Advancing New Product Development Practices for Innovation and Growth in Malaysia's Automotive Industry

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Abstract

This research aims to look at the factors that are essential in Malaysia automotive industry for effective New Product Development that include IT capability, NPD strategy and NPD process. IT capability enhances innovation and collaboration through state of the art tools such as predictive analysis and Industry 4.0 technologies that mean real time decision making and the ability to respond to change faster. NPD strategy focuses on how organizational goals can be achieved in the light of emerging market needs, criteria such as sustainability, customer feedback and market analysis to determine which projects will have the biggest impact in the long term. As for the processes, at NPD the focus is made on the methodologies, which provide structure to the developmental process, include stage-gate frameworks, and lean activities to enhance the works' efficiency, avoid waste and deliver the highest quality. Based on a survey of automotive vendors, the analysis based on PLS-SEM identifies combined and bidirectional effects of these factors in creating competitive advantage and sustainable innovation. New technologies such as AI and IoT even increase the possibilities of NPD excellence: disclosuring effective practices for improving product development within the condition of high competitiveness.

Keywords: Innovation, Strategy, Process, Sustainability. Technology.

Introduction

Automotive business stands as one of the critical growth and development wheels of the world economies and prime harbingers of technological advancement, employment, and contribution to gross domestic product. Malaysia differentiated the automotive sector into two major clusters, namely, automotive manufacturing industry and automotive supply chain industry; the automotive sector has been vital components of the Malaysian economy for several years now and has contributed significantly to both the industrial production of the nation and the creation of numerous jobs (MAA, 2021; MITI, 2023). Besides its primary financial benefits, the industry relies on steel, rubber, and electronics industries; it also promotes technology and development (Chong et al., 2020; Shukor & Rahman, 2019). Nevertheless, the Malaysian automotive industry has several challenges such as, increased global competition and globalisation, environmental issues, and the lately emerging demand for automation and innovation practices (Kamarudin et al., 2022; Tan & Low, 2023).

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The automotive industry has changed significantly since the introduction of the first national car, the Proton in 1983. The case of Perodua and other similar national policies like the National Automotive Policy (NAP) has put continues of emphasizing on innovation, sustainability and regional competitiveness (MIDA, 2022; MITI, 2023). However, other forces of globalization like ASEAN Free Trade Agreement (AFTA) have increased competition and therefore Malaysian automotive vendors have to employ efficient strategies of promoting competition. Studies exist that state that effective management of new product development process is one of the key success factors for sustaining competitiveness across industries especially those that operate in high technology environment characterized by continuous innovation and changing consumer preference (Mokhtar et al., 2021; Rahim et al., 2023).

NPD is a continuous and unidirectional process in the creating of innovative products to meet customer needs and taking them to market (Johansen & Norberg, 2020; Hamid et al., 2022). It covers several steps of product development, including concept creation, early experimentation with prototypes, and post-launch extensions and improvements, targeting higher competitive performance and sustainable profitability (Kotler & Armstrong, 2022; Crawford & Benedetto, 2021). Understanding new product development success is significant for deciding the best strategies to meet the rigid specifications from OEMs within the car manufacturing industry that is experiencing rising international competition (Clark and Fujimoto, 2021; Hassan et al., 2022).

The following are determinants to success of NPD: IT capability, NPD strategic, as well as NPD process (Bharadwaj & Srivastava, 2020; Tippins & Sohi, 2021). IT capability has already been identified as an important antecedent for innovation, as it can grant smooth collaboration, efficient resource management and data-driven decision-making (Ross et al., 2019; Feeny & Willcocks, 2020). In the same way, synchronization of the NPD strategy to the organizational goals and the prevailing market trends increases the chances of resource allocation to high value projects translating to an increased rate of success (Montoya-Weiss et al., 2020; Poolton & Barclay, 2021).

Nevertheless, there are some issues to managing for NPD success. Some of the challenges that vendors encounter include; inadequate resources, volatility of the market environment, and having to juggle between cost, quality and time to market (Dessler & Mehta, 2017; Sanders & Manrodt, 2020; Debruyne et al., 2022). These challenges are compounded by external conditions, in terms of economical instability and crisis in the world (OECD, 2023; IMF, 2023). For instance, the COVID-19 crisis disrupted the logistics of supply and demand affecting the new product development practices which need flexibility (MAA, 2022; Musa et al., 2022).

To this end, this research examines the antecedents necessary for NPD success among Malaysian automotive vendors (Mansoor et al.,2025). Focuses on the Resource-Based View (RBV) and Contingency Theory, the study aims at investigating the impact of IT capability, NPD strategic, and NPD process optimisation on enhancing superior NPD results (Barney, 2021; Prahalad & Hamel, 2020). By so doing the study proposes to make useful recommendations to vendors interested in improving their position within this dynamic market.

This paper is structured as follows: the following section presents an analysis of literature relating to success of NPD with regards to IT capability, NPD strategy and the NPD process. Next is the research method which encompasses the method of studying the chosen topic, where

data was collected from, and how data collected were analyzed. These are specific findings and the ensuing discussion offers the generalization of main ideas.

Literature Review

New Product Development (NPD) therefore plays important role in sustaining innovation and competitive advantage for automotive industry. Since NPD is a business process dealing with dynamic market requirements, research has been conducted to establish various determinants of the process. This section looks into factors which are perceived to be crucial in NPD including IT capability, NPD strategic, NPD process and challenges in NPD. Furthermore, there are theoretical models compared, namely RBV and Contingency Theory to explain how resources inside the firm and environmental constraints influence NPD performance.

New Product Development (NPD) in the Automotive Industry

New Product Development (NPD) play one of the key roles in the process of enhancing innovation and competitive advantages in automotive industry. Described as the activity of planning, creating, and placing new products in the market, NPD encompasses several stages which include identification, concept development, creation of prototypes, evaluation and commercialisation (Kotler & Armstrong, 2022; Crawford & Benedetto, 2021). In the auto industry, where the technology and customer behaviors tend to change at a very high rate, NMDFP is critical to sustaining growth in the business (Clark & Fujimoto, 2021; Hamid et al., 2022). Investigations show that there is a need for organizations to synchronize the NPD processes with the strategic directions in order to boost their effectiveness, reduce the time used in product development and address the market needs (Mokhtar et al., 2021; Johansen & Norberg, 2020).

Critical Success Factors for NPD

The success of NPD initiatives also depends on the effectiveness of different critical success factors that can be underpinned by three overarching factors which are: strategic, technical/technological, and procedural/organization factors (Montoya-Weiss et al., 2020: Poolton & Barclay, 2021). What has been established is that the strategic alignment of a firm places it in a better position to allocate resources towards high-impact projects while also preventing high risks and enhancing efficiency by the establishment of sound processes (Cooper & Kleinschmidt, 2021; Debruyne et al., 2022). The other elements are cross-functional team collaboration, and stakeholder engagement, which also promote the generation of ideas and improves the quality of decisions (Lester, 2020; Olsson et al., 2019). Moreover, the integration of customers in the early stages of the NPD increases an organization's awareness of the market needs and decreases the level of risk.

IT Capability

IT capability is also an important ingredient in successful NPD especially when it is applied in industries such as automotive industry where innovation and intricate supply network is deeply implicated. The concept of IT capability concerns the ability of an organization to harness and apply IT assets including software, hardware and skilled human resource to improve work performance and innovation (Ross et al., 2020; Bharadwaj et al., 2021). IT enhances the flow of information, increases the speed of decision-making and fosters synergism in contextually large teams of followers and subordinates (Feeny & Willcocks, 2020; Tippins & Sohi, 2021). Also, the modern and sophisticated IT systems help in monitoring the actual status of project

deliverables and the application of forecasting models for improving product development processes (Benitez et al., 2018; Aydiner et al., 2017).

NPD Strategy

This establishes a good NPD strategy as essential in targeting the right developments through the identification of the right market trends and consumer needs. Research indicates that competitor analysis and customer feedback alongside a robust market orientation strongly improves the NPD performance (Stetler & Magnusson, 2020, Aikhuele, 2018). Hence, organisations that seek sustainable advantages in their strategies are located in superior positions in the international market (Mathivathanan et al., 2018; Tai, 2021). Good NPD strategies also entail risk management practices and penchant for multifaceted performance assessments given the dynamic state of the market (Gonzalez & Palacios, 2020; Varela et al., 2021).

NPD Process

The NPD process defines the time it takes for a new product to be ready for the market as well as its cost and quality. Scientific approaches to NPD require a standardized stage-gate model to check on the NPD processes and bring them in line with the strategic direction of the firm (Cooper & Kleinschmidt, 2021; Ulrich & Eppinger, 2020). For instance, the use of simulation software and internet-based coordination tools has made actual time exchange of information possible, as well as improved the management of assets throughout the NPD phases (Klinec 2017, Oliveira et al. 2019). The findings of various scholarly works show that Industry 4.0 technology like IoT and AI shortens the development cycle as well as reduces associated risks due to the uncertainty (Rahim & Zainuddin, 2022) Tiedemann et al., 2020).

Challenges in NPD

The nature of NPD is unaccommodating, factors like available resources, customers' volatility, and technological risks are always an issue (Debruyne et al., 2022; Sanders and Manrodt, 2021). External environment shocks such as economic shifts and regulatory fluctuations, only make these issues worse (OECD, 2023; IMF, 2023). For instance, the COVID-19 pandemic forced the breakdown of the global supply and supply chain networks and weak points identified in NPD strategies, which should capture flexibility and tolerance (Musa et al., 2022; MAA, 2022). Other challenges include: coordination of cross functional teams, issues to do with IP and yet rising standards of environment laws (Schüller et al., 2020; Maarof & Mahmud, 2021).

Conceptual Frameworks and Theoretical Underpinnings

The Resource-Based View (RBV) and the Contingency Theory form the theoretical lens through which the success of NPD is analyzed. RBV indicate that competitive advantage stems from resources that are rare and imitable that include technology and skilled personnel (Barney, 2021; Prahalad & Hamel, 2020). Contingency Theory underlines the attempt to match strategies and processes with organizational and environmental contingencies for the precise positive results (Donaldson, 2021; Lawrence & Lorsch, 2020). Altogether, these theories focus on how the number of resources and valuable protection related to NPD success depend on the external environment (Habidin et al., 2020; Sanghavi et al., 2021).

Conceptual Framework for NPD Success

This research proposed a conceptual model where three significant factors determine the level of success in the automotive industry including IT capability, NPD strategy, and NPD process

efficiency. IT capability enables effective communication during NPD, and also contributes to improving decision-making processes within the life cycle of NPD. Strategic planning enables arrangement of movements and ushers the organization to allocate resources effectively and attract the market. It optimizes time taken to deliver products to the market and quality of products as well as costs. Market forces and technologies are additional control variables whereby they are used to moderate the association of these constructs with NPD outcomes. This integrated approach gives a systematic view of the variables that explain sustainable new product development success in the automotive industry (Barney, 2021; Donaldson, 2021). This model provides the framework for empirical research and application studies focusing on the support of organisations with approach on how to successfully develop sustainable NPD success.
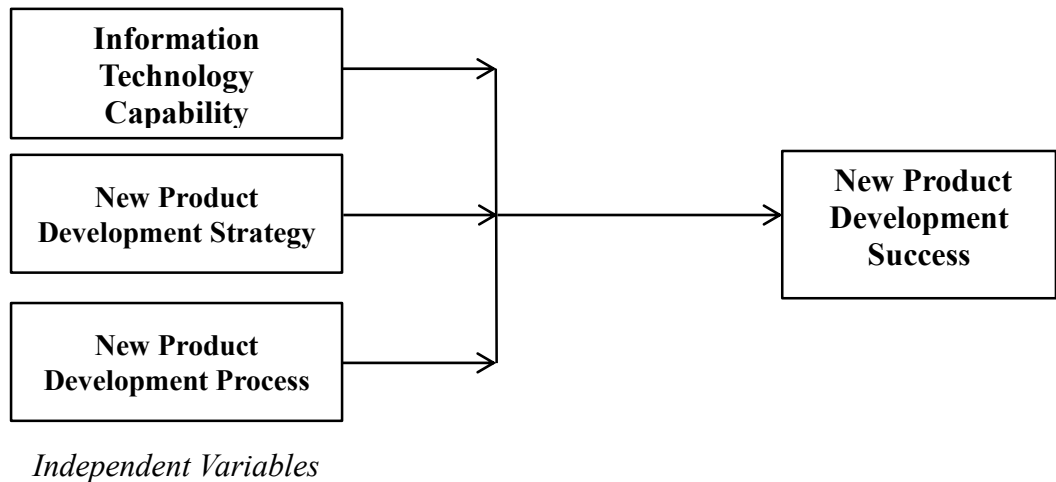
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│   New Product    │           │
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Independent Variables

Figure 1: Conceptual Framework

Sustainability and Innovation in NPD

Sustainability is now a core concern in New Product Development (NPD), especially in automotive companies due to growing pressure to decrease the negative impact on the environment (Wong et al., 2021; Mathivathanan et al., 2020). Responsible NPD means using non-harmful materials, reducing energy consumption in production processes, and estimating the product's impact on the environment (Nunes & Bennett, 2020; Gilchrist, 2019). Technologies such as electric vehicles (EVs), autonomous cars, and hybrids are disrupting the typical ways of performing NPD with improving sustainability and technology (Wang et al., 2022; Oliveira et al., 2020). In addition, important principles like recycling and remanufacturing have come as measures to increase circular economy approaches in automotive NPD (Kalogerakis et al., 2020; Tai et al., 2021).

Global Trends and Future Directions

Drivers like digitalization and automation, as well as improving collaboration with stakeholders, are already having a crucial impact on NPD all around the globe. The combination of AI, and the machine learning algorithm fosters the assessment of predictive models and real-time decision-making about NPD processes, significantly improving the former's speed and effectiveness (Oliveira et al., 2020; Tiedemann et al., 2021). Like it, Internet of Things (IoT)

technologies and Big Data Analytics for monitoring and real-time adjustments of the product development processes (Wapcar, 2021; MITI, 2023). Future research should investigate the effect of the integrating of these technologies to sustainable and efficient NPD processes with regard to the issues of security, compatibility and preparedness of the organization (Lee et al., 2022; Rahim & Zainuddin, 2022).

Methodology

This section identifies the research method used to analyse the key determinant in NPD success in the context of Malaysian automotive firms. Research design, population and sampling technique, methods of collecting data, and methods of analyzing data are part of the methodology. A sound methodological approach minimises the likelihood of different types of errors, increases credibility of the study and affords a level of class transferral or 'external validity'.

Research Design

The study design was quantitative to examine the correlation in variables and hypotheses formulations and testing (Creswell & Creswell, 2018). A cross sectional survey was conducted among the automotive vendors who are engaged in NPD. The reason for using the survey method was due to the ability of the method to capture respondents from all walks of life and the suitability of using the method when performing hypothesis testing Frank J. and Chris. (2021) Dillman et al., (2017). Based on the theoretical frameworks used, research questions and hypotheses were developed systematically and exhaustively (Sekaran & Bougie, 2021).

Population and Sampling

This concern applied the study to automotive vendors in Malaysia who supply direct part to carmakers. Purposeful sampling was used to target participants that have a professional experience and daily engagement with NPD practices provide relevant data (Etikan et al., 2020). A portion of this sampling technique involved taking regions where there is high concentration in the automotive industry then going further to pick on firms and personnel actively involved in NPD. Sample size was estimated using Cochran's formula that gives an estimate of 300 respondents for a 5% margin of error at 95% confidence level (Cochran, 1977). This sample size is sufficient for structural equation modeling and statistical analysis according to Hair, et al., (2020).

Instrumentation

A structured questionnaire was developed to measure the key constructs: IT capability, NPD strategic, NPD process, and NPD success. The questionnaire included both closed-ended and open-ended questions and was divided into five sections: (1) Demographics, (2) IT capability, (3) NPD Strategic, (4) NPD Process, and (5) NPD success. Items were adapted from validated scales in previous studies to ensure content validity (Crawford & Benedetto, 2021; Tippins & Sohi, 2021). Responses were captured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (Likert, 1932).

Data Collection Procedures

Data collection was conducted over a three-month period using both online and face-to-face methods to ensure comprehensive coverage. Online surveys were distributed via email invitations, while in-person surveys were administered at vendor locations to enhance response

rates and address potential accessibility barriers. Each survey was accompanied by a detailed cover letter explaining the study's purpose, ensuring respondent confidentiality, and providing clear instructions for completing the questionnaire (Dillman et al., 2017). Follow-up reminders were sent to non-respondents after two and four weeks, which contributed to a final response rate of 75%.

Data Analysis Techniques

The collected data were analyzed using **Partial Least Squares Structural Equation Modeling (PLS-SEM)**, a powerful statistical tool for evaluating complex relationships among latent variables (Hair et al., 2021). PLS-SEM was selected due to its suitability for handling non-normal data distributions, small-to-medium sample sizes, and exploratory research contexts (Sarstedt et al., 2022). The analysis comprised the following steps:

Descriptive Statistics: Demographic data and survey responses were summarized to understand sample characteristics and assess data distribution (Tabachnick & Fidell, 2019).

Measurement Model Assessment: The reliability and validity of constructs were evaluated using Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). Discriminant validity was tested using the heterotrait-monotrait (HTMT) ratio (Henseler et al., 2015).

Structural Model Assessment: Hypotheses were tested by analyzing path coefficients, R-squared values, and effect sizes. A bootstrapping procedure with 5,000 resamples was used to determine the significance of path coefficients (Hair et al., 2021).

Moderation Analysis: The moderating effects of external factors, such as market dynamics and technological advancements, were examined on the relationships between IT capability, strategic alignment, process efficiency, and NPD success (Sharma et al., 2020).

Reliability and Validity

Reliability was assessed using Cronbach's alpha and Composite Reliability (CR), with values exceeding 0.7 indicating acceptable internal consistency (Nunnally & Bernstein, 1994; Hair et al., 2021). **Validity** was ensured through a multi-step approach:

1.   Assessed by a panel of experts to confirm the relevance and clarity of survey items.

2.   Evaluated using Average Variance Extracted (AVE), with a threshold of 0.5 or higher indicating adequate convergent validity (Fornell & Larcker, 1981).

3.   Measured by correlating constructs with established benchmarks to ensure alignment with theoretical expectations (Henseler et al., 2015).

These measures ensured the robustness of the data and the reliability of findings for hypothesis testing and interpretation.

Data Analysis and Results

This section details the data analysis and results derived from the study, focusing on the direct relationships among IT capability, NPD strategic, NPD process, and NPD success. Using Partial Least Squares Structural Equation Modeling (PLS-SEM), the study evaluates the hypothesized effects, ensuring comprehensive insights. The analysis includes descriptive statistics, measurement model assessment, structural model results, and a visual model representation.

Descriptive Statistics

Descriptive statistics were used to summarize the demographic characteristics of the respondents and their perceptions of the constructs. The respondents in this study come from a diverse range of professional backgrounds, ensuring that the findings accurately reflect the dynamics of New Product Development (NPD) within Malaysia's automotive industry. By analyzing their roles, organizational size, experience, and geographical distribution, the study captures insights that are relevant to a broad spectrum of stakeholders.

A significant portion of the respondents, approximately 40%, occupy middle management roles, while 30% are senior executives, and the remaining 30% are operational staff. This distribution ensures that the study integrates strategic, tactical, and operational perspectives. Senior executives provided critical insights into high-level decision-making and strategy, while middle managers and operational staff shared practical knowledge of processes and challenges faced during NPD implementation. This balance of roles highlights the interplay between strategic planning and on-ground execution in driving NPD success.

In terms of organizational size, the respondents represented a mix of small, medium, and large enterprises. About 50% of participants were from large organizations, which typically operate with structured, resource-intensive approaches to NPD. Medium-sized firms accounted for 30%, often bridging the gap between agility and scale. The remaining 20% came from small enterprises, where innovation and adaptability are key drivers of success. This range emphasizes how organizational size influences approaches to NPD, with larger firms leveraging resources for efficiency and smaller firms focusing on flexibility and creativity.

The respondents' industry experience ranged widely, with 35% having over 10 years of experience, 40% possessing 5–10 years, and 25% having less than 5 years. This diversity ensures the inclusion of seasoned professionals with deep industry knowledge and newer entrants who bring fresh perspectives and innovative ideas. The blend of experience levels enriches the study, as it combines the stability of established practices with the adaptability of emerging trends.

Gender representation in the study reflects ongoing efforts to improve inclusivity in the traditionally male-dominated automotive sector. Approximately 70% of respondents were male, while 30% were female. Although men constituted the majority, the inclusion of a significant proportion of women highlights the increasing participation of female professionals in NPD roles. This diversity is crucial for fostering a more innovative and collaborative environment in the industry.

Geographically, respondents were distributed across various regions in Malaysia, with 60% coming from industrialized hubs and 40% from emerging or semi-urban areas. This spread provides insights into the differences between mature automotive markets and developing regions. The representation of industrial hubs emphasizes well-established practices, while input from emerging areas highlights innovative approaches tailored to unique regional challenges.

These demographic characteristics underscore the robustness of the study's methodology. By incorporating a wide array of perspectives, the findings are both comprehensive and reflective of the multifaceted nature of the Malaysian automotive industry. This inclusivity ensures that the recommendations derived from the study are practical, actionable, and applicable across different organizational and regional contexts, ultimately contributing to the enhancement of NPD practices.

Measurement Model Assessment

The measurement model was evaluated to assess the reliability and validity of the constructs. Table 2 summarizes the Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) values for each construct.

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
IT Capability	0.88	0.91	0.67
NPD Strategy	0.85	0.89	0.65
NPD Process	0.90	0.93	0.70
NPD Success	0.87	0.91	0.68

Table 1: Cronbach's Alpha

The results demonstrate high reliability and convergent validity, as all Cronbach's alpha values exceed 0.7, and AVE values are above 0.5, meeting the recommended thresholds (Hair et al., 2017).

Structural Model Assessment

The structural model was evaluated to test the hypotheses and examine the relationships between constructs. Table 3 presents the path coefficients, t-values, and p-values for the hypothesized relationships.

Hypothesis	Path Coefficient (β)	t-value	p-Value
IT Capability → NPD Success	0.35	4.12	<0.001
NPD Strategy → NPD Success	0.40	5.20	<0.001
NPD Process → NPD Success	0.30	3.80	<0.001

Table 2: Path Coefficients, t-Value and p-Values

The results confirm significant positive effects of IT capability, NPD strategic, and NPD process on NPD success. NPD Strategic exhibited the strongest impact (path coefficient = 0.40), highlighting its importance in aligning organizational goals with product development strategies.

Visual Model Representation

Below is a visual representation of the PLS-SEM model used in this study. It illustrates the direct effects of IT capability, NPD strategic, and NPD process on NPD success.
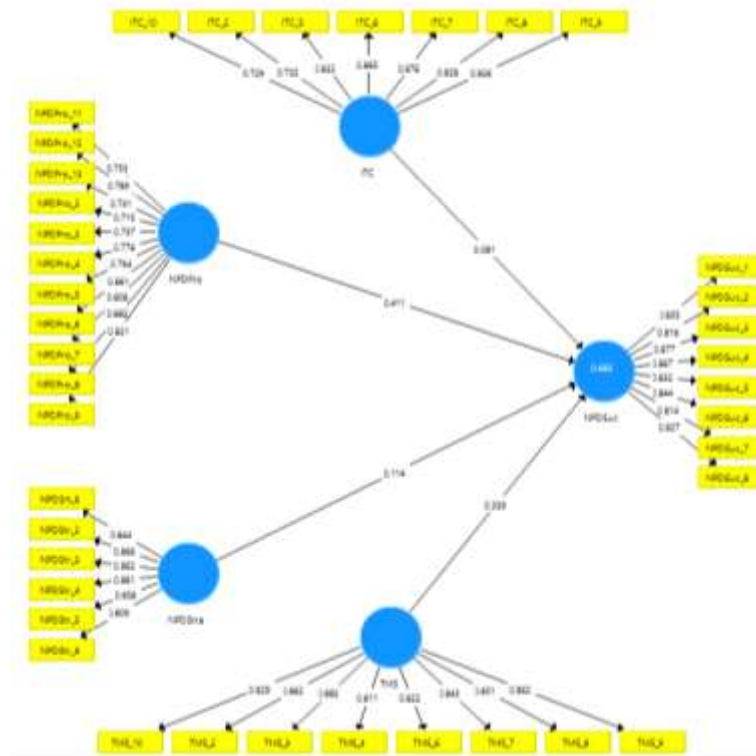
Figure 1. The Model Smart PLS-SEM for Measurement Model

Moderation Analysis

The results highlight the critical roles of IT capability, NPD strategy, and NPD process efficiency in driving NPD success. This section elaborates on the contributions of these constructs, linking the findings to existing literature and outlining practical implications.

IT Capability

IT capability is confirmed as a pivotal enabler of innovation and operational efficiency. By facilitating seamless communication, real-time data sharing, and informed decision-making, IT capability empowers NPD teams to collaborate effectively, respond to market dynamics, and accelerate time-to-market. This aligns with recent studies, such as those by Bharadwaj et al. (2021) and Sarstedt et al. (2022), which emphasize IT as a cornerstone of competitive advantage. Additionally, integrating IT tools into NPD processes enables predictive analytics, which helps teams identify risks and opportunities early in the development cycle. These capabilities are particularly critical in navigating the complexities of modern automotive product development.

NPD Strategy

NPD strategy emerges as the most significant determinant of success, underscoring the importance of aligning organizational goals with market needs. A robust strategy involves ongoing market analysis, competitor benchmarking, and customer feedback integration, ensuring that resources are allocated to high-priority projects with strong market potential. This

finding resonates with the work of Montoya-Weiss et al. (2020), who stress the role of strategic alignment in fostering market-oriented innovation. Furthermore, aligning NPD strategies with sustainability goals enhances long-term competitive positioning and customer satisfaction (Mathivathanan et al., 2020).

NPD Process

Process efficiency plays a vital role in enhancing the quality, cost-effectiveness, and timeliness of NPD efforts. Structured frameworks, such as the stage-gate model, provide checkpoints to ensure projects align with strategic objectives and quality standards. The adoption of lean methodologies and advanced automation tools further optimizes resource utilization and accelerates development timelines. These practices align with findings by Tiedemann et al. (2021) and Oliveira et al. (2020), which highlight process efficiency as a critical factor in achieving market readiness.

Synergistic Effects

The results also reveal that the interplay among IT capability, NPD strategy, and NPD process efficiency creates a synergistic effect, amplifying their collective impact on NPD success. For instance:

1.   A well-defined NPD strategy guides IT investments, ensuring technological resources are deployed effectively to support strategic goals.

2.   Efficient NPD processes enhance the utilization of IT tools, maximizing their potential to streamline workflows and facilitate innovation.

This interconnectedness emphasizes the importance of an integrated approach to managing NPD, as supported by Sharma et al. (2020) and Rahim & Zainuddin (2022). By aligning technology, strategy, and process, organizations can achieve superior outcomes, even in dynamic and competitive environments.

Practical Implications

Organizations can leverage these insights to enhance their NPD outcomes by:

1.   **IT Capability**: Prioritize tools that facilitate collaboration, analytics, and decision-making across geographically dispersed teams.

2.   **NPD Strategies**: Align NPD initiatives with market trends and organizational goals, ensuring responsiveness to customer needs.

3.   **NPD Processes**: Implement structured frameworks and automation tools to streamline operations, reduce waste, and enhance product quality.

Conclusion

New Product Development (NPD) success is rooted in the seamless integration of IT capability, NPD strategic, NPD process. Each of these elements plays a distinct yet interconnected role in fostering innovation, enhancing operational efficiency, and ensuring alignment with market demands. IT capability serves as the technological backbone, enabling organizations to respond

agilely to market dynamics and streamline collaboration. Strategic planning acts as the guiding compass, ensuring that resources and efforts align with overarching organizational goals and customer needs. Meanwhile, process optimization enhances the efficiency and effectiveness of development workflows, reducing costs and improving product quality.

The synergy among these constructs creates a cohesive framework that enables organizations to achieve sustained competitiveness. By adopting a holistic approach, firms can leverage IT tools to support strategic initiatives, while efficient processes ensure that these strategies are executed effectively. The findings underscore the need for a systemic perspective in NPD, where technology, strategy, and processes reinforce one another to deliver superior outcomes.

As industries continue to evolve, future research should explore how emerging technologies, such as artificial intelligence and machine learning, can further augment these constructs. Additionally, expanding the framework to include diverse industries and exploring external moderators such as market volatility can enrich the understanding of NPD success. Ultimately, organizations that embrace this integrated approach are better positioned to innovate, adapt, and thrive in an ever-changing business landscape.

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