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BARRIERS TO INNOVATION AS IMPEDIMENTS TO THE INNOVATION PROCESS IN THE FOOD PROCESSING BUSINESSES IN MAHARASHTRA

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ABSTRACT

For a developing country like India Innovation is a vital point for success and the greatest pillar of survival for any organization. However, Impediments to innovation decrease innovative activities of the firm and therefore they need to be overcome over time. Based on the firm-level survey data, this study identifies the main hurdles standing in the way of innovation at every level of organization with the structured questionnaire and interview in the Food Processing Businesses in Maharashtra – Western state of India. The questionnaires were distributed for 100 responses to the company owners and managers for needed data. The data gathered through a questionnaire were analyzed quantitatively with descriptive statistics while the data gathered through interviews was analyzed qualitatively. The findings of this study indicate that major barriers in the process of Innovation are Cost of Finance, Complexities in Assisting Government support for availing Finance, Market dominated by Established businesses, Uncertain Demand for Innovative products, lack of resources, Difficulty in finding partners for Innovation. Based on the findings, the barriers are subdivided into two segments: External and Internal Barriers. Further, the research includes major steps taken by firms to handle barriers such as increased investment in R & D, Arranged brainstorming sessions to come up with new ideas, increased communication from top to bottom level, improved processes to reduce costs and enhanced quality products. The findings from the study can be utilized for the policy implications and innovation management in Food processing organizations in India.

Keywords: *Handling of Innovation barriers, Food Processing Industry, Policy Implications.*

Introduction

With the green revolution, India is transforming its position from scarcity to surplus in terms of food production. However, as compared to other countries, the Food processing level of India is less than 10% of its agro output and that is a growing concern for the economy of the country about less innovative systems lying in the sector. The Indian Food industry is the second biggest contributor of food in the world after China. Maharashtra is the leading state in the food processing sector in India. It contributes around 14 percent of manufacturing in Food processing in India, 13 percent of India's exports and six percent of total industrial investment (Invest India, 2021). This immense contribution is all due to fine weather, cheap labor, skills and development and efforts of the government. Although due to some barriers from internal and external environment, the industry is lacking the innovative food production. Despite a strong agriculture base and supply-side dynamics, product development and innovation in the food industry have taken a back seat due to the number of impediments. according to CII - Grant Thornton report titled "Indian Food and Beverage sector". Small firms without innovative output run with the risk of being uncompetitive because of obsolete products and processes in the market economy. Research on barriers (obstacles or impediments) to innovation has been an important approach to understanding how innovation at national, industry, and firm levels can be facilitated and developed to enhance their competitive advantage(Baldwin and Lin, 2002). The main rationale to reduce the innovation barriers is that they deter/ reduce the firm's innovation capabilities and thereby reducing the

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chances to compete in the market especially in the developing country like India where a constantly dynamic environment is shaping the food industry fully versatile. The global Innovation index has ranked India 48th out of 131 countries representing low capability to innovate within industries but still has vast opportunities to improve by enhancing the quality dimensions with the lowest barriers in the road to be ahead. Concerning to stake of the food industry in the ecosystem of the country, the present research examines the external and internal barriers faced by the Micro, small, and medium enterprises especially in Food processing businesses in Maharashtra (a western state of India), specifically working under the category of Ready to eat foods, Frozen foods, Confectionery, Spices, and Masala and Milk and allied items. To get the fortunate results of the innovation efforts these obstacles need to be tackled by top management. The major obstacles are the cost of finance, insufficient Government support, lack of resources, lack of qualified personnel, and lack of information on technology are jointly reducing the probability to innovate and sustain. The market forces and the competition have the biggest effects on the innovation performance of the organizations.

Literature Review

The limiting factors to the innovation are prone to affect the innovation performance which varies from firm to firm due to external, internal, and other restricting factors (Hadjimanolis, 1999) which needs to be identified to understand the innovation processes of the firm to overcome these barriers (D'Este et al, 2012). In this sense, (D'Este et al, 2012) mention that "the ability to identify barriers in the firm is a result of the firm's involvement in innovation activities' '. Following that the main contribution of this paper is to identify and analyze the factors restricting the process of innovation especially concerning Product, Process, Marketing, and Technological Innovation in Food processing firms in Maharashtra state. Within this framework of reference, the barriers are those restrictions to the firm's propensity to innovate which inhibits the process of innovation and thereby leading to the lower capability to sustain the innovative practices in the market. Businesses can perform utmost in the innovation if they can receive funding on proper time and eliminate the problems such as a market dominated by established businesses and uncertain demand for innovative products (Jung et al., 2016)**.** The study focuses only on the food industry with the specific size of the firms as because the barriers to innovation differ depending on certain conditioning factors such as size and industry (Piatier 1984; Dougherty 1992; Henderson and Cockburn 1994). The use of the internal capabilities forms the robustness to overlook the barriers from the outside environment. Hartono et al. in their paper argued that the food industries are lagging behind in their internal capabilities and this forms the most barriers from outside of the firm. Previous studies have classified the barriers into the most common classification as external and internal barriers to Innovation (Piatier, 1984). Another classification of barriers is given by D'Este in their study such as revealed and deterred barriers. According to them, revealed barriers do not prevent the firm from being innovative but they increase the consciousness and knowledge of facing the barriers of that kind in the organization and thereby leading to have the strength to perform better. However, the firms which face deterred barriers are the main hampering factors to innovation that are impossible to solve.

The present research identifies external barriers to innovation as main impediments to innovation within-firm than internal barriers as highest respondents have responded with the most occurring barrier as an external barrier. Because of their inability to be overcome, some extrinsic obstacles become deterred barriers. For example, Frequent changes in Government policies.

This study aims to develop a theoretical basis, confirmed by empirical support that identifies and analyzes the fundamental factors that affect firms' innovation processes and their subsequent performance.

Authors	Barriers to Innovation	Major Findings
Sileshi Talegeta (2014)	• High cost of Innovation • Lack of Finance • Government's Policy and regulation • Organizational culture • Lack of skilled personnel • Size of enterprise • Inadequate R& D • Lack of cooperation • Lack of technological and market Information	• Highest adopted innovations are Technological, Process and product Innovation • Lack of info on technology, Inadequate R &D, High cost of Innovation, Organizational culture, lack of skilled personnel, Inadequate finance are the most influential barriers to Innovation performance

Luengo et al. (2019)	Cost barriers • Cost of internal RDI activities • Cost of external RDI activities • Cost of training activities • Cost of acquisition of other external knowledge • Cost of procurement of advanced hardware and software	• The main barriers is lack of preparation to meet the new needs of the market • Lack of investment in training activities reduces the innovation level of the firm • Barriers differ with the size of the company
Madrid Guijarro et al. (2009)	Internal Barriers • Lack of Financial resources • Poor human resources • Weak Financial Position • High cost and risk External Barriers • Turbulence • Lack of external partners • Lack of information • Lack of government support	• Innovation costs are too high and difficult to control • Lack of government support is second highest barriers to innovation • Barriers exist in both size of the firm; small and medium firms • Lowest barriers are associated with the managers/employee resistance
Radicic, Dragana (2021)	• Knowledge Barriers • Competition Barriers • Financial Barriers	• availability of skilled labor, innovation partners and technological knowledge are major barriers to innovation • Competition barriers has the highest impact on the radical innovations • Firms do not find the financial barriers as hampering factors
Madeira et al. (2017)	Economic Barriers • Lack of funds • Lack of finance • Innovation costs too high • Knowledge Barriers • Lack of qualified personnel • Lack of information on markets • Lack of information on technology • Difficulty in finding partners for Innovation	• Major finding suggest that high innovation costs, uncertainties in the demand for new goods and services and lack of personnel qualified are the barriers which hinders the firm • Businesses have less propensity to engage in process innovation due to costs of innovation are too high, the lack of qualified personnel, uncertainty in the demand/market for new goods or services and a lack of market information
Blanchard et al. (2013)	• Lack of funds within enterprise or group; • Lack of finance from sources outside enterprise; • Innovation costs are too high; lack of qualified personnel; • Lack of information on technology; • Lack of information on markets; • Difficulty in finding cooperation partners for innovation;	• Financial and non financial factors both affect the innovation performance equally • R &D intensity plays major role in innovation performance • Larger firms are more engaged into R & D leading higher ability to innovate.
Szambelan (2020)	Market barriers • Strong price competition • Strong competition on product quality, reputation or brand • Dominant market share held by competitors • Innovations by competitors	• Companies face high to very high pressure from market buyers • Internal capabilities are not fully used which form the most barriers in the food industry

Hartono (2019)	• Lack of funds within your enterprise or group • Lack of finance from sources outside your enterprise • Innovation costs too high • Excessive perceived economic risks • Staff resistance • Manager resistance • Organizational rigidities within the enterprise • Lack of qualified personnel	• Employee and organization attitude-related barriers hamper product, process and marketing innovation • Financial barriers is the major barrier and have negative relation with the innovation

Research Objectives

- To identify the external and internal barriers to innovation in the food processing industry of Maharashtra
- To understand the corrective measures taken by the firms to overcome the barriers to innovation in the food processing industry of Maharashtra

Research Methodology

- **Questionnaire Development**

This study analyses the barriers to the innovations faced by all food processing firms in the western state of India. To serve the purpose a small questionnaire was developed containing the main 4 barriers of innovation with 6 sub barriers in each explaining the meaning of the main barrier. The scale of the questionnaire was adapted from OECD (Oslo Manual, 2005), a five-point Likert scale "Strongly agree" coded as 1 to "Strongly disagree" coded as 5. Further, the multiple select questions included steps taken by owners and managers to handle the barriers. According to the guidelines of OECD publication 2017, the size of the firm is determined based on the number of employees as per the following: In small and medium-sized enterprises (SMEs) employ fewer than 250 people. SMEs are further subdivided into micro-enterprises (fewer than 10 employees), small enterprises (10 to 49 employees), medium-sized enterprises (50 to 249 employees). Large enterprises employ 250 or more people. As the study focuses more on the barriers faced by the organizations, micro-firms are also taken into consideration for responses.

- **Data Collection and Analysis Methods**

Maharashtra is considered one of the most economically rich states of the country with a high industrial reach. The study was conducted in the Food processing industry of Maharashtra using quantitative methodology with the help of a survey questionnaire in 2020. Multiple government organizations were contacted to reach out to the final level of organization people who can respond to the study efficiently with sound knowledge of innovation and barriers in the organization. The set of questionnaires were mailed to 810 firms with follow-up calls of reminder to collect the necessary information. 120 respondents responded with the full questionnaire representing around 14% response rate which is very low in the food industry segment where people find it critical to share innovation information of organization even for the academic research purpose. Finally, 100 responses were taken for the research consideration after deleting incomplete questionnaires. The data gathered through the primary survey was analyzed through descriptive statistics; mean score of Likert scale data and standard deviation. The classification of the respondents according to product category and the size of the firm is given in table 1.

Classification by Category of Business and firm Size

Table 1

Product Category of the Firm	**F***	**Size of the firm**	**F***
Ready to eat foods	36	Micro enterprises	29
Frozen foods	15	Small enterprises	33
Confectionery	12	Medium-sized enterprises	26
Spices and masala	27	Large enterprises	12
Milk allied items (Ice cream, cheese, Milk beverages etc)	10		
Total	**100**		**100**

Note: F* – Frequency

Results

Due to the unavailability of structured data on innovation and with the very low response rate from the industry there has been very less research done on firm-level innovation in India and this is the first literature contribution of firm-level barriers to innovation in the food industry in an Indian state. As per the results of descriptive statistics mean and standard deviation, Market and Economic (External) barriers are the most frequently faced barriers by the food organizations in Maharashtra. Many respondents in the interview have stated that Entrepreneurs end up wasting a lot of time on Government related work - GST returns, ESIC, PF returns, TDS returns, Income tax audits, FSSAI returns, Pollution board, Boiler Certificate, Barcode Work, old sales tax issues (like collecting C-Forms), etc. Due to lethargic and bureaucratic systems firms are not able to spare the time to think about innovations at the organizational level. With the expectations of knowledge of all rules and procedures from the FSSAI manual, firms are pressed down under the load to have all information by heart, or else they would have to bear heavy penalties. The regulatory landscape of the Indian Food Industry has been changed from multiple authorities driven (Prevention of Food Adulteration - PFA) to a single authority driven (FSSAI). However, there is an inadequacy of guiding system throughout all the legal requirements in running a Food Processing Business especially small business owners running a business with insufficient knowledge will be a curse!

To my knowledge, there is a paucity of innovation research in the Indian SMEs in any industry. However, this study focuses on the identification of barriers to innovation and corrective measures taken by the Food Processing Industry in an Indian state.

Internal Barriers to Innovation

Several previous studies confirmed that major barriers are related to cost, institutional constraints, human resources, organizational culture, the flow of information, and government policy (Mohen and Roller 2005; Baldwin and Lin 2002). Small firms are more prone to internal barriers to Innovation due to a lack of man and machine resources. A developed food processing sector would reduce the chances of business failure by overcoming the impediments to the process of Innovations within the firms. The internal barriers emerged from internal environment of the organization and thereby more controllable than external barriers (Khattak et al., 2011). However, joint efforts of all stakeholders are necessary to break down the effects of barriers. The findings are in line with the previous study confirming mean values from table 2 and 3 (Internal barriers) confirms the high magnitude of the average of the barriers faced by respondents as compared to table 4 and 5 (External Barriers) representing internal barriers are less occurring in Food processing firms. Especially organizational barriers are the least frequently occurred barriers, as per higher mean values shown in table 2.

Table 2

Organizational Barriers	Mean	SD
Manager's attitude is risk avoider	2.93	1.09
Lack of experience of innovation to Managers	2.95	1.14
Employees are resistant to change	3.12	1.23
No reward to employees who bring external knowhow/technology that improve our products/services	3.20	1.18
Poor management of innovation committee,	3.22	1.17
Company culture not supporting innovation	3.24	1.25
Note: The values are self-assessments using Five-point Likert scales		

Table 3

Knowledge Barriers	Mean	SD
Lack of qualified personnel	2.46	1.12
Lack of integration of external knowledge and other external inputs into a firm's innovation activities	2.62	1.09
Difficulty in finding partners for innovation	2.67	1.08
Lack of follow up the results of innovation	2.68	1.06
Lack of information on technology	2.73	1.16
Lack of information on Markets	2.87	1.17
Note: The values are self-assessments using Five-point Likert scales		

External Barriers to Innovation

With the high intensity of competition and dynamic market structure, almost all firms face external barriers which originate from the external environment. Tables 4 and 5 exemplify external barriers to innovation that threaten the sustainability of the innovative products in the markets. Ranging from higher to lower, almost all respondents have responded with somewhat higher and moderate external barriers faced in the firm. For all innovative firms, costing aspects are the most important base to successfully implement and launch innovation activities. March et al (2002) found that most obstacles to innovation in all the sectors arise from the excessive cost of maintaining innovation projects.

The government of Maharashtra has launched many schemes ensuring funds are directed towards start-ups and innovative projects of firms. However, the mean value of 1.05 indicating most of the companies are facing the highest occurring barrier as Complexities in government support in availing finance. This means due to the bureaucratic system and complex procedures, availing finance from different government schemes is more difficult than raising money at a high cost from other private sources which would affect the cost aspects of the innovation and leading the firm less competitive in the market.

More innovative firms tend to face higher barriers than non-innovative firms (Mohnen and Rosa, 2002; Galia and Legros, 2004) in the form of new product acceptance from the market, adoption of changing scenarios by employees, financial difficulties to fund innovations, and so forth. Further away, non-innovative firms may be at the stage of starting the innovation process or have not implemented any innovation at all. In a nutshell, the levels of the barriers in both firms are different. Innovative firms face barriers with increasing levels of innovation and non-innovative firms face barriers due to the new creation of innovation in the firm (Segarra-Blasco, et al. 2007).

Table 4

Economic Barriers	Mean	SD
Complexities in assisting Government support in availing finance availability/Business guidance/getting business registration/establishment etc..	1.05	1.12
Strong price competition in the market	1.90	1.04
Cost of finance is too high to fund innovation activities	2.06	1.11
Lack of resource availability to allocate innovation activities	2.26	1.14
Difficulty in availability of finance	2.32	1.02
Note: The values are self-assessments using Five-point Likert scales		

Table 5

Market Barriers	Mean	SD
Market dominated by established businesses	2.03	1.00
Uncertain demand for innovative products	2.36	0.98
Government restrictions/Actions/ Policies	2.45	1.12
Lack of suppliers ready to supply on time at a given price	2.45	0.98
Customers/end users are not involved in the process of testing new products/services	2.92	1.15
Products/processes has been fully/partially obsolete as a result of competitors' innovations	3.12	1.20
Note: The values are self-assessments using Five-point Likert scales		

Every organization which wants to innovate fuels the innovation process with manpower but somehow innovation gets stifled and the idea of innovation remains intent at the end due to the obstacles which hinder the innovation. To get the most privilege of the innovation outputs one must reduce the obstacles which stifle innovation processes within the firm. All respondents stated that their companies have adopted one or more steps to handle the barriers to innovation where most of the respondents responded that they Increased communication from the top to the bottom level to foster innovation within the department groups as innovation is not a single-handed process. Many previous studies revealed that the greater the firm's involvement in innovation activities, the greater the importance is given to barriers to innovation to overcome that barrier. Some studies also found a positive relationship between the perception of barriers to innovation and innovation activities due to more consciousness towards overcoming barriers for improving the innovation activities. (Baldwin & Lin, 2002; Galia & Legros, 2004, Sanna-Randaccio, & Sanova, 2009)

Steps taken by owners to overcome/handle barriers to innovation	F*
Found alternative and cheap source of finance	40
Reduced the price of products in order to compete in market	46
Increased investment in R & D	54
Increased investment in training and development	49
Arranged brainstorming sessions to come up with new ideas	54
Increased communication from top to bottom level	61
cooperated with external agencies to foster innovation	30
Arranged different workshops for employees to think new towards innovation	28
Decentralized decision making for Leaders and managers	30
Improved processes to reduce costs and enhanced quality products	58
Improved technology to reduce costs and enhanced quality products	48
Used different marketing strategies to make the customers aware about our products	48
Used the tools such as SWOT analysis, PEST analysis	28
Used BCG matrix, 4P s, Porter's five forces, etc. for strategic planning	22

Note: F* – Frequency

Conclusion

Indian Food processing industry is very versatile and has opportunities for every stakeholder. The major drivers shaping the food industry are robust consumer demand, new lifestyles, changing taste and preferences, more informed consumers in the digital era who wants to try new products launched in the market. Although the strong production bases the food processing industry in Maharashtra is challenged mainly with external barriers from the market. Especially, obstacles are in the form of lack of clear guidelines/procedures in availing finance from the Government, cost of Innovation, high competition, Lack of sufficient resources. The barriers are diverse and they demand to tackle up to be more innovative and productive to derive maximum market benefits. The controllable and uncontrollable challenges have put a hindrance in achieving its high potential. Red Tape in government systems and complex procedures are the biggest obstacles that are in a way of innovation. Lack of structured data in the Innovation field is the main reason for low research on firm-level Innovation in India due to limitations of the individual data collection. The findings from the mean values suggest that the economic and the market barriers are the major barriers faced very frequently by the food processing firms than knowledge and organizational barriers. In this context, firms that face the barriers majorly like Complexities in government support, Strong price competition, cost of finance, market domination by established businesses, and uncertain demand for innovative products in the market are less likely to innovate than the firms that do not face these barriers. Such barriers hinder innovation performance leading the food industry less productive and innovative at national and international levels. There should be a single guiding authority that helps with all obligatory requirements for existing businesses and new start-ups. In a nutshell, obligatory requirements should consume the least possible time so that firms can spare time to think and implement organizational innovation/new ideas. Findings from the study can be used to identify challenges in Maharashtra to maximize the innovative capabilities and to provide the solutions to address them widely.

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