

Article

Quality of Product size as a Strategy of Design Innovation

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Abstract: This study investigates the effects that product quality and design innovation strategy have on small and medium-sized businesses (SMEs). A number of important problems are identified, including a lack of creativity, higher production costs, and copyright issues. The main emphasis is on how improving the shape of a product can increase its marketability and competitiveness through redesigning its design. A mixed-methods approach using factor analysis and surveys is used to evaluate the relationship between innovation strategy and product quality. The results highlight the critical role that strategic design and interdisciplinary collaboration play in enhancing product utility, user engagement, and brand uniqueness. The study's final conclusion is that SMEs can significantly improve their competitiveness by adopting holistic design innovation strategies that address the functional and aesthetic aspects of products. The applications call for the development of conditions that support efficient teamwork, incorporate client feedback, and leverage technology advancements to maintain innovation and market relevance.

Introduction

For an organization to succeed, innovation is crucial. Innovation strategies when used properly can boost an organization's competitiveness and add value for its consumers and shareholders (Baker, Grinstein, & Harmancioglu, 2015) (Rubera & Kirca, 2017). As corporate executives create and implement more effective and efficient procedures for cutting costs or promoting the development of better products, innovation can also result in higher organizational performance and income (Chowhan, 2016; Simester, 2016). Any given innovation's success could be fleeting, thus it's critical to foster an innovative culture within businesses if they want to maintain their competitive edge and increase their profit margins (Ferreira, Fernandes, Alves, & Raposo, 2015; Villan, da Silva, & Camilo, 2016). To improve corporate performance, executives in the business world should work to cultivate an innovative culture inside their companies. In order to advance toward cutting-edge development and boost productivity as well as their ability to compete in their particular marketplaces, organizations can benefit from innovative efforts (North & Kumta, 2018). Leaders of small and medium-sized businesses (SMEs) frequently lack the funding necessary to implement innovation strategies because of the expenses involved in making new adjustments (Herrmann & Nadkarni, 2014). Innovation techniques can help organizations get a competitive edge in a market and potentially boost profits in the fast-paced global business landscape (Prajogo, 2016; Visnjic, Wiengarten, & Neely, 2016). A strategic endeavor promotes improvements in products and processes. Consequently, interaction with suppliers and customers effectively promotes creative performance.

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Effective innovation management requires tying innovation to strategy. To help businesses adapt to their surroundings, strategy outlines capital, commodity, process, and gadget design. This gives organizations the ability to decide what tasks and roles to assign to certain projects. A clear conceptual direction is necessary for an innovation to be effective. The use of creativity by an organization to carry out its business plan is indicated by its innovation policy (Meeus & Oerlemans, 2000) (Gilbert, 1994).

Statement of Problem

In line with the goals of Saudi Vision 2030, the value of product design and development cannot be overemphasized, especially when it comes to the aesthetic and tangible qualities of a product. These features are essential in captivating and satisfying consumers, particularly in goal of supporting Small and Medium Enterprises (SMEs). Even though product shape plays a crucial role, many businesses struggle with developing creative innovative layout that effectively integrate shape to improve usability, boost sales, and enhance brand recognition. This lack of satisfactory not only hinders success in highly competitive environments but also affects how users interact with and adopt new products. It is imperative to acknowledge the importance of a comprehensive grasp and effective utilisation of design innovation strategies when the form of a product plays a significant role in both its visual appeal and its functionality, user interaction, and brand messaging. The primary task is to identify, develop, and employ design strategies that use product shape to meet developing market demands and consumer preferences, while also considering the limitations of sustainability and manufacturability. A successful approach to design innovation is essential in enhancing and optimizing product development processes. This approach should contain collaboration across different disciplines, taking into account the different viewpoints of consumers, promoting technical aspects, and facilitating creative exploration.

Literature Review

Abbasi, D (2020) Rapid technological advancement, shorter product life cycles, and an influx of new businesses are all causing incumbents to struggle to keep up with the demand. To thrive, expand, and succeed in the long run in this market, it is essential to constantly innovate and create new products. Crossan, M.M (2010) both new and old companies can benefit from innovation if they want to gain and keep a competitive edge. Prajogo, D.I. (2016) it promotes development and has inherent advantages for the economy, health, and environment. By combining their internal information with that of their suppliers, consumers, rivals, academic institutions, and government bodies, SMEs can innovate. Product and process innovation within SMEs are thus directly impacted by external information. Orellano, M (2021) Universities and government organizations contribute a wealth of knowledge that greatly influences process and product innovation, respectively. Morales, P.; Flikkema, M (2021) Customers and government agencies play a role in enhancing companies' capabilities. Oyewo, B (2022) the term "innovation" refers to the process of learning, linking, and investing in order to create or utilize newly acquired information to create products, services, or procedures that aim to evolving consumer demands. When it comes to innovation, though, R&D isn't enough to ensure success. To innovate, businesses also require cross-industry and intra-industry knowledge transmission, integration, and cooperation. Mondal, S (2023) more competition has arrived with globalization, and one way for businesses to stay competitive is through developing new products. Azevedo, M (2021) Portuguese micro- and small-scale business owners rank innovation as the third most important factor in internationalization, behind "favorable growth prospects in a new market" and "customer follow-up." This finding is in line with the literature review's findings on economies in transition. Allen, G.J (2022) In order to accomplish this, it is crucial to seek out ways to improve each product or cycle of incremental innovation. Ali, J. (2021) SMEs aim to enhance the product quality through innovation, in contrast to large corporations that concentrate on diversification through the addition of new inputs, attributes, and technologies. All food and agribusiness enterprises, even SMEs, are impacted by internal market externalities, trade rules, supplier collaboration, cooperation for innovation, membership in a trade association, and research and development. Agustia, D (2022) Companies can achieve

significant improvements in several dimensions and stay competitive and responsive by associating innovative product development in accordance with TQM, specifically assessment, ideation, design, and ongoing enhancement of products. In this approach, small and medium-sized enterprises (SMEs) are able to provide customers with superior products and services that exceed their expectations. Zapata-Roldan, F (2022) the manufacturing sector is more likely to innovate, according to studies, and there are statistically significant differences in the degrees to which the element "access to new technologies or resources" is important. Sergeevna, B.L (2019). By maximizing the utilization of scientific resources, technological reserves, development, and production capacity, knowledge intensive organizations can achieve a double win: lower unproductive costs and higher product quality through innovative product management. It also makes it possible to gather data regarding the present development process and the company overall, which is crucial for making strategic decisions in a timely manner. Annunen, P (2021) new product development (NPD) has the potential to provide substantial revenue, profit, and an edge over the competition for businesses. Yin, S (2019) Innovation and new product development not only bring in customers and money, but they also provide internal benefits for businesses, such as cutting costs with technology that is developed in-house. Cooper, R.G (2001) Therefore, it has become an important and difficult problem for company development to figure out how to apply thorough evaluations of NPD and the product innovation process to reduce development risks and increase product success rates. According to Subrahmanya (2012), two empirical "Innovation Projects" carried out in the past ten years in Bangalore, a well-known Indian high-tech metropolis, found that small and medium-sized enterprises (SMEs) in India tend to innovate incrementally, driven by customer feedback and involving innovations in both products and processes. In order to gain a competitive edge and expand their market value, small businesses can employ innovation tactics. According to Karlsson, Larsson, & Öhrwall Rönnbäck (2018), Riyadi & Sumardi (2017), Vendrell-Herrero, Gomes, Bustinza, & Mellahi (2018), and Urban & Von Hippel (1988), innovations can be a way for a firm to generate value in its products or services as long as they are both helpful and cost-appropriate. According to Peter (1985) and others, a corporation can raise its market value and stay ahead of the competition by implementing strategies for innovative technologies and processes. Sources cited include Hua and Wemmerlöv (2006), Jajja, Kannan, Brah, and Hassan (2017), and Feng, Prajogo, Chuan Tan, and Sohal (2006). According to (Subrahmanya, 2012), businesses can utilize innovative methods to do four things: (a) keep clients from rejecting their products or services after they've been offered to them, (b) lower manufacturing costs, (c) boost quality, and (d) break into new markets. Companies can gain a competitive edge and higher market value by using innovation methods. In order to cope with market unpredictability, business executives might implement innovative techniques. According to Yazdani and Murad (2015), companies can use innovation as a strategy to stay ahead of the competition. When rivals implement new market forces and adopt or develop creative ideas, it can be difficult for organizations that prioritize innovation and depend on it for competitive benefits (Rogers, Singhal, & Quinlan, 2019). As a part of innovation practice, innovation strategy is crucial. The study's technique for obtaining the innovation strategy aspects is described in the next section.

Research Objectives

- The objective of this paper is to examine the quality of the product as a design innovation strategy of SMEs in Saudi Arabia

Research Methodology

Methods of Data Collection	<p>An online questionnaire survey was conducted to ensure a broader reach and engagement. Participants were provided with the opportunity to complete a web-based survey form via email invitations or online platforms.</p> <p>A targeted questionnaire survey method was implemented to engage individuals who may not have access to or choose online surveys. Investigators conducted the poll in person with participants through face-to-face interactions, like conferences or seminars, ensuring personal involvement and the opportunity for clarifications or novel viewpoints.</p>
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Development of Questionnaire	The form of survey used in the research was meticulously created using the findings of an earlier study. This approach ensured that the survey items were relevant, comprehensive, and aligned with the study's objectives. The survey instrument likely covered various aspects related to the management of innovation, with a particular focus on the effectiveness of product dimensions in driving design innovation.
Respondents	The technique of data collection involved distributing questionnaires to designated participants, either through online platforms or face-to-face interactions, ensuring the prompt gathering of responses. Afterwards, the collected data was carefully managed and organised to facilitate smooth analysis and interpretation.

A self-monitored online and personal questionnaire survey was used to acquire data for this paper's purpose. An earlier study informed the development of the questionnaire, which included a single section on innovation strategy-related factors (statements). A 5-point Likert scale, with "strongly disagree" serving as the anchor point, was used to set the questions. We asked small and medium-sized enterprise (SME) owners, managers, and supervisors to rank the relevance of various innovation management variables. Online distribution of 120 surveys was carried out. We use e-mail, phone to follow up on responses. There were 98 replies, or 81 percent of the total. We checked the collected answers for any blanks. In the end, data analysis was conducted using 98 valid responses.

Data analysis

Variables	No.of.Items	Cronbach Alpha Value
Innovation Strategy and Quality of the Product	14	0.789

From the above table "Innovation Strategy and Quality of the Product" indicates that the 14-item scale is a reliable measure with a Cronbach's Alpha value of 0.789. This supports the use of this scale in further research or practical applications related to innovation strategies and product quality assessment, ensuring that the data collected will be consistent and dependable

Table 2 KMO and Bartlett's Test of Innovation Strategy and Quality of the Product Variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.876
Bartlett's Test of Sphericity	Approx. Chi-Square	1251.138
	df	21
	P value	0.000

Table 2 reveals that the KMO measure of sampling adequacy is observed as 0.876 showing higher value compared to the threshold value of 0.600, thereby the KMO value of 0.876 indicates that factor analysis is best applicable to analysing of 12 innovation strategy and product quality variables. The KMO value also reveals a strong sign of sampling adequacy for the present data set. Similarly, Bartlett's test of sphericity was applied to examine the relevance of the data for factor analysis of 12 innovation strategy and product quality variables. Table shows that the test value of 1251.138, is highly significant ($P < 0.000$). Hence the data is highly fit for factorisation of 12 innovation strategy and product quality variables. Consequently, all the above measures show that the data set is highly fit for applying factor analysis.

Table 3 Factor Analysis				
Items	Factor Loadings	% of Variance	No.of.items	Cronbach Alpha
IS-1	0.856	22.18	4	0.876
IS-2	0.780			
IS-3	0.752			
IS-4	0.872			
IS-5	0.821	12.37	4	0.791
IS-6	0.765			
QP-1	0.742			
QP-2	0.752			
QP-3	0.812	10.56	6	0.723
QP-4	0.834			
QP-5	0.778			
QP-6	0.767			

The initial factor pertains to "Innovation Strategy" and comprises 4 elements that significantly contribute to this factor. The substantial factor loadings (ranging from 0.752 to 0.872) demonstrate a strong correlation of these elements with the fundamental construct. This factor accounts for 22.18% of the overall variance, highlighting its significant impact within the dataset. The Cronbach's Alpha value of 0.876 indicates a high level of reliability, signifying that the elements consistently gauge the innovation strategy construct. The second factor comprises elements IS-5 and IS-6 derived from the innovation strategy, as well as QP-1 and QP-2 related to product quality. The factor loadings demonstrate important strength, and a Cronbach's Alpha value of 0.791 suggests a high level of reliability. This collective evidence indicates that these items collectively assess an additional dimension of innovation strategy associated with product quality. The third factor is predominantly centered on the "Quality of Product," with four items making notable contributions to this factor. The factor loadings (0.767 to 0.834) validate a robust association with the underlying construct. This particular factor accounts for 10.56% of the overall variance. The Cronbach's Alpha value of 0.723 shows acceptable reliability, and consistently assess the aspect of product quality.

7. Discussion

The KMO (Kaiser-Meyer-Olkin) measure of sampling adequacy stands at 0.876, beyond the threshold of 0.600. This substantial KMO value implies the adequacy of the sample for conducting factor analysis, revealing strong partial correlations among the variables, thus establishing the suitability of factor analysis for this particular dataset. Furthermore, Bartlett's Test of Sphericity, exhibiting an estimated chi-square value of 1251.138 and a significance level of $P < 0.000$, validates that the inter-variable correlations are of significant magnitude for factor analysis. These assessments collectively affirm that the dataset is optimally configured for factor analysis, furnishing a solid foundation for scrutinizing the fundamental structure of innovation strategy and product quality variables. The factor of Innovation Strategy encompasses the most significant proportion of variability and comprises elements that exhibit a strong correlation with the innovation strategy concept. The considerable reliability (with a Cronbach's Alpha

value of 0.876) suggests that these elements consistently gauge the innovation strategy, underscoring its pivotal role in comprehending the formulation and execution of innovation strategies. This factor innovation strategy and product quality components from innovation strategy and product quality, implying an interconnectedness between these constructs. The high reliability (Cronbach's Alpha of 0.791) demonstrates that these measures effectively capture a supplementary aspect of innovation strategy closely linked to product quality. Quality of product factor predominantly focuses on the quality of the product and elucidates a substantial proportion of the variability. The reliability, indicated by Cronbach's Alpha of 0.723, is deemed satisfactory, thereby verifying that these items consistently assess the aspect of product quality. This factor underscores the significance of product quality within the realm of innovation strategy.

8. Conclusion

Our study examined the competitive dynamics and main drivers of foreign market entry for small and medium-sized exporting enterprises, particularly focusing on how they decided to focus their efforts on process innovation. Valuable insights regarding the impact of the product shape on customer appeal, satisfaction, and brand distinctiveness have been revealed through research on its role in promoting design innovation. The shape of a product transcends mere aesthetic considerations; it emerges as a crucial element in enhancing product functionality, user interaction, and market competitiveness, as indicated by an extensive study involving feedback from SMEs in the UK and Saudi Arabia. The interview findings clearly demonstrate that integrating innovative shape concepts into product development can significantly enhance both the aesthetics and utility of a product. According to numerous interviewees, an unconventional shape can differentiate a product from competitors, especially in markets where items tend to resemble one another. Research suggests that companies that prioritize innovative form in their design process often yield the most successful products and loyal customer bases. By incorporating insights from various industries, this study further underscores the significance of interdisciplinary collaboration. In addressing sustainability and manufacturability challenges, the strategic process must encompass the fusion of technology, customer perspectives, and creative design thinking. Overall, organizations aiming to distinguish themselves in competitive markets would be wise to strategically leverage product shape as a fundamental aspect of design innovation. Companies should cultivate environments conducive to effective interdisciplinary teamwork to allow product design to progress in response to emerging technologies and customer input.

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