# Together we will find a 'Jugaad': Resource bricolage in the Indian mobile payments sector

*Completed Research Paper*

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## Abstract

This case study examines the process by which a startup in the resource-constrained environment of India was able to develop an innovative mobile payment solution using resource bricolage, recombining elements at hand. We illustrate how the startup, facing internal resource constraints and operating in an infrastructure and regulatory constrained environment, developed a mobile payment solution especially for the consumers at the Bottom of the Pyramid (BoP). Examples of Jugaad innovation, whereby effective solutions are improvised from limited resources are provided. These include working with the local kirana stores, using basic mobile phone technology rather than smartphones and enabling BoP customers to make banking transactions. Our findings are very different to those of mobile payment researchers investigating the sector in the developed countries, and even in some countries in the developing world. Through the emphasis on BoP customers, there are also some observations relating to social inclusiveness.

**Keywords**

Mobile payments, Startups, Bricolage, Jugaad, India.

## Introduction

An increased influx of mobile devices along with recent developments in mobile technologies has led to the establishment of mobile payments as a critical component of mobile commerce. Mobile devices have evolved from a pure communication device to a payment platform (Bamasak 2011) and mobile payments have grown in terms of user base and transaction volume across the globe (Deloitte 2012).

Mobile payments represent a complex and interdependent ecosystem with many actors. These include mobile network operators (MNOs), handset manufacturers, financial institutions, merchants, government agencies, and consumers (Ezell 2009). Orchestration of the mobile payment ecosystem requires establishing partnerships and fostering collaboration among the actors. In addition, some key issues need to be resolved such as the business model challenge. Thus, the ecosystem in Europe and North America remains underdeveloped even though there is a well-defined infrastructure in place (Castonguay and Holland 2010; Knote 2013) due to the difficulties in fostering coordination among the actors (Contini et

al. 2011). Key players such as the MNOs and the banks both want to position themselves to own the relationship with the customer and the information that mobile payment services provide.

Banks and MNOs are identified as the dominant actors present in the mobile payment ecosystem (Ondrus and Pigneur 2005). For example, in the developing world, the majority of mobile payment solutions are provided either through a MNO, e.g., M-PESA in Kenya and GCash in Philipines (Morawczynski and Pickens 2009; Pickens 2009) or through a collaboration between MNOs and banks, e.g. EasyPaisa in Pakistan and bKash in Bangladesh (Mauree and Kohli 2013).

In addition, both banks and MNOs have important financial and managerial resources that are essential for the mobile payment ecosystem. For example, banks have an advantageous position in risk management (Ondrus and Pigneur 2005). Similarly, MNOs provide the necessary technical and network infrastructure for mobile payments (de Reuver et al. 2011). Furthermore, both banks and MNOs have an existing customer base which is a key asset in the mobile payment ecosystem (van der Heijden 2002).

Although, banks and MNOs control significant resources, some startups offer mobile payment solutions. For example, Square, a U.S-based startup provides a mobile payment service through a small magnetic card reader plugged in the headphone jack of smartphones (Ondrus and Lyytinen 2011). However, Square did not face constraints on financial resources and U.S has an established financial infrastructure required for mobile payments. Countries such as India do not have such an infrastructure in place (Bel and Gaza 2011). In addition, India is strongly governed by the financial regulator, the Reserve Bank of India (RBI). Regulatory constraints can limit the mobile payment providers' freedom in structuring the business model, service proposition and distribution channels (Heyer and Mas 2009).

It is difficult for organizations, facing significant regulatory constraints, resource constraints (both financial and managerial) and an inadequate infrastructure, to develop innovative mobile payment solutions. In this study, we explore how startups that face these resource constraints and deal with poor financial infrastructure develop mobile payment solutions.

Our research question is, *"How do startups facing resource constraints and inadequate infrastructure create innovative mobile payment solutions?"* We answer this question by investigating the development of a mobile payment solution by an Indian startup. Building upon the theory of resource bricolage, we demonstrate how startups in India are leveraging existing resources to create new mobile payment solutions.

## Bricolage

Mobile payments are a radical product innovation (Ondrus and Pigneur 2007). Traditional innovation demands large resource investments, a characteristic of older and richer firms (Senyard, Baker, & Davidsson, 2011). For example, Safaricom the dominant MNO of M-PESA had significant resources under its control such as large market share (around 80%), big customer base, strong distribution network, trusted image and budgets to finance the investment needed to deploy the mobile money service (Mas and Radcliffe 2010).

However, firms under resource constraints are sometimes able to innovate through different pathways (Senyard et al., 2011). One such pathway employed by resource constrained firms is 'Bricolage'. This is defined as "making do by applying combinations of the resources at hand to new problems and opportunities." Ciborra and Lanzara (1994) see it as an element of organisational improvisation. Baker & Nelson (2005) identify three key elements of bricolage: "making do" indicates active engagement with problems and opportunities; relying on "the resources at hand" including those that are readily available cheaply; and the combination of resources to new effects and purposes.

In the mobile payment ecosystem, the industry architecture is crucial as the ecosystem involves actors from different industries such as telecommunications, banking, and retail. Industry architecture delineates how roles, relationships and activities are divided among the participants and how value is created and appropriated (Tee and Gawer 2009). An important aspect of the business environment in the context of mobile payments is the structure and development of financial, telecommunication and ICT infrastructures and markets (Dahlberg et al. 2008).

Although some research acknowledges the interplay between firms and their environment as a source of

innovation capabilities (Cohen and Levinthal 1990), traditional innovation can address the inspirational needs and desires of the affluent consumers for complex and expensive products. However, in developing economies this implies ignoring a large proportion of the population. For example, the technology developed by Square works only with smartphones. In a country like India where many people do not own a smartphone (out of India's 900 million mobile users only 40 million have smartphones[1]) this technology ignores most mobile users. Since attaining, a critical mass of consumers is essential for mobile payments to succeed, mobile payment solutions need to reach these customers.

Scholars studying innovation in ICT have highlighted the national, cultural and social factors that impact on ICT innovation (Avgerou 2003; Heavin et al. 2003). Although culture is an important dimension in understanding ICT development, it is temporal and emergent (Westrup et al. 2003). This suggests that a universal approach to study ICT innovation (especially in the context of developing countries such as India) might hinder understanding because context-specific practices, such as Jugaad that we explore in this paper, are present. In the context of mobile payments, cultural and social factors are particularly relevant. For example, Cuendet, Medhi, Bali, & Cutrell (2013) argue that developing regions exhibit variability in spoken languages and users often have low levels of literacy, with little experience interacting with sophisticated technologies. Mobile payment service providers need to deal with such issues. We address this concern, by exploring the practices of bricolage to give effect to innovation in the mobile payment industry in India.

## Research Method and Setting

This study follows a qualitative case study design based on multiple data sources and historical data analysis over a seven year period (Yin 2008). The qualitative research design enables us to address the novelty and the complexity of the phenomenon within the real-life context and investigate its nuances and details. India is chosen as the research setting first because India is an infrastructure-constrained country implying that the financial and technical infrastructure is not adequate and second, because unlike countries such as Kenya, India is strongly governed by the financial regulator. From a mobile payment provider perspective, it implies dealing with a constrained business environment in terms of both the infrastructure and the regulation. Third, the cultural environment of India requires dealing with significant challenges and complexities such as the presence of multiple regional languages, high proportion of unbanked population and low literacy rates. India has 18 official languages and two-thirds of the population in India is illiterate (Goyal et al. 2012).

The case chosen is a company named Alpha India Financial Services. Alpha is an India-based startup launched by two partners with 0.5 million dollars donated by family and friends in 2007. The company provides a low cost financial services infrastructure to extend the reach of financial institutions to the un-banked in urban and rural areas. The company targets 'bottom of the pyramid' (BoP) customers such as house cleaners, auto rickshaw pullers, and vegetable vendors who earn less than 5,000 Indian National Rupee (INR) a month (approximately 80 dollars). The mobile transactions enable consumers to deposit, withdraw, remit, and pay by clicking buttons on the mobile phone; they simply compose and dial a sequence of numbers. There is no need to compose messages thereby taking into account the problem of literacy and the presence of multiple languages in India. Furthermore, the dialing of this sequence of numbers is treated as a 'missed call' so that the consumer is not charged for dialing. In addition, the mobile number serves as the financial identity of the users. In Figure 1 we show how the payment is made to another user through the mobile phone.

In our study, we build upon a series of 20 face-to-face semi-structured interviews with each lasting about 40 minutes with multiple follow-up interviews, and access to archival records and internal documents. Interviews were not tape recorded due to confidentiality agreements. The researcher took extensive notes during the interviews and immediately after prepared memos and wrote case diaries. Archival records and documents provide information such as key dates and events and cover long time periods. The data were analyzed using the principles for conducting interpretive field studies (Klein and Myers 1999; Walsham 1995).

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[1] http://www.firstpost.com/tech/indians-just-love-to-play-on-their-smartphones-says-neilsen-report-623664.html

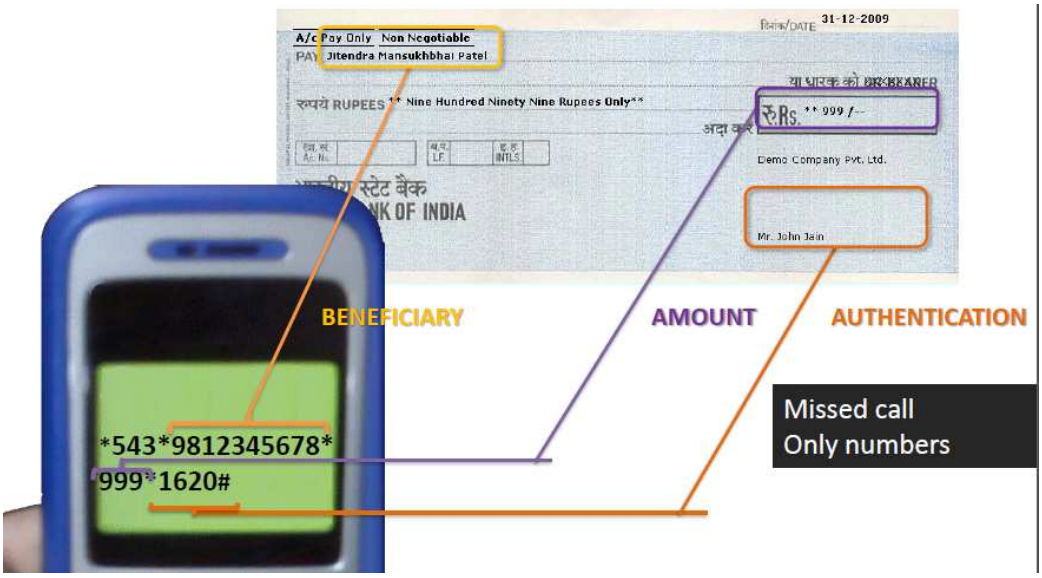


Figure 1: Transactions through mobile

Key interviewees were identified as the study progressed, and the researcher, using the 'snowball sampling' strategy, approached some. The participants include representatives from the company, a network of retailers known as the customer service point (CSP) representatives. Official letters were sent to the organization ensuring the confidentiality of the results and describing the research project. Our respondents provided us with insights on the nature and number of constraints they faced initially and at later stages, the ways in which they dealt with these challenges and constraints, the processes of developing the mobile payment solution, the patterns of interactions with their partner institutions, and the broader effects of these to their business. In terms of data analysis, we followed an inductive approach to identify the emergence of patterns and themes from the data. The next step in the data analysis phase involved organizing and structuring the data to identify the processes and the role of actors in this ongoing mobile payment innovation and the subsequent outcomes of this innovation. Next, we analysed the relationships between the key concepts such as constraints, processes and outcomes and included 'the approaches to deal with the constraints and challenges'. Based on our data analysis, we demonstrate how a startup can create an innovative mobile payment solution by employing resource bricolage.

# Key Findings

## *Migration history and the need for domestic remittances*

The very first concern for a business is to have a consumer base. Unlike MNOs and banks, a startup such as Alpha did not have an existing consumer base. They identified the migrant workers in Delhi as potential consumers and started working with them. These people did not have access to financial services and mostly relied on traditional means of sending money such as hawala, an alternative remittance system that exists parallel to 'traditional' banking or financial channels (Jost and Sandhu 2003).

*"In Delhi a lot of workers come from Bihar who are low wage workers and often earn about 2 or 3 dollars a day. They do not have official residency and in some cases, they do not even have proof of identity and thus are unbanked. But they need to pay bills, send money home, and pay landlords. In addition, most of them are illiterate and even do not know how to do a signature. Thus, we identified this set of consumers and developed an infrastructure especially for them. We also tapped the areas where most of the migrant workers tend to reside. This is how our journey started." (Manavsi, VP International Business, Alpha).*

## *Finding Jugaad all the way*

A crucial element of bricolage involves dealing with unexpected situations, being responsive to constrained situations and act accordingly (Halme et al. 2012). Jugaad innovation is prevalent in the Indian context. Jugaad is a Hindi word that loosely translates as the gutsy art of spotting opportunities in the most adverse circumstances and improvising effective solutions using simple means and limited resources (Radjou et al. 2012). Jugaad innovation entails responding to rapid changes in the environment and serving the BoP consumer (Radjou et al. 2011). An example of Jugaad is seen when Alpha faced a regulatory constraint as they started their operations. In particular, the RBI mandated the necessary inclusion of a bank in any mobile money solution. To deal with this Alpha started working as a business correspondent (BC) for one of the largest public sector banks in India, the State Bank of India (SBI).

*"Initially we were established as a technology provider. However, when we decided to work as a BC for SBI, we realized that a technology provider is not entitled to be a BC. Thus, we had to set up a nonprofit arm of the company. As a BC, we open no-frills accounts for the unbanked consumers at the BoP with just a photo, mobile number, and proof of identity. We acquire consumers for the bank. As the journey started there were several constraints and we had to adapt accordingly and quickly." (Alok, Business Analyst, Alpha).*

## *My Mobile, My Identity*

As argued earlier, India is a financial and technical infrastructure-constrained market. Unlike developed economies, the number of users that adopt sophisticated technology is low. This is especially true for the consumers at the BoP. To deal with these constraints, Alpha took advantage of an existing resource that is readily available i.e., the rising (albeit low cost) mobile phone penetration in India. India has about 870 million mobile subscribers and is adding 10 million a month (Radjou et al. 2011)

*"We wanted to provide a low cost infrastructure to our users. Something that is easy to use and simple. One thing that all the BoP consumers have is a mobile phone. Thus, we decided to capitalize on the ubiquitous mobile phone, resource that is already present. The mobile phone number forms the account number of the no frills bank account and for authentication purposes, we provide simple to use authentication codes. All payments and remittances are done by composing a sequence of numbers. There is no hassle of composing messages over the mobile phone." (Rakesh, Business Development Manager, Alpha).*

*"Who wants to get in the hassles of carrying debit cards? … Mobile is the best. It is simple, safe, and the fastest way to send money." (Ram, Alpha CSP, who owns a stationary shop).*

## *Capitalizing on the trust in Kirana stores*

An additional challenge was how to establish CSPs where consumers can go and open their account for the first time. Alpha did not have enough funds to open branches in every locality. This would also imply paying for office rents, employees and other running expenses. In addition to the financial constraints, the absence of an adequate banking infrastructure posed further constraints. The absence of bank branches and lack of willingness on the part of bank employees to serve BoP consumers posed further hurdles.

*"Instead of opening branches in different localities, we tied up with the kiranas, chemist stores, stationary shops, and small cyber cafés. An important issue was how to establish trust with consumers. We decided to engage with these local kirana stores in the neighborhood. The consumer knows these kirana shops as most of them have been in the locality for many years and the consumer trusts the local kirana shop or chemist shop (indeed these consumers do not go to a doctor if they are ill, they go to the chemist shop in their locality). The consumers are already interacting with them on a daily basis and they purchase day-to-day grocery items from kiranas on credit and so they are popular and trusted in rural areas." (Prakash, Area Sales Manager, Alpha).*

Another respondent mentions, *"These local stores attract more people to their shops because of our business, which is an additional source of income to them and boosts their primary business." (Manavsi, VP International Business, Alpha).*

### *Banking, Bread and Butter: Kirana stores as local bank branches*

Local kirana stores effectively act as a local bank branch in the locality. The consumers can go and open no-frills accounts at these outlets. All the operations are done through mobiles - account opening transactions, cash deposit and cash withdrawals. Once the account is opened, the consumers can pay bills, transfer money, and recharge the mobile balance on their own at home or at work. In addition, by making retail stores that are widespread in rural areas as their CSPs, Alpha has eliminated the need to set up expensive bank branches.

*"Banks are not willing to serve BoP consumers; they incur a cost of about 50 INR per hour to serve them. Migrant workers are humiliated in banks and are ill-treated. But they come to my shop, buy bread, butter and do deposit and withdrawal transactions. Even for bread and butter they pay with their mobile."* (Parth, Alpha CSP, owns a kirana store).

### *Resource bricolage and recombining elements at hand*

Resource bricolage incorporates identifying existing resources and scanning external markets for such resources. Thus, Alpha is leveraging existing distribution networks, existing consumer base, and interaction patterns and combining them to create an innovative mobile payment solution.

*"It is through combinations of two existing key resources that we have developed this mobile payment solution. First is the mobile phone which has a widespread presence and second a strong distribution network made up of kiranas and chemist shops."* (Manavsi, VP International Business, Alpha).

### *Collective Bricolage*

A recent strand of research on bricolage lends support to collective bricolage (Duymedjian and Rüling 2010; Halme et al. 2012). Collective bricolage implies that individuals within an organization carry out bricolage activities collaboratively. Similar behavior is observed in our case, albeit at an inter-organizational level wherein the main actor ensures that all other partners work with limited resources.

Alpha works with limited resources and ensures that other partners such as the consumers and the retailers also work with no additional investment. This enables Alpha to provide a low cost service to the consumer. For example, the mobile payment solution provided by Alpha is MNO, device and location agnostic, implying that the product works with all kinds of phones, anywhere and with the services of any MNO. Furthermore, no investment in point-of-sale (POS) devices is required to process transactions. Instead, Alpha leverages existing infrastructure.

*"These kirana stores already have a mobile phone and that's enough. No need for sophisticated POS instruments. In our model, every mobile phone is an Automated Teller Machine (ATM)! And anyone with a mobile phone is a merchant! And yes, you only need a basic mobile phone to do the transaction. No need for a smartphone. Only basic numeric literacy is required to perform the transactions." (Ramit, Sales Manager, Alpha).*

*"I prefer this system because I do not need Internet to process the transactions. So, I save the expenditure on Internet connectivity. A mobile phone is sufficient. I do not need to buy other hardware such as a computer or POS terminal." (Jitesh, Alpha CSP, owns a kirana store).*

### *Creation of new roles and entities in the ecosystem*

Alpha constantly found ways to minimize resource spending. In each locality, Alpha assigns a Super CSP, which is a major retail store. Super CSP identifies and recruits reliable retailers in the area. The task of recruiting and training new CSPs, answering queries, and maintaining and distributing cash is assigned to the Super CSP. This in turn saves a lot of time and effort on the part of Alpha as they scale up their business.

*"As we expanded, we needed to find new CSPs, but maintaining each one of them and training them became cumbersome. We now only recruit Super CSPs and they in turn recruit CSPs in the respective locality, interact with CSPs, and perform other tasks such as liquidity management and cash collection and distribution. We now mainly interact with the Super CSPs." (Prakash, Area Sales Manager, Alpha).*

## Discussion

Our aim has been to study the creation of mobile payment solutions in highly resource-constrained environments. This paper examines the processes through which a startup creates new products under such constraints. In addition, this study considers the impact of internal and external constraints on the mechanism of resource bricolage, especially in startups. The internal constraints include the small funds available at initial stages, lack of reputational capital, and a small team. The external constraints were the constraints posed by the environment, in particular regulatory and infrastructure constraints. Our findings contribute to the literature on mobile payments by highlighting the effect of social and cultural factors, market structure, and regulatory environment.

Alpha was able to create an innovative mobile payment solution by leveraging existing resources such as mobile telephony, widespread presence of local kirana stores, and the trust and popularity of these stores. Furthermore, it combined these resources to develop a new mobile payment solution. It is noteworthy that Alpha is neither an MNO nor a bank; it is an independent entity in the ecosystem. Alpha continues to work with minimum resources and encourages its partners to work with minimum spend.

Our research also highlights that the macro country environment acts as the driver of the micro levels' incentives and knowledge on how to work (Lamb and Kling 2003). The role of the environment as guided by the RBI was also crucial in determining the business model of Alpha.

Our study also extends the literature on the resource bricolage perspective. Most of the work in the context of resource bricolage focuses on the analysis of cases in the context of developed countries (Baker & Nelson, 2005; Senyard et al., 2011). Our study explores the concept of resource bricolage in the context of a developing country and in a different industry setting (mobile payments) which is a resource intensive industry.

It is argued that bricolage often provides imperfect and temporary solutions (Senyard et al. 2011). Our study suggests otherwise, that a long term engagement with bricolage can lead to simple products that are valued by consumers. In addition, not enough attention is paid to the value obtained from the product and its affordability. Baker & Nelson (2005) observed that firms that relied heavily on bricolage provide low quality products to customers who could not or would not pay more for high quality goods. Our study demonstrates how the mechanisms of resource bricolage can be employed to address the needs of the consumer at the BoP by developing affordable and low cost products that are simple to use and provide a good value proposition.

Firms engaging in resource bricolage demonstrate a willingness to act and find ways to make do with the resources at hand (Senyard et al., 2011). We have shown that they treat material and human capital as resources that other organizations might see as worthless (Garud and Karnøe 2003). For example, the banks in the Indian mobile payment industry view the consumers at the BoP as a liability. Our study demonstrates, contrarily, how one organization considered BoP consumers as a source of opportunity.

Our study also lends support to the theoretical notion of collective bricolage discussed by Duymedjian and Rüling (2010) and Halme et al. (2012). Collective bricolage is crucial at an inter-organizational level, and assumes greater importance in developing low cost products and in cases where there are actors from different industries. Not only do the products providers need to engage in collective bricolage to ensure that a critical mass of users is achieved, it is essential that consumers be able to use the products with minimum effort.

## Conclusion

This study explores the process involved in the development of mobile payment solutions for the un-banked people at the BoP. Our results demonstrate that by employing resource bricolage and Jugaad innovation, startups can develop innovative mobile payment solutions for BoP consumers. This study has both theoretical and practical implications. On a theoretical front, this study employs a new theoretical lens to illustrate the mechanism of resource bricolage to create an innovative mobile payment solution in the presence of resource constraints. Our research also contributes to the studies on mobile technologies in developing countries. In addition, we consider the different institutional setting of the mobile payment industry to evaluate the resource bricolage mechanism. From a practical viewpoint, this study emphasizes

how entrepreneurs can create products by using minimal resources and still generate profit in the long run. In addition, by considering the consumers at the BoP as a source of opportunity, entrepreneurs can work toward societal inclusiveness.

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