

Understanding Jugaad: ICTD and the Tensions of Appropriation, Innovation and Utility

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ABSTRACT

This paper seeks to bring scrutiny to 'Jugaad' as concept of user driven innovation in the context of ICTD research. We collate and organize a variety of definitions denoting adoption and innovation of technology in constrained eco systems. We attempt to bring a nuanced understanding of contextual processes supporting or hindering use adoption and innovation of ICTs by probing the multi-meanings of Jugaad as ground-up processes of technology adoption

Categories and Subject Descriptors

K.4.0 [Computers and Society]: General

General Terms

Management, Human Factors, Theory.

Keywords

Jugaad, India, ICTD, Frugal Innovation, BOP consumer

1 INTRODUCTION

Jugaad is a many-splendored conceptual tool in popular culture, business strategy research and journalistic writing. It is regarded as the latest trend in strategic management circles, an example of bottom-of-the-pyramid (BOP) disruptive innovation, a chaotic yet successful work around resource constraints and a trope for India's emerging software power. The term itself refers to a broad and widespread practice, originally in rural India, of jury-rigging and customizing vehicles using available resources, skills and know-how. While the practice is often associated in journalistic parlance with illegal/grey and corrupt practices, the notion of Jugaad has triggered excitement among commentators on India's IT capability and a work ethic rooted in its society and culture. In this paper we attempt to re-imagine Jugaad technologies from the perspective of populations in resource poor environments. Extending an ICTD frame of reference to Jugaad technologies, we showcase and explore, from examples in a variety of cross-domain extant literature, practices surrounding technology adoption and innovation, their widespread implication as local resource for renewing and extending use and access. We do this by discussing aspects of Jugaad processes and asking if they can be understood as innovations or simply affordable and usable

alternative technology resource creation for consumption. We also recast and deconstruct Jugaad for a renewed understanding in the ICTD discourse on user adoption of technologies.

The concept of Jugaad has many faces, and spawns a spectrum of interpretation through the twinned impulses of widespread celebration and abject critique. Jugaad as 'new face of global competition' [5] is a heady mantra for finding working alternatives amidst a corrupt and inefficient state, bureaucracy, and infrastructural glitches. Gulati posits Jugaad-inspired private business as the space that can redeem India's traditional business culture. Such a view reimagines and situates Jugaad in a framework of organic Indian-ness qualified and nurtured by its innately and deeply rooted traditions. Another argument views Jugaad-type innovations as a growing contribution to workable functional infrastructures. Weaved into this argument, which will be taken up in the discussion, is the systemic risk taking perceived as a positive contribution to a development in the form of the Jugaad culture of 'making do'. Thus Jugaad becomes India's cultural and vocational answer to its glaring infrastructural gaps, public facility deficits contributing to the 'bricolage' of jury-rigged, self-repaired 'mend and make do' ethic and cost-effective solution to under resourced and serviced poverty [16].

Print and popular culture discourses, including Bollywood cinema, allude to alternative meanings of street smartness, wheeling-dealing, street survival, sometimes grey and illegal activity in the informal economy instigated through a smart optimal use of minimal resources [2]. In the rapidly growing demand for the consumption of digital media, largely routed through intricately networked pirate conduits [11, 17], informal and make do practices order and organize its entire market economy, sometimes alluded as 'Jugaad modernity' [18]. Based on the more robust and skill-building ecologies of repair, this is an allusion to a much weaker sensibility of 'mend and make do'. Both the robust and the weak allusions contribute to a strong line of argument in the social science streams of literature situating Jugaad in an overarching framework of resource constraints within which people create and operate technologies of survival

The paper identifies and bears down on dominant interpretations of Jugaad in the service of fine-tuning and contributing its meanings towards development debates. If systematic innovation is a development imperative, these involve and integrate the following streams of thought: 1. How much is a risk economy and servicing acceptable in the light of developing countries and the accompanying instability of resource infrastructures? 2. Do these lead to entrenching a culture of repair rather than innovation? 3. Is Jugaad just an approach to local use? 4. Does it account for innovative breakthroughs in meaning by rendering existing technologies practical and usable in a local context? We hope to begin a dialogue, addressing some of the above questions, in this note.

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ICTD 2013, Dec 07-10 2013, Cape Town, South Africa

ACM 978-1-4503-1907-2/13/12

<http://dx.doi.org/10.1145/2517899.2517938>

2 DEFINING JUGAAD

We align and bring three stands of research about Jugaad as concept and contextually driven social process. 1. Business literature 2. Connotations of Jugaad in ICTD case-studies 3. Social science literature on Jugaad. We further organize each of these to resonate with the organization of the discussion section in the paper.

2.1 What is Jugaad?

As a term, Jugaad, is a Hindi phrase broadly meaning “to make do”; it was initially associated heavily with a class of jury-rigged vehicles powered by engines intended for water pumps. These vehicles are assembled from various locally available parts, and serve an important need: economical transportation of goods and people in rural areas. At the same time, they are known to be unregulated and often unsafe. Today, this idea of making do has been extended as a business philosophy, capturing Indian creativity alongside the need to navigate gray/illegal areas in order to get things done in a resource-constrained context. Frugal Innovation defines Jugaad as an innovative and improvised solution born from ingenuity and cleverness, equating it to similar concepts in other countries, including “D-I-Y” (do it yourself) in the United States

2.2 Theorizing Jugaad

Jugaad is definitionally cross-disciplinary, twinning business and academic research by bringing together diverse scientific domains and applied fields to conceptualizing Jugaad in multiple ways. In Schumpeter’s expression it encompasses ‘industrial mutation’, a process of creative destruction revolutionizing economic structures by creating new ones. A quick round up of definitions point to Jugaad epitomizing the following traits: Seek opportunity in diversity; do more with less; think and act flexibly; keep it simple; include the margin; follow your heart. Dubbing Jugaad as innovation’s Holy Grail [9], affordability and sustainability are replacing premium pricing and abundance as drivers of innovation disrupting business models, modifying and creating organizational capabilities. India, the land of Jugaad, is home to the one cent for a one-minute telephone call, US\$30 for a cataract surgery, and US\$2,000 for a car. Everyday technology innovations like the missed call, the expansive gray markets, the ICT repair shops and the rotating mobile phone market are all part of the Jugaad ecosystem. A more overly ‘development’ driven appraisal of Jugaad would call out a commitment to serving the un-served, embracing a social vision and accepting and creatively operating through constraints with a focus on people, similar to early conceptions of Appropriate Technology [12], which advocates for locally produced and sourced grassroots innovations. The concept of Jugaad from a BOP perspective is not as a quick fix but a new framework to an efficient and effective way of survival, sometimes coined as frugal innovation [1].

Jugaad then needs to be understood within this overarching framework of resource constraints within which people ‘mend and make. Social Science literature views Jugaad as a nondescript, unethical and socially chaotic practice. India’s overloaded vehicles, precarious infrastructure and a culture of risk taking are considered as a strong incubator of this widespread Jugaad phenomenon. Jeffrey [7] from a study of popular culture and Bollywood cinema points to an alternative meaning denoting street smartness and for wheeling-dealing, even borderline criminal activity in the informal economy instigated through a smart optimal use of minimal resources. In the informal economy, growing demand for digital piracy for entertainment and leisure goes by the name of ‘Jugaad modernity’ [2, 18] which has spawned street

entrepreneurship around digital piracy and skills around ICTD repair and maintenance and a gray market practices [11, 12].

The dialectical potential of the term Jugaad came to the attention of theorists through both an exposure to India’s dramatic poverty and its capacity for globalization. Innovation is another framework of India’s sustained and ongoing growth making Jugaad an element in achieving systematic all round development. Thus, the innovations that have occurred globally in the ICT sector have eclipsed more localized systemic risks and, in turn, Jugaad’s association with negative connotations such as indolence and indigence [2, 4].

While Jugaad appears to suggest a process of leap-frogging from grassroots to systematic innovation, the contradictions in the reified understanding of the term compared to evidence on the ground are of localized responses to poverty rather than innovation.

2.3 Jugaad ICTD

Over the past decade, information and communication technologies have re-homed, increasingly, through local modes of adoption in the Global South. As Heeks [6] suggests, two decades after the launching of ICT4D 1.0 with the coming of the Internet and the Millennium Development Goals (MDGs) ICT4D 2.0, is contending with new technologies, new approaches to technology skills, and above all a new approach to digital inclusion of the world’s poor. In accordance with possibly an ICTD 2.0 [13] the advent of “per-poor” innovations provides the harvest on which ICTD scholars, policy-makers and practitioners can reap inferences for thought and action. The paper also speaks to the theme of Jugaad entrepreneurship and the informal business sector for repurposing ICTs towards the more organic social processes of digital literacy and inclusion. Using the lens of 2.0 versions ICTD, Development and the Web technologies, we take a closer look at the Jugaad technologies at work in India, a country with sizable underserved populations using a multitude of ICT tools in their workaday as active producers and innovators. Often lacking even skeletal technological infrastructures, underserved populations create local amenities forging necessary technological infrastructure investments and maintenance.

3 ICTD JUGAAD: QUICK ROUNDUP

This section is prompted or provoked by reimagining Jugaad away from its more mainstream connotations. The aim is to tease out from ICTD discourses around theories, projects of new deployments, design solutions to incubate and sustain relevant usable technologies among underserved and poor user communities.

From a variety of mobile phones to large transport vehicles, any technology featuring locally-driven minor tweaking, a major re-assembling, or ground-up innovation will be fodder for analysis. We attempt to focus on the learning and employability of these technologies for those creating community or private infrastructures to furnishing start-up survival economies. Our observations point to extremely constrained economic and technical resource pools, creating and pressing technologies for specific advantages in everyday workarounds for basic amenities, work commute, self-skill building and engaging in small enterprises. In many underserved locales and neighborhoods like urban slums, remote and rural areas, challenges begin with lack of access to and sub-standard technology infrastructure. These are further amplified by challenges in access to knowledge and training, as well as high costs of technology maintenance, use infrastructures, and supporting start-up survival economies.

Technology/ICT-aided artifacts and social processes in poor and constrained environments and their creative resource management to accommodate a growing demand for locally functional and impactful technologies. The latter includes a range of artifacts and skill ranging from the original Jugaadi tractors in Punjab, to the Chukudus in Congo, imaginative camera use in rural South Africa, Photoshopping pictures for local tastes in the Indian down markets, Cyber café business models in Mumbai, or computer training institutes, maintaining client PCs (home and office) and PC assembling. We propose that these are nodal in immersing technology consumption and offer opportunities for skillful adoption and use. Much of these are a variety of context-specific, sometimes commercially successful instances of technology/ICT aided services localized and enmeshed with everyday routines. These function as survival strategies for everyday basic services and affordable workarounds, often for the bottom-of-the-pyramid consumer. More importantly, the Jugaad processes not only procure technology, either donated, deployed, sometimes even purchased, but are learnt, repurposed, and disbursed through informal and peer-to-peer networking, training and servicing. These practices ensure that technologies are affordable, accessible, usable and serviceable to populations marginal to mainstream and global markets.

A cross section of Jugaad-type engagements with an emphasis on technology practices supporting directly or indirectly socio-economic existence and improvement can range from information sharing practices to social habits around everyday infrastructures and sometimes, creating a new approach or artifact to resource building. The challenge is to identify these improvement seeking opportunities being converted to actual individual or community facilities. Bringing Jugaad into the purview of ICTD can provide conceptual clarity to keywords like innovation, creation, adoption, immersion and use. We will showcase ICTD projects that are donor driven, state ordained, or initiated via policy, focusing primarily on top down processes featuring locally immersive and creative adoption of donated or existing technologies.

4 DISCUSSION

Investigating the performance of Jugaad among several projects and research studies encountered hues and shades of local practices in accepting and absorbing technologies. It points to a range of actors, agencies and technologies from a farmer adopting tech-aided outreach programs to a street entrepreneur self-learning mobile phone and PC repair and maintenance skills. As technologies migrate and pass through various use communities, new practices and behaviors are registered, routinized and incorporated into them. These renewed forms of use, shaped by the socio-technical ecologies of user communities, become new ways of immersing technologies be it for every day, public or commercial use.

4.1 Top Down Technologies Bottom-up Adoption

Traditional Jugaad is bottom-up tech or marriage of bottom-up tech made from parts distributed through top-down mechanisms. However, in many well-known and successful ICTD projects, top-down as a phrase is complicated by participatory methods, etc. Digital Green, StoryBank, m-Pesa which are all top-down technologies informed by bottom-up methods.

Digital Green is a donor driven NGO driving a targeted participatory process for human mediated local video production and instruction model for dissemination and training agricultural extension systems. The operating force behind Digital Green is the human machinery in charge of the entire chain of video

production, dissemination and adoption of best practices to maximize the potential of building the capacity of farmers on improved, sustainable agriculture. The MultiMedia Narrative (MMN) [4] application is a top down ICTD intervention among people who do not have access to a working reliable ICT infrastructure. In such a setting a novel application for affordable camera phones was deployed to create innovative multimedia narratives on mobile platforms in this region, and greater attention to their local use. Akin to findings of the related Story Bank project [3], a multimedia story-phone application trialed in rural India, a variety of cultural and development stories were created by different sections of the community. These interventions suggest that users showed a diversity in creating content types and media forms much of which was entertainment related and some to health, education and advertising purposes. An important insight from this study challenged distinctions between content created for personal and community use, entertainment and 'development' purposes and the importance of locally created user driven adoption. While they do not entail physical construction of new technologies from existing artifacts, these projects embody the spirit of Jugaad by valuing the needs, priorities, and interests of the target communities.

One of the unintended consequence and the huge success of m-Pesa, the mobile banking platform in Kenya, was its local subversion as a savings tool and services. While primarily introduced as a means of transferring money, M-Pesa also doubled up as a savings repository for many of its unbanked clients. Similarly, Micro-finance investment and self-help groups function entirely on local participation and collective motivation to pay back micro-loans and routinize daily operations. Likewise, correspondent banking in India is a locally human-mediated process to bank the unbanked rural populations. Even multinational companies seek local support to enlist clients for effective and persistent and saving banking services. At the same time, mobile money remains limited in utility for unbanked Indians, due to the local requirement for a bank account to cash out mobile money accounts [8]. Thus we see a way in which regulatory structures can limit the Jugaad-ability of a top-down innovation.

Research on ICTs for development has frequently pointed to shared access models as enablers of sustainable development, digital inclusion and tools that most fit the demands of integrated development in resource poor countries. Several studies of this space have called out to its general failure as a business model and at best moderate in its success as a social tool for inclusive development. The case of rural tele-centers or internet kiosks was a force birthed under rural telephony and digital inclusion projects in the wake of MDG for rural India.

One such project in rural Maharashtra witnessed ingenious tinkering with the computing technologies left behind by a failed state-sponsored tele-center initiative. Local entrepreneurs in charge of running internet kiosks spotted the demand for photoshopped pictures, quickly shut off the sputtering and expensive internet, loaded cracked versions of Photoshop and began the art of airbrushing and glamorizing photos of clients. Soon, photography paved the way for videography and clients who were not interested in paying for information on the weather or silk farming paid liberally for photos [10]. Many of the tele-center kiosks became local businesses catering to the digital needs of the have-less, be it downloading ringtones to a basic mobile phone or a quick piece of advice from a session of web astrology.

The coming of the mobile internet and the deepening of its user base can be attributed equally to user ingenuity and the BOP

market innovation. Micro pre-pay and deal-a-day Internet plans are dexterously used to juggle with resource constraints and the need to persist with the internet. Sharing internet time among friends to searching appropriate software, optimizing them for the mobile phone, and tips and tricks circulating among resource-crunched users to expand talk time and internet downloads are a few bottom-up examples of extending and expanding use. Mobile phone and PC-based repair ecologies in the slums of urban India, employing informal and even illegal channels, are actively expanding services to maintain and repair a variety of ICTs for the resource poor populations. These small enterprises grow by getting a toe-hold into relevant business and client networks. This micro-entrepreneur/ICT serviceman exploits both the formal and informal sectors: drawing on the non-formal business and client network for enterprise establishment and seek new and evolving services requiring more formal certification, licensing and branding of products and services. It is in the creative fusion of the formal–informal sectors we see expansion of local mom and pop ICT service stores [14].

5 CONCLUSION: WHAT IS JUGAAD: INNOVATION OR SURVIVAL?

Jugaad is tied deeply to the local limitations preventing access to “formal” goods, and also hindering traditional forms of innovation. Social processes characterizing Jugaad reside at the intersection of technology consumption, resource constraints, and cultural production specific to low-income communities in India [13]. We have two major strands of thought defining Jugaad as a social force: 1) as a simple response to beat the often forbiddingly expensive open market goods; 2) as a creative response to affordable, usable and relevant products requiring low-capital investments catering to a market ignored by formal economic market forces.

How do we perceive innovation in developing countries? A common argument suggests that Jugaad is evidence of the innovativeness of people in low-resource contexts; we argue that belief in this innovativeness should not have been under question in the first place. To characterize the innovativeness as Jugaad is to forget that we need to change the structures that limit the potential for innovation. At the same time, ICTD is often paternalistic and techno-deterministic –many interventions are developed entirely in the west, with very little connection to reality in the field. This has sort of worked for mobile phones (but we see differences in the actualization of mobiles) but failed for computers and tele-centers. The Jugaad approaches used in these contexts highlight the ways in which grassroots innovation attempt to overcome the limitations of top-down interventions. The examples provided by m-Pesa and StoryBank further underscore the ways in which top-down approaches can actively draw on local innovation/needs.

In this paper we use a few cases of ICT adoption and innovation in developing countries to explore the concept of Jugaad. Using these cases, we have attempted to clarify the concept of Jugaad and further suggest that users of the term should be careful to understand that Jugaad is as much situated in the best of localism and “frugal innovation” as it is in the structures that limit creativity and encourage illegal behaviors. We encourage thinking about Jugaad as a way to re-situate ICTD interventions in local contexts.

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