

The Role of Frugal Innovation and Social Entrepreneurship in Supporting Socioeconomic Life in Emerging Markets

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Abstract

Some studies highlight frugal innovation as the product of research and development by multinational corporations (MNCs), prompted by opportunity in new markets and underserved customers. Other studies suggest frugal innovation emerged originally by poor people with the aim of achieving economic outcomes for themselves. Frugal innovation emerges in the context of resource scarcity and institutional voids, with the motive to provide the low-cost, accessible and handy solutions for underserved, bottom-of-the-pyramid (BoP) population. There is a parallel stream of literature on social entrepreneurship, which explores innovation by BoP communities directed towards achieving socio-economic outcomes. Frugal innovators and social entrepreneurs are common study population because both appear to face the challenge of needing innovation in an extreme context and both share a common motive of serving BoP customers. The study will explore frugal innovation and social entrepreneurship, from small business perspective – nano, micro and small enterprises (NMSEs) – in the Kingdom of Saudi Arabia (KSA) and India. The study will aim to identify antecedents to innovation, enabling and constraining factors in the respective emerging markets, and the respective impact of such innovations. The study will be based on an inductive examination of live experiences of innovators and entrepreneurs across the two developing economies, with the intention to develop theory related to frugal innovation and social entrepreneurship from a small business perspective, and attempt to chart the potential impact of these approaches on the local community, associated businesses and the wider economy.

Keywords: Frugal Innovation, Social Entrepreneurship, Emerging Markets, Socioeconomic Status

Introduction

Aims and context

This study aims to explore frugal innovation and social entrepreneurship from NMSEs perspective prompted by extreme context of institutional voids and resource scarcity. NMSEs include **Nano enterprises:** run by sole traders or frugal / social innovators without any employee; **Micro enterprises:** up-to four employees only and **Small enterprises:** having five to nineteen employees only. This study will report live experiences of innovators and entrepreneurs in the emerging markets of KSA and India in order to build a deep understanding of frugal innovation and social entrepreneurship. Vision 2030, KSA's blueprint for future, launched in 2016, provides a broad context for this study. The government's aim is to diversify and strengthen all sectors of the economy and reduce dependence on oil sector (Vision). This study seeks to close the gap in literature on frugal innovation that mainly focuses on MNCs at present. Multiple case studies approach will be used to identify the antecedents and the enabling and the constraining factors for innovation

in emerging markets. Findings will help in determining strategies that support (frugal) innovators and (social) entrepreneurs succeed in developing economies.

Research question and research objectives

RQ: *How are the related concepts of frugal innovation and social entrepreneurship supported within NMSEs to achieve sustainable socio-economic performance in an environment of extreme constraint?*

To answer this RQ, the following research objectives are identified:

- RO1: Identify the antecedents to innovation (given the extreme context of institutional voids and economic necessity) in emerging markets?
- RO2: Investigate the key factors in the process of frugal innovation and social entrepreneurship in emerging markets?
- RO3: Identify factors that enable and constrain frugal innovation and social entrepreneurship?
- RO4: Critique frugal innovation and social entrepreneurship in terms of impact (outcomes)?
- RO5: Identify a framework that explains FI and SE in small businesses?

Contribution to knowledge

In reviewing literature, frugal innovation appears largely as a product of research and development (R&D) by MNCs prompted by perceived opportunity in new markets and by underserved customers (Zeschky, M, Widenmayer & Gassmann 2011), (Zeschky, M, Widenmayer & Gassmann 2014), (Agarwal et al. 2017). In Western markets, innovation has usually meant the development of new products with advanced features (Mukerjee 2012), (Meagher 2017). However, in context of emerging markets, companies need to adopt frugal innovation strategies to penetrate. Key considerations of include affordable pricing (Mukerjee 2012), (Winterhalter et al. 2017) for BoP customers (Prahalad, Coimbatore K & Hart 2002), knowing the customer and reconstituting the value chain when offering product and services for economically disadvantaged customers. One issue is to understand the real conditions where the customers live and will use the product (Mukerjee 2012). Illustrating this consideration, Nokia realised a low-cost mobile phone for India needed to be rugged, able to withstand heat and dust, and needed to offer a torch facility for power-cut prone rural areas. Other strategies include the capacity to serve and reach mass consumers as achieved by Vodafone while selling low-cost, pre-paid vouchers through groceries and convenience stores (Mukerjee 2012) (Meagher 2017).

There are numerous examples of large corporate attempting frugal innovation, but NMSEs in emerging markets lack focus on this concept (Agarwal et al. 2017), (Hossain 2018). There is also a lack of critical insight into the related concept of social entrepreneurship that drives social innovation in BoP communities (Weerawardena & Mort 2006). Thus, one of the contributions to knowledge of this research is to close theoretical and practical gaps in the nascent field of frugal innovation and social entrepreneurship. Another contribution to knowledge of this research is to identify enabling and constraining factors facing NMSEs and the last prospective contribution is the development of a common theoretical framework that incorporates frugal innovation and social entrepreneurship by small businesses, which in turn enables innovators and social entrepreneurs to survive and succeed in their respective economies.

Statement of significance

This study is significant from three points of view; economic, innovative, and social. One practical contribution is identifying factors that will enable NMSEs to harness frugal innovation and social entrepreneurship to increase their profits and sustainability. The growth of NMSEs will in turn help fulfil the wider vision of the KSA to diversify and strengthen all sectors of the economy and reduce dependence on the oil sector, noting that SMEs are reported to currently make a low contribution to GDP – estimated at 20% (Vision), in contrast to SMEs in developing countries that on average contribute near 33% (OECD.org, 2017). Moreover, a frugal innovation pathway will help NMSEs reach a wider range of customers and consumers by providing new products, services and systems that are affordable to millions of low and middle-income consumers in emerging markets (Bhatti 2012; Zeschky, MB, Winterhalter & Gassmann 2014).

This study may also identify business models which can support low-cost innovations and reduce production costs while retaining product value and maintaining technological development (Radjou & Prabhu 2015; Rao 2013; Tiwari & Herstatt 2012). In effect, these insights may help disrupt the process whereby the price of products and services increases as some redundant features are added to innovations. This research also has a social significance, as support for social entrepreneurs will help them solve social issues for BoP under-served people surviving in an extreme context of institutional voids and resource scarcity (Bhatti et al. 2018).

Literature Review

Innovation is a way of thinking that generates new ideas, discovers new ways of practice or helps make new devices applied by a person, group or institution (Rogers, E 2003), while entrepreneurship is the managerial process for creating and managing innovation (Drucker 2014). From strategic business perspective, innovation is necessary in order to survive and is concerned with creating competitive advantage by perceiving or discovering new and improved ways of competing in an industry and bringing them to market (Porter, M 1990). Thus, innovation and entrepreneurship are two sides of the same coin. The work of an entrepreneur is to innovate, which is the act that endows resources with a new capacity to create wealth (Drucker 2014), and systemic innovation is integral to organisation survival. To paraphrase Schumpeter, 'dynamic disequilibrium' is the "norm of a healthy economy and the central reality for economic theory and economic practice" (Drucker 2014), while 'creative destruction' explains the process when innovations start to compete with each other in terms of performance, rather than simply on price (Spencer, Kirchhoff & White 2008). These are key concepts in explaining the 'windows of opportunity' for innovation, both from within the firm (related to an event, process need and/or change in market structure) and also from without (demographic, change in perception and new knowledge) according to (Drucker 2014). The focus is consistent with the stress Drucker placed on low-tech entrepreneurship and the challenge of balancing technological possibility with limited resources, but with the caveat added by Prahalad et al., (2002) of serving BoP (and under-served) customers.

Innovation studies have emerged across disciplines; from marketing to product development, technology management, economic, organizational theory, sociology and more (Bhatti et al. 2018);(Bernstein & Singh 2006). Based on a review of recent literature, researchers appear to concentrate on a single dimension of innovation, such as within organization (Damanpour 1991), in technology application (Ettlie 2000) or over market-related issues (Hargadon & Sutton 2000). Innovation literature can also be categorized by areas of interest: first, in making innovation, second, the systemic nature of innovation, third, how innovations differ, and fourth, innovation and performance (Fagerberg 2004). Both frugal innovators and social

entrepreneurs and their associated small businesses represent a highly relevant study population, as both confront the common challenge i.e. need to innovate in context of institutional voids and resource scarcity, and deliver affordable products and/or services for BoP communities.

Types of innovation

Assuming success of initial idea and potential innovation (estimated at about 15% of all creative ideas), three broad types of innovation are identified (Christensen, Bohmer & Kenagy 2000; Christensen, Raynor & McDonald 2015). The most common type, comprising about 80 to 90% of all innovations, is *sustaining* innovations which focused on economies of scale and make a good product better, improves margins, gains market share, but also creates little net growth. Motor vehicle industry is a typical example of *sustaining* innovations. Second type of innovation is *efficiency* innovations which focus on doing more for less and result in businesses freeing up cash flow, but this approach leads to diminishing growth and eliminating jobs as well. An example of efficiency innovation is Walmart. The third type of innovation is *disruptive* innovations that disrupts the current way of business which helps to make, for example, expensive products more affordable and more accessible to mass or underserved customers. The rise of low-cost, mass produced computers and mobile phones are examples of this type of innovation. Disruptive innovations create growth and jobs, but need capital. Figure 1 illustrates the three types of innovation, with the obvious limitation that it is difficult to categorise innovations by one of the three identified types. Frugal innovation, as illustrated, can comprise all three types but is associated mostly with small firms or start-ups, which usually complement larger companies by producing niche products (or services) that are affordable, accessible and convenient for mass communities.

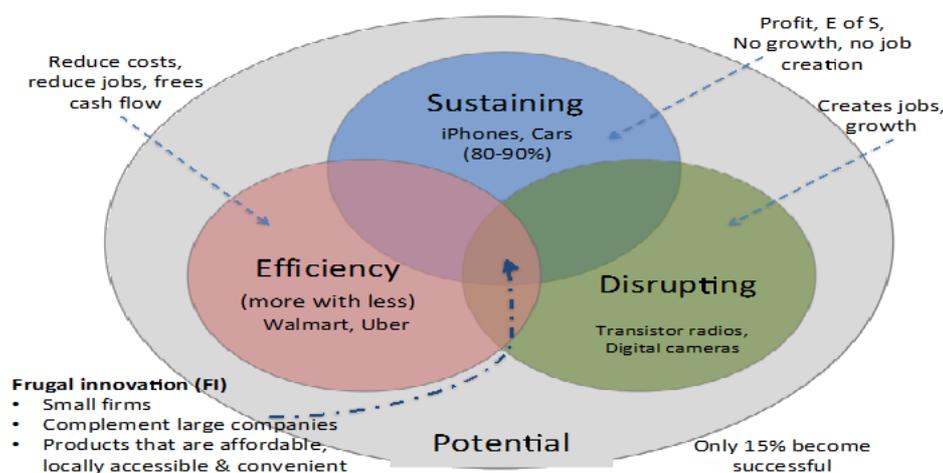
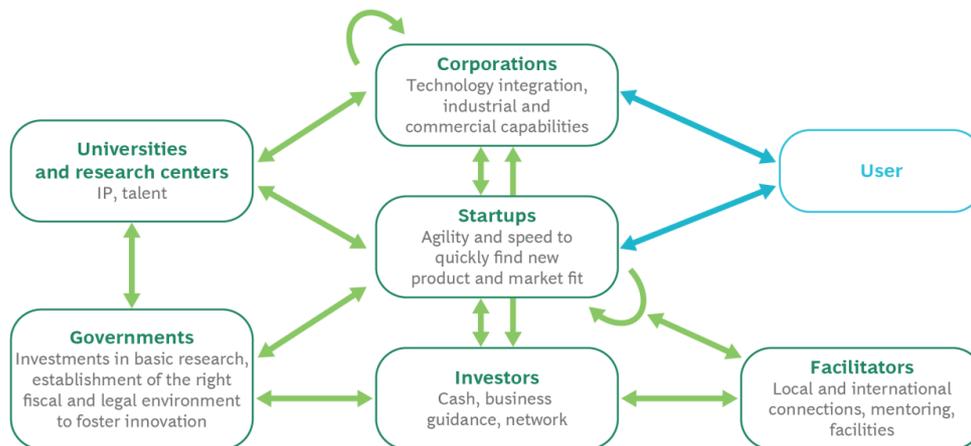


Figure 1: Types of innovation (drawing on Christensen (Christensen, Bohmer & Kenagy 2000; Christensen, Raynor & McDonald 2015)

Deep Technologies

Deep technologies belong to emerging area of innovation that offers significant advances over the existent technology. Its emergence has arguably made innovation more fragmented and diverse – in geographic, functional and industrial terms (Massimo Portincaso 2019). Emerging fields include advanced materials, artificial intelligence, biotechnology, block chain, drones, robotics, quantum computing etc. Deep technology is described as having potential *big impact* in areas such as health and well-being, environment, responsible production, and affordable and clean energy, but it also takes *long time* to reach market-

maturity and *requires a lot of money* to develop and reach scale. Moreover, because of associated complications with technology risk, traditional funding sources are not viable for these innovations. Deep technology is no longer the sole domain of large companies with unlimited funding, and the scientific community due to several reasons. One is the ready availability of newer, less expensive technologies, cloud-based services, computer-aided design (CAD) and manufacturing, and 3-D printing. Another is the widely dispersed skills and knowledge, and contacts and market access that link many players in deep technology ecosystem. Figure 2 below suggests, small start-ups are in many ways central to deep technology ecosystems as they enjoy agility and speed to quickly find new products and market fit:



Sources: Hello Tomorrow; BCG and Hello Tomorrow analysis.

Figure 2: Deep technology ecosystems (illustrated)

Social entrepreneurship

It is difficult to distinguish between social entrepreneurship and social innovation. Social entrepreneurship is best defined as innovation that brings positive change for society (Tracey & Jarvis 2007). The primary objective of social entrepreneurs is to create social value firstly, and then to make profits in order to ensure that social value continues (Mair & Marti 2006). The researchers and practitioners' interest in social entrepreneurship is concerned with providing solutions around social issues, in terms of unemployment, poverty and illiteracy etc (Hilgartner & Bosk 1988). Likewise, these social benefits aid the society, whereas non-social projects or organizations or individual company do not (Thompson 2002).

Even though social entrepreneurs are focused on activities related to the commercial market to gain both economic values alongside creating social value, social entrepreneurship has roots in the study of nonprofit institutions (Bhatti et al. 2018) and social entrepreneurship is largely independent self-employment activity directed towards economic growth, social inclusion and/or job creation (Chu et al. 2011; Coy et al. 2007; Hattab 2012; Rose, Kumar & Yen 2006; Tipu & Arain 2011; Zamberi Ahmad 2012). Understandably, the subject of entrepreneurship and the study of structural push factors (such as the subjective benefits of self-employment) and attitudinal pull factors (such as greater job satisfaction and economic individualism) are a fertile research area (Patrick, Stephens & Weinstein 2016). Another emerging area of interest related to entrepreneurship is the study of frugal innovation (Hossain 2018).

What is frugal innovation?

Frugal innovation is a relatively new phenomenon, coined as recent as six years ago (Hossain 2018) and various definitions have evolved mainly through three stages of thinking: related to products (2012-2013), related to markets (2014-2015), and related to the criteria (2016-2017) (Pisoni, Micheline & Martignoni 2018). These definitions are listed in the table below Hossain (2018).

Table 1: Definitions of frugal innovation

Type of...	Frugal innovation (s):	Reference
Product-oriented view (2012-13)	"... stems from resource scarcity: utilizing limited resources to meet the needs of low-income customers."	(Sharma & Iyer 2012)
	"... is innovative, low-cost and high-quality products and business models originating in developing countries and exportable to other developing countries or even the developed world, often termed as 'frugal innovation'."	(George, McGahan & Prabhu 2012)
	"...is a new management philosophy, which integrates the needs of the base of the pyramid (BoP) market as a starting point to develop solutions that are expected to be very different from the alternative solutions."	(Gupta 2012)
	".... is also an innovation process design in which customers are the key focus to develop accessible, adaptable, affordable, and appropriate products."	(Basu, RR, Banerjee & Sweeny 2013)
Market-oriented view (2014-15)	"... are typically built on new product architectures that enable entirely new applications at much lower price points than existing solutions."	(Zeschky, MB, Winterhalter & Gassmann 2014)
	".... are products and services that focus on crucial needs, spare resource use or eliminate non-essential features in the design process."	(Kuo 2017)
	".... has a higher technical novelty and a higher market novelty than good-enough innovation and cost innovation."	(Zeschky, M, Widenmayer & Gassmann 2014)
	"Involves product innovation when there is a scarcity of affluent customers and distinguish it from bricolage, which is when material resources are scarce, and from improvisation, when time is scarce."	(Cunha et al. 2014)
	"... has low to medium sophistication, medium sustainability, and medium emerging market orientation."	(Brem & Wolfram 2014)
	".... refers to products and services that are	(Agnihotri

Type of...	Frugal innovation (s):	Reference
	developed under resource constraints.”	2015)
Criteria-oriented view (2016-17)	“... is ‘good-enough’, affordable products that suffice the needs of resource-constrained consumers.”	(Agarwal et al. 2017)
	“.... is a resource scarce solution (i.e., product, service, process, or business model) that is designed and implemented despite financial, technological, material or other resource constraints, whereby the final outcome is significantly cheaper than competitive offerings (if available) and is good enough to meet the basic needs of customers who would otherwise remain un(der)served.”	(Hossain & Anees-ur-Rehman 2016)
	“Frugal innovation consists of three attributes: substantial cost reduction, concentration on core functionalities, and optimized performance level.”	(Weyrauch & Herstatt 2017)

Organisation for Economic Co-operation and Development (OECD) report (2011) outlined that governments should seek ways to boost innovation without necessarily engaging in new programme spending, primarily to meet social demands. As a result, there have been several calls in both academia and industry to search for alternative approaches to innovation in order to ensure cost-effectiveness in meeting societal and environmental demands (Ahuja & Chan 2014). The traditional paradigm for innovation is “fail fast, fix fast, learn fast”; in contrast, frugal innovation relies on “fail cheap, fail fast, fail often” (Radjou, Prabhu & Ahuja 2012) founded on the principle that the chance of success increases with innovations. Additionally, ideas only become an innovation “when it can be replicated reliably in a meaningful scale at practical costs”(Senge 1990).

Sometimes the concept of frugal innovation is associated with MNCs such as Nissan, GE and Unilever (Zeschky, M, Widenmayer & Gassmann 2011), with products typically designed to meet the needs of poor people in developing countries for obvious reasons e.g. increasing the profit. For example, at about \$2,200, Tata's Nano car is priced at relatively low cost. Many design features such as power steering, air conditioning, antilock braking, airbags, passenger-side mirror etc. are given up to reach this cost. Notwithstanding, according to a study, Tata could not meet the Indian market demand (Zeschky, M, Widenmayer & Gassmann 2011). Further, frugal innovation helps MNCs to create new market segment. Chinese company Galanz created a new microwave that was cheap, small, and energy efficient which enabled it to raise its microwave's customers percentage from only 2% to 60%, making it one of the biggest microwave company in the world (Gloria & Ding 2008; Hart & Christensen 2002b). Additionally, MNCs engage in frugal innovation to take advantage of new type of customers. For instance, another Chinese company Haier made a new washing machine (Mini Magical Child) intended to serve BoP customers by providing them cheaper option with the same features of large and expensive washing machines. This was an immediate success and the company is now promoting similar products for sale worldwide (Hang, C-C, Chen & Subramian 2010). Also, there is portable ultrasound health care device of GE in this context that is handy and serves poor in rural China (Rao 2013).

Despite these examples, NMSEs are not much concerned about resource scarce solutions for developing economies and emerging markets. Thus, literature perhaps does not reflect the full reality of frugal innovation and social entrepreneurship, especially in terms of resources scarcity and institutional voids in emerging markets. So, this study will focus on factors that enable or constraint NMSEs in terms of frugal innovation and social entrepreneurship in Saudi Arabia and India, respectively.

What are NMSEs?

NMSEs are classified differently according to each country's economic system. For instance, the Australian Small Business and Family Enterprise Ombudsman, revealed that 61% of Australian businesses are Nano enterprises, 27% are Micro enterprises, 9 % are small enterprises and only 3% are having 20 or more employees (*Small Business Statistical Report-Final*).

One of the important sectors in India is Micro, Small and Medium Enterprise (MSME). It contributes around 38% to GDP and employs almost 80.5 million people in about 36 million enterprises across the country. Contrary to this, approximately 28.9 million people are employed in large industries. The reason lies in the belief that MSMEs are more capable to address the structural problems than large sectors in context of unemployment, regional imbalances, unequal distribution of national income and wealth. MSMEs are classified as follows:

Table 2: NMSE by employees in KSA, India, AUS, USA, and Europe

	The number of employees (KSA)	The number of employees (India)	The number of employees (AUS)	The number of employees (USA & EUROP)
Sole trader (Nano)			0 employees	
(Micro)	1-5	1-9	1-4	<10
(Small)	6-49	10-49	5-19	10-49
(Medium)	50-250	50-300	20-199	50-250
Source	(<i>Survey of Small and Medium-sized Enterprises 2017</i>)	(<i>What's MSME</i>)	(Ombudsman 2016)	(OECD 2017)

MSMEs and Frugal Innovation

MSMEs in Saudi Arabia face problems such as insufficient financial support, lack of training, bureaucracy and unpredictable policy changes (Zamberi Ahmad 2012). The lack of innovation is one of the obstacles facing MSMEs in KSA (Waked 2016). In addition, researchers do not cover these problems, so academic resources are minimal. Frugal innovation can create new markets by using new application (Winterhalter et al. 2017). KSA is an emerging market and no study, like this, has been undertaken there yet. Kuo (2017) showed that harnessing frugal innovation could provide affordable products to poor customers and at the same time profit to the producers.

Frugal innovations aim to improve global sustainability due to a continuous reduction in the demand for resources in different economies (Knorringa et al. 2016). The method aims to use a limited number of assets to produce goods and service that can be used to meet the needs of the people in a certain country. Since KSA is reliant on petroleum, once the mineral is depleted it will be difficult for the Kingdom to finance its development projects (Knorringa et al. 2016). Thus, it would be prudent for the government to seek alternative investments that will enable to support the future economy and during periods when oil prices are low.

How frugal innovation intersects with other concepts

The concept of frugal innovation overlaps other concepts that have similar features (Agnihotri 2015); (Ahuja & Chan 2014); (Brem & Wolfram 2014); (Rosca, Arnold & Bendul 2017). In Indian context, *Gandhian innovation* vouches to “do more with fewer resources—for more people” (Prahalad, Coimbatore Krishnarao & Mashelkar 2010), which emphasizes the principles of affordability and frugality common to frugal innovation, as well as that of inclusive growth or inclusive innovations. It can thus be considered to be the intersection of frugal (and inclusive social) innovations. Other examples of organic and local approaches to innovation emerging in specific countries are shown below (Prabhu & Jain 2015); (Nair et al. 2015); (Radjou & Prabhu 2015):

- **Jugaad (India):** An impromptu solution generated by an intelligently innovative fix in Hindi heartland.
- **Chuangxin (China):** Focuses on saving resources.
- **Gambiarra and Jeitinho (Brazil):** Innovative solutions that help in agriculture, automotive, and bio-fuel problems.
- **Kanju and Jua Kali (Africa):** Innovative solutions such as using solar equipment for lighting in Kenya.

Other concepts that have been established in developing countries include:

- **Catalytic innovation** that provides economic and sustainable solutions for poor consumers through innovative activities focused on the community (Craymer 2007).
- **BoP innovation** that provides products and services that serve poor customers (Prahalad, Coimbatore Krishna 2006) and a related **inclusive innovation** that aims to help BoP customers with a better life (George, McGahan & Prabhu 2012).
- **Good-enough innovation** which focuses on essential features of the products, keeps them and eliminates nonessential features and functions to make products affordable to the poor (Hang, C-C, Chen & Subramian 2010; Zeschky, MB, Winterhalter & Gassmann 2014).
- **Resource-constrained innovation** that uses minimum resources to produce low-cost products (Ray & Ray 2011); (Sharma & Iyer 2012).

There are further related concepts connected to both developing and developed countries e.g. grassroots innovation, disruptive innovation, reverse innovation, blowback innovation and trickle-up innovation (Hossain & Anees-ur-Rehman 2016; Rosca, Arnold & Bendul 2017; Rosca, Reedy & Bendul 2018). Reflecting the interconnected nature, frugal innovation is also described as reverse / trickle-up / blowback innovation since it emerged in developing countries and later got successfully transferred to developed countries (Hossain 2013, 2018). The closest concept to frugal innovation (and social entrepreneurship) is BoP innovation. However, BoP innovation focuses on poor customers with < \$1500 annual income (Hart &

Christensen 2002b), while frugal innovation can include both poor and also middle-income customers (Hossain & Anees-ur-Rehman 2016); (Knorrington et al. 2016).

Frugal innovation and theoretical perspectives

Theoretically, frugal innovation is a new concept and in spite of numerous literature, its theoretical discourse is still sparse (Hossain 2018). In frugal innovation literature, several theories have been reviewed e.g. diffusion theory, institutional theory, resource dependency theory, disruptive innovation theory, network theory, organisational theory, international product life cycle theory and transaction theory (Hossain 2018). Some studies explore frugal innovation from the point of view of sustainability and open innovation (Hossain 2013, 2018). Resource-based theory can be used to explore how the scarcity of resources constrains the process of innovation among individuals, organisations and companies. In other word, resource scarcity is the fundamental principal of resource dependency theory, where several organisations are competing and attempting to collect similar restricted resources (Hessels & Terjesen 2010). A study (George, McGahan & Prabhu 2012) of some rural inhabitants who live in geographically dispersed areas and need last-mile services explores how they could get these resources through distribution and logistics systems. Thus, frugal innovation is usefully explored by applying resource-based theory (Hossain 2018), while diffusion theory, (Rogers, EM 2010) suggests innovation flows from the elite to the masses with decreasing product value, making these products affordable for poor consumers.

In contrast to other innovations, a key feature of frugal innovation is that it flows from the masses to the elite by diffusion (Hossain & Anees-ur-Rehman 2016). Therefore, in low-income countries, diffusion theory is unsuitable and its application has been criticised by scholars (Strang & Soule 1998); (Zanello et al. 2016). This alternative diffusion theory should have unique features in the context of communication channels, innovation, society and time (Hang, CC, Garnsey & Ruan 2015). Frugal innovation might be considered disruptive as long as it transforms complicated and expensive products and makes them affordable (Slavova 2014; Soni & T. Krishnan 2014). Frugal innovation can also be examined by institutional theory (Zeschky, MB, Winterhalter & Gassmann 2014). For example, this might explain different actions that actors/ companies in developing countries take in the context of institutional voids (Khanna & Palepu 1997; Mair, Marti & Ventresca 2012)

Enabling factors for frugal innovation

It is difficult to predict frugal innovation's success (Manceau & Morand 2014). However, developing countries that have resource-constrained environments are a perfect for frugal innovation to grow (Zeschky, M, Widenmayer & Gassmann 2011). Some scholars argue that robust collaboration between MNCs and subsidiaries and local firms is one of its success factors (Sako 2009). However, MNCs need customization to suit production in unstable and unpredictable places (Hossain 2018). More freedom for innovation teams is required to develop frugal innovation products or services for more price-sensitive customers (Tiwari & Herstatt 2012). In order to achieve this, a deliberate change in capability and mindset is essential (Hossain 2018).

One of the enabling factors of frugal innovation is transferring local market knowledge and technical knowledge, and companies need to think differently and change their organisational structure in order to change their employees' mindsets (Agnihotri 2015). Some essential issues related to its success are target costing, quality function deployment and value analysis (Zeschky, M, Widenmayer & Gassmann 2011). Core value identification and localisation are critical success factors for MNCs in emerging markets. Also, for frugal innovation proximity to the local market is crucial for development, commercialisation, effective innovation during

team formulation, the value chain and marketing (Agarwal & Brem 2012). Dandonoli (2013) argues that its adoption process can be accelerated and its chances of success can be increased by collaboration between developed and developing countries' entities. For success of frugal innovation, it is crucial to ignore unsuccessful projects and keep looking for new ways to succeed (Denning 2014).

Constraining factors of frugal innovation

The constraining factors associated with frugal innovation are outcomes of its development under various constants. MNCs are looking to the complicated task of facilitating low-income consumers through developing frugal innovation (Ray and Ray, 2011). Meeting the needs of poor consumers is not easy in the technical and organisational contexts (Parthasarathy 2013). Some scholars such as Zeschky, M, Widenmayer and Gassmann (2011) stress that the MNCs will have to restructure their settled business models.

Sustainable growth is also a challenge for policymakers, so they must strongly advocate for developing frugal innovation (Publishing 2010). Another key issue for frugal innovation is scalability (Rosca, Arnold & Bendul 2017); (Wohlfart et al. 2016). MNCs are afraid of self-cannibalisation that can result from the existence of high-end innovations in the same area as frugal innovation (Angot & Plé 2015); (Wohlfart et al. 2016). According to Sako (2009), MNCs could encounter difficulties when there is an overlap between frugal innovation. Developing countries may face difficulties in innovating due to the scarcity of resources, unsteady infrastructure with restricted access and financial problems (Ahuja & Chan 2014).

Companies confront three fundamental challenges, " proper integration of material efficiency, inclusive local production employment and decent work for all and inclusive and sustainable local industrialization (Lev Levänen et al., 2015)." In addition, limited education, disqualified infrastructure and fragmented distribution systems can also constrain the diffusion of frugal innovation (Nari Kahle et al. 2013)(Parthasarathy 2013). Radical innovation is familiar in western countries, whereas developing a frugal mindset and culture can be difficult and need extraordinary effort (Agnihotri 2015), and the higher administration department may be unwilling to specify resources for frugal innovation (Angot & Plé 2015).

Implementing Frugal Innovation

A study of five medical and laboratory devices and equipment firms using frugal innovation found that frugal innovation business models created new market segments in countries like India and China (Winterhalter et al. 2017). The study also claimed that it enhances the understanding of suitable business models in medical and laboratory firms and the value proposition can serve three groups of customers: the healthcare system, clinics/doctors and patients (see Figure 3).

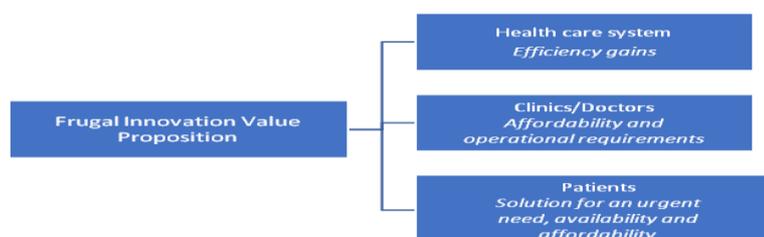


Figure 3: The value proposition of frugal business models in the med-tech sector (Winterhalter et al. 2017).

Frugal innovation, focused on customer requirements, must provide products and services at a low price and yet high quality. Low-income customers need products that simply meet their minimum requirements and frugal innovation provides these kinds of products by removing non-essential functions (Radjou & Prabhu 2015). Eliminating non-essential features or functions also help reduce product costs by minimising resource usage. Equally, the cost and price of products can be reduced by redesigning production processes (Radjou & Prabhu 2015).

Frugal innovation enhances social and economic benefits by providing products at affordable prices which leads to improve the standard of living. For example, noting that over 70% of the Indian population live in villages without access to banking, Vortex company designed solar energy enabled ATMs consuming 90% less power than regular ATMs for these areas (Tiwari & Herstatt 2012). In Philippines, MyShelter foundation invented solar bottle bulb that helps poor customers to get basic lighting and decrease fire accidents in poor areas. In India, ChotuKool, a low-cost battery-powered refrigerator developed by Godrej, serve poor people facing electricity to preserve their food. Similarly, Solar cooker is another product of Godrej that serves customers who cannot afford electricity (Kuo 2017).

Table 3: Frugal Innovation other examples

No.	Company name	Enterprise type	Product name	Product feature (BOP target)	Reference
1	GE (USA)	MNC	Mac 400	Portable, economic for institutions, Affordable to customers	(Rao 2013)
2	Aravind Eye care System (India)	Hospital chain	Eye care	Economic surgery, economies of scale, Sophisticated technology	(Khan 2016)
3	Jodo Gyan (India)	Small non-profit	Bamboo Microscope	Economic, handy; Simple technology, Durable	(Basu, P 2007)
4	Trans African Hydro Meteorological Observatory (Kenya)	Public Benefit Organisation	MA-4100 forecasting weather sensor	Small size, Economic, Simple	(Howell, van Beers & Doorn 2018)
5	Safaricom (Kenya)	Public limited company	M-Pesa	Accessible, Simple, Efficient	Lukas (Wellen & van Dijk 2018)

Emerging markets

Majority of frugal innovation case studies are from India (Agarwal et al. 2017). In contrast, not a single publication about Saudi Arabia has been found. Notably, 70% of constraint-based innovations publications are by developed countries, USA being at top of the list with 43 publications followed by UK, Germany, and Switzerland (Agarwal et al. 2017). However,

KSA and India, being emerging markets, both are also ideal location to examine native frugal innovation (Hart & Christensen 2002a).

Table 4 and 5 provide short summaries of both Saudi Arabia and India in terms of similarities and differences.

Table 4: Similarities

	KSA	India
Economic status	G20 member	G20 member
Economic type	Emerging markets	Emerging markets
Location	Middle East	Asia

Table 5: Differences

	KSA	India
Income	GDP per capita \$1,979.4 World bank	GDP per capita \$20,849.3 World bank
Literacy rate	97.9% General Authority for statistics KSA	71.69% Stastia.com
Population	33,413,660 (2018) but Saudi population 2018 (20,768,627) General Authority for statistics KSA	1,366,315,967 (2018) Worldometers
Economic	Oil centric	Diversified
Religion	Islam	Secular
Government type	Monarchy	Federal parliamentary republic
Language	Arabic	Language diversity

Methodology and Conceptual Framework

Being an exploratory study, it employs qualitative approach of research design conducted through multiple case studies. Survey-based methodologies are either inappropriate or less preferred (Corbin 2008); (Van Maanen 1979) (Yin 1984). Additionally, quantitative methods are less capable of capturing the details and providing insights and cannot help to achieve the aim of any study that is looking at understanding of richness and complexity of the innovator's experience, which is well suited to a qualitative approach (Lincoln & Guba 1985). Moreover, in new areas of research that lack an extant body of theories or data, exploratory fieldwork is required (Glaser & Strauss 1967); (Noda & Bower 1996). Finally, the use of case study approaches is practical for further studies by developing new concepts (Noda & Bower 1996).

This study will use multiple cases, which will give reliable results (Yin 1984) wherein researchers can adapt to strategy and have flexibility of data collection. Another characteristic of case study method is the capacity to triangulate (Veal 2005). The downside, however, is the method is time-consuming, complicated in conduct and creates a large number of documents that needs to be managed (Yin 1984). Another criticism of this approach is the difficulty of generalizing the conclusion since it relies on a few cases of exploration (Tellis 1997). The goal of qualitative study is to detail ‘thick’ descriptions of specific situations or experiences and such studies are useful particularly to reveal the role of contextual factors that influence innovation. A qualitative approach also allows the capacity to distinguish between how and why individuals understand the phenomena differently.

The study will collect primary data using semi-structured flexible interviews suited for small-scale research. Here, the interviewer prepares open-ended questions that give the interviewee the freedom in what and how much to say and how to explain (Drever 1995). In terms of flexibility and according to the participants' responses, the researcher will have the ability to ask additional questions. All interviews will be recorded if participants agree and translation from native dialects into English will be required using qualified translators. This study will use inductive research with the aim of conducting 12 interviews, 6 in Saudi Arabia and 6 in India. Abdul Latif Jameel Company, Jeddah has been chosen as interview destination in Saudi Arabia, whereas Centurion University, Odisha will serve the same purpose in India. To achieve the aim of confidentiality, no sensitive data will be mentioned that could affect the participants' sensibilities. Thus, participants' names will be substituted by code numbers to protect their identity. Their answers will be analyzed and compared to check for similarities or differences between the responses. The most and the least common answers will then be considered to generate related themes.

To speed up research process and to avoid data selection bias, all interviews will be recorded. This will boost confidence in case the supervisor, as an authorized party, will take part in coding during data analysis. The recording will be saved into computers as .wav files and the Adobe Audition will be used as the recording software. In case of any failure of recording equipment, written notes will also be taken. The audio records will be transcribed manually into .txt files, and will be examined in search of common themes using NVivo, which is well suited to identify and describe both implicit and explicit ideas within the data— i.e., themes. Codes will then be generated to illustrate the identified themes and applied or linked to raw data as summary markers for later analysis. Data will be stored on the R drive, digital drive account provided by Victoria University.

Conceptual framework

The concept of frugal innovation “is a resource scarce solution (i.e., product, service, process, or business model are designed and implemented despite financial, technological, material or other resource constraints) whereby the final outcome is typically significantly cheaper than competitive offerings (if available) product that is described as being good enough to meet the basic needs of customers who would otherwise remain un(der)served” (Hossain & Aneesur-Rehman 2016). Similarly, creating social value is the primary objective of social entrepreneurship for un(der)served communities, albeit with creating economic value to ensure sustainability a secondary objective (Mair & Marti 2006). The aim is to achieve an understanding of enabling and constraining factors of frugal innovation & social entrepreneurship in NMSEs, and the downstream impact of these two concepts in an emerging market context.

Figure 4 summarises the different market structures, (social or economic) motives of the innovation and other associated characteristics. The focus is on the grey section – that

represents the nano, micro and small firms typically associated with frugal innovation and social entrepreneurship in a resource-constrained context.

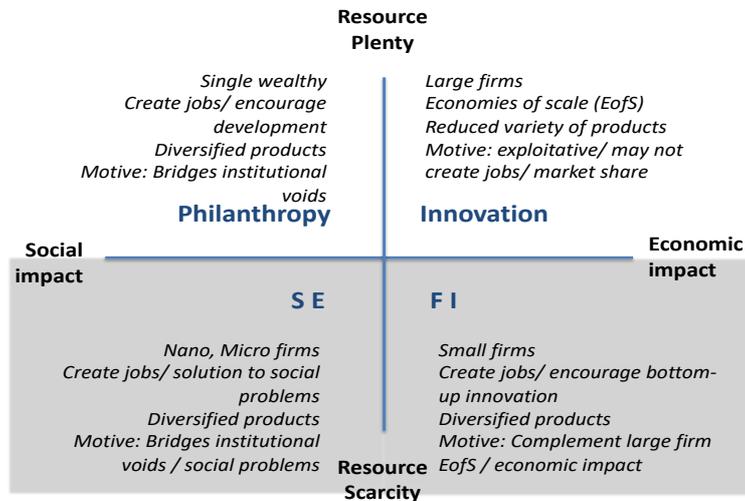


Figure 4: Market structures and motives (for innovation)

Given this contextual focus, the conceptual framework of this study is illustrated in Figure 5 as follows:

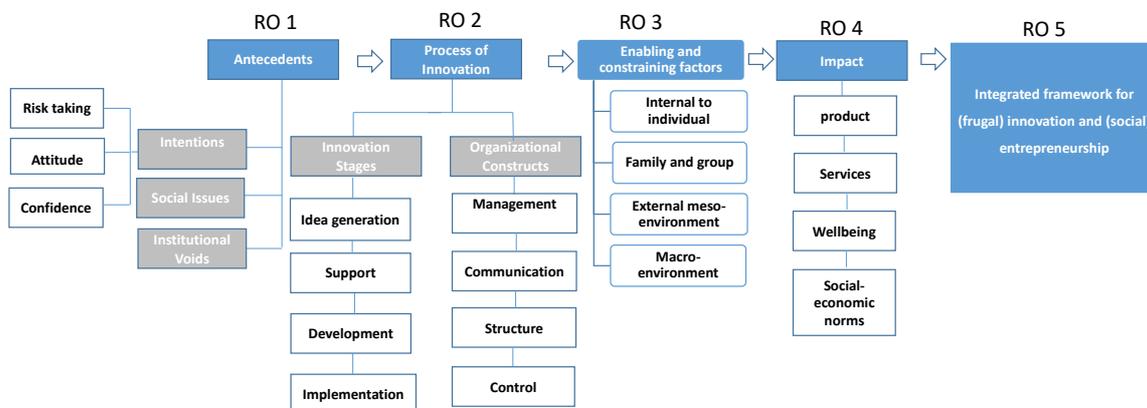


Figure 5: Conceptual framework for frugal innovation & social entrepreneurship

As illustrated, the conceptual framework starts with antecedents to innovation (RO1) that are identified in three categories: the intention of entrepreneurs (risk-taking, attitude, and confidence) (Moorthy & Annamalah 2014); the social issues, such as lack of education, income security and such that can lead to an increase in the rate of crime, poverty, unemployment, sexual crime, unwanted pregnancies etc. (Sarkar & Pingle 2018); and possible institutional voids (Bhatti et al. 2018). The next step is to examine the process of innovation (RO2) across innovation stages (idea generation, innovation support, innovation development, and innovation implementation) that are moderated by management and related organisational constructs (RO3) such as communication, structure, and control (Bernstein & Singh 2006). The final step is testing the impact of innovation in terms of products, services, lifestyle (wellbeing) and related socio-economic norms (RO4). It is hoped that this study will ultimately support the development of a common frugal innovation and social

entrepreneurship framework (RO5) for NMSEs in order to support sustainable socio-economic performance in an environment of extreme constraint.

Conclusion

The study will provide empirical evidence on the problems faced by Saudi and Indian NMSEs engaged in an environment of extreme constraint. Arguably there are factors related to the individual characteristics of both entrepreneurs / innovators of businesses and enterprises that affect their ability to innovate in such contexts. It is also anticipated that there are some obstacles which affect innovation and subsequent business performance. It is ultimately hoped that the findings of this study will enable policymakers to enhance their support of the needs of frugal innovators and social entrepreneurs in NMSEs.

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