Journal of Information Systems Engineering and Management
2024, 9(4s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Strategic Technological Entrepreneurship Innovation and its Impact on SME's: A Cross-Case Analytical Study in the Indian Context

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ARTICLE INFO

Received: 18 Aug 2024
Revised: 10 Sept 2024
Accepted: 28 Oct 2024

ABSTRACT

The rapid advancements in technological innovation have influenced business operations across industries, and Entrepreneur of SMEs in particular have recognized the strategic importance of technological innovation to enhance growth and competitiveness. In this paper, we study the technological innovations in SME's using a case study-based approach to assess their impact based on five dimensions and identify two factors: product innovation and product diversification, which were validated using in-depth interviews and observations with firms in our research methodology.

The findings of this paper provide valuable insights into the strategic technological innovations used by the SME firms and how they are impacting them. They highlight the real-time practical operational aspects of the firms and how they are utilizing technological innovations in their businesses.

Keywords: strategy, innovation, technological, SME's,Entrepreneurship

1. INTRODUCTION

Innovations in technology provide fresh strategies for making the most of limited resources in a sustainable way (Klewitz and Hansen, 2014; Rennings, 2000). There are several important facets of a business, including its ability to compete and grow sustainably, as well as its overall success (Chatzoglou and Chatzoudes, 2018; Martnez-Alonso et al., 2022; Razavi et al., 2016; Santana et al., 2015). (R&D), innovation models and management, and the effects of innovation have all been the subject of studies in recent years (Akbari et al., 2020).

Previous literature studies have acknowledged that is necessary to research on the technical innovation behavior of SMEs (Hilmersson and Hilmersson, 2021).

The need of technical innovation for success and SME's survival has already been established by numerous studies (Sharif and Huang, 2012). It is noted that technological innovation is seen as a driver of sustainability practices (Ramirez-Orellana et al., 2022) and expanding in markets leading to improved performance (Garca-Lopera et al., 2022) and business growth (SMEs), often resource-constrained (Musteen et al., 2010). (Donbesuur et al., 2020).

Specifically, SMEs may be able to contribute to the success of innovations because of their unique talents and resources (Barney, 1991). (Sirmon and Hitt, 2003). The sales growth rates of (SMEs) who engage in both exporting and exploratory and/or exploitative technical cooperation are higher than those of SMEs that engage in either exporting or collaboration alone, or in neither (Mara Teresa Bolvar-Ramos; Joan-Llus Capelleras, 2020). Small and medium-sized businesses (SMEs) face significant difficulty in securing and developing their innovation capability (Moon-Koo Kim; Jong-Hyun Park; Jong-Hyun Paik, 2018). Process captured, which occurs at both intra- and inter-organizational levels, is also crucial to the growth of innovation ecosystems (Agnieszka Radziwon, Marcel Bogers, and Arne Bilberg, 2017). Because of their precarious position in the market, (SMEs) may look to bolster their meagre

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2024, 9(4s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

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resources and lessen their exposure to risk by adopting coopetition techniques (Julien Granata, Mickal Géraudel, Katherine Gundolf, Johanna Gast, and Pierre Marquès, 2016).

2. LITERATURE REVIEW

2.1 About (SME) in India:

Small firms in India's booming industrial economy play a crucial role. Exports, jobs, and output have all grown in this sector over the years. Mali (1998) said that in the current global world context, SMEs must improve in the areas of diversification, development, marketing, upgradation of technology in order to compete.

Bala Subrahmanya (2004) research examined how economic reforms affected low- and medium-volume enterprises. He said that the small-scale sector's unit growth, employment, output, and exports have all been hampered by limitations. He suggested that India's small businesses boost their technological and financial capabilities to compete on a global basis.

Using data on units, employment, output, and exports, Shastri et al. (2011) assessed the effects of domestic and globalization on SME firms.

2.2 Most Salient Characteristics of SMEs:

SMEs are typically the product of initiative and expertise of an entrepreneuror group of entrepreneurs capitalizing on a shared set of abilities. There are other SMEs that are being founded for the sole purpose of providing for their families. Many commercial and retail establishments fall into this category. Some of the most notable features' classifications as per the Government of India can be seen as:

CLASSIFICATION	MICRO	SMALL	MEDIUM
Enterprise and Services	Investment in the Plant not more than Rs 1 Crore and not more than Rs 5 core Annual turnover	Investment in the Plant not more than Rs 10 Crore and not more than Rs 50 core Annual turnover	Investment in the Plant not more than Rs 50 Crore and not more than Rs 250 core Annual turnover

2.3 Innovation as a Concept

To keep up with shifting consumer preferences, technological developments, and competitive landscapes, businesses must constantly innovate new goods, processes, and systems (Utterback, 1994).

Myers and Marquis (1969) noted that innovation is not a discrete event but rather a series of interconnected steps. It is more than just producing something novel to think about, making something fresh to use, or creating a new market. Everything is working together in this process. To keep up with shifting consumer preferences, technological developments, and competitive landscapes, businesses must constantly innovate new goods, processes, and systems (Utterback, 1994). Myers and Marquis (1969) noted that innovation is not a discrete event but rather a series of interconnected steps. It is more than just producing something novel to think about, making something fresh to use, or creating a new market. Everything is working together in this process.

(Clark,1987). The magnitude of an innovation is the total number of unique changes made (Dewar & Dutton, 1986). Businesses that wish to gain a major competitive edge through innovation should implement innovative ideas and technology that are tailored to their specific strategic goals (Neckupulos, 1993). Research findings agree on one point: to maintain a competitive advantage, a company must continually improve its infrastructure and push the boundaries of innovation.

2.4 Models of Innovation

According to the interactive model of innovation (Rothwell & Zegveld, 1985), innovative ideas emerge when these three factors—the existing market, the existing scientific knowledge, and the existing organizational capacities—

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interact. The process can be broken down into several discrete steps, each of which serves a unique but interrelated purpose. Trottt's (1998) innovation management paradigm emphasizes the significance of cross-functional collaboration, noting that contacts with the external environment are as vital as those within internal departments such as marketing, R&D, operations, and strategy. Research and development concentrate their efforts on factors beyond the company's control, such as scientific and technical progress, rivals, suppliers, customers, and academic institutions. Societal requirements, rival firms, suppliers, partnerships, distributors, end-users, and strategic allies are just some of the outside influences that marketers consider. Managers and executives will talk to a wide range of companies and organizations outside the company, including suppliers, customers, and government agencies.

The new product development network model emphasizes the integration of marketing, research and development, and production in the creation of new products. This information is amassed over time as the project evolves from its inception as a concept (technological breakthrough or market opportunity). This procedure is the backbone upon which network models are built (Nonaka & Takeuchi, 1995). Effective product creation relies on a combination of internal processes and external connections, both of which are emphasized here. The product development process can be boosted by bringing in outside expertise through external links (Liker et al., 1995).

In most NPD models, knowledge is accumulated over time. According to Trott (1998), the initial step in NPD is gathering information. The R&D department's technology monitoring, the hiring of talented people, the networking of organization employees (gatekeepers), the licensing of contract research and patents, the company's own market research, third-party research firms, customers, suppliers, competitors, publications, databases, internal RD, and conferences are just some of the many sources that contribute to the organization's knowledge base.

2.5 Linking Strategy to Innovation Projects

In most research, the unit of analysis has tended to polarize into, on the one hand, the detailed level of discrete innovations and, on the other hand, the more general level of industries and national economies. It is striking, however, that neither the extensive National Science Foundation review of the innovation literature (Tornatsky et al., 1983) nor the Sussex University Science Policy Research Unit's research bibliography (Henwood and Thomas, 1984) have a chapter on strategy; this reflects the dominance of the single innovation project as the unit of analysis in this literature (Richard Rosenbloom and Robert A. Burgelman, 1989). This gap at the firm level has limited the value of research results for strategy analysis and how companies can develop and maintain a unity of purpose and direction in their development and deployment of technology. Broadly, strategic, and operational issues are both present in most activities undertaken in the manager's workday (Henry, Munzaberg, 1975).

It is through their involvement in operating issues that most managers both refine their strategic maps and influence the strategic orientation of their organization. Technology strategy, at its heart, is a reactor of capabilities developed through projects. Implementation projects draw on and refine development projects and contribute to the knowledge base of the organization (Jaikumar R. 1986). Technology strategy is a map of the desired evolution of that knowledge base.

2.6 Cross-Functionality of Technology Strategy

The strategy should be a compass heading rather than a detailed itinerary—an overall direction that leaves the organization free to exploit opportunities as they arise. Functional strategies help ensure the myriad daily decisions made in each function are consistent with the business strategy. An issue we need to keep in mind is the distinction between content and process. Quinin (1986, 88) has argued that the process is the content since the rest is likely to be a matter of ex post rationalizing or symbolic exhortation. An organization has a myriad of specific technologies.

The generic technology domain concepts such as distinctive technological competencies (DTC) and strategic technology areas (STA) help management characterize these technologies at technologically and managerially relevant levels of aggregation. This also serves as a strategic handle on the contours of the organization's technology activities. Technological progress is gradual and relies on the steady accumulation of knowledge (Rakesh Bsanr & Pankaj Chandra, 1998). Therefore, capabilities are progressively developed over time.

2.7 Technology Strategy-Innovation Relationship

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Projects, either process- or product-related, represent varying degrees of innovation, depending on the nature or degree of competitive advantage sought to be achieved. Innovations are driven by a) the technology supply chain; b) interaction among functional groups; and c) complementary assets for appropriable and successful commercialization (generic, specialized, or co-specialized). A high-quality manufacturing system and a technically trained sales team are both necessary for a technology strategy to succeed in its goal of producing products with higher performance (Robert Burgelman & Rosenblom, 2001). The innovation map of the portfolio of projects, at any point in time, mirrors the integration of the technology strategy and product market strategy of the firm as an emerging "realization" of either the intended or emergent strategy.

2.8 Capabilities, Competencies, and Learning in Managing Innovation

When these capabilities are related to those that the firm will have to develop in developing new products and processes and responding to new market circumstances, they are dynamic, as Teece and Pisano (194) emphasize. Across research and development, product and process development, manufacturing, human resources, and organizational training, the dynamic capabilities refer to management abilities and a unique combination of resources (Lawson & Samson, 2001). Competitors have a challenging time replicating a company's strengths if those strengths deliver significant benefits to customers and the company has access to several marketplaces.

Capabilities, on the other hand, are difficult to mimic because they are complex phenomena that include the interactions of individuals and structures. We understand that talents and capabilities are hard to replicate because they are unique to each organization. Together, these qualities and core competencies give businesses an edge in the marketplace that lasts.

The static routine, which is the ability to reproduce previously done tasks, is distinguished by Teece (1986) from the dynamic routine, which allows the firm to create new competences. The argument is that tacit knowledge may predominate in settings where these dynamic procedures are used, making them difficult to identify. Griffith et al. highlight the idea of the "social learning cycle," which is the extent to which a company engages in activities including problem-solving, knowledge diffusion, knowledge absorption, and knowledge scanning.

Competencies in producing physical products have been separated from those in producing services into their own categories. Griffith et al. highlight the idea of the "social learning cycle," which is the extent to which a company engages in activities including problem-solving, knowledge diffusion, knowledge absorption, and knowledge scanning. Competencies in producing physical products have been separated from those in producing services into their own categories. Materials expertise and fabrication and assembly expertise are two subsets of production competencies. The ability to take a raw material and turn it into a finished product is an example of material competency. The ability to fabricate and assemble things means you can make and put parts together, modules, and whole systems. The criteria for determining if something is a capability should address the questions of worth, rarity, imitability, and the organization itself. About value, the focus will be on whether it adds value in the present compared to the past.

The capabilities should be those that allow the exploiting of opportunities and neutralizing threats. In terms of rarity and limitability, the firm must decide whether other firms already process these resources and could learn to imitate them. When it comes to creating a unique corporate identity, the past of the organization is crucial. The accumulation and use of a company's resources and competencies over time is what gives it a competitive edge, and this is achieved through a series of "small decisions."

The influencers' moderating effect on a company's integrative capacities allows it to take in information from the outside world and combine the numerous technological talents generated by its many divisions (Grant, 1996). Absorptive capacity is the process of internalizing external knowledge. When an organization tries to access and profit from external knowledge, the process is always easier if an initiative-taking approach is taken.

Earlier attempts in this regard will help the firm absorb later technological relevance faster and more efficiently. R&D, manufacturing, and production and training experiences laid the foundation for the potential absorptive capacity to profit from outside. Critical knowledge is important in determining absorption capacity. It is not just

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2024, 9(4s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

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technical knowledge but also awareness of expertise outside and inside the organization. Commonality as well as diversity in the knowledge base are important in determining the absorption capacity.

Intermeshing of complementary functions and redundancy in expertise is required in terms of encouraging cross-functional absorptive capacity amongst research and development, design, production, and sales, for example. Personal interactions across departments, liaison positions inside each division, multi-departmental task forces, and a product manager acting as the system's integrator all play a role. The company needs a core group of technicians and scientists already employed there who are not only experts in their domains but also intimately knowledgeable of the company's unique requirements, organizational processes, routines, supplementary resources, and extramural relationships.

The term "innovative routines" was coined by Nelson and Winter (1982). They argue that the things an organization is good at are those that have been established as established practices within the company. These regular activities represent the "core capabilities" of the company. The next step, after discovery, is for the company to invest in growing and capitalizing on these skills. To do this, one must first predict how consumers' needs will shift in the next few years (say, three to four) and then assess how well existing core competencies will serve to meet those needs.

We also need to figure out which market prospects present us with a sustained competitive edge thanks to our unique set of talents and experience. The internal knowledge accumulation process that produces true business prospects is adopted, implemented, and accepted, followed by behavioral modification, assimilation, and the creation of core routines; this is the pattern of how the learning cycles connect with one another.

This increases the company's internal knowledge accumulation process by increasing the company's capacity for learning. For an organization to learn, added information must be incorporated into established practices; in other words, it must become a permanent part of the team's lexicon of abilities and expertise. Knowledge is transferred from people to the company during application by the work group.

Innovation is a dynamic capability, according to the research of Lawson and Samson (2001). No matter the field or company, successful innovations share commonalities in terms of essential components and procedures. Innovators who consistently perform at the highest levels are those who have figured out how to tap into this meta-capability.

All departments, from research and development to product and process creation, can benefit from dynamic capabilities, which consist of unique managerial skills and resource combinations. Production, HR, and Developing Capabilities in organizations with the use of interactivity, businesses can take in information from outside sources and combine the numerous technical competencies created by separate divisions within the organization. Higher-order integration capabilities, like the ability to shape a variety of capabilities, are what make innovations possible.

Managers tasked with bringing a technical innovation into widespread use are, according to research compiled by Barton and Karus, significantly better prepared to steer the innovation's development than to manage its implantation.

From their research, we learn that innovation development and innovation implementation are two distinct processes, with implementation requiring a unique set of skills, knowledge, and resources that fall under the umbrella of managerial capabilities but are the primary focus of innovation development (as defined by Hammel and Prahlad, 1990). According to Barton (1995), foundational technological competencies can be cultivated through methodical routine and deliberate decision-making.

2.9 Product Innovation

Introducing novel or enhanced items to the market in response to shifts in consumer demand is what we call "product innovation" to thrive and expand, finding unmet needs in the market, inventing new products or services, and applying innovative technologies are all aspects of product innovation. New product development is crucial to the success of firms. Innovation helps SME’s businesses adapt to the ever-changing market and find new ways to make money. Incremental innovation, disruptive innovation, and radical innovation are all viable options for SMEs looking to update their product lines.

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e-ISSN: 2468-4376
https://www.jisem-journal.com/

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A culture of experimentation and risk-taking, as well as a methodical approach, are necessary for successful innovation. SME firms that keep focusing on the invention are always able to survive the market conditions, it is also seen that SME's who share knowledge and ideas get benefited in their business (Néstor Fabián Ayala & Marie Anne Le-Dain, 2022).

2.10 Product Diversification:

Product Diversification is like a firm who wants to adds new products to there business which can be relatable products or it can be near to existing products or altogether a new product, firms that believe that focusing on only one product may potentially add a risk to their business usually go for diversification path via creating new products, forming alliances, going into markets that are yet to be discovered or untapped markets, to diversify the firm should weigh all its Pros and Cons by doing market research, analysis, checking their existing strength and weaknesses and then planning the next steps, successful small and medium-sized businesses are increasingly those that have learned to diversify their product offerings.

3. CONCEPTUAL FRAMEWORK

Our conceptual framework can be seen as the technological strategy and technological capabilities that combine to help in product development, which can be diversification and innovation, which help in SME performance. These factors enable, in turn, diversification of products and innovations of products into new products and markets, and SME performance is positively impacted by fostering competitive advantage, growth, and innovation. Technological strategy shows the plan adopted by SMEs to leverage the technology landscape to achieve their business goals; this involves integration, utilization, adoption decisions, and a plan. Technological capabilities encompass the firm's effectiveness in utilizing and deploying its competencies and resources to acquire, utilize, develop, and leverage technological aspects. Product development focuses on the customer's needs and preferences, where the infusion of technology plays a vital role in leading the product into innovation or diversification. Overall, we can see the SME's performance in terms of growth, competitive advantage, market share, and customer satisfaction.

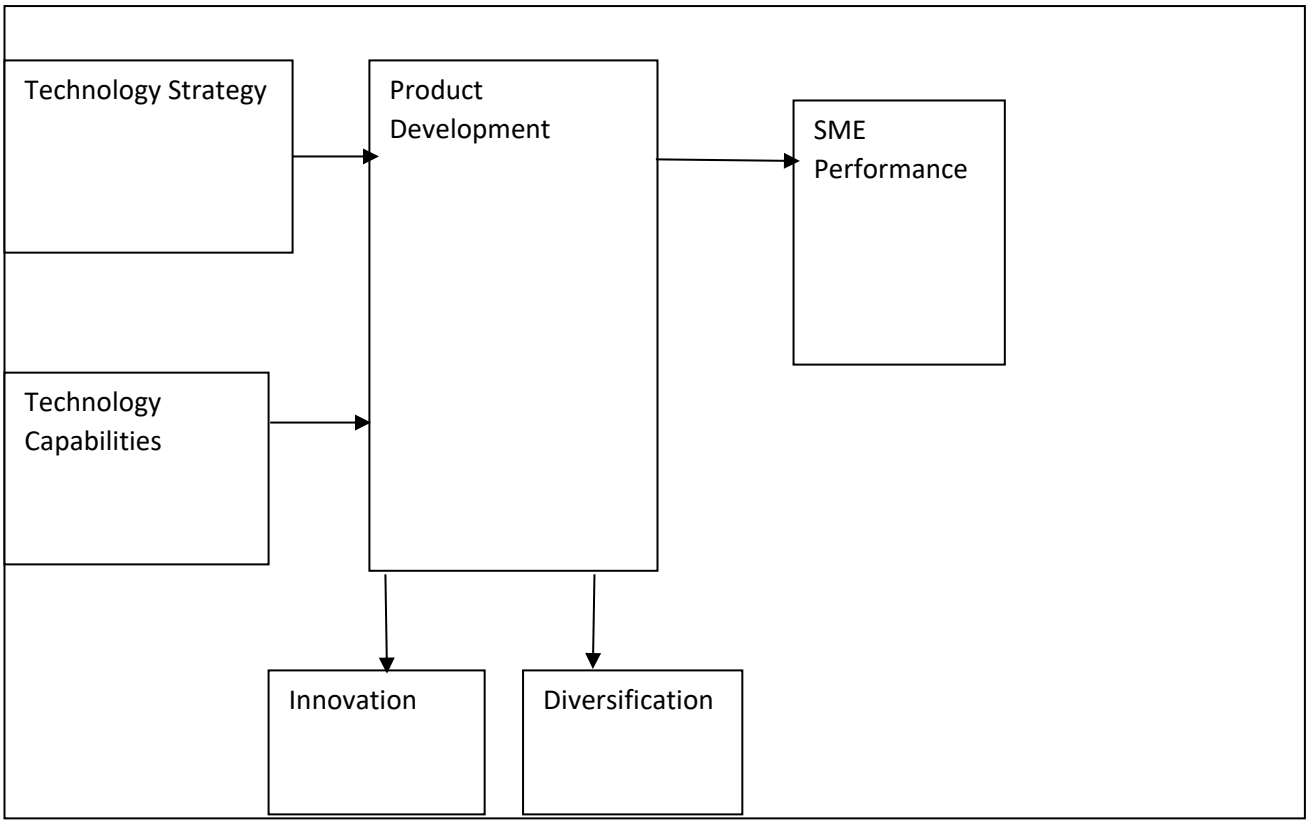

Figure 1. The conceptual framework

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e-ISSN: 2468-4376
https://www.jisem-journal.com/

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Technology directly affects the competitive position of firms and, thus, their success in their competitive domain. Defining the firm's technology as it affects its ability to maintain competitiveness is central to market success. The management of technology focuses on the principles of strategy and organization in making technology choices to create competitiveness. Innovations reflect the creation of competitive advantage—in the form of process as well as output, through product as well as product changes. Exploitation of the full potential of technological choices demands a close "connection or integration" between technology and business strategy decisions.

The development of technological capabilities is at the heart of this integration. It is through the deployment of these capabilities that a competitive advantage is created. Technological capabilities are sought to be built up in such a manner that they support the intended generic competitive strategic position. The strategies of product innovation and product diversification have been shown to help SMEs expand their product lines, reach new customers, and reduce their reliance on a sole product or market. However, it is important for SMEs to carefully weigh the pros and cons of innovative technologies before committing to them. resources to support their innovation efforts. As technology continues to advance, SMEs that embrace innovation and adapt to change are most likely to thrive in the future.

4. HYPOTHESIS FORMULATION

According to the research already done, originality is crucial for effective product development (Guo et al., 2017). Making fresh and beneficial ideas that gets ideated into actual products is a difficult undertaking in the innovation process (An et al., 2018). H0: The organization's inventiveness improves as new ideas and perspectives are generated, H1: Invention and originality in making things, Creativity has a beneficial effect on coming up with new products. Leaders' willingness to take chances is essential to fostering an environment conducive to innovation (Amabile & Pratt, 2016). This incentive motivates workers to experiment and take risks during product development (Im & Nakata, 2008), which in turn fosters an environment conducive to innovation (Crespell & Hansen, 2008). In the existing literature, diversification is referred to as "global diversification," (e.g., Chang et al., 2016; Denis et al., 2002), with the following hypothesis being mentioned: H1. Global diversification and performance of the firm shows horizontal S-shaped relationship in SMEs, whereby performance decreases for low levels of GD, and increases for high levels of GD.

We proposed the below hypothesis formulation in terms of production innovation, where we can see that production innovation leads to the competitiveness and survival of SME firms in the market, and firms keep innovating on their product lines.

	Null hypothesis (H0)	**Alternate hypothesis (H1)**
Product Innovation	Product Innovation does not correlate with SME firm for its survival in market	Product Innovation can lead to competitiveness and survival of SME firm in market

Similarly, for product diversification, we can see that production diversification leads to the competitiveness and survival of SME firms in the market, and firms do not rely on one product line for operations and diversification.

	Null hypothesis (H0)	**Alternate hypothesis (H1)**
Product Diversification	Product Diversification does not correlate with SME firm for its survival in market	Product Diversification can lead to competitiveness and survival of SME firm in market

5. METHODOLOGY

We adopted a case study approach for doing a cross-case analysis of two SME firms in an Indian context so as to provide comprehensive analysis, rich insights detailing real life context of the firms. Also, case study approach is rich and empirical in nature which help in understanding the context of SME in India.

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This further enabled us to do comparative analysis, learning different approaches, their operating models that led us to generate insights and draw conclusions.

Case 1: Indotech Switchgear and Controls

The first case firm is Indotech Switchgear, which is an SME working in the energy meter sector. Looking at the five Dimensions about them, we can see that:

Dimension

1. Establishment:1991
2. Products/Services offered: Energy meter.
3. Nature of Ownership: Pvt. Company
4. Location of Firm:Ghaziabad
5. Performance of last five years

We can see the last 5-year progress made by Indotech:

Year 2022

In 2022, the company created the reflow oven as part of expanding sheet creation for usage in meters and becoming self-reliable post-COVID times. Due to the reasons below, the company focused on the oven flow and took it on as a project to use it for making thermal chips.

Reflow Oven

The use of high-quality insulations results in an operational power consumption of no more than 1 kilowatt (KW) (such as silicon heat compound, glass wool, etc.). (With the exception of the preheating period.) Fast-heating and constant-temperature radiation and/or briskwind, thestainless-steel conveyor and high-precision controller guarantee a long service life without rust or corrosion. For precise, closed-loop speed regulation and stable motion, a high-frequency encoder-equipped brushless motor is used. PID intelligent automatic temperature controllers regulate the temperatures in each chamber independently.

Year 2021

With the rise of digitization and customers' increasing reliance on mobile and online services, the corporation spent this time investing in mobile apps and online tracking tools for users. First, they deployed apps on consumers' mobile devices and web tracking to track their energy usage. They were able to pinpoint the source of power outages and fix them, cut down on time spent manually checking meters, and boost productivity as a result. Second, they implemented robust encryption and data protection mechanisms in their mobile apps and internet monitoring platforms to keep users' personal information safe from prying eyes. In 2021, they will have implemented these features, which will allow them to offer innovative services within their industry.

Year 2020

The company began investing in smart switch boards, Wi-Fi, Bluetooth, and home solutions in 2020, allowing homeowners to remotely turn on and off lights and other appliances using their Wi-Fi networks. This enabled people to control their homes' lighting, ventilation, and other systems remotely, using only their smartphones. Homeowners can save energy and money by using the scheduling and automation options available on some modern switchboards. Strong data protection measures were included in the design of its smart switch boards, Wi-Fi, Bluetooth, and home solutions.

Year 2019

This year, precision enhancements were a top priority. Customers may rest easy knowing that our goods are among the most reliable on the market because we guarantee a minimum accuracy level of Class 1. (The energy meters are immune to more than thirty-two known tamper types). This increases the products' capability for security and comprehensively covers all known tamper types.

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Year 2018

This year's push is toward replacing traditional meters with prepaid computerized ones known as "smart meters." Meters that use analogue readings: They relied heavily on these time-tested meters, which have been there for decades. Once the wheel was invented, analogue meters were no longer produced in favor of digital ones. They have begun researching and analyzing smart meters, which can link to a home's Wi-Fi network and send real-time data on energy usage to the utility company, as well as providing homeowners with notifications when their consumption is unusually high.

Case 2: Polar Auto Engg Industries Private Limited

Dimension

1. Establishment:2001
2. Products/Services offered: Electrical sheet, fabricated parts.
3. Nature of Ownership: Pvt. Company
4. Location of Firm:Faridabad
5. Performance of last five years

We can see the last 5-year progress made by Polar Auto:

Year 2022

Because of their prior manufacturing knowledge, they zeroed in on electrical meters and cables. The first product line for the company was electrical metering components and wire, they manufacture smart meter parts and ship them to third-party suppliers, who then assemble the meters. By sharing consumption data in real time with the grid, these meters help homeowners cut costs and conserve resources, their wires are used in subterranean cable laying projects.

Year 2021

The company specialized in producing precision-turned components because of the widespread need for and application of such parts across numerous sectors. One of the first things they did was pioneer the industrial method of precision turning, in which a cutting tool is used to precisely shape and size a spinning workpiece. The automotive and electronics sectors received screws, bolts, nuts, shafts, fittings, and connectors, all of which were incorporated into the final products. They use a computer numerically controlled lathe, which spins the material but keeps the cutting tool in the same place. The velocity of the material is not controlled by a human operator, but rather by coded instructions entered into a computer.

Year 2020

Given the rising popularity of compressed natural gas (CNG) and their prior experience with training and research during the COVID era, they decided to focus on developing CNG vehicle parts. They initiated a new endeavor to create CNG auto parts. The first product they manufactured was CNG cylinders, which are used to transport compressed natural gas and are typically made of carbon fiber or aluminum alloy. They developed a CNG regulator to control the pressure of the natural gas and provide a constant flow of fuel, which is placed between the high-pressure cylinder and the engine. In order to incorporate CNG into the combustion process of internal combustion engines, they developed a component known as the compressed natural gas injector. By producing these parts, they are offering petroleum CNG manufacturing companies with the materials they need to keep the wheels of commerce turning and the goods moving.

Year 2019

Sheet metal manufactured goods were the main focus this year. Protecting delicate electronic components is a popular application for sheet metal enclosures. Electronic enclosures, junction boxes, and control panels are all common uses. Sheet metal brackets are used for mounting components to a surface or for holding components in place. Their use is common in the fields of transportation, aviation, and construction. Thirdly, sheet metal panels: doors, windows, and roofs all rely on sheet metal panels for protection and structural support. The chassis of many

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vehicles and machines is made of sheet metal because of its strength and durability. So, they made all of these to meet the demand for metal sheets from various other businesses.

Year 2018

This year, the company put an emphasis on plastic components injection molding. Parts injection molding is the process of making plastic components by injecting molten plastic into a mold cavity. Designing Molds Injection molding requires careful consideration while designing the mold. It establishes the parameters by which the final product will be manufactured. Because of the elevated temperatures and pressures involved in the molding process, the mold is typically composed of steel or aluminum. Materials are selected based on a number of factors, such as the part's intended usage, the available budget, and any aesthetic preferences the designer may have. Mold cavities are filled with molten plastic using injection molding machines. A hopper, heating element, screw, and plunger make up the bulk of the machine's main components. After melting the plastic, injecting it into the mold cavity, cooling and solidifying the item, and finally ejecting it, the injection molding process is complete.

6. VALIDATION

We validated the factors (product innovation and product diversification) using the questions below in an in-person interview process.

Questionnaire

Question list	Indotech	Polar Auto
1. Any support for schemes being introduced for product innovation and diversification	Yes	Yes
2. Any patents filed for innovation	Yes	Yes
3. Any IP filed for innovation	Yes	Yes
4. Expansion plan and future product services and expansions	We want to keep innovating in our existing products, our core is meter business	We diversified products, so that we cater broader range of product and services
5. Who is responding to the question?	Owner	Owner
6. Level of the person responding to questions	Overall head and owner	Overall head and owner
7. Years spent at the company	Since the inception of the company	Since the inception of the company

Questions Set 1

Product innovation-Factor1	Scale1-Bad	Scale2-Average	Scale3-Good	Scale4-Vgood	Scale5-Excellent
1. Effectiveness of your company's approach to identifying customer needs not met yet that could be addressed via product innovation (Scale 1-5)					

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2. Success of the product innovations developed in meeting customer needs and generating interest in the market (Scale 1-5)					
3. Employee engagement and motivation to participate in the product innovation plan (Scale 1-5)					
4. Are risk management processes put in place to manage risks associated with product innovation? (Scale 1-5)					
5. Need for aligning innovation with the overall company's strategy and goals Balancing? (Scale 1-5)					
6. Leveraging emerging technologies to drive product innovation (Scale 1-5)					
7. Marketing strategies used to generate interest and drive sales of the products? (Scale 1-5)					
8. Product innovation efforts' success in achieving the goals set out for them (Scale 1-5)					
9. post-launch monitoring and evaluation done by the company? (Scale 1-5)					
10. Future investments planned for innovation? (Scale 1-5)					

Indotech Answers	
Polar Auto Answers	
Same answers by both	

Questions Set 2

Product diversification-Factor2	**Scale1-Bad**	**Scale2-Average**	**Scale3-Good**	**Scale4-Vgood**	**Scale5-Excellent**
1. Effectiveness for identifying new product opportunities and diversification (Scale 1-5)					
2. Product diversification efforts in generating interest in meeting customer needs and market Scale (1-5)					
3. Employee participation in the product diversification process (Scale 1-5)					
4. Risk management processes put in associated with product diversification? (Scale 1-5)					

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e-ISSN: 2468-4376
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5. Product diversification strategy alignment with company's strategy? (Scale 1-5)					
6. Emerging technologies usage for diversifying your product offerings? (Scale 1-5)					
7. Marketing strategies to drive sales from diversification? (Scale 1-5)					
8. Success of product diversification to what extent? (Scale 1-5)					
9. Monitoring after post-launch of products resulting from diversification? (Scale 1-5)					
10.Future investment for diversification? (Scale 1-5)					

Indotech Answers	
Polar Auto Answers	
Same answers by both	

7. FINDINGS

For Indotech, we can see that the company is factored around innovation of their products; they were effective in identifying customer needs and kept product innovations in meeting customer needs; they innovated the electrical meter product lines year on year; they leveraged customer insights; collaborated with local partners; kept innovation thought processes; and they continuously monitored industry trends and improvisation in their products. For Polar Auto, we can see that the company is factored around diversification of their products; they were effective in the company's approach to identifying customer needs for diversification and risk management associated with diversification of products, and they kept a diversification approach for the products starting from electrical, plastics, precision turn components, and fabricated sheets. They kept on developing a new product year on year and researched via supplier inputs and leveraging existing capabilities to see new product visualization.

8. CONCLUSION AND SCOPE FOR FURTHER RESEARCH

Technology directly affects the competitive position of firms and thus its success in its competitive domain, the SMEs that prioritize technological innovation in these areas of innovation and diversification are better able to endure the rigors of the modern marketplace changes and competition, the Product Innovation and Product Diversification factors helped the firms to keep their business operating in the dynamic marketspace, It is important for SMEs to carefully weigh the pros and cons of new technologies before committing and adopting to them for success in their operations and investments, we can see that the firms that opts for technology innovation leads it to product innovation and product diversification of the company thereby increasing the SME performance, the further research can study on other factors like Growth, Sustainability, Operational efficiency, it can also be analyzed the Reasons why some SMEs want to be in SME's category even when they can move out of SME's tag and grow bigger in numbers and revenue aspect and further Analyzing different sectors like Automobile, Textiles and SME's in these sectors.

9. LIMITATIONS

Our paper has some limitations that can be enhanced during future research work: Firstly, the study was conducted in Delhi and NCR firms in the Indian context that are operational in these regions; more research work can be done in other states of India outside Delhi and NCR and further in other countries around the world as a next step. Second, the firms taken were focused on the electronic industry; in this aspect, more research can be done in other sectors like automobiles, finance, food, and retail to study the impact of technological innovation in SME's aspect.

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2024, 9(4s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

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