

FRUGAL INNOVATION CHARACTERISTICS: MARKET, PRODUCT AND BUSINESS PERSPECTIVE

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ABSTRACT

In decades, innovations are mainly to serve the consuming market of populations. India has started to promote the innovation to serve the “un-served” market. The fact that emerging countries have huge “un-served” populations and experiencing resource constraint, innovators are required to provide innovations that are extremely low in cost and able to withstand the constraints. The term frugal innovation is promoted for such innovation. In this study, the characteristics of frugal innovation are defined from market, product and business perspective. A model is proposed to merge all the characteristics and perspectives.

Keywords: Frugal Innovation, innovation, “un-served” market.

1. INTRODUCTION

A new milestone in automotive industry has arrived upon the launching of *Tata Nano* in 2009. On 17 July 2009, Mr.Vichare and Mr.Balakrishan received their first *Tata Nano* vehicles (Tata Motors, 2009). By that time, it was nearly impossible to create an automobile products with selling price of \$2,230 (Kurczewski, 2009a)



Figure 1 : New-Tata Nano- LX- Dazzle Blue.
Reprinted from <http://www.tatanano.com/>

The 4-seater car is powered by 624 cc aluminum engine, 2 cylinder gasoline, and 4-speed manual transmission and able to achieve 25 kmpl petrol consumption. . The engine is able to produce 38 PS power and maximum speed of 105 km/H (Kurczewski, 2009b). It is able to suit the performance required by the rural customers.

ChotuKool is another successful extremely low cost product that was innovated by Godrej (Godrej, 2014).

ChotuKool successfully introduces a on-the-go cooling and food preservation solution and it contributes to a great value to rural and small-scale business (Godrej, 2014). With capacity of 35 L, 7.3 kgs of weight and power consumption of 62 W, *Chotukool* is able to reach 28^o drops below the room temperature. It has a price tag of S\$69 (Munuswamy, 2009) and It was considered as the lowest fridge in the world as of 2009 (Kavlekar & Kumar, 2014). .



Figure 2: Chotukool, Improving Rural Living Standards. Reprinted from:
http://chotukool.com/social_impact.aspx

Above examples are the phenomenal innovations for the emerging markets especially to serve the “un-served” society (situated at the bottom of the economic pyramid). Business in emerging market has 2 chronic issues that may hinder business penetration: (1) low purchasing power and

(2) high number of institutional voids (Mahmood, Kondis & Stehli, 2013).

This study is mainly focusing on identifying the characteristics of frugal innovations/products and proposing a simplified model for frugal innovation identification from the identified characteristics.

2. CHARACTERISTIC OF FRUGAL INNOVATIONS

Previous examples of frugal innovation show that the innovations have several distinct characteristics from other types of innovations. We combine the characteristics into 3 major perspectives. Market Perspective, Product Perspective and Business perspective are discussed further as below.

2.1 Market Perspective

The term of frugal innovation was introduced globally by Carlos Ghosn the Chairman and CEO of the *Renault-Nissan Alliance* in 2006. He defined frugal innovation market perspective as innovation under severe resource constraints (Radjou, Prabhu, Ahuja, 2012). Bhatti and Ventresca (2013) identified the market for frugal innovation as innovation with resource scarcity, affordability constraints, institutional void and applicable to large population. Additionally, Tiwari and Herstatt (2014) set the requirements for frugal innovation market as a market with economies of scale. Market research from Rolland Berger (2013) explains that it is necessary to adapt local requirements into frugal innovation performance.

Furthermore, Tiwari and Herstatt (2012) proposed assessment criterion (Table 1) for identifying frugal innovation lead market. The study was based on the case of India as the market leader for frugal innovation.

Table 1. Assessment on Lead Market Factor for Frugal Innovation (Tiwari and Herstatt, 2012)

Lead Market Factors	
Group	Factor
Cost Advantage	Economies of Scale
	Growth of Demand
	Factor costs
Demand Advantage	Size of demand
	Anticipatory needs faced by prospective customers
Technological Advantage	Availability of skilled labor
	Access to open knowledge networks
Export Advantage	International demonstration effects
	Similarity of Local demand to foreign market conditions
	Multinational firms & mobile users
	Export incentives
Market Structure Advantage	Cross-national policy convergence
	Market competition

Market for both *Tata Nano* and *ChotuKool* is India. Based on Table 1, India has all the necessary market conditions for accepting frugal innovations (Tiwari & Herstatt, 2012). Cost and demand advantages are supported by the large and growing population of India. The steady GDP growth of India is another fuel for the demand advantage.

Technologically, India market is considered as the pool talent in Asia or even the World. Skilled workers are abundantly available. Networking, diversity of talents and international exposure give an access for open innovation possibilities. By doing so, R&D cost for frugal innovation can be pressed to minimum.

As part of BRICS countries, India's market has been designed for export-friendly market. Many large multinational companies has been utilizing this policy and creating a competitive market in India.

Comparing the previous studies and the actual condition of India as the lead market of frugal innovation, we would like define the characteristic of frugal innovation market as a market with huge number of un-served populations with constraint on resources.

2.2 Product Perspective

It has been reported by Radjou et al. (2012) that Mr.Ghosn (CEO of the *Renault-Nissan Alliance*) in 2006 defined frugal products as products with characteristic of cost-effectively and being develop quickly. Zeschky, Winterhalter and Gassmann (2014) separated the products of frugal innovation from the good-enough innovation's and the cost innovation's. They defined frugal innovation has both new functionality and lower cost product, whereas cost innovation is only focus on the lower cost but similar functionality and good-enough innovation has tailored functionality at lower cost. This separation has given an impression to us that frugal innovation may have state-of-the art technology since the extreme condition of technology properties (new functionality and lower cost) need to be addressed simultaneous.

Findings from Tiwari and Herstatt (2014), suggested that value proposition of frugal innovation/product can be achieved by:

- Reducing overall cost of ownership.
Cost is defined as selling price, operating cost, maintenance and repairing cost.
- Robustness
The innovations shall be able to handle various infrastructural voids and environmental hurdles such as power breakdown, voltage fluctuation, dust, and extreme temperature.
- User friendly.

Focusing on the technology advancement of *Tata Nano*, Tata Motors has filled 31 design and 37 technology patents (Tata Motors. (n.d(a)). The patents are ranging from vehicle technology, manufacturing technology and material technology (Ellis et al., 2014). These patents are the evidence that *Tata Nano* has state-of-the-art technologies. The filled technologies are meant to realize the extremely low cost and high reliability products.

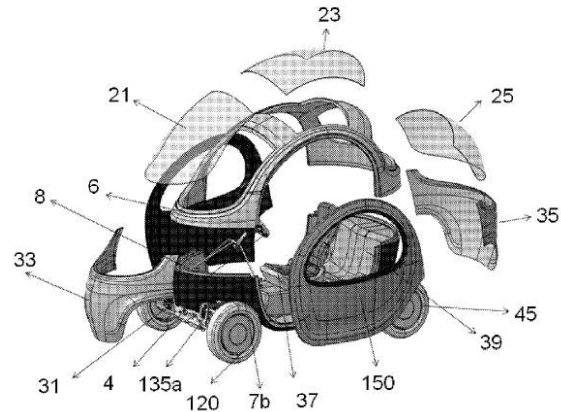


Figure 1. Tata Nano related patent, US8690226 (Ellis et al., 2014)

Meanwhile, *ChutaKool* uses a thermoelectric chip (instead of compressor) to main a cool temperature on a 12-volt DC current or external battery (Innosight,n.d; Munuswamy, 2009). It has only 20 parts, as opposed to more than 200 parts in a normal refrigerator (Munuswamy, 2009).

Having compared on the product, technology and previous studies on the frugal products, we define the frugal products as products with extremely low cost, high reliability and using state-of-the are technologies.

2.3 Business Prospective

Research on the business model of frugal innovation by Winterhalter et al.(2014) found that frugal business logic is about efficiency in all operations and efficacy in innovation and marketing.

Tata Motors uses modular design to keep down the cost and to allow tailoring by the customer requirements (Tata Motors, 2009b). This approach allows the car to be shipped in kits to the assembly sites and put together at the nearest assembly point from customer site (Tata Motors, 2009b).

ChutoKool is distributed using community networks (Innosight, n.d). The part is deployed by India Post to targeted communities. Campaign by mouth-to-mouth recommendation work with various NGO and community self-help group to spread the word (WIPO, 2013). Financially, partnership with micro financing institution and commission fee to the villagers are also being implemented (Munuswamy, 2009).

Generally, business prospective of the frugal innovation to be characterized as an efficient and effective business model with razor-thin profit margin.

3. PROPOSED FRUGAL INNOVATION MODEL

We believe that the frugal innovation is mainly determined by 3 perspectives. They are: (1) Market Perspective (2) Product perspective and (3) Business perspective. All of these 3 perspectives shall be fulfilled for the assessment whether or not an innovation is a frugal innovation (refer to figure 4). All these perspectives are highly interconnected to each other's. Any adjustments on one of these perspectives may directly influencing to the other 2 and it may lead to failure.

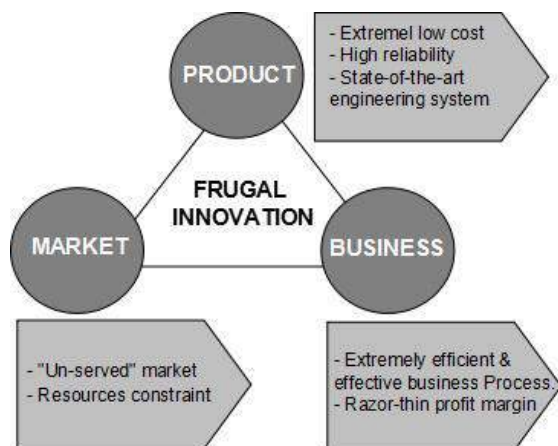


Figure 4. Proposed Frugal Innovation Model

It is understood from the market condition that the “un-served” market has huge value but it has limitation on the resources. Addressing this condition, product perspective shall design a product that has extremely low cost and able to withstand the resource constraint condition (high reliability). Extremely low cost product does not mean only low in the production cost, it also encompasses low cost in the operating cost and the maintenance cost of a product at users’ application.

Extremely low cost product and high reliability design requires state-of-the art engineering systems. It comprises of engineering design and engineering material. Engineering design process

requires more computer software for design simulation. Open innovation is used to minimize the development cost. Material selection requires extreme works in accommodating the high reliability design but extremely low cost requirements.

To make this innovation to be business viable, business process (include production process) shall be in high efficiency and effectiveness. Razor-thin margin profit requires the product to be produced in big volume. A comprehensive marketing and supply chain network is required to ensure efficient production and selling process. Local social networking may be used to efficiently distribute and sell the products.

4. CONCLUSION

Frugal innovation may be the answer for serving the community at the bottom of economic pyramid. The proposed model may be used to understand or identify the potential candidate of frugal innovations.

Serving the “un-served” communities require not only very low cost product, but it also need extra effort in accommodating the high reliability products with state-of-the-arts technologies and very efficient business process for the production as well as the distribution of the products.

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