

Innovation and entrepreneurship in India: Understanding *Jugaad*

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Abstract

In this article, we use the term *jugaad* to describe the frugal, flexible and inclusive approach to innovation and entrepreneurship emerging out of India. We articulate why this method is appropriate within the Indian context and highlight similarities between *jugaad* and innovation originating from other emerging (and developed) economies. Next, we identify different types of organizations that engage in *jugaad* and elucidate their abilities, or lack thereof, to do so. Finally, we incorporate the notion of *jugaad* within current theorizing on innovation and entrepreneurship and outline an agenda for future research on this topic. Overall, we provide insights on a mode of innovating that is increasingly prevalent in economies around the world and take steps towards integrating this concept into the mainstream theory, practice and policy discourses around innovation and entrepreneurship.

For much of the 20th century, innovation was the largely the preserve of the more advanced economies of North America, Western Europe and Japan (Ahlstrom, 2014; McCloskey, 2010; Mokyr, 1990, 2002). Governments and corporations in these economies gradually developed a structured approach to innovation that involved large research budgets and highly qualified technical personnel executing detailed plans over long time horizons (Lerner, 2009). When corporations took over the mantle of innovation from governments, their innovation approach was typically one that delivered more benefits at higher cost to a relatively small number of people (Prahalad, 2012). Specifically, firms would plow large sums into research and development (R&D) in an attempt to push the technology frontier, and then incorporate the technologies developed into products that, when launched, would be sold at premium prices to recover costs. Products were typically targeted (at least initially) to a small niche of the most technology savvy and/or affluent consumers in the more developed economies, though benefits would later accrue to a wider population (Ahlstrom, 2010; Nordhaus, 1997).

In the 21st century, however, several things have changed in terms of where, how and by whom innovation is done. Much innovation has shifted to the large emerging economies of China, India and Brazil (Ramani & Szirmai, 2014; Tellis, Prabhu, Chandy & Eisengerich, 2013). Moreover, a significant amount of the innovation that is taking place in these countries can be more appropriately characterized as being frugal, flexible and inclusive. That is, innovators in these contexts are making ingenious use of existing resources and technologies, employing a mindset that combines improvisation with pragmatism and developing solutions for communities that have traditionally been underserved (Radjou, Prabhu, & Ahuja, 2012; Radjou & Prabhu, 2015). Finally, social

ventures and other organizations and individuals are increasingly as much a part of the innovation process as are large firms.

This article examines the nature of this shift within the context of innovation and, relatedly, entrepreneurship, that is unfolding in India. First, using the term *jugaad* (pronounced ju-gaar) to describe this form of activity, we will elaborate on its key characteristics and elucidate why this approach is important within the Indian context. We will also explore the similarities between *jugaad* and innovation activity taking place in other emerging economies as well as in more advanced countries. Second, the paper will look at the types of organizations doing *jugaad* in India – this includes social ventures, large Indian firms, multinationals and the government. We will discuss the pros and cons of organization type in relation to their engaging in *jugaad*, i.e., while social ventures have the motivation and the commitment to do *jugaad* but are often unable to scale their solutions, MNCs have diametrically opposite incentives and capabilities. Third, we outline a research agenda of the many interesting but yet unanswered questions concerning this concept as well as locate it within current theories of innovation and entrepreneurship. In particular, we draw pertinent linkages between *jugaad* and the literatures on creativity (Amabile, 1996), effectuation (Sarasvathy, 2001), bricolage (Levi-Strauss, 1967; Baker & Nelson, 2005), improvisation (Miner, Bassof & Moorman, 2001), disruptive technologies (Christensen, 1997) and the sociology of markets (Fligstein, 2001). In doing so, we attempt to forge a more systematic approach to the study of *jugaad* – one that we believe is deeply warranted, given the relevance of this form of innovation in contemporary strategic landscapes.

This paper makes contributions in three key domains: In articulating a specific definition of *jugaad*, locating this idea within contemporary literature and providing a trajectory for research on this phenomenon, we take key steps towards fostering theory

building around this concept. From a practice standpoint, we highlight the strengths and weaknesses that different organizations possess in performing such activity as well as demonstrate the multi-faceted nature of *jugaad*, one that encompasses the product, process, business model and organizational domains. Finally, our study proposes more serious consideration of such grounded and context-friendly approaches to innovation and entrepreneurship by policy makers, ones that complement the top-down methods that have typically dominated conversations in this domain. Overall, we provide insights on a mode of activity that is increasingly prevalent in economies around the world and take steps towards integrating what has hitherto been largely an empirical descriptor into the mainstream theory, practice and policy discourses on innovation and entrepreneurship.

Jugaad: The Indian approach to innovation and entrepreneurship

It is increasingly clear that much of the innovation coming from India differs from the traditional structured approach to innovation in at least three ways (see Table 1). First, Indian innovators (and their innovations) tend to be highly frugal (Prahalad, 2012; Radjou, Prabhu, & Ahuja, 2012). They are proficient at taking cost out of the entire innovation process, from the generation of ideas, to the development of products and services, to their commercialization. They are also adept at getting more from less by making ingenious use of existing resources and technologies rather than pushing the technology frontier *per se*. For example, Indian mobile phone service providers such as Bharti Airtel have been credited with their ability to develop a highly frugal business model rather than build sophisticated network equipment with expertise they did not possess or buy it with capital they did not have access to. Instead, they were able to leverage the technology and expertise of firms such as Nokia-Erikson and IBM and

deployed a business model that obviated the need to spend prior to earning (Prahalad & Mashelkar, 2010). Likewise, the Indian Space Research Organization (ISRO) has established a strong track record in terms of the success of its missions, most of which have been completed at a fraction of the costs of its Western counterparts NASA and the European Space Agency (Chandrasekhar, 2011; Tiwari & Herstatt, 2012). It is possible that this ability to be frugal is a functional adaptation to the resource scarcity (Porter, 1990) that Indian organizations face across the board, from the scarcity of capital, technology, land, infrastructure and skilled labor.

Second, in contrast to the highly planned approach of big R&D organizations in the West, Indian innovators are typically flexible in their approach to innovation. Indian innovation, rather than being planned and sequential, is frequently of an improvised nature, carried out by groups that combine technical and market expertise, who explore many different options in sequence or in parallel, and who are comfortable handling scenarios fraught with ambiguity (Sarasvathy, 2001). An example is Tata Motor's approach to developing the Nano car – in particular, its response to uncertainties regarding the use of land in West Bengal to house a factory and its last minute decision to pull out of the state and locate its plant halfway across the country in India's western state of Gujarat. A further example of this flexibility is the firm's initial decision to go with a totally knocked down kit model that would involve distributed franchised local entrepreneurs doing assembly and dealership before the firm switched back to a more conventional distribution and delivery model when faced with time constraints. It is likely that this flexibility of Indian innovators is a response to the uncertainty and volatility that they constantly face in their business environment.

Finally, Indian innovators are inclusive in their approach to innovation. Specifically, they frequently develop solutions for communities that have traditionally

been underserved (George, Nicholson & Corbishley, 2015). Consider the case of Mansukhbhai Prajapati, a grassroots innovator from a village in Gujarat who developed the MittiCool clay refrigerator. This appliance is made entirely of clay, except for a glass door and a plastic faucet at the bottom. It costs around \$50, consumes no electricity, is 100 percent biodegradable and produces zero waste over its lifetime (Radjou, Prabhu & Ahuja, 2012). The MittiCool is targeted at the hundreds of millions of rural Indians who would like a refrigerator but cannot afford one or do not have access to a reliable supply of electricity to run one. A similar approach to innovation has yielded the Swach, a low-end water filter that does not require electricity and utilizes waste (such as rice husks) that is widely available (Ahlstrom, 2010). Again it is possible that Indian innovations are inclusive in response to operating in an environment in which large numbers of people live outside the formal economy and have limited access to the products, services and infrastructure that we take for granted in more advanced economies.

INSERT TABLE 1 AROUND HERE

In this paper, we characterize this frugal, flexible and inclusive approach to innovation and entrepreneurship as constituting *jugaad*. Originally referenced to describe hybrid vehicles that farmers in Punjab were known to cobble together from sundry parts (water pumps for the engine, bullock carts bodies for the chassis, etc.), and colloquially used by the Indian populace when they describe initiatives aimed at “making things happen”, the term *jugaad* has increasingly come to denote the creative improvisation (Varma, 2004; Krishnan, 2010; Sekhsaria, 2013) associated with innovation and entrepreneurship activity observed in these contexts. More recently, Radjou, Prabhu and Ahuja (2012) have defined *jugaad* as “the art of overcoming harsh

constraints by improvising an effective solution using limited resources". In this paper, we refine this formalization to both broaden and deepen the theoretical specification of this concept.

The phenomenon that we term *jugaad* in this paper mirrors similar approaches and terms such as *gambiarra* or *jeitinho* in Brazil, *kanju* in Africa, *jiejian chuangxin* in China, DIY (do-it-yourself) in the United States and *Systeme D* in France. Moreover, it has a growing number of parallels within contemporary scholarship covering innovation in emerging economies (Brem & Wolfram, 2014). These include frugal innovation (Bhatti, Khilji & Basu, 2013; Radjou and Prabhu 2015), frugal engineering (Kumar & Puranam, 2012 by way of Carlos Ghosn of Nissan), Gandhian innovation (Prahalad & Mashelkar, 2010), inclusive innovation (George, McGahan & Prabhu, 2012) and reverse innovation (Govindarajan & Trimble, 2013). Besides, researchers have begun documenting equivalent approaches to strategy among firms operating in emerging economies (Guillen & Garcia-Canal, 2012; Zeng & Williamson, 2007). While there are differences in nuance and emphasis among these conceptualizations, we maintain that it is the similarities in the contexts described and behaviors observed across them that are particularly striking. We also believe that the time has come to distil and integrate the essential elements from these convergent ideas in order to move beyond rich description and develop more cumulative and robust theorizing of this phenomenon. This paper represents our effort at moving the conversation along this trajectory.

Why *jugaad* is important in the Indian context

Despite over two decades of growth, the Indian economy continues to face significant structural shortcomings as well as legacy institutions that are hampered by bureaucracy

red tape (George et al., 2015; Nair, Ahlstrom & Filer, 2007). Large numbers of people remain outside the formal economy and have benefitted little from globalization. Upwards of 40 percent of Indians are unbanked, live beyond the reach of the electricity grid, and do not benefit from good education and health services. These people lack access to cheap credit, savings solutions or insurance, expend large amounts of money or time in securing unhealthy heating, cooking and lighting fuels such as kerosene or wood, and suffer from illiteracy and poor health (Dreze & Sen, 2013). Attempts by the government, aid agencies and NGOs to bring these large numbers into the formal economy have met with limited success (Alvarez, Barney, & Newman, 2015).

One of the key reasons for this failure is the cost associated with bridging the so-called “last mile” problem. For instance, while it may be economically viable to extend the electricity grid to a small town, taking the grid to every village in the vicinity of the town is not. The same holds true of government efforts through state owned banks to make financial products available to rural Indians. India has 600,000 villages. To set up a physical branch in every one of these would quite literally break the bank. A similar challenge exists in the provision of healthcare, which is challenging (though not impossible) to deliver to the villages (George et al., 2015).

Challenges aside, the need to develop products and services that appropriately serve the urban and rural poor in India remains a priority. There are many reasons for this. For one, these communities constitute a large segment of humanity. While the “consuming class” in India accounts for about 200 million in all, those in the next rung of the population – whom we refer to as aspirants -- account for another 600 million (Khanna and Palepu 2006). Moreover, this latter group continues to grow as more Indians move up the socioeconomic ladder. It is quite likely that by 2020 there will be about 500 million Indians earning between \$5000 and \$10,000 per annum (in PPP

terms), and nearly the rest of the country -- another 600 million -- earning between \$2500 and \$5000 per annum PPP. Given that the “consuming class” has been the target of multinational and large domestic firms for at least two decades now, this segment is getting saturated and competition for its customers is significant.

By contrast, the aspirants – who are denizens of slums in Indian metros as well as citizens of the smaller tier two and three towns, and the countryside -- have rarely been on the radar of these organizations, in large part for the reasons identified earlier (Prahalad, 2009) . These communities have aspirations and purchasing power, which, although low at the individual level, are significant in the aggregate. Providing these groups with basic goods and services can have a significant impact on their lives, enabling them to augment their income earning capacity and broaden the opportunities available to them (Sen, 1999; Alvarez et al., 2015; Bruton, Ahlstrom & Si, 2015; George et al., 2015). Addressing the needs of these people in a relevant manner -- despite the considerable obstacles involved -- represents one of the most pressing business and societal challenges of our time. This, in turn, has necessitated the ongoing development and honing of innovation mindsets and practices that can adequately address the unique issues that these conditions pose (Young, Tsai, Wang, Liu & Ahlstrom, 2014).

Along these lines, the private sector, social ventures, the government as well as members of these communities have recently begun to address this problem through the use of local and cheap technologies combined with clever organizational and logistical arrangements. In doing so, they have unleashed a variety of creative, ingenious and non-conventional solutions that often possess the three hallmarks of the *jugaad* approach that we identified earlier: they are frugal in the sense they make effective and economic use of the limited resources that they have access to (Holger, Kahle, Dubiel, Prabhu, & Subramaniam, 2015); they employ and demonstrate flexible thinking and

pragmatic action (Jain, 2012), one that reflects a mindfulness of the complex and volatile environments that they are navigating; and they are focused on including excluded groups, not just as users but also as members of an ecosystem producing and distributing these services, thereby augmenting their income and contributing to their development (Kahle, Dubiel, Holger, & Prabhu, 2014). Two outstanding instances of such solutions are Harish Hande's Solar Electric Lighting Company (SELCO) and Dr. Mohan's Mobile Diabetes clinic.

Jugaad in action

Harish Hande set up SELCO in 1995 with the goal of providing solar lighting solutions to rural Indians who do not have access to electricity and typically use kerosene lamps to light their homes (Dash, Radjou, Ahuja & Prabhu, 2010). SELCO was not set up as a non-profit NGO; rather, it was always Hande's intention to ensure that his operation be viable from a business perspective. But how could Hande get poor rural Indians to pay for solar panels and batteries that even affluent Indians could rarely be induced to purchase? A key insight came to Hande from a fruit cart vendor who told him that while spending \$6 a month was too much, incurring a cost of 20 cents a day was not. This comment brought home to him the fact that a majority of people in his target group spent all of what they earned on the same day. Specifically, at the end of every day they applied their day's earnings to pay off debts and buy food and other household items. Buying kerosene was part of this process. Hande's customers would typically go to an outlet from where they would pay approximately 25 cents for a sufficient amount of fuel for that night.

Knowing this made it clear to Hande that he would have to find a way to supply solar power on a daily basis at more or less the same price as kerosene. Working backwards, he devised an ingenious business model that does precisely this. Hande

selects and trains local people to manage and maintain the solar panels and batteries. In collaboration with a bank, he obtains a loan for these local entrepreneurs, which he initially guarantees. With this loan, the local entrepreneur sets up shop with solar panels which they use to charge lamps, which in turn are rented to the villagers every evening. The local entrepreneur charges a rental of 20 cents per lamp to make the option competitive with kerosene. At this price and sold in this way, solar lighting is not only a more economical option, it is also healthier than kerosene as it does not emit noxious fumes and is not a fire hazard, while providing a better quality of light (it is more intense and longer lasting). Overall, the solution is frugal (it consumes fewer resources than burning kerosene), it has flexible business thinking behind it, and it includes a large number of people who would otherwise be excluded from access to clean energy solutions.

Dr. V. Mohan is a world-renowned diabetes specialist based in Chennai on India's southeast coast (Radjou, Prabhu & Ahuja, 2012). He has a very successful practice, serving patients in that metropolis. However, as a specialist he is also acutely aware that diabetes is a major health problem in India's rural areas where many people do not know what the disease is or how to manage it. Moreover, it is hard for people from the countryside to come to the city for treatment as this costs money and takes time away from work in the fields. Similarly, Dr. Mohan's city employees cannot travel to or live in the countryside to serve rural patients.

Faced with this challenge, Dr. Mohan has devised an ingenious *jugaad* solution involving a mobile diabetes clinic. The clinic is a large, renovated van donated to him by the World Diabetes Foundation and equipped with sophisticated medical equipment and a satellite dish to broadcast images from the van to the city hospital. The van travels from village to village. Patients enter the van and look through the eye piece of the

medical device within. An image of their eye is beamed via V-SAT to the physician sitting in the clinic in Chennai. Based on this image the doctor makes an prompt diagnosis that is relayed back to a local health volunteer in the van. The local health volunteer then communicates the diagnosis and treatment plan to the patient. When the van leaves, the local health volunteer ensures that the patient follows up on the doctor's advice and returns for a check-up when the van makes its next visit to the village. An interesting part of this model is the role of the local health volunteer. These volunteers are often people who may have no more than a high school education. Dr. Mohan selects and trains them in his city hospital. They then return to their village communities to play this important role in the healthcare model. Importantly, they do not receive a wage for their labor. Nevertheless, they benefit from the training they receive, the increased social capital they accrue, and the enhanced job opportunities they attain (for instance with pharmaceutical companies looking to hire rural sales representatives).

Solutions such as Harish Hande's and Dr. Mohan's will not eliminate rural poverty and access problems on their own. However, taken together and in large numbers, such enterprises can and are making a difference. A common criticism is that social ventures lack scale and cannot therefore make a significant dent on the large challenges facing these economies (Sachs, 2005). However, these small scale models serve as inspiration for other social entrepreneurs to get involved, thus providing opportunities for scaling out. And increasingly larger organizations, including large domestic and multinational corporations, are becoming involved. We now turn to a discussion of the different types of innovators and enterprises doing *jugaad* in India.

Organizational types and *Jugaad*

There are at least four types of organizations engaged in *jugaad* in India (see Table 2). These include social ventures, multinationals, large Indian firms and

government agencies and departments. These actors bring their own motives and abilities while engaging in *jugaad*. We discuss the strengths and weaknesses of each of these actors in turn.

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Social Ventures. Social ventures such as MittiCool, Dr. Mohan’s Diabetes Specialities Center and SELCO, bring a great deal of passion, patience, local knowledge and commitment to the challenges posed by exclusion. The importance of these elements in addressing the problems of low-income groups cannot be underestimated. There are many instances in the development economics literature of top down initiatives that have had the benefit of money and technology but lacking knowledge and sensitivity to facts on the ground, have failed to achieve their objectives (Dunn, 1979; Easterly, 2006). Miller (2012) provides a compelling description of the chequered fates of World Bank funded projects in the area of solar energy solutions for off-grid consumers in Indonesia, Sri Lanka and India. In many cases, it is not new technology or large amounts of capital that is needed as much as a deep knowledge of the nature of the problem and the lifestyles and socio-cultural context of the communities or customers that one is dealing with (Jain & Koch, 2015).

Along these lines, Mansukhbhai of Mitticool had not only a detailed knowledge of clay products and their manufacture but also understood the mindset and aspirations of rural consumers as an insider. Harish Hande of SELCO spent time learning from farmers, urban fruit vendors and rural off-grid households about the way in which they earn, spend and consume energy. He also spent a great deal of effort setting up the infrastructure that underpins his business model: selecting and training local

entrepreneurs to manage and maintain solar panels and batteries as well as developing relationships with rural banks to work out financing for the micro-enterprises started by these individuals. Dr. Mohan, in turn, combined his knowledge of rural healthcare with a commitment to selecting and training local healthcare volunteers that underpin his model. It is only after innovators have deep knowledge of the local context and the nature of the problem they are attempting to solve that they cast about for technical and monetary solutions that fit the problem at hand. In many ways, their approach to *jugaad* is user driven, that is, one that solves a specific need as opposed to a top-down solution that attempts to impose a one-size-fits-all solution for a need (Cronin, 2014).

If passion, commitment, patience and local knowledge are the strong points of social ventures, their weak point typically is their inability to scale their solutions. Having developed and implemented a solution suited to a particular community, social ventures frequently lack the resources to extend their services to other contexts. Moreover, because their solutions are often specific to a particular community, they are less likely to generalize to other groups. For instance, Harish Hande readily admits that his model, designed for urban and rural Karnataka state, may well not apply to the neighbouring states of Maharashtra and Tamil Nadu for reasons to do with culture, geography, income distribution and so on. So, instead of attempting to scale up his solution, he has opted to scale out by training others like him from these states who would be able to take the applicable elements of his model and tailor them to their own requirements (Dash et. al., 2010).

MNCs. Large multinational firms could well be regarded as the mirror image of social ventures vis-à-vis their approach to *jugaad*. MNCs possess vast resources compared to new ventures; these resources span the financial, human, technical, marketing and operational domains. MNCs can draw on these resources and their vast

experience in multiple markets to develop solutions for low-income groups (Hart & Christensen, 2002; Anderson & Markides, 2007). And while in the past they may have had no intention of addressing these problems beyond those required through their Corporate Social Responsibility initiatives, increasingly they also have the motivation to reach these groups in search of growth and profit (Prahalad, 2009). But this commitment is still a fledgling one: Despite their numbers, low income groups still represent highly fragmented markets with great potential but low current value. In contrast to the smaller but more high value markets of the urban middle class, the urban and rural poor remain relatively unattractive to multinationals. Driven by quarterly results and meeting shareholder expectations of immediate growth, the hard work of developing markets for these underserved communities is something that MNCs find difficult to commit to, in contrast with the patient and resilient manner that social ventures demonstrate. While there have been a few notable cases of MNC success (Govindarajan & Trimble, 2013) in these contexts, these have largely come when the company has been willing to start from a blank slate and explicitly incorporate elements of a *jugaad* approach. However the more common scenario is one in which these firms, facing conflicting objectives, have found it difficult to sustain their initiatives.

A case in point is BP's attempts to develop a smokeless oven for the millions of Indians who use wood to cook in open fire stoves. Such a mode of cooking is not only deeply injurious to health but also acts as a major environmental pollutant. In its "Beyond Petroleum" years BP made a sustained effort to develop a business solution for this problem (Sharma, 2011). Investing close to \$50 million, they worked with scientists at the Indian Institute of Science to develop a technical solution to the problem. Dubbed the Oorja stove, the smokeless oven they developed used biomass pellets as fuel. BP went on to create a supply chain for the distribution of the pellets in addition to selling

the stoves themselves. But then the world changed for BP; its priorities shifted back to petroleum and the market they were targeting proved to be too miniscule compared to the other opportunities they enjoyed (Sharma, 2011). These factors conspired to persuade them to give up on the whole enterprise. The outcome was that they divested their business; it is now run by a smaller company that focuses entirely on this product, and does not have to deal with the far larger and more profitable competing lines of business that BP owns.

A final weakness of MNCs is their relative lack of local knowledge (Geertz, 2000; Khanna, 2015). The literature on the international expansion of products is littered with cases of firms from developed economies that take products designed for their consumers directly to emerging market consumers (i.e., with little or no adaptation) and meet with limited success (London & Hart, 2004). The inability or unwillingness of MNCs to adapt their successful solutions from other markets to local conditions is a major source of failure especially when the target markets are not the urban elites of India but the rural masses. This is where large domestic firms might well be able to step in with greater success.

Local Firms. Large domestic firms potentially make up the intermediate case between social ventures and multinational firms. Domestic firms have some of the resources that MNCs possess as well as the capabilities of working in other multiple markets. Moreover, many of these firms, by virtue of long standing operations in India, have accumulated knowledge of local conditions including in urban slums, Tier 1 and Tier 2 towns and rural communities. Moreover, because many of these firms are family owned or belong to business groups, they have a longer-term perspective and thus greater patience and commitment than MNCs who, for the most part, are accountable to shareholders and thus have a shorter term orientation to their thinking (Le Breton-

Miller, Miller & Lester, 2011). It would therefore seem that of the three organizational types, large domestic firms are most likely to succeed in their efforts to reach low income groups and build markets around these communities.

An example of an Indian firm with seeming success in this regard would be the Tata Group. Specifically, Tata Motors' Nano car is an interesting example of a large domestic Indian firm offering a highly affordable product with a view to creating an entirely new segment of aspiring car owners who hitherto would only have been able to buy motorcycles or scooters. By all accounts, the company was successful in achieving the vision of designing and manufacturing such a car for the urban and rural masses of India. But despite their long years of experience with Indian consumers, the company stumbled in the marketing, distribution and financing of the car (McClain 2013). First of all, it seemed to display a relative lack of understanding of the psyche of the Indian low-income consumer in a basic way; namely, that while these consumers undoubtedly required an affordable product, they nevertheless did not aspire to something that had been endlessly trumpeted as the world's cheapest car. Even the underserved are aspirational: the Tatas seemed to have not paid sufficient attention to this fact.

Second, while there are large numbers of urban and rural Indians who have sufficient assets to use as collateral against a loan to purchase the car, many of these consumers are unbanked and thus do not have a credit history against which to secure such a bank loan. Again the Tatas ought to have known about this institutional lacuna in the Indian market but were nevertheless blindsided in this regard. While it is plausible that the car will eventually have a greater impact and the Tata Group's commitment to bringing out products and solutions designed for India's underserved communities remains unquestioned, such examples are a cautionary tale for those who believe that large domestic firms will inevitably be successful in developing these markets. Indeed,

these cases reveal the chasms in mindsets that often exist between the urban elite that constitute management and the rural masses who operate by their own norms and rules, and highlight the need for holistic thinking and great patience while navigating and crafting solutions for these sections of society.

Government institutions, Indian government agencies and departments are the fourth actor working on frugal, flexible and inclusive solutions for the Indian masses. As the custodians of Indian health, education and social service provision, government agencies, whether federal or state, play an important role in attempts to include excluded groups and breach the last mile problem. For instance, the Reserve Bank of India (India's Central Bank) and many large state-owned (public sector) banks have financial inclusion as a part of their mission and consequently have annual targets they have to meet in terms of banking unbanked Indians. Many of these organizations are at the forefront of designing policies and implementing solutions to bring low cost credit, savings, and insurance solutions to rural Indians. Equally, agencies such as the Unique ID Authority of India with its Aadhaar service have attempted to provide the infrastructure needed to assist with financial inclusion and ensure transparency and efficiency of the public distribution system and welfare programs (such as the National Rural Employment Government Act). In certain states such as Chhattisgarh, GPS tracking and smart card technologies have been used to bring greater accountability and transparency to the public distribution system which provides food aid to low income groups through a network of state subsidised "ration shops". Even the Ministry of Human Resources has contributed to these efforts by championing the \$50 Aakash tablet PC for distribution in Indian schools. While the federal and state governments have the motivation to drive inclusive growth and have the resources to do so, they often falter from bureaucracy, lack of transparency and accountability and the

inevitable corruption that follows. In some cases, the government does not have the resources or the expertise to deliver on large projects and in these cases there are opportunities for partnerships with other players.

Jugaad via alliances. Given the relative strengths and weaknesses of the different organizational types engaged in *jugaad*, alliances between them offer considerable promise to achieve inclusive growth. Many large domestic firms and MNCs, recognising that they lack the detailed ground knowledge of social ventures, are increasingly keen to engage with these smaller players as a way to improve their own access to new business opportunities as well as implement their business models efficiently and effectively in these contexts. Take for instance large banks such as ICICI Bank. These players are keen to reach unbanked rural Indians both because they have financial inclusion targets to meet and because they see business opportunities in this space. Nevertheless, they face challenges related to identifying and assessing the credit worthiness of customers in these scenarios. They also face challenges in maintaining a physical presence in Indian villages (setting up and staffing bank branches would be prohibitively expensive). Instead, they have formed partnerships with two types of smaller players: the kirana (mom and pop store) shop owners that are ubiquitous in Indian villages and smaller mobile phone based financial service providers like Eko. In this regard, thanks to Reserve Bank legislation, kirana shops can now act as “business correspondents” for Indian banks and these shops effectively become a low cost bank branch for firms such as ICICI Bank. The financial service providers like Eko provide a conduit between kirana shops in villages and their counterparts in cities, thereby providing a key service to rural consumers that have family members in cities working as migrant labour who send money home frequently. There are further alliances between large Indian mobile phone operators and banks as well; the mobile phone operators help reduce the

customer acquisition costs for banks by drawing on the data they have on a large number of rural mobile phone users. Such alliances enable an effective and efficient combination of different organizations, a marriage of the ability of the large with the motivation of the small and local.

***Jugaad* around the world**

It is important to note that many other emerging economies in Asia, Africa and Latin America also have their own thriving equivalents of *jugaad*. In Brazil for instance, there is a long history of *jeitinho* or *gambiarra* inspired solutions in biofuels, automotive, beauty and agriculture (Radjou & Prabhu, 2012). African economies such as Kenya have developed a reputation for their *jua kali* inspired entrepreneurs not only in micro enterprises but increasingly in areas such as mobile payments (e.g., M-Pesa) and IT (e.g., Nairobi's IT hub which has been dubbed Silicon Savannah). Likewise, South Africa is developing a reputation as an area of excellence in the application of mobile-based solutions in health. Clearly other emerging economies are similar to India in facing extreme scarcity of resources, a volatile environment and a large number of citizens excluded from the formal economy. Frugal, flexible and inclusive innovation and entrepreneurship is therefore clearly important to such economies as well. What is less clear, however, is the relevance that *jugaad* and its relatives have within advanced economies. After all, these economies are relatively affluent, have stable institutions and populations that are largely in the formal economy. As a consequence, one might imagine that the use of *jugaad* in these contexts may be rather limited.

Interestingly, however, there is a growing movement in developed economies towards frugal, flexible and inclusive innovation (Radjou & Prabhu, 2015). For one thing, these economies have been dealing for some time with growing inequality, a

trend that began with the offshoring of manufacturing to China in the 1980s and back office work to India in the 1990s and was exacerbated by the financial crisis of 2008. Real incomes have been falling for over two decades and the middle class has been increasingly hollowed out in advanced economies. Moreover, governments have overspent and are now in a fiscal prudence, belt-tightening mode. This has put pressure on the budgets of households and governments alike. Thus there is a need for frugality even in relatively affluent economies (see Radjou and Prabhu 2015).

Second, there are more positive drivers of such bottom up innovation in the developed world. People in these economies are increasingly empowered to innovate in small groups with small amounts of capital and resources thanks to the ubiquitous availability of low cost software and hardware. Moreover younger people appear to be more skeptical of big business while recognizing the power of the market to solve many social problems and meet human needs. Take, for instance, the case of Design for America, a Chicago based group of former students from Northwestern University. With backgrounds in design, engineering and business, this group set out to solve the problems of people not in distant Africa or Asia but in nearby USA. One of the first problems they focused on was hospital acquired infections which affect 2 million people annually in the US alone leading to 100,000 deaths each year and \$2-4 billion dollars in health care costs. To tackle this, they began by visiting a local Chicago hospital where conversations with and observations of nurses and doctors revealed that while they had every intention of being hygienic, the current solutions for hand hygiene (wall mounted gel dispensers) made it hard for them to wash their hands between operations. This suggested that the solution might be a mobile dispenser that clips onto the scrubs of doctors and nurses. The team then developed prototypes of such a dispenser in their

studio using basic computing hardware, software and 3D printers. Once these were tested they were ready to go into manufacturing which they outsourced.

Finally, to market their product they did not require an advertising budget but used the web, social media, viral marketing and TED talks to spread news about their solution. Thus all steps of the innovation process from idea generation, to development, to commercialization were done frugally. The end product was a \$3 unit that was highly affordable to buyers and could result in significant cost savings in the long run. Such examples are now ubiquitous in advanced economies -- from computing to content (think free apps and crowd sourced software). It is entirely likely that a new bottom-up approach to innovation is brewing in the developed world that could potentially lead to many potential partnerships between advanced economy and emerging world *jugaad* exponents.

Getting systematic about *jugaad*: A research agenda

The recognition of *jugaad* in India and similar phenomena in other emerging economies as well as the maker movement in developed economies suggests that a frugal, flexible and inclusive approach to innovation and entrepreneurship has global appeal. Given the growing scarcity of resources worldwide and the increasing pressures on household and government budgets everywhere, it is very likely that this appeal is no mere fad or fashionable trend that will burn out in a year or two. If anything, it appears that the relevance of this kind of activity will grow and that emerging markets may well lead the way in demonstrating how it should be done.

In terms of academic research, the significance of *jugaad* raises many issues; indeed, it suggests an entire research agenda of interesting but yet unanswered questions. On this front, an important starting point for enabling its systematic study is to specify the concept of *jugaad* more precisely. This is important given the highly

colloquial usage of the term among its practitioners, the proliferation of nomenclature in this domain (frugal innovation, Gandhian innovation, inclusive innovation, reverse innovation and frugal engineering being five related concepts describing essentially similar phenomena) and the resulting different interpretations that scholars have attached to its significance (Brem & Wolfram, 2014). Indeed, the term has gained some notoreity, with a few scholars and practitioners steering away from its usage due to its emphasis on “making-do” and the implicated low quality and provisional nature of solutions emerging from such innovation practices (Prahalad & Mashelkar, 2010; Kumar & Puranam, 2012). More generally, the jostling between terminology has contributed to much conceptual confusion that needs to be addressed (see Table 3 for our own sensemaking of the variegated vocabulary associated with this phenomenon).

INSERT TABLE 3 AROUND HERE

Our own perspective is to embrace the term *jugaad* given its local roots, cultural situatedness and most importantly, precision – compared to the other terms – in capturing the essence of this approach (warts and all) to innovation and entrepreneurship within these contexts. Moreover, we suggest that a *jugaad* approach to innovation and entrepreneurship has the following elements associated with it: frugality, flexibility and inclusiveness. Frugality refers to the ingenious use of limited resources at hand. Flexibility alludes to the ability to rapidly adapt and improvise to changing circumstances. And finally inclusivity involves developing goods and services for individuals and communities who are significantly constrained in their capacity to pay and are often marginal participants in the market-based economy.

Taken together, these various dimensions of *jugaad* reflect the context within which such innovation takes place. Put differently, the native environment has contributed to what we perceive is a unique mindset and culture associated with this form of innovation. It is important to note that from our perspective, *jugaad* is both a verb that describes how individuals and firms “make things happen” as well as a noun that connotes the outcomes of this process. In sketching out the contours of this concept, we provide what would appear to be a very different gestalt for how innovation and associated entrepreneurial activity is conceived, designed and implemented in emerging economies – one from which lessons can be drawn for even the world’s more developed economies.¹

Now that a working definition of *jugaad* has been provided, the next key step is to articulate a research agenda that allows us to both systematically understand the many dimensions and nuances of this form of activity as well as develop pathways that enable its incorporation into the mainstream academic, practitioner and policy discourses on innovation and entrepreneurship. We do so by developing a frame for inquiry that organizes this exploration into three levels: individuals, organizations and markets/fields. For each of these levels, we identify lines of inquiry that can be gainfully examined to further our understanding of this concept. In addition, we highlight linkages between *jugaad* and well-established discourses in the literature, and offer suggestions around how there can be a fruitful interplay between them. Here, the multi-dimensional nature of *jugaad* can also be usefully deployed to explore interfaces between these streams of literature – for example between bricolage and effectuation.

¹ This conceptualization resonates most closely with the notion of Gandhian innovation as discussed by Prahalad and Mashelkar (2010).

More generally, our research strategy here is to maintain the distinctiveness of the native construct as well as develop linkages to extant theory. A similar approach, for instance, has been used to examine, the linkages between *guanxi* (connections) and the broader literature on social networks (Lin and Si, 2010) and social influence (Cialdini, 2006). We now turn to providing an exposition of our proposed research agenda (see Table 4).

INSERT TABLE 4 AROUND HERE

Individuals

A useful first step for research at this level would be to more carefully characterize the solution-seeking approaches of innovators employing a *jugaad* approach. Two characteristics particularly worthy of investigation are the ingenuity and resourcefulness that skilled exponents of *jugaad* typically exhibit. By ingenuity, we refer to the thought processes by which these individuals make connections and associations as part of generating acts of insight (Usher, 1954). Resourcefulness, in this context refers to the innate ability of individuals within these communities to creatively reuse and repurpose resources for multiple needs (see our more detailed discussion on bricolage below). More generally, it would be useful to understand if approaches to creative problem solving differ between advanced economy and developing country entrepreneurs, as well as between those in higher versus lower income groups. Put differently, are the lateral thinking approaches of grassroots, rural or urban slum innovators different from their more educated urban counterparts not to mention their developed country counterparts? Furthermore, a deeper understanding of the psychological and socio-cultural influences that underpin an individual's propensity to

engage in *jugaad* represents a fruitful line of inquiry. More generally, these investigations would collectively contribute to more culturally informed theories of creativity and entrepreneurship.

Along these lines, the concept of *jugaad* has a natural affinity with *jugaad* with the voluminous literature on creativity (Amabile, 1996) and the emerging scholarship on effectuation (Sarasvathy, 2001, 2008). Regarding the former, Amabile (1983) has extensively documented how individual creativity is impacted by the social environment. Given the constraints that innovators in emerging economies face, a particularly productive line of inquiry would be to examine how these significant limitations can, in certain cases, spur creative action (see also Mullainathan & Shafir, 2013). Likewise, Sarasvathy (2001) has specified how entrepreneurs often operate out of an effectuation logic, that is they take a set of means as given and then construct effects from those means. This depiction resonates at a primal level with the Indian experience, with many of its entrepreneurs parlaying their limited means and operating in uncertain conditions (engaging in *jugaad*) to create successful outcomes (Varma, 2004). Here, research that seeks to understand how and why certain communities possess an innate disposition and ability to engage in *jugaad* activity would provide us with insights into a more socio-culturally infused notion of effectuation. Taken together, these research directions represent productive interfaces wherein the study of *jugaad* can significantly extend the explanatory scope of these literatures.

Organizations

Here, our earlier discussion suggests that large and small firms, domestic and multinational companies, as well as government organizations are all engaged in *jugaad*. Moreover, we demonstrated how each of these organizational types has

different capabilities and motivations when it comes to performing such activity. The empirical question however remains: when are we likely to see a particular type of firm do *jugaad*, and under what conditions will a specific kind of organization be more likely to succeed at such activity?

Another set of questions concerns the nature of activities that these different players engage in as part of performing *jugaad*. For instance, a question of significant practical import concerns the methods that these organizations employ to take cost out of the innovation process (i.e., how they are able to practice being frugal throughout the innovation process, from generating ideas to developing and commercializing them). A further set of questions involves studying the practices that they deploy for dealing with uncertainty and volatility, that is to say, how are they able to improvise solutions and maintain flexibility? Here, an understanding of the complicated and nuanced relationship that organizational actors in emerging economies have with the institutional environment they are embedded in, would be particularly useful. And finally, to what extent is the quest to be inclusive a factor in the decision-making of firms that engage in *jugaad*? How do these different organizations attempt to strike a balance between what might be viewed as doing good versus doing well? At a broader level, work that more carefully identifies and categorizes specific practices associated with a *jugaad* approach would provide us with a deeper appreciation of the organizational underpinnings of this form of innovation. Along these lines, understanding the extent to which this style of thinking percolates decision-making within a business – i.e., taking an integrative perspective and explicating the different facets of a *jugaad* culture, chaotic as such a system is likely to be (Boulding, 1987) -- via careful observation of exemplar exponents of such activity, represents a promising trajectory for future work.

In addition, studies are needed that examine an organizations attempt to migrate their *jugaad*-inspired solutions to a more systematic and standardized rendition. How do these actors address the challenge of scaling their grassroots-generated innovations? In advanced economies, studying the reverse trend –incorporating *jugaad* within a largely systematic mode of innovation, especially as these firms increasingly cater to emerging markets -- represents a promising domain of research. Tracing the changes to capabilities, cultures and mindsets – and the resultant outcomes -- that such migrations engender, will likely provide some fascinating insights.

Finally, investigations are warranted into how firms combine traditional, systematic, top-down methods with grassroots, experimental, bottom-up approaches that *jugaad* symbolizes. Put differently, understanding hybrid approaches to innovation – ones in which firms synthesize and leverage disparate sources and methods of innovation for creating novel products, services and business models to address the needs of underserved communities -- represents a particularly exciting line of inquiry.

From a theoretical viewpoint, there are useful linkages to be made between *jugaad* and the literatures on bricolage (Levi-Strauss, 1967; Garud & Karnoe, 2003; Baker & Nelson, 2005) and organizational improvisation (Miner, Basoff & Moorman 2001). In terms of the former, Baker and Nelson (2005) identify employing the resources at hand, combining these resources for new purposes and “making do”, as elements of bricolage that entrepreneurs within resource-poor environments deploy to render their solutions. In actively constructing their resource environments, these individuals create “something from nothing”. The authors go on to specify two different forms of bricolage –parallel and selective – and link these to such outcomes as firm growth. The literature on bricolage, then, provides a robust theory of action under conditions characterized by severe resource constraints – one that has significant

parallels with a *jugaad* approach. Indeed, a number of the principles that Rajdou and colleagues (2012) identify in their book – such as seeking opportunity in adversity, doing more with less and acting flexibly – have clear counterparts in the bricolage discourse. The investigations that we have proposed can further extend the literature in at least two ways – developing a more actor-centric conceptualization of bricolage as well as capturing the nuanced and pragmatic relationship that these actors have with the institutional arrangements that they are situated in.

Moreover, a *jugaad* approach to innovation and entrepreneurship can be viewed as involving a constant stream of improvisations, which following Miner, Bassof & Moorman (2001), we define as “deliberately and materially fusing the design and execution of a novel production”. In addition to examining the scope and frequency of improvisational activity within organizations engaged in *jugaad*, another interesting set of research questions revolve around examining the impacts that engaging in continual *jugaad* has on the competencies, learning and survival of an organization. Finally, studies that involve comparing the practices associated with *jugaad* vis-à-vis those advocated by exponents of design thinking and lean experimentation – methodologies that have been inspired by the literature on creativity, improvisation and learning – would also be useful. Along these lines, there would appear to be similarities between *jugaad* and the bias to action and deep understanding of the user that design thinking advocates, as well as the emphasis on conserving resources that a lean experimentation methodology is grounded in. On this front, field-based as well as historical studies that chronicle the emergence of a *jugaad* innovation can provide insights into the workarounds, shortcuts and ingenuity underlying these solutions – that in turn, can inform and refine the practices associated with design thinking and lean experimentation.

Markets and fields

At the field level, there are a number of research questions of practical import that merit investigation. For instance, given that different types of firms may be good at different aspects of a *jugaad*-driven innovation, are we likely to see a division of labor develop and specialization occur? Will we, for instance, start to see small, entrepreneurial firms initiate (i.e., identify and develop) *jugaad* solutions, while large firms become more involved in the process of scaling up and ensuring large scale commercialization? Moreover, what forms of cooperative relationships will develop between small and large firms attempting to devise *jugaad* solutions? In a similar vein, will we see more cross-national partnerships start to occur with, for instance, advanced economy firms supplying the technology and emerging market partners providing the business model and the local market knowledge? What form are these partnerships likely to take, and what would the role of large public players like governments as well as grassroots organizations such as NGO's play in this process? Taken further, understanding how firms promote, mobilize and orchestrate *jugaad*-type activity among members of a larger ecosystem that they belong to represents a promising area for research. More generally, adopting a field perspective and examining the activities of various actors (government, firms, users, etc.) as they engage in both macro- and micro-level interventions to (re)configure entire sectors via *jugaad* interventions would provide us with a more contextualized and embedded view of this activity within a larger system of innovation.

On the market side, a key research question of interest concerns what drives consumer adoption and use of *jugaad*-inspired innovations. A related question concerns the productivity and livelihood impact of the adoption and use of such innovations. It is

clear that affordability is a key factor driving the adoption of *jugaad* innovations by low-income groups. However, affordability alone does not guarantee adoption. Take the Nano car, for instance. Despite being an engineering and manufacturing marvel and achieving radical affordability, the initial sales of the product among lower income groups were less than spectacular. At least one of the reasons for this was that low income groups, like all other income groups, have aspirations, and these aspirations are a powerful driver of their consumption behaviour. The failure to appreciate this resulted in Tata Motors overemphasising the low cost of the car over aspirational features such as design and maneuverability. Firms engaging in *jugaad*, and researchers studying the phenomenon, will need to understand better the subtle interplay between aspiration and affordability in the minds and behaviour of consumers worldwide.

In many cases, adoption of *jugaad* innovations alone will not guarantee their actual use. Take the case of smokeless ovens developed for tribal communities in Orissa. Intended to help them avoid the harmful effects of using open fire wood stoves, these smokeless ovens clearly had the best interests of the intended users at heart. Moreover, pilot studies with these communities obviated the cost issue by giving them to users for free. Nevertheless, researchers found that these tribal communities failed to use the smokeless stoves and soon reverted to their old practice of burning wood in open fires. The reasons for this were twofold: the food did not taste the same and cooking with the new stoves interfered with the age-old social practice that women of the communities engaged in of gathering wood together in groups. The latter point alone, given the role that such activity plays in providing women social contact and support, is critical to understanding the actual use of these innovations. Specifically, social and cultural context is as important as cost and aspiration in driving usage (Jain & Koch, forthcoming).

This suggests that we need to develop a deeper understanding of the markets within which *jugaad* innovation takes place. Along these lines, exchange spaces in emerging economies are often extremely resource constrained in that their members earn very little income (Mair & Marti, 2009; Viswanathan, Sridharan & Ritchie, 2010). We contend that it is an organization's interpretation of the markets that they are navigating that determines the assemblage of *jugaad* innovations they design and deploy in order to gainfully engage with its participants. Elucidating how these dynamics unfold via detailed field-based studies, we believe, is a particularly fruitful avenue of inquiry given that these can provide us with insights into the mechanisms by which organizations attempt to develop inclusive and equitable markets for such underserved communities (Mair, Marti & Ventresca, 2012). Along these lines, recent work suggests that engaging with these markets typically involves *jugaad* activity that spans multiple domains, including product, process and business model innovations (Jain & Koch, 2015).

Building on this, gaining an understanding of the different business models that *jugaad* innovators employ represents another useful line of research. Here, questions related to the viability of these business models as well as their impact on adoption and use of the innovations as well as on the livelihoods of the adopters, would yield useful insights. For instance, in the case of off-grid solar lighting solutions, is a pay-as-you-go business model (solar light as a solution) business model more viable for a firm than an up-front transactional model? And which of these models is likely to result in greater adoption and use? A useful technique that can be applied for drawing inferences in these instances is Randomized Control Trials (RCTs) or field experiments, a methodology that has gained significant traction in development economics circles over the last few years (Banerjee & Duflo, 2011). Applying such a scientific approach to the

testing of *jugaad* innovation and the business models that support them in the field offers great potential to provide rigorous answers to the question raised above.

Additionally, studies that trace the economic and socio-cultural impacts of *jugaad* innovations introduced into underserved communities are acutely needed. For some years now, a debate has raged between those who have argued for the beneficial effects of marketing these innovations to low income groups (Prahalad, 2009) versus those who have voiced concern that such interventions only drag these people deeper into poverty unless they are able to generate incomes and improve productivity (Karnani, 2007; Ansari, Munir & Gregg, 2012). More generally, we still know very little about the long-term effects of the introduction of these innovations into these communities. Along what dimensions do they have a positive or negative impact? How do individuals within these communities themselves repurpose these innovations? To what extent do these innovations become a part of the lives of these individuals and what influence do they cast over them? Answers to these questions will require in-depth longitudinal investigations that trace the adoption, diffusion and ongoing use of these innovations in a chosen set of communities. While difficult to implement, such studies can provide us with a valuable trove of information on consumption dynamics in these segments of society that would have significant practical import.

These empirical investigations have a strong resonance with and will likely contribute to the literatures on disruptive innovation (Christensen, 1997; Nair & Ahlstrom, 2003) and the sociology of markets (Fligstein, 2001). Given that the former is centrally focused on examining low-cost innovations that invade mainstream markets over time, there are obvious parallels between this work and the notion of *jugaad* innovation. Indeed, Hart and Christensen (2002) explore how generating disruptive innovations for bottom-of-the-pyramid (BOP) markets represent a significant

opportunity for multinationals. We believe that work on *jugaad* innovation can usefully extend our understanding of the nature of disruptions as they unfold in these contexts. Along these lines, studies that explicate the factors that enable such innovations to gain traction among these communities (typically by getting users to substitute archaic technologies or switch from non-consumption) as well as those that examine the extent to which such innovations are able to subsequently make a dent on the mainstream market, both locally and globally, would be particularly pertinent. Similarly, in conceptualizing markets as fields that are comprised of a complex arrangement of institutions, the sociology of markets provides a theoretical apparatus for examining their constitution via the action of multiple actors, that include governments (Fligstein, 2001). However, empirical studies in this domain have largely focused on studying markets within advanced economies. In tracing the process by which individual actors, individually or collectively, actually go about commercializing their *jugaad* innovations, researchers can usefully extend this body of research.

Above, we have offered suggestions on studies at various levels of analysis that can collectively begin to usefully unpack the concept of *jugaad*. In the spirit of symmetry, we need to also conduct studies that help us better understand the limitations of *jugaad*. As indicated above, some scholars have alluded to the fickle nature of this form of innovation, one that provides quick-fixes and workarounds, but not necessarily solutions that are likely to have a sustained or meaningful impact (Prahalad & Mashelkar, 2010; Kumar & Puranam, 2012). Along these lines, what factors – at the individual, firm and market level – contribute to more (or less) effective instances of *jugaad*? Taken to its logical conclusion, this line of reasoning suggests that engaging in *jugaad* – like any other form of innovation – can have highly variable outcomes, and in some cases, a predominantly dark side associated with it. Given this,

conducting studies that employ a multiple case research design to examine whether a *jugaad* innovation has had a positive, neutral or negative outcome (for the various constituents involved) in a particular situation would be useful for discerning the underlying factors contributing to this variation, that is, they would help establish the boundary conditions under which this form of innovation works (Christensen, 2006).

In providing a precise specification of *jugaad*, locating this notion within a number of contemporary discourses unfolding within the innovation and entrepreneurship literatures and articulating a research agenda aimed at advancing our understanding of this phenomenon, this paper makes several significant contributions toward advancing theory building around this concept. This is important as it serves both to propel *jugaad* beyond the realm of descriptive evidence as well as provide a theoretical frame for observing innovation that is unfolding in India and other emerging economies. In giving *jugaad* its due as both a theoretical concept and a relevant practice within these scenarios, we emphasize the integral role that context plays within studies of innovation and entrepreneurship and encourage more explicit incorporation of this facet in studies moving forward.

At a broader level, research along the trajectories identified can be immensely valuable in addressing one of the key challenges of our time – providing services and products to the 4 billion individuals on the planet who do not have access to numerous good and services that would significantly improve their health and standards of living. The characteristics of *jugaad* that we have identified earlier – frugality, flexibility and inclusiveness – both reflect a viable response to functioning in these environments as well as represent the means for developing meaningful interventions that have strong potential for gaining traction among these communities and transforming them in the process. Designing and conducting studies that help us build a better theoretical

understanding of *jugaad* can likely have significant ramifications within the domains of policy and practice.

In this paper, we have illustrated processes akin to *jugaad* that are unfolding across the globe. Besides, we have delineated the strengths and weaknesses that different actors possess in performing such activity. Moreover, we have demonstrated that *jugaad* needs to be viewed a holistic concept, one that encompasses innovations in the product, process, business model and organizational domains. In doing so we provide an enhanced understanding of the practice of *jugaad*, one that can provide guidance to organizations intending to emulate this form of innovation. At a policy level, our study advocates for more serious consideration of “bottom-up” *jugaad* approaches to innovation by governments and think tanks, given the robust impact they can have on large swathes of humanity. This, we suggest, can productively manifest itself in developing public-private-community partnerships that foster such forms of innovation and entrepreneurship. We also foresee considerable promise in the crafting of hybrid forms of innovation that combine elements of *jugaad* and more systematic approaches. More fundamentally, our study contributes to the policy discourse by highlighting the value that a sociological and anthropological lens can bring to addressing the vexing but not intractable problem of developing products and services for underserved communities around the world.

Conclusion

Above, we have sketched out a wide-ranging agenda for research on *jugaad*. We view this as a start for carrying out deeper investigations into a concept whose significance within the domain of innovation and entrepreneurship is only likely to grow moving forward. As we turn our attention to how such activity gets done in the so-called developing world, understanding the mechanisms and practices that undergird *jugaad* –

and documenting both the similarities and differences on how this activity is performed across these contexts – will be crucial. This will require field-based longitudinal studies that carefully document the mindsets invoked, actions performed as well as the processes that unfold, that collectively constitute a *jugaad* solution. Such work, at one level, will add to our comprehension of grassroot-level, bottom-up that are gaining traction across the world. More significantly, it will contribute to the development of a more socio-culturally informed theory of innovation and entrepreneurship, one that illuminates how history and context fundamentally impact the nature of such activity.

Rather than viewing *jugaad* and other indigenous forms of innovation as anachronisms that will inevitably disappear as a more global mindset takes hold, we embrace the diversity that these approaches bring as well as the human ingenuity that we observe in studying this phenomenon. Simply put, firms, consumers and governments in both developing and developed countries stand to benefit from practicing, applying and supporting frugal, flexible and inclusive (i.e., *jugaad*) innovation. Academic researchers in many business related fields -- including marketing, strategy, organizations and international business – will find that studying various aspects of this phenomenon will not only likely advance knowledge within their fields, but will also generate insights that have considerable policy and practical significance and how economies develop and modernize (Liu, Wang, Zhao, & Ahlstrom, 2013; Parente & Prescott, 2002) . We look forward to conducting (as well as witnessing) many more studies pertaining to this exciting new line of research.

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Table 1
Specifying *Jugaad*: frugal, flexible and inclusive elements

<i>Jugaad</i> innovation	Frugal	Flexible	Inclusive
MittiCool clay fridge	Uses widely available materials like clay and water; highly affordable	The inventor and founder improvised many technical as well as business solutions to bring his idea to life	Aims to provide a fridge for those who would like to own one but cannot afford them
SELCO's solar lighting solution	Rents solar charged batteries on a daily basis so it is as affordable as buying kerosene	Uses a network of "local entrepreneurs" who enable customers to rent locally when they have spare cash	Aims to provide clean energy for off-grid users who otherwise rely on kerosene
GE's Mac 400 ECG machine	Device is itself affordable; but the per scan cost is also low	Portable and robust enough to enable doctors to carry them to rural clinics from cities	A machine specially built for rural Indian clinics who would otherwise not benefit from such technology
Tata Motor's Nano car	Affordable (\$2500) yet aspirational car	Had to improvise a lot around product development, manufacturing and distribution of the car	Designed for Indians looking to upgrade from two wheelers

Table 2
Organizational types and *Jugaad*

Types of organizations involved in <i>jugaad</i>	Examples of <i>jugaad</i> innovations they've developed	Elements of their value proposition
Social ventures, e.g., MittiCool, SELCO, Dr. Mohan etc.	SELCO's solar lighting solution for off-grid users	Network of "local entrepreneurs" who enable customers to rent solar charged batteries on a daily basis
Large multinational firms, e.g., GE, Siemens, Unilever	GE's Mac 400 ECG machine for rural India	Robust, affordable, portable, easy to use and maintain product
Large domestic firms, e.g., Tata Motors, Godrej etc.	Tata Nano car	Affordable (\$2500) yet aspirational car for Indians looking to upgrade from two wheelers
Indian government agencies and departments, e.g., State owned banks, Indian Space Research Organisation etc.	Unique ID Authority of India's Aadhar card	Biometrics to identify Indian citizens uniquely for benefits and public distribution system

Table 3
***Jugaad* juxtaposed with related Indian innovation constructs**

Term	Authors	Definition	Elements Frugal	emphasized Flexible	in definition Inclusive
Frugal innovation	Bhatti & Ventresca, 2013	Means and ends to do more with less for more people	x		x
Frugal engineering	Kumar & Puranam, 2012 (via Ghosn)	Achieving more with fewer resources	x		
Reverse innovation	Govindarajan & Trimble, 2013	Any innovation that is adopted first in the developing world	x		
Inclusive innovation	George, McGahan & Prabhu, 2012	Development and implementation of new ideas which aspire to create opportunities that enhance social and economic wellbeing for disenfranchised members of society			x
Gandhian innovation	Prahalad & Mashelkar, 2010	Do more with fewer resources for more people	x		x
<i>Jugaad</i> innovation	Radjou, Prabhu & Ahuja, 2012	Art of overcoming harsh constraints by improvising an effective solution using limited resources	x	x	
	Prabhu & Jain, 2015	Frugal, flexible, inclusive approach to innovation and entrepreneurship	x	x	x

Table 4
A research agenda for *Jugaad*

Theoretical domains (Representative work)	Research Questions
Creativity (Amabile, 1983)	<ul style="list-style-type: none"> • Examining the role of constraint and a “blank slate” in generation of <i>jugaad</i> • Explicating similarities/differences in problem-solving approaches between exponents of <i>jugaad</i> and their Western counterparts
Effectuation (Sarasvathy, 2001)	<ul style="list-style-type: none"> • Identifying individuals/communities who are more likely to engage in <i>jugaad</i> and tracking their record at constructing entrepreneurial paths • Highlighting the limitations associated with a <i>jugaad</i> mindset
Bricolage (Baker & Nelson, 2005)	<ul style="list-style-type: none"> • Elucidating <i>jugaad</i> cultures within organizations • Investigating <i>jugaad</i> within high-tech contexts • Migrating from <i>jugaad</i> to systematic innovation (and vice versa); Exploring hybrid forms of innovation • Specifying actor engagement with institutional environment
Improvisation (Miner, Bassof & Moorman, 2001)	<ul style="list-style-type: none"> • Investigating <i>jugaad</i> as ongoing adjustments in organizational trajectory • Understanding the impact of “continual <i>jugaad</i>” • Explicating underlying practices that enable frugal, flexible and inclusive – i.e., <i>jugaad</i> -- innovation
Disruptive innovation (Christensen, 1997)	<ul style="list-style-type: none"> • Understanding how <i>jugaad</i> innovations gain traction in underserved markets and tracing the extent to which they invade mainstream markets • Illustrating business/organizational models crafted for <i>jugaad</i> innovation
Sociology of markets (Fligstein, 2001)	<ul style="list-style-type: none"> • Examining the emergence of partnerships/field-level interventions that foster <i>jugaad</i> innovations • Characterizing the nature of markets that <i>jugaad</i> innovations serve; tracing market development activity that <i>jugaad</i> practitioners engage in • Measuring the productivity/livelihood impact associated with the adoption/use of <i>jugaad</i> innovations