of Cost and Market Access Capability		
Analyzing Logistics, Warehousing, Commission, and Research Costs for Each Channel		
Selecting Each Channel in Terms of Net and Gross Profit		

Based on the table above regarding the interview texts from experts, which resulted in basic, organizing, and global themes through open, axial, and selective coding, the Marketing Intelligence Model Based on Product Development is designed as follows:

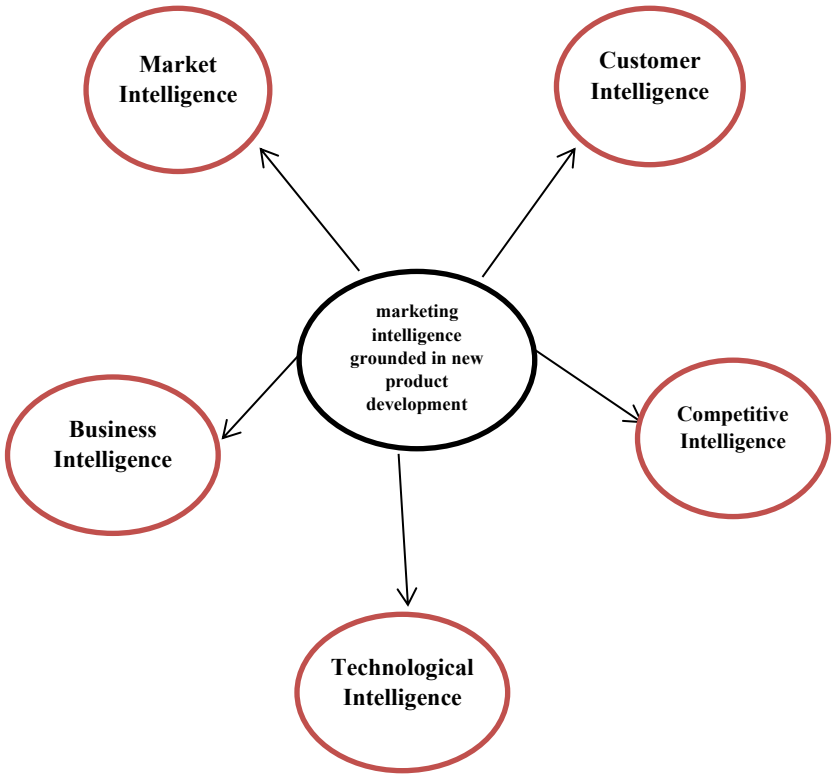

Figure 1. Marketing Intelligence Model Based on New Product Development

The dimensions of marketing intelligence grounded in new product development encompass: Market Intelligence, Customer Intelligence, Competitive Intelligence, Technological Intelligence, and Business Intelligence. Furthermore, the components constituting each dimension of marketing intelligence based on new product development are as follows:

1. **Market Intelligence:** Company behavior towards competitors in the market and understanding customer needs.
2. **Customer Intelligence:** Customer feedback regarding products, buying behavior analysis, and customer segmentation.
3. **Competitive Intelligence:** Company readiness regarding competitors' market orientations, identifying and covering competitors' market gaps, and marketing strategy relative to competitors.
4. **Technological Intelligence:** New technologies, energy productivity, and standards.
5. **Business Intelligence:** Profitability analysis of existing products, sales forecasting for new products, and optimal selection of distribution channels.

5. Discussion and Conclusion

The findings of the present study, which identified five dimensions of marketing intelligence based on new product development in the country's lighting industry, indicate a fundamental transformation in understanding the nature of innovation processes within this strategic sector.

These five dimensions—Market Intelligence, Customer Intelligence, Competitive Intelligence, Technological Intelligence, and Business Intelligence—operate not only as independent components but as an integrated and reciprocal system that enables the conversion of raw data into strategic insights for developing novel products.

Market Intelligence, focusing on a deep understanding of customer needs and competitive behavior in the market, provides a foundation for identifying innovation opportunities; Customer Intelligence, through buying behavior analysis, qualitative feedback, and precise segmentation, enables customized product design; Competitive Intelligence, by identifying market gaps and strategic readiness against competitor moves, strengthens sustainable competitive advantage; Technological Intelligence, focusing on emerging technologies, energy productivity, and compliance with international standards, paves the way for disruptive innovations in the lighting industry; and Business Intelligence, through profitability analysis, sales forecasting, and distribution channel optimization, ensures the successful commercialization of new products (Vishnoi, 2025).

These findings are aligned with previous studies while simultaneously extending existing theoretical frameworks. Khan et al. (2022) emphasized the vital role of market sensing ability in new product development success, showing that this ability affects innovation performance through four dimensions: understanding customer needs, predicting market changes, identifying emerging opportunities, and responding to competitors. The findings of the present study separate and enrich these four dimensions into two distinct dimensions of Market Intelligence and Competitive Intelligence, adding precise operational components such as "covering competitor gaps" and "understanding company behavior towards competitors" (Khan et al., 2022).

Furthermore, Alsaad et al. (2022) confirmed the positive relationship between business intelligence capabilities and the performance of new service products, demonstrating that operational data analysis, demand forecasting, and resource optimization are three key components of business intelligence in product development success. This finding is in complete agreement with the components identified in the present study: profitability analysis, sales forecasting, and optimal selection of distribution channels (Alsaad et al., 2022). In the realm of Technological Intelligence, Wang et al. (2021), in the context of sustainable development of industrial lighting products, showed that integrating new technologies with environmental and social criteria not only increases energy efficiency but also strengthens brand value. This finding has a significant correspondence with the present study's emphasis on energy productivity and standards as components of Technological Intelligence (Wang et al., 2021).

Yildiz et al. (2024), in the field of organizational absorptive capacity, also demonstrated that an organization's ability to identify, absorb, and utilize external knowledge is a prerequisite for successful innovation. The marketing intelligence dimensions identified in the present study provide the operational infrastructure for this absorptive capacity in the lighting industry; for example, Competitive Intelligence identifies technical and marketing knowledge of competitors through active monitoring, while Technological Intelligence absorbs and utilizes this knowledge in the form of new technologies (Yildiz et al., 2024).

From a theoretical perspective, the five-dimensional nature of marketing intelligence in new product development constitutes an extension of Narver and Slater's (1990) Market Orientation framework, which introduced three dimensions: competitor orientation, customer orientation, and interfunctional coordination. The present study, by adding technological and business dimensions, offers a more comprehensive framework for today's dynamic environments—especially in technology-intensive industries like lighting—where technological innovation and smart commercialization are as critical as understanding customers and competitors (Slater & Narver, 1994).

Additionally, this model aligns with Teece's (2020) Dynamic Capabilities Theory. Teece argues that successful organizations in volatile environments possess the ability to integrate, reconfigure, and utilize external knowledge. The five dimensions of marketing intelligence identified in this research precisely embody these abilities at the operational level: Technological Intelligence for absorbing external technical knowledge, Customer Intelligence for understanding emerging needs, and Business Intelligence for utilizing this knowledge in creating economic value (Teece, 2020).

Liao et al. (2023), in the context of manufacturing industries, also showed that integrating Competitive Intelligence and Technological Intelligence, particularly in identifying competitors' technological gaps, leads to disruptive innovations. This finding aligns with the component "identifying and covering competitors' market gaps" in the Competitive Intelligence of the present study and indicates that Competitive Intelligence is not limited to monitoring competitors but must extend to their technological opportunities (Liao et al., 2023). Furthermore, Zhao et al. (2022), in the consumer electronics industry, emphasized that Customer Intelligence must move beyond buying behavior analysis to a deeper understanding of customers' environmental and social values. This approach overlaps with the present study's emphasis on energy productivity in Technological Intelligence, since in the lighting industry, customers' environmental values directly influence the selection of energy-efficient technologies (Zhao et al., 2022).

A key innovation of this research is the emphasis on the specific characteristics of the lighting industry, which distinguishes this model from general frameworks. In this industry, which is undergoing a transformation from traditional technologies to smart systems based on the Internet of Things (IoT) and Artificial Intelligence, Technological Intelligence is of particular importance. Recent studies indicate that more than 60% of new product developments in the commercial lighting sector focus on energy efficiency and smart lighting technologies (Technavio, 2024). Moreover, given global and national environmental pressures to reduce energy consumption, the component of "Energy Productivity" in Technological Intelligence is not merely a competitive advantage but a strategic requirement for market survival (Wang et al., 2021). These features indicate that the marketing intelligence model must be customized according to the industrial and environmental characteristics of each sector to possess the necessary efficiency.

In conclusion, the five dimensions of marketing intelligence identified in this study provide a comprehensive and practical framework for organizations in the lighting industry. Through the integration of market, customer, competitor, technology, and business knowledge, they can transform the new product development process from a random activity into an intelligent and

predictable system. This model is not only aligned with robust theoretical frameworks such as Market Orientation, Dynamic Capabilities, and Absorptive Capacity but by adding technological and business dimensions, it has enriched them for today's innovative environments.

The success of this model in Iran's lighting industry, which faces challenges such as sanctions, competition with imports, and pressure to reduce energy consumption, requires converting these five dimensions into operational organizational infrastructures. To achieve this goal, the following suggestions are presented:

First, lighting industry organizations should develop integrated data collection systems that consolidate market, customer, competitor, technology, and business data into a centralized analytical platform to enable cross-analysis and the discovery of hidden patterns. Second, given the pivotal role of Technological Intelligence in this industry, investment in university-industry collaborations is essential to access new smart and energy-efficient lighting technologies. Third, continuous staff training in market data analysis and interpretation of customer insights is critical for converting data into strategic decisions. Fourth, creating Key Performance Indicators (KPIs) for each of the five dimensions of marketing intelligence—such as response rate to customer feedback, speed of identifying emerging technologies, and sales forecast accuracy—is recommended for continuously measuring the effectiveness of this model. Fifth, future research should examine the moderating role of organizational factors—such as innovation culture, organizational structure, and transformational leadership—in the relationship between marketing intelligence and new product development success to gain a deeper understanding of the mechanisms affecting this model. Sixth, given the rapid technological developments in the lighting industry, it is suggested that the present model be tested in other environments, such as the automotive industry or consumer electronics, to assess its generalizability.

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ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.