



## THE DEVELOPMENT OF FRUGAL INNOVATION IN EMERGING ECONOMIES: INSTITUTIONAL POLICY AND CUSTOMIZATION PERSPECTIVES

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### Abstract

Frugal innovation has been recognized as one of the emerging concepts that have assisted the emerging economies to contribute to the overall growth and development of the global economy. Emerging economies with scarce amounts of sources and higher rates of low and mid-income consumers usually face barriers in attaining growth, as the organizations lack creative solutions or unique product manufacturing ideas. Even in such situations, frugal innovation is capable of driving organizational and emerging market success through the development of innovative and creative ideas as well as an effective business model under the manufacturing process of the products. The development of quality customer-oriented products at low-price through the use of efficient resources has helped the organizations (manufacturing) to generate sales and keep up with the pace of the rapidly changing market and consumer purchase trends. Based on this context, the research report aims to portray the significant relationship between the frugal innovation and the institutional policies, relationship with the resources, and its relationship with the product customization applications in the emerging economies since past years. In conducting research, various academic journals and past studies have been utilized to justify the significant research findings in the paper.

Keywords: frugal innovation, emerging economies, institutional policy, product customization

### Introduction

Frugal innovation can be referred to as the concept, through which social and business values could be enhanced

with efficient usage of varying resources, such as funds and energy. In recent years, frugal innovation has transformed the strategic thinking abilities of organizations from the perspective of environmental sustainability, affordability, and quality (Lim & Fujimoto, 2019; Melkas et al., 2019). At the moment, this concept has been identified to play a significant role in contributing to the US national economic growth and development. Economic challenges at the moment make it less possible for the countries to achieve their growth and development.

Challenges such as higher demand for sustainable products, increased use of resources, and increasing demand for quality products and its services are identified as the main barrier for economic growth and development across developing and underdeveloping countries. However, the frugal innovation concept has been a game-changing aspect that has enabled countries, such as the US to achieve economic growth and development while ensuring reduced usage of resources, improving product or service quality, and achieving environmental sustainability at the same time (Radjou & Prabhu, 2015). Advancement and business improvement of the emerging economies, through the application of frugal innovation, has further contributed to the overall growth and development of the global economy in recent years.

However, the revolution of the manufacturing organizations, operating in the emerging markets has further raised major concern for outperforming them in terms of product sales, business growth rate, technological transformation, and generation of social

values while using an efficient amount of resources and effort since past years (Pansera, 2013). Based on this context, this research report aims to explore the development of frugal innovation across the emerging economies in the world and its significant relationship with the institutional policies, application of resources, and product customization applications in the emerging economies.

## Literature Review

### *Frugal Innovation and Institutional Policy in Emerging Economies*

According to Casanova et al. (2019), the economies of the US, Asian, and African countries have been able to manufacture products and its services at feasible rates if compared to the manufactured product price in the developed countries. Effective concepts of innovation such as frugal innovation and bottom-of-the-pyramid have played a significant role in making this possible for the emerging markets of the US, Asia, and Africa. As emerging markets in the world have been lacking in manufacturing creative and unique products, frugal innovations have greatly enabled the organizations of the emerging market to follow a unique strategic approach to develop new products and services. The new production process and advanced business models have been started for being used by the organizations of the emerging market with the help of frugal innovation. Besides, Sharmelly and Ray (2018) stated that emerging markets are different as compared to the developed markets. Emerging markets have been facing market problems such as price-sensitiveness especially

among middle-class people across the globe. Consumers in such a market have also been identified to make higher demands on quality products at affordable prices. Thus, on meeting such demands in the emerging markets, multi-national companies (MNCs) have introduced a frugal innovation concept to avoid business market challenges and maintaining its market growth and environmental sustainability as well (Sharmelly & Ray, 2018).

Zeschky et al. (2014) also entailed that on realizing the capabilities and effectiveness of frugal innovation strategy, organizations including MNCs have been provided with an opportunity to achieve growth. Even the policy enforcers (National government) of the emerging market or the economies in the world also enjoyed this opportunity to frame market policies that would promote social values, funding schemes of the public, and acceptance of the frugal innovation among the market regulations. This opportunity has benefitted emerging markets to further fulfil the demands of the public, establish innovation, manufacture products at a higher scale, and deliver quality products at feasible prices through efficient use of resources. Economic growth and development of countries such as the US started emerging while tackling market challenges through the application of frugal innovation. However, Cai et al. (2019) argued that frugal innovation has led MCNs to achieve success on enhancing their business growth at a global level across emerging markets but there are still other emerging market firms (EMFs) that lack understanding on the frugal innovation, lack of access over policy information, and support from the government institutions. Due

to this problem, the emerging market has been facing a major barrier towards the attainment of growth and development (Cai et al. 2019).

Winterhalter et al. (2017) argued that there are other sectors such as the healthcare sector, which are in great need of innovation. In such sectors of the emerging markets, enforcing policies regarding the compliance of frugal innovation, delivery of social value, and economy could affect the market growth and economy of the nations. People in the rural areas of the emerging economies lack access over healthcare treatment services so even though if such organizations enforce policies, they are expected to fail on delivering social values, market growth, and the national economic growth since lack of healthcare facilities among people in rural areas remains a major challenge for them. Kroll et al. (2016) also agreed that the emerging markets require enforcement of policies to acquire understanding about the legal policies to be enforced and they must also be able to recognize their challenges that need to be addressed by these market policies. Failing to do so may fail in achieving innovation due to the loss of support from the government and the public authorities. As the policies are identified to be tailored to the development and growth of the national economy, lack of policy enforcement would mean loss of economic growth and development for the nation itself (Kroll et al. 2016).

#### *Frugal Innovation and Resources in Emerging Economies*

According to Weyrauch and Herstatt (2016), innovation is adopted by the emerging economies based on three

types of innovation i.e. frugal innovation, good-enough innovation, and the cost-related innovations. Selections on these types of innovation directly depend on the challenges or the type of demand made by the consumers in the emerging markets. In the emerging markets, where availability of resources is at a scarce level such as low-income of middle-class consumers or availability of low energy resources, frugal innovation is approached for establishing sustained growth and development of the market and the national economy as well. In terms of emerging economies, where markets are driven towards attaining sustainable development and enhancement of technology, frugal innovation plays a major role in fulfilling such market needs, and this way, the economic and market growth is stabilized. Besides, Basu et al. (2013) opined that in emerging economies, a need for frugal innovation is associated with making efficient use of resources while maintaining the sustainability of the environment and generating social values for the citizens. "When seeking sustainable solutions to global challenges, it is critical that all inhabitants be treated with equity. From a moral or a business standpoint, equity is inextricably linked to sustainable, globalized solutions. World hunger, poverty, social injustice, and general lack of resources that afflict billions of people are all important aspects to consider when ideating for large-scale sustainability solutions" (p. 64).

In this context, prior research has argued that apart from social values, lack of low-cost technological products is a major challenge that is faced in the emerging economies due to the lack of resources i.e. price affordability of the

consumers (Jiang et al., 2020; Geldes et al., 2017; Suseno et al., 2017) It is therefore to enable simpler technological designs could be cited as one of the major requirements in the emerging economies. Economic growth and development with these challenges have been affected due to the lack of financial resources among the consumers. Thus, enhancing or developing a simpler technological design through the application of innovative process with efficient usage of resources further become crucial needs. Thus, the application of frugal innovation becomes crucial for IT-based organizations and consumers for the development of simpler technology that could be purchased at affordable prices (lower price). Through this approach, emerging economic growth also becomes possible. Prabhu (2017) also stated that "more and more people in the West are now empowered to do with limited resources what only large firms or governments could do in the past. Ubiquitous tools and technologies such as smartphones, cloud computing, three-dimensional printers, crowdfunding, and social media have given rise to frugal grassroots innovation and entrepreneurship exemplified by the lean start-up and maker movements and the sharing economy" (p. 2).

Exploring three case studies in India, Tiwari et al. (2014) argued that frugal innovation is found to be more capable than just enhancing the economic growth and development of nations. Evidence on the case study highlighted that besides dealing with problems related to price sensitivity and environmental sustainability of the emerging markets, the application of frugal innovation also resulted in the development of a new solution through

efficient use of resources and higher usage of inventive analogies. Management skills of the firms operating in the emerging market of India were enhanced through the application of frugal innovation. These enhanced skills further proven to possess capabilities to create opportunities for themselves on overcoming challenges and delivering social values as well as customer needs in the emerging market of the nation through the application of frugal innovation as well. “The transfer of knowledge from one context to another can be fostered by the use of inventive analogies. In the process of an inventive analogical transfer existing solution elements from a familiar conceptual domain (the base) are used to solve a given problem or engineering challenge at hand” (p. 4). Simula et al. (2015) also stated that frugal innovations are bound to help firms in the emerging market, which are beyond the level of expectation. The authors also highlighted that introduction of frugal innovation in the emerging economies with low-income markets is also capable of generating opportunities for themselves through the enhancement of their knowledge regarding the effectiveness of implementing innovation theories, frameworks, and models under their strategic approach (Simula et al., 2015).

*Frugal Innovation and Product Customisation Applications in Emerging Economies*

Mourtzis et al. (2016) further stated that application frugal innovation by the manufacturing organizations in the emerging economies has helped them in exploring regionalization and customization practices. Through these practices, such organi-

zations have been able to adapt to their market conditions and meet the customer requirements. Augmented Reality (AR) (mobile application) can be portrayed as an example of the customization application, which has been developed through the implementation of frugal innovation in emerging economies. On using AR, manufacturing organizations operating in the emerging markets are now able to identify the consumer requirements and to customize products to be manufactured accordingly. “The use of mobile applications is an enabling technology capable of supporting the ubiquitous access to data and integrating the customer and their needs in the product design process. More and more companies are starting to base their business on mobility and on distributed decision making in order to target and reach new markets” (p. 228). Agarwal and Brem (2012) further argued that emerging economies such as China and India did not prefer to customize the western products into the local or domestic markets. Rather than customizing such emerging economies preferred to re-designing products from the beginning, helps in ensuring the production of cost-affordable quality products to its customers (Agarwal & Brem, 2012).

On this statement, Colledani et al. (2016) argued that frugal innovation has helped the emerging economies in different ways. Across some of the emerging economies, one of the major problems faced by the manufacturing organizations has been identified to be logistic complexities. Due to this problem, such organizations have failed in delivering the manufactured products to its consumers within the estimated delivery date. On dealing with logistic

complexities, manufacturing organization has succeeded in integrating new ideas such as providing just-in-time specification/customization under their product delivery services. Customization has also fostered new services, such as a feature of viewing the product manufacture status by the customer themselves so that they could track their product starting from the initial to the final phase i.e. product delivery. As per Mourtzis (2018), organizations in emerging economies have highly prioritized their consumers in their product designing process since they focus on attaining customer satisfaction. The application of frugal innovation, through the attainment of customers' satisfaction, has helped such organizations in many different forms. "Frugal innovation exploits the concept of intelligent use of resources, to develop highly functional products that can be adjusted to meet specific requirements of different markets, which may have different consumer buying powers, with optimal cost and quality per case" (p. 1162).

According to Zeschky et al. (2014), manufacturing organizations operating in the emerging markets, where competition is higher have also succeeded in attaining competitive advantage through customization of their products in terms of quality and price. Even though the middle-consumer population has been rapidly increasing in emerging economies such as China and India, cost innovation has helped organizations in maintaining the sales production flow at a constant rate. Newer solutions such as developing products with the minimum usage of resources helped the organization to reduce its product prices so that low-income customers could afford to pur-

chase it. However, these middle-class consumers in the emerging markets are facing constraints such as poverty or infrastructure unavailability. So, in dealing with such challenges, the organizations have further emphasized developing effective and creative solutions for customizing or redesigning the products to maintain its quality and cost through the application of innovative concepts such as frugal, reverse, resource-constraint, and trickle-up innovation. Besides, a lack of understanding of such concepts could be a problem for the organizations in the emerging economies. The EU Commission (2015) further stated that, in the emerging markets, where consumers face financial problems such as poor income, they do not require customization. This problem denotes a major requirement of products with reduced costs through the application of frugal innovation. In case of low-income markets, customizations of the products are essential for reducing the price, technical specification and creative design whereas, middle-income consumers in the emerging market further indicates a major requirement of product customization for reducing the product price at the time of maintaining its quality on generating higher market sales (EU Commission, 2015).

Further, Agarwal et al. (2019) opined that across emerging economies, the application of frugal innovation and customization of the products manufactured by the organizations are directly based on consumer behaviours and their income. For example, emerging economies comprise four major markets, which entail high-end, mid-range, low-end and low-low end consumer income. Among these emerging markets, the application of frugal inno-

vation and product customization is found to be higher, especially in the mid-income and low-end income markets. Economic growth and development are greatly affected in these two markets since customers face challenges as well as constraints such as poverty. On achieving sustained growth of the economy, customization of products through the application of frugal innovation becomes crucial. Belkadi et al. (2016) further argued that frugal innovation and customization is essential for the organizations in the competitive emerging markets to maintain stable growth of their market shares.

Popescu (2013) also opined that the emerging economies hold a major contribution to the growth of the world economy and organizations operating in it to enjoy vast opportunities at the same time. However, strategic thinking and developing creative and effective solutions such as customization of products and services also become challenging for such economies at the same time. This is mainly because of the higher market competition, rapid growth of consumer population, insufficient income of the consumers, and their diverse preferences for products and services from the organizations. The past studies have made it evident that effective innovation and product performance holds a significant relationship in driving economic growth and the organization's product sales. Thus, overcoming certain constraints and challenges such as increasing competition, consumer diverse product requirements, and insufficient income of the consumers requires creative and innovative solutions. Frugal innovation and customization of the product in emerging economies have further

proven to be a creative and effective solution for the emerging problems in sustaining its growth as well as for the organization to attain competitiveness and higher product sales in the past studies. Mourtzis et al. (2017) also stated that, manufacturing organizations operating in the current emerging economies must shift towards introducing frugal innovation to keep up with the pace of global innovation and product design trends. Frugal innovation possesses the ability to integrate new business models, through which organizations can develop low-cost products while making efficient usage of resources. It also provides a product customization facility for such organizations, based on customer requirements such as low-cost products with quality design (Mourtzis et al., 2017).

Maric et al. (2016) highlighted the old and robust 3D printing model manufactured in the past 30 years, which can be referred to as one of the product customization application. This model was developed with the help of a computer and computer-aided design (CAD) software and then, fabricated by using the 3D printer in cross-sectional layers. Besides, this model has been identified as customizable quickly. Although this model became robust due to the evolution of technology, transformation on the 3D printing model was achieved through the application of frugal innovation by the manufacturing organizations operating in the emerging economies. This model was further referred to as the low-cost frugal 3D printer and was integrated under the manufacturing process of the products. This product customization application further helped manufacturing organizations to customize the shape and features of the product be-

fore it was manufactured. Mourtzis et al. (2016) further argued that the development of mobile applications has always been crucial for the manufacturing organizations in delivering the individual needs of the consumers as well as market requirements. Such mobile applications had proven to be effective for organizations during the manufacturing process of the product. Providing accessibility on the mobile application to the consumers would further have enabled the consumer to design or customize products based on their preferences through the use of augmented reality (AR) feature of the application (Mourtzis et al., 2016).

Thus, the collection of designs also proved to be helpful for the organizations on reviewing every product design customized by the consumers. Based on the majority of similar product, designs could have further benefited manufacturing organizations to fulfil the demand of the consumers (Mourtzis et al., 2016). Besides, Belkadi et al. (2016) also stated that the global modular approach has been considered as the product application that has allowed the consumers to engage in configuring or customizing their products as per their individual needs. Alongside, the integration of frugal innovation and the global modular approach have proven to be effective for collecting information on the customized product of every consumer and designing the products by the manufacturing organization accordingly to attain consumer satisfaction through their product requirement fulfilment (Belkadi et al., 2016).

### Conclusion

Emphasizing the literature findings, it can be understood that frugal innovation as a concept has played a major role in the world economic growth and development through the generation of creative, unique, and innovative solutions. Above all, the past studies have shown that frugal innovation is more capable of enforcing the legal market, economy, and organizational policies to govern operational activities in the emerging markets. This concept also ensures the development of effective business strategies for the organizations but, it has also displayed effectiveness on delivering organizational values, customer values, and social values for the organizations in the emerging markets. A broader perspective of the manufacturing organizations on developing business and operational strategies has also been achieved through the integration of effective business models and theories under their strategies. Through the application of such strategies and business models, manufacturing organizations have been able to produce goods as per the consumer needs and their affordability. Application of frugal innovation has further helped the manufacturing organizations to attain competitiveness, generate higher sales, and majorly contribute to the development of the global economy.

Furthermore, some of the studies have also shown that frugal innovation can not only help in constructing effective and innovative solutions, but also possesses an ability to assist especially manufacturing or technology-based organizations to tackle market and manufacturing process constraints as well. Emerging economies such as China and India, where the consumer faces financial and poverty-related is-

sues are bound to affect the manufacturing organization's business growth through the reduction of quality products at higher prices. For such organizations, frugal innovation has helped them in generating creative ideas such as reducing the price of the product as per the consumer's affordability and maintaining its quality while making efficient use of resources on manufacturing products. Even in case of rapid change in the technological and market trends at the global level, integration of frugal innovation theory or concept has been able to assist the emerging markets to keep up with the pace of technological advancements, which are continuously taking place at the global level.

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