New Business Models: Barriers to Innovation
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Role of Innovation

Innovation plays a vital part in growth of economies and is more critical in a knowledge economy. Countries that show more evidence of innovation are richer and grow faster. Similarly, companies that show more evidence of innovation post better financial performance and have higher share prices, (Mohanen and Rosa, 1999). Ownership of an innovation not only gives a competitive edge, in sectors characterized by network economies, it shapes and changes the boundaries of the sectors. To win the race to innovate, especially in such sectors is extremely essential.

Telecom sector is evolving very rapidly both in terms of technology and policy. Such changes in the service provision chain attract new players and push existing players in to considering and possibly adopting new lines of businesses or adopting new business models. New players from related sectors are likely to emerge and compete with the incumbents. In telecom service provision, this competition was earlier limited to the information and entertainment sectors, but it now encompasses players from a variety of sectors (logistics, banking, fast moving consumer goods (FMCG)). Incumbent telecom service providers need to understand the dynamics of this changing landscape. Understanding the process of innovation is critical for this as the growth of business for telecom service providers in the future will depend on their ability to leverage the gains from it.

While the earlier value creation in telecom services was distributed within the entire network, it is now increasingly moving closer towards the end user (figure 1) and will play a dominant role in value creation for the customer and drive revenues and profits for enterprises. This is also the area where companies will compete to be the first to innovate. There are two major implications of this for telecom service providers: i) They need to understand the consumer behaviour patterns in related sectors (for example, banking, logistics, FMCG etc.) ii) They need to be able to forge partnerships with a variety of technology and content partners to exploit the emerging areas of businesses. This will have implications for actors in the value chain as they will need to develop partnerships or linkages with a number of new kinds of players and as boundaries between different roles are redrawn.

A precondition for organizations to innovate is their ability to successfully utilize new technologies. It is not only the role of lead users that is important but also the organization's ability to institutionalize its usage. This often requires a review and change of existing business processes, expenditure on resources, training and evangelization. These changes could lead to working with a new set of actors, understanding their business process and possibly developing a collaborative value proposition towards the customer. Those organizations that have the capability to innovate in this manner will be at a competitive advantage

Innovation Frameworks

Research in innovation in mobile services follows two predominant paths: innovation theories and models in general and such theories and models as applied in the context of Information Systems. However there are lacunae in the application of existing theories of adoption and diffusion of mobiles. Standard diffusion theories works under "the stringent assumptions of an invariant unit of innovation and a definable population of potential adopters (Rogers, 2003), while the mobile services market presents different scenarios (Jarvenpaa et.al., 2003). Multiple mobile services with different scaling properties can be diffused as a result of the deployment of several devices and other services, thus vivid reinvention can be present" (Constantiou et.al., 2007).

Theories and Models of Innovation

Diffusion theories have focused on the role of users and features of technological innovation (Rogers, 1995; Rogers, 2003) and factors that contribute to adoption (adopter characteristics, social networks, communication process, promoters' strategies, and nnovation attributes such as triability, relative advantage, compatibility, observability, and complexity, Rogers, 2003) as well as on the role of organizations in the creation or adoption of an innovation. (Daft 1978; Damanpour and Evan 1984; Damanpour, 1996). The role of knowledge in brining about service innovation is highlighted in (Cavisgil, et. al., 2003, Stuart, 2000). Innovative firms support knowledge creation and work with a variety of sources of knowledge such as partnerships with customers and suppliers. Such firms are able to leverage the explicit and facet knowledge of partners to design innovative products (Cavisgil, et. al., 2003, Stuart, 2000).

Innovation Studies in Information Systems

Theories of adoption and diffusion of IT based innovation Information systems (IS) focus on individuals' perceptions about using an innovation and its affect on their adoption behavior (Agarwal & Prasad, 1997, 1998, 1999; Moore & Benbasat, 1991; Rogers, 1995). Several studies examine the relationship between perceived ease of use, perceived usefulness, and the use of other information technologies (Adams, Nelson, & Todd, 1992; Davis, 1989; Davis et al., 1989; Hendrickson & Collins, 1996; Mathieson, 1991; Szajna, 1996). Their research has supported the technology acceptance model (TAM) proposed by Davis (1989), which posits that perceived ease of use and perceived usefulness can predict the usage of technology.

Other theoretical models that attempt to explain the relationship between user beliefs, attitudes, intentions, and actual system use include the theory of reasoned action (TRA) (Ajzen & Fishbein, 1980), the theory of planned behavior (TPB) (Ajzen, 1991), and the technology acceptance model (TAM) (Davis, 1989; Davis, Bagozzi & Warshaw, 1989).

Innovation studies in IT have also focused on the disintermediating effects of IT, especially with the growth of Internet and development of intra company networks, and subsequently extranets (Nissen, 2001;Lim, et al., 2007;)

Innovation Studies on Mobiles

A popular framework to view innovation in mobile systems at the national/regional level has been that proposed by Lyytinen and King (2002). They posit that three interacting and dynamic systems: innovation systems, market place and regulatory regimes (appendix 1) influence the structure and form of the mobile industry. They argue that the key to understanding the development and evolution of advanced mobile infrastructure and the resulting adopting and diffusion of mobile services across different national and regional markets is to understand the changing interaction among the three systems. While this model provides a macro picture, it does not provide insights in to the role and motivations of different actors to participate and benefit from the innovation process.

To get an understanding of the individual and organizational drivers of adoption and diffusion of mobile services, various authors have adopted a number of theories from the Information Systems field including Technology Acceptance Models, Theory of Reasoned Action as well as extensions and modifications to the above (e.g. Venkatesh, Morris, Davis, & Davis, 2003, Lu & Yu, 2006; Lu et al., 2003; Gilbert & Han, 2005). While these models have been able to explain IT diffusion and adoption, they show significant shortcomings in their ability to capture the diffusion and adoption of mobile services (Blechar, Constantiou and Damsgaard, 2006). In addition, many such studies emphasize past behaviors and are limited in forecasting future behaviour (Meade et al., 2006).

While the Internet made geographical distance irrelevant and also allowed for business to be conducted 24*7, the need to use a PC limited the flexibility with which users could use these applications (for example, users could not use internet when they had no access to PC, broadband connection or electricity). By having such applications on the mobile makes these shortcomings redundant. This will bring about a revolution in the enterprise supply chain that will be of a significantly high order.
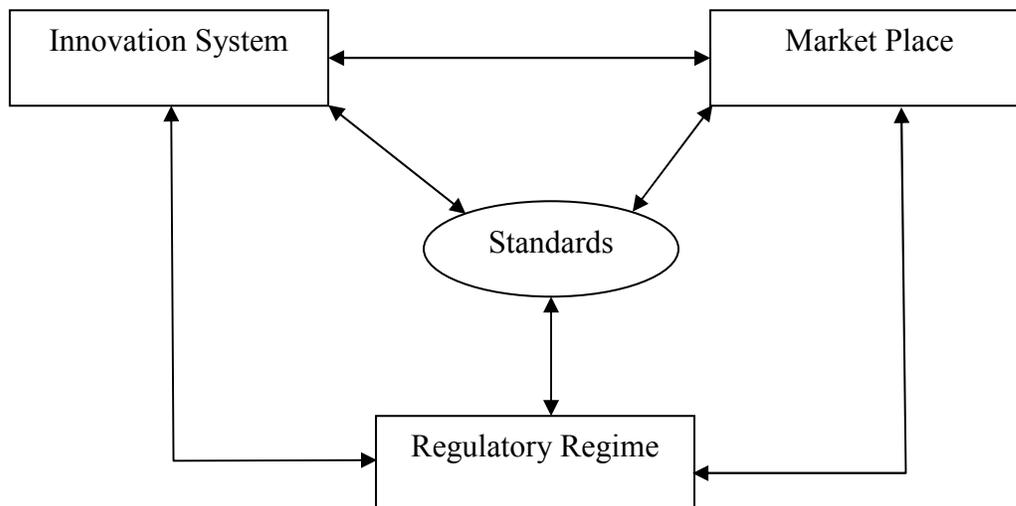
Figure 2: Wireless industry's institutional environment (Lyytinen & King, 2002)

There are some authors who feel that some characteristics of mobile services that may require a rethink of the applicable adoption and diffusion theories and models is the fact that when new services are introduced, these do not necessarily replace the existing one (a premise of the existing models) and further adoption may be driven by network effects and externalities, rather than user characteristic per se (Constantinou, Damsgaard, Knutsen, 2007). Also the theory of social shaping (MacKenzie & Wajcman, 1985) in which technology is shaped in a social context also challenges the diffusion theory.

The predominant focus of innovation studies in mobiles is on the adoption and diffusion of mobile services by individuals (Olla, 2004; Massini, 2004; Bouwman et. al., 2007; Lau, 2003; and others). While some of the studies (Lau 2003) have also considered the role of regulation (customer privacy and customer protection), most studies have focused on factors from the user perspective that will drive adoption (ease of use, perceived usefulness, attitude of users etc).

Few studies have examined the role of mobile systems in business enterprises, though with the proliferation of mobiles, these could have a significant impact on business processes (for example, supply chain in various sectors), while IT literature cites several studies of impact of IT on businesses. This is possibly because IT was first an artifact within the enterprise and subsequently became a more personal artifact. IT innovation research therefore, focused on the role, motivation and other attributes of individuals and teams within organizations. On the other hand, mobiles have been personal devices, used for convenience, flexibility and value addition to personal and professional life, and now extended as a part of the organization's IT infrastructure. It would be important to understand to what extent the impacts of mobiles are similar to IT and on what dimensions will it be different.

Most studies based on innovation in the context of mobiles have focused on developed countries. However, the drivers for innovation/introduction of new services are very different in developed and developing countries. Some of these are:

- *New Services versus Augmenting Existing Services:* A very important differentiator is that in many of the developing countries mobile services are not seen as augmentation of existing available services but as the only available channel of service provision. For example, in most developing countries, for most individuals mobile phones were the only phones they owned, rather than as an additional phone over the fixed line phone. This has implications for service design and delivery and acceptance. Low acceptance levels to new technologies can lead to situation of less than critical mass. On the other hand, since there is no prior conception of service provision, services over mobiles may become acceptable, even though they may be limited or

cumbersome to avail (due to current technology constraints such as small screen size). A classic successful example of this kind of leverage is the i-mode success in Japan. In Japan, internet penetration rates were very low at the time of introduction of i- mode. When i-mode was introduced as a means of accessing Internet based content, there was a rapid uptake. There had been little choice or preconceptions for individuals in terms of comparison with a PC based multimedia rich graphics experience. So even the limited graphics capability of mobile phones was acceptable.

- *Drivers for Introduction of Services:* The drivers for operators for adoption introduction of new services are very different. For example, in Europe and OECD countries, saturation of voice markets is driving the path towards m commerce. In India, the subscriber base is still growing, (urban markets are not yet saturated at the lower end, rural markets are virtually untapped). The decreasing ARPU of service providers as they start providing services to a growing base of population, with lower ability to pay that is driving the introduction of innovative services. This has implications on appropriate business models for driving revenues.

- *Type of Services*: Most value added services in western countries focus on "entertainment", discretionary consumption services (high end services, paying for clothes, etc), while in India (as in Africa), several services have been developed for providing services that are critical/core to the generation of livelihood. The kind of information that is sought to be provided and the type agencies with whom service providers have to establish links is very different.

- *Stage of Growth at the Time of Introduction:* The stage in the growth of mobile services when the innovative services were introduced is very different in developing countries. For example, in developed countries, value-added services were introduced when the penetration of mobile services was fairly high. In developing countries, several value added services are being provided when penetration rates are low. This has implications for achieving critical mass

In order to understand the impact of mobiles on new business models and barriers to innovation, we analyzed the business processes, drivers and constraints of selected organization in adoption of new services.

Methodology

We followed a two phased approach as follows:

Phase 1:
- Focused on the innovations in mobile business models (based on secondary research, both Indian and international) to analyze the business processes, drivers and constraints, at the business and policy level.   We also analysed what is different about India and why.
- Assessed the role of mobile payments in the development of such models.

Phase 2:
- Since mobile banking, payments and financial services are a critical part of m Commerce, we studied the policy and regulatory constraints in the provision of these services.

Phase 1

Scope: Initial secondary research was done to identify those applications where there was an explicit commercial value proposition linked to a specified customer segment. Mobile based transactions formed a critical part of the transaction value chain. Not all parts of the transactions needed necessarily be done using a mobile. While mobile banking is a critical part and touted as the next "killer application", it may not necessarily be a part of the selected case studies. We analyzed the ecosystem of these services and defined the criteria that make these services innovative.

For the selected case studies, in depth interviews (semi structured) were undertaken with the key designers, proponents, and users of the service. This helped us to analyse the drivers and constraints in the successful implementation of such models. Policy and regulatory issues related to the provision of such business models were also identified.

Selection of Case Studies

In order to select case studies, we explored the areas where mobiles have been used to introduce new business models. Further by developing and analyzing the case studies, we not only identified the Critical Success Factors but also the Barriers to Innovation.

Since new ventures play a very important role in innovation, especially in the telecom sector, we wanted to pick up case studies of such firms that are involved in developing new business models through innovation in technology – Oxigen (www.myoxigen.com), and A Little World (ALW) (www.alw.com). In order to balance the portfolio, we selected one study from an established FMCG company – Marico India Limited (ML) (www.marico.com). We hoped that this case study would bring out the implications of introduction of an innovation in an existing business process.

An important factor that was taken in to account in the selection of case studies was that there should have been a significant spread of services. For example, in the case of the two new ventures, there should have been at least 5000 points of implementation or beneficiaries and in the case of ML, at least 80 per cent of its target group should be using the service.

Role of New Ventures in Telecom

New ventures not only play an important role in the economy by creating new jobs, they distribute wealth and innovate much more than the established firms. New ventures in the telecom sector face significantly higher challenges than those in other sectors as they must not only contend with high levels of knowledge intensity in their sectors and regulatory challenges but also face other factors common to other new ventures such as lack of knowledge on their business environments, shortage of and hindered access to qualified personnel, access to finances, limited internal know-how to manage the innovation process effectively and efficiently, and restrictive laws and regulations (Tiwari and Buse, (2007) quoting Ylinenpää (1998), Friedrich Ebert Stiftung (2004), Acs and Audretsch (1990), Baldwin and Gellatly (2004), Rammer et al. (2006), Mohnen and Rosa (1999)).

Unit of Analysis

While innovation research has focused on two different units of analysis: individual and the organization, we focus on the organizational innovation. Since the benefits of mobile technology, or any technology for that matter are hard to quantify in isolation, we analyzed the business processes that these organizations innovated on. Thus the unit of analysis is the business process. This approach helps to establish linkages of the mobile application with the business performance.

Criteria of Selection of Business Processes

The choice of the business process was based on the following criteria:

1. It dramatically reduced the complexity of the process (for example Oxigen, ALW, ML)
2. It dramatically reduced the cost of doing business (Oxigen, ALW, ML)
3. It increased the scope of services that could be provided (Oxigen, ALW, ML)

Figure 2 depicts the context of mobile usage within an organizational business process
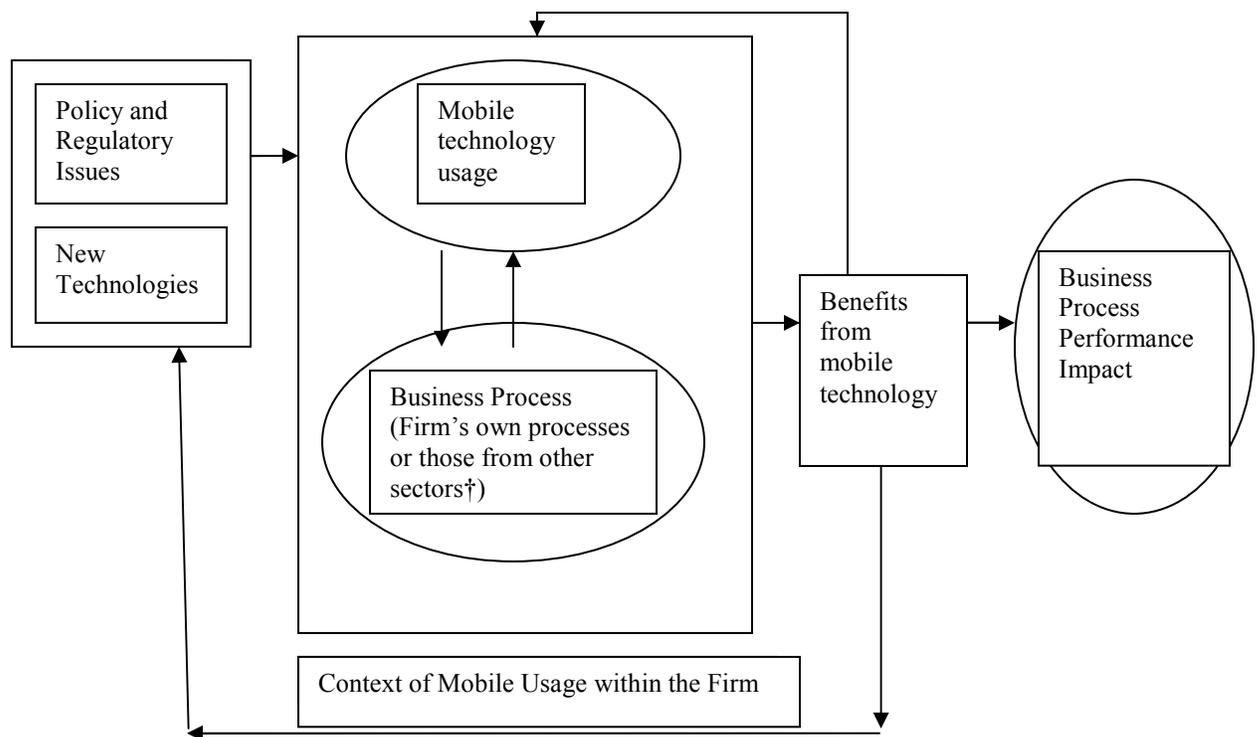
Figure : Context of Mobile usage within an Organizational Business Process

† An example of the "firms own process" is that of ML whereas AWL and Oxigen are examples of business processes adopted from other sectors.

Outline of Case Studies

A framework for case analysis has been developed that considers the following: how does the organization provide value to customers, deal with other organization (including its partners and government) manage its financial issues in the context of its current and future strategy. We also examined the regulatory and policy issues in the external environment that may influence the current business models. The underlying concept of a business model was taken to be "the way in which a company creates value for all its participants including partners, suppliers and customers. A business model is then taken as the architectural configuration of different components of transactions designed to exploit a business opportunity" (Li and Whalley, 2002).

Oxigen (www.myoxigen.com): Oxigen is a new venture that started its operations by developing a Point of Sale (POS) terminal for disintermediating the supply chain of recharge coupons for mobile services. It changed the supply chain from being operator specific to being operator agnostic through creation of a virtual recharge coupon

database. Further, by interfacing a POS device with the database, Oxigen reduced the upfront requirements to become a part of the distribution chain, both for distributors and retailers. This gave significant market opportunities to smaller retailers and distributors to become a part of the distribution chain as well as for existing distributors and retailers to expand their businesses. For Oxigen, experience on this platform enabled it to launch a number of products (Oxicash, Mobibuzz) and services (payment for hospitals, retail chains, hotels etc) using the mobile platform.

For payments, it uses a mobile wallet that interfaces with Oxigen servers. It uses WAP, GPRS, and services such as SMS, web based transactions for these transactions.

Its unique positioning lies in the fact that it leverages the growing base of mobiles, is operator and service agnostic. This means the platform can be used to provide a number of services from a variety of operators. For example, its services are available for GSM and CDMA platforms as well as the Internet. So, it has evolved its business model to be able to exploit the changes in the external environment such as availability of GPRS networks to provide WAP based services. The Oxigen platform could proliferate as it was supported by physical processes and systems for managing cash collection through its "Feet on Street," developing partnerships with POS manufacturer, telecom service providers, retailers and distribution (appendix 1)

A Little World (www.alw.com): provides m-banking facilities, either as a stored value card or as an extension of a physical bank. It uses a system of modified mobile (augmented through biometric authentication, and mobile camera) to provide a channel for distribution of money to National Rural Employment Guarantee Scheme (NREGS) beneficiaries, which would not exist otherwise. The combination of the hardware and software, both for enrollment (including biometric authentication) and disbursements specially designed to handle the requirements of NREGS and follow Reserve Bank of India (RBI) guidelines (in terms of meeting KYC and security requirements) etc make this initiative unique. The attributes of its unique model are the provisioning of an end-to-end solution, with the leverage of the existing mobile infrastructure and design of business processes that are compliant with those of its partners (banks, government agencies) and the regulator (RBI). Its ability to provide secure transactions as per RBI guidelines makes it a strong candidate for further deployments by banks to reach their financial inclusion targets. (appendix 2)

Marico Industries Limited (ML) (www.marico.com): used mobiles to directly build links with coconut farmers and copra converters, by disintermediation of the various traders and brokers in its supply chain. While this provided better information to ML for planning its manufacturing and managing the associated supply chain, it also gave farmers a better price. For ML, getting assurances about quantities of different varieties of copra was more important than small reduction in prices that disintermediation in the supply chain would have resulted in. For the farmers, getting a higher price was obviously better as they could partly appropriate the margins of middlemen. The process also allowed them to have a say in the decision process regarding at what price-quantity point they would sell rather than it being determined by the brokers and traders. The

simplified accounting processes was important driver of adoption. They were able to influence to get additional services such as expected arrival time of their trucks, thus getting more control over the delivery process and for Marico, it meant early data for planning its operations.

The innovation lay in understanding the issues faced by farmers, and developing electronic interfaces to enable them to participate in the supply chain more effectively. The IT enabled backend with mobile interface, along with the requisite training and literacy riding on the back of the mobile boom created a winning situation both for farmers and ML. (Appendix 3)

Analysis

This is among the early studies to examine innovations in the context of mobile services in business enterprises in a developing country context. The present study is not comprehensive; it is exploratory and will hopefully lay the ground for further work. It aims to identify the constraints and challenges in deploying innovations in a developing country context.

Oxigen and ALW were more involved in first of its kind development, whereas ML innovated by first providing a very simple system for farmers to bid and then providing a tri lingual web interface on mobiles.

Both ALW and Oxigen deal with payments systems. ALW is bank based (though not bank led), Oxigen is neither directly bank based nor bank led, though it deals with payment transactions. Neither system is telco led (as in the case of M-Pesa or WIZZIT).

We see in the three case studies that each organization had the capacity to respond to changes in the external environment, and to influence and shape it (Burgleman 1991; Child 1997). http://www.brunel.ac.uk/2146/brese/docs/lam_wp1.pdf) This is a measure of their innovation capacity.

- *Role of IT and Supporting Processes*: The success of these enterprises lay in being able to use mobiles to directly impact business performances by dramatically reducing complexity in the underlying business processes. In all the cases, developments in IT were critical to support this reduction. It was extremely important to understand the role of the complementary supporting processes related to the core processes in making the process outcomes successful. For example, having an effective physical system for cash collection complements the electronic recharge coupon system. The ability of the top team to envisage and implement and develop such IT based solutions is important. Offering high quality electronic services requires access to highly qualified experts and special resources as exemplified in all the cases. Essential capabilities need to be obtained. These often reach beyond those that are available within the company or even the industry segment that the company is operating in.

- *Influence of Regulatory Regime on Innovation and Market Place*: The specific model selected by ALW and Oxigen have implications for the cost of service as well as for services that may be provided. The cost of regulatory compliance as provided by the RBI is high for ALW as highlighted.

  In order to facilitate mobile payments and banking, there is a need to come up with a framework that works on the principle of proportionality. The section on policy recommendations outlines some measures based on such principles. The limitation imposed on Oxigen due to regulatory compliance will affect the type of services and products that it can provide. For example, it cannot provide products that will allow person to person transfers (such transactions need to be routed through Oxigen platform.

  The framework provided by Lyytinen and King (2002) gives a useful way of examining how the regulatory regime influences the innovation system by limiting the products and services and the eventual outcomes in the markets (Oxigen). On the other hand, the NREGS gave an opportunity that ALW was able to leverage to bring innovation to the market. The requirement of interoperability in this case highlighted later shows the role of standard in the innovation process.

- *Expanding the Boundaries of Knowledge through Partnerships for Innovation:* Very often deployments of innovation require the development of partnerships with customers and among companies (for example suppliers). The cases highlight how the companies successfully managed the complexity and generated new knowledge that was necessary for innovation using their customers and suppliers. As highlighted in the case studies, innovation developed around new knowledge possibly from outside the narrow domain of the firm. The firms were able to leverage this knowledge to embed it in a business process that significantly impacted business performance (Cavusgil, Stuart).
  - *Customers*: In the cases, having a joint proposition towards the customer amongst the several businesses that came together for providing the solution was required for the innovation to be useful. For example, ALW shares the customer (beneficiary) with the banks and the government agencies both responsible for the disbursement process. Similarly in Oxigen, the customer is shared with various service providers with whom Oxigen has a tie up. The complexity in sharing the customer arises on account of identifying the requisite service bundles and attributes each service provider is responsible for. Competitive advantage will lie with those players who can use the customer data to develop services that exploit the innovation.
  - *Suppliers*: All the companies in the study were able to establish such partnerships successfully. The significance of these partnerships in sharing knowledge, customer data and business processes is more critical in Oxigen and ALW. For ML, the partnerships that IT department developed

to implement the solutions were important. By the very nature of these partnerships, these are not bound by tight contracts, but rather a shared vision for growth/profits. Cooperation is sought with companies from other segments of industry that have these complementary resources and capabilities, instead of acquiring and incorporating them into the company's own processes.

- *Implications for Strategy*: The issues in managing possible clashing cultures and strategies, when companies from different segments of industry need to collaborate in order to realize that business proposition should not be under estimated. These also reflect a measure of founder manager's capabilities, vision and approach to be able to make a partnership a success. The cross-sector character of the innovations in the sector increases the complexity of the network and processes required to deploy the innovation creatively.

    Finally, there is a need to develop and implement measures for financing, risk sharing and obtaining return on investments for each contributor in the network in a manner that reflects their position (in the network).

Challenges

- *Growth of Mobile Users*: The success of these case studies critically depends on the growth of mobile base in the population especially within the target segment. Any government policy that does not support or reduces the rate of growth will be a barrier to innovation. Lack of a clear framework for licensing new services (3G, WiMax etc) or spectrum availability are examples of one set of such policies. Another set of policies that effect adoption of mobiles are those that deal with taxes and duties on handsets and costs related to service provision by way of duties and taxes. Typically telecom service providers pay nearly 25 per cent of their revenue by way of taxes and duties. Lowering such taxes could bring down service provision costs and lead to greater adoption of mobile services.

- *Network and Application Upgradation*: Without adequate, widespread GPRS enabled networks in place, the business model of ALW, Oxigen or ML will not be effective. Web enablement was a critical part of success of all the case studies. For ML, it is important that farmers or Copra Converters have web enabled phone for the value added services (like access to accounting information). For Oxigen, its entire bouquet of services is available on the web, so web enabled mobiles will help it to proliferate. For ALW, the enrollment and disbursement processes require a web platform to enable security implementation. Technically, that does not appear to be a major challenge. However, contextualizing the services in the local language could be a barrier. If these services are to be availed by people with low levels of literacy then voice based support is necessary, as implemented by ALW.

- *Absence of a Framework for VAS in USOF*: Until now, USOF has been supply driven and focused on infrastructure and service provision. There is a scope for it to consider VAS that are critical for financial inclusion.

- *Scalability:* Possible growth of ALW and Oxigen may be limited by their ability to scale by developing their organizational systems for managing this growth, such as extensions of retail chains in the case of Oxigen. They may also need to examine alternative business models for growth. For example they could conceive of a model, where the organization has a central design and coordination team. Several local teams/organizations could then be franchised for deployment. For ALW, in the current model, since transactions happen through the Head office of a bank, certain amount of centralization is inevitable. However decentralized deployment to the extent possible may be thought of.

- *Regulatory Challenges:*
  - Who can Participate?: According to the current RBI guidelines mobile payments refer to the "information exchange between a bank and its customers for financial transactions through the use of mobile phones", thus reducing the scope of services that third party providers such as Oxigen. Further, telecom service providers are viewed as providing "telecom network infrastructure". RBI guidelines state "mobile payments service providers are intermediaries for providing the technology framework for the implementation of the mobile payments services. The mobile network operators provide the telecom infrastructure and connectivity to the customers. Their role is limited to providing the SMS/WAP/GPRS/USSD/NFC GSM or CDMA voice and data services connectivity and in hosting the certain technology solutions like USSD". Similarly, banks may offer mobile payment services only to their own customers. Further, such banks are required to have a physical presence in India.

This is unlike many other countries (South Africa, Philippines) where telcos (Safaricom, Smart, Globe) have been initiators of mobile payment services and increasingly as a vehicle for remittances. While it is necessary for RBI to safeguard the public interest, it should examine the scope of services that could be provided by a variety of service providers. By limiting mobile payments to banks, the population that is unbanked is potentially left out. This framework also fails to leverage the expertise of telcos in service provision, customer service, billing and collection.

- *Security*: Current RBI banking guidelines for mobiles payments leave it to the banks concerned to weigh the risks and use appropriate techniques (SMS, USSD, WAP etc). However, RBI also suggests a two level authentication and ultimately working towards digital certificates. The guidelines suggest different levels of authentication may be selected. This imposes a heavy cost on development of security for all transactions, as borne by ALW. While it is important that adequate

security mechanisms are in place, especially for formal banking transactions, such a burden could be a barrier to deployment, especially in those cases where transactions are small value, which is the case with the majority of transactions. In Africa, there were low external regulatory requirements of security so information on amounts and the beneficiaries was transmitted in open text or USSD. As this was a simple implementation, it could be deployed fast (Wizzit, M-Pesa) (Ref).

- *KYC Requirements*: For meeting the existing KYC requirements for banks, a biometric authentication is almost a necessity in villages, since most villagers have no formal identification. (This is due to there not being a national system for identification). The cost of capturing, validating and transmitting this information with the required levels of security is high. This lack of a national id system is a barrier to quick deployment, unlike in Kenya and Tanzania, where formal physical id could be used to disburse the amounts.

Regulatory Constraints:

- In Africa (Kenya and Tanzania, Ref), most m banking in rural areas was for transfer of money between individuals. In India, to date most such transactions have been between the public banks/government agencies and the citizens. The limitation on person to person transfers electronically and between a non licensed entity to individuals is recommended by RBI.

- *Proprietary Platforms and Interoperability*: A service provider can appropriate large gains from a VAS by adopting proprietary platforms provided it can also leverage a first mover advantage. For example, in Japan, provision of VAS has been through close collaboration of handset and service providers. In India, both Oxigen and ALW worked closed to develop the POS and the modified mobile. However, given the competition in the Indian telecom sector and since the distribution of customers across major service providers is even, the first mover advantage is not significant. This reduces the advantage of a proprietary platform.

  Choice of adoption of a proprietary versus standard interfaces/platforms is important, especially for both ALW and Oxigen. While both systems have been designed to run on any GSM/CDMA network, the handset (for CSP)/POS/software is based on proprietary systems. As both systems run on any telecom service network, customers could switch their service providers and yet continue to use Oxigen based products and services. However, amounts deposited with Oxigen can be used to buy only Oxigen provided products and services. In that sense, it is not interoperable. For ALW, the issue of interoperability with respect to banks does not arise (for the specific application that has been documented), as various banks have worked out mutual agreements about operating in usually non-overlapping territories. However, if the concerned government agency wanted to change its bank, then it would have to work in great details with the selected bank and ALW, as ALW incorporates some bank

specific processes. If the bank wanted to change from ALW, there would be costs to redesigning the system interfaces of the bank applications with that of ALW. This provides a competitive first mover advantage to both Oxigen and ALW.
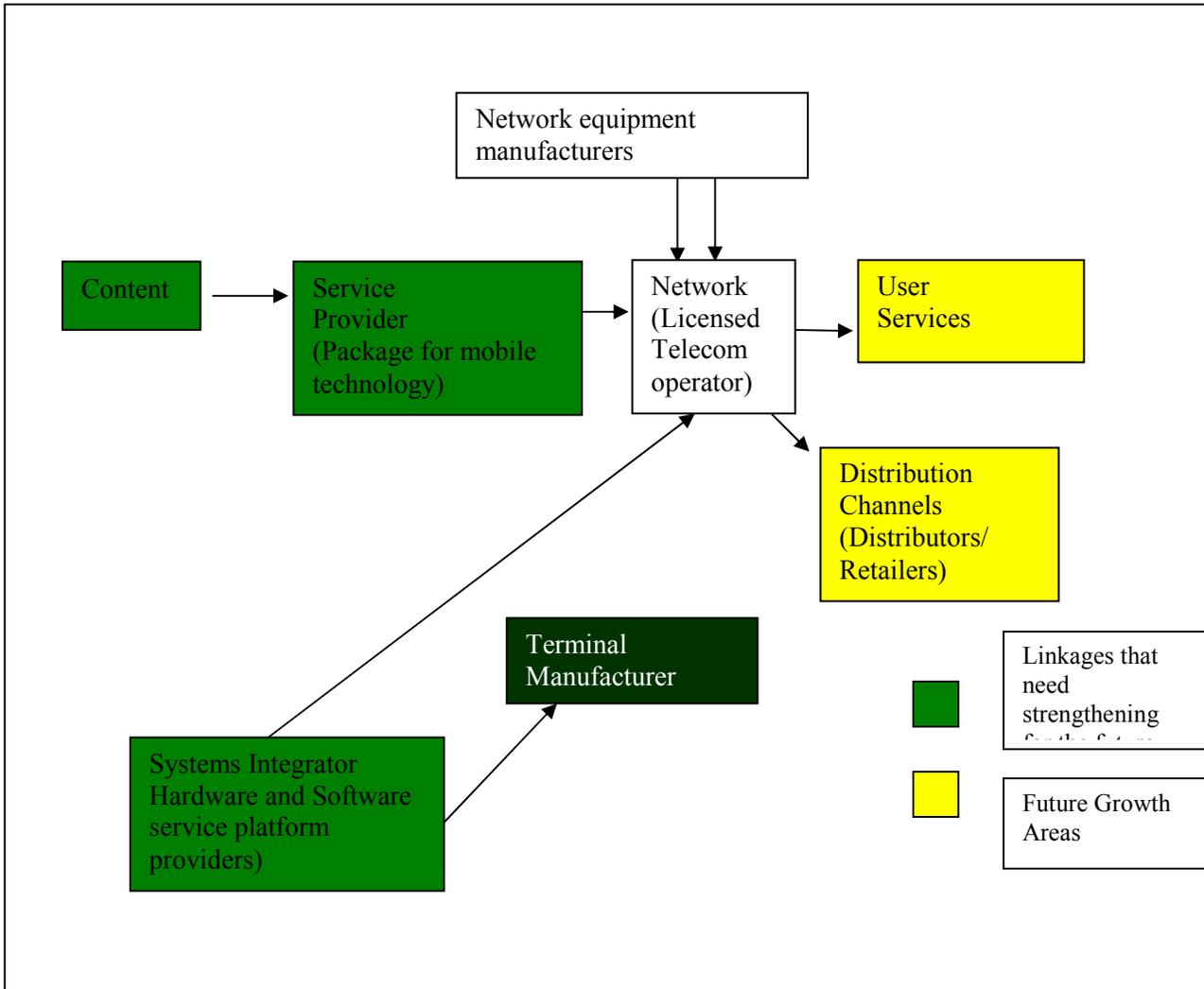
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│                                     │ Terminal     │  \    └───────────────┘ │
│                                     │ Manufacturer │   \                      │
│                                     └──────────────┘    \  ┌───────────────┐ │
│                                         ▲                \ │ Linkages that │ │
│  ┌──────────────────────┐              /                 ██│ need          │ │
│  │ Systems Integrator   │─────────────/                    │ strengthening │ │
│  │ Hardware and Software│                                  └───────────────┘ │
│  │ service platform     │                                  ┌───────────────┐ │
│  │ providers)           │                                ██│ Future Growth │ │
│  └──────────────────────┘                                  │ Areas         │ │
│                                                            └───────────────┘ │
└─────────────────────────────────────────────────────────────────────────────┘
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Figure 1: Value Chain of Mobile Services with Future Areas of Growth.

Implications for Telecom Service Providers:

1. *Advocacy and Research for Spread of Mobiles*: It is important for service providers to work with regulators/policy makers academic institutes for advocacy and research to reducing the barriers to innovation that are related to spread of mobiles. The spread of mobiles could enhance not only the use of telecom services, but also give rise to new services. This will enhance the knowledge and capacity of service firm to innovate. As highlighted in the introduction, innovation capability gives nations competitive edge.

2. *Scanning t he Environment from Divergent Perspectives*: Any innovative service that will drive adoption needs to be reviewed by service providers. Some of these are brought about by formal policy/regulation in other sectors (such as the financial inclusion policy of the RBI), whereas other value propositions may emerge from customer insights in a variety of other service sectors, such as logistics, health, education etc. For example, customers may value information on their mobiles on location of their parcels which they have sent through a logistics service provider.

   The above two situations require different roles for existing telecom service providers. On one hand, they need to understand how mobile networks may be used to fulfil policy/regulatory mandates in a variety of sectors. Usually such mandates will require interoperability, providing universal coverage, working with government providers. In the second example, telecom service providers may want to tightly integrate their offerings on specific platforms. The organizational mechanisms (within the telecom service provider) to deal with two totally different situations will require to be thought of.

3. *Expanding the Domain of Influence and Enhancing Partnerships*: Telecom service providers will increasingly need to work with system integrators, content providers, handset manufacturers etc much more closely as well as with domain experts.

   Telecom service providers would need to view their distinctive competencies in managing a variety of value chains and deriving appropriate business models. In the emerging telecommunications value network, a company can specialize in one or a few interconnected nodes by leveraging its distinctive advantages or competences in either new technology, customer relationships management, infrastructure management or specific domains (logistics, retail, banking). Alternatively, the company can seek to dominate one particular route through the value network—for example, aiming to provide integrated solutions and deliver a unique value proposition. The result is a highly complex and competitive

telecommunications market, where companies compete with players in their own but also with companies from other industries operating under different value propositions and economics. In the earlier example where financial service companies enter the mobile phone market, they do so not to necessarily make money from the provision of mobile phone services (this could even be a cost centre operating at cost or even making a loss) but instead through the financial transactions that mobile phones make possible (Maude, Raghunath, Sahay, & Sands, 2000).

It is mostly likely that the current strategies and business models of the mobile operators are insufficient for dealing with such competition. Further research is clearly needed in this area.

Policy/Regulatory Recommendations

- *Framework for Licensing New and Existing Wireless Services*: Lack of a clear framework for licensing new services (3G, WiMax etc) or spectrum availability will hamper the growth of adoption are examples of policies that will be barriers for growth and innovation.

- *Existing Taxes and Levies*: Policies/regulation that deal with taxes and duties on handsets and costs related to service provision by way of duties and taxes need to be made "adoption and usage" friendly. While the government may be unwilling to let go off this source of revenue, it must tradeoff this against the revenues that will accrue to it from additional service tax due to the increase in base of mobiles and service usage.

- *Expanding the Scope of USOF*: Policy makers and regulators need to design a framework that allows for projects/initiatives focused on micropayments/financial inclusion to be funded through the USOF. This could further drive mobile adoption. Until now, USOF has been supply driven and focused on infrastructure and service provision. There is a scope for it to consider VAS that are critical for financial inclusion.

- *Regulatory Issues for Branchless Banking*: The questions surrounding regulation of branchless banking need to be addressed in a comprehensive and systematic way. Some of the key issues as they pertain to service providers are as follows:

  - *Facilitating a Variety of Payment and Banking Modes*: The target for policy in this case is the unbanked poor. The issue is how to formulate "proportionate" regulatory policy (DFID , Focus Note No 43, January 2008)[1]. RBI will have to examine its existing policies to see how to embed

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[1] The principle of "proportionality" as it appears in "General Principles for International Remittance Services" jointly developed by the World Bank and the Committee on Payment and Settlement System of the Bank for International

this principle to facilitate not only mobile banking but also other payment systems such as electronic wallets, accounts offered by non-bank issuer of stored value accounts. While there is a case for making regulation for such services more flexible, there is a need to ensure that the consumers' rights are well protected.

- o *Role of Agents/Business Correspondents*: The role of agents/business correspondents becomes important and is critical for spread of mobile banking services, especially in rural areas. There are no "best practices" regarding regulation established yet in this domain. Countries have identified the scope of such services differently. For example, Safaricom does not own contractual responsibility for Wizzit and M-Pesa agents vis-à-vis their customers, and both these services do not provide services that will make them come under the banking framework. This gives them the scope to appoint agents, based on their business assessments. In Brazil, "correspondents" held an "agency" relationship with the bank for whom they did business until 1999. However, the scope of correspondent was enhanced to include a wide variety of retail establishments that are permitted to serve as agents. A framework was also developed for banks and their agents by identifying the liabilities, roles and responsibilities of each. In India, RBI has identified the specific entities that may legally act as BC. There is some evidence that these restrictions and not so clearly defined regulatory framework has restricted the expansion of such services in India.

- o *Appropriate-KYC Requirements*: The role of KYC requirements, emerging from the anti money laundering and terrorist financing concerns place a requirement of extensive documentation. In South Africa, such requirements were removed for accounts with a maximum balance of

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Settlements in Basel states "…Proportionate means that the legal and regulatory framework should not be overly restrictive and burdensome relative to the possible issues it is designed to tackle or the number and value of [transactions] involved..".

The UK Financial Service Authority states the principles behind proportionality as " the restrictions we impose on the industry must be proportionate to the benefits that are expected to result from these restrictions. In making judgments in this area, we take into account the costs to firms and consumers…..This approach is shown, in particular, in the different regulatory requirements we apply to wholesale and retail markets".

Further, building on this principle and the role of innovation, the same document states "…Allowing scope for different means of compliance so as not to unduly restrict market participation from launching new financial products and services" (FSA, "Principles of Good Regulation") accessed on November 20, 2008.

nearly $3,868 and a daily transaction limit of $773 (South Africa, Ministry of Finance, 2004). Such examples show that RBI could tailor its recommendations based on the context of large unbanked population and experience of other countries involved in similar endeavors.

o *Managing Float*: There are significant regulatory challenges in allowing nonbank based providers to become agents with regard to the float they generate by way of deposits. In the case of bank based agents, this float can be monitored as a part of the banking regulation. In the former case, the customer does not have a contract with the bank. The deposits are pooled and may be in the service provider's name. In such a case the security of individual deposit is an issue, and also whether the provider will honor the customers claim, especially in case there is an issue with liquidity. Regulatory agencies will have to design and implement rules in this particular context. Again, different countries have adopted and implemented a variety of regimes. Designing prudent regulatory oversight mechanisms is not only important for protecting customers, making them public is important for winning customer trust.

o *Security and Data Privacy Requirements*: Policy makers/regulators need to identify adequate security and data privacy mechanisms for mobile transactions. We recommend the principle of proportionality for those transactions dealing with small amounts. Obviously, it would be extremely expensive for the service provider to keep complete details of all micro payments for a long period of time. For more commercially oriented transactions, we recommend adequate regulatory oversight as per the existing norms.

o *Interoperability*: The requirements for interoperability imposed by the regulator are a double edged sword. While they seem to provide a level playing field, they could reduce the incentives for operators to provide innovative services and exploiting the first mover advantage. Policy makers and regulators would need to evolve mechanism that examine interoperability in the longer term.

The RBI has recommended that mobile payment providers should adopt the formats being worked out by the Mobile Payment Forum of India, while keeping long term interoperability requirements in mind.

What is Different about India and Why

1. *Drivers for New Services*: In Europe and OECD countries, saturation of voice markets is driving the path towards m commerce. In India, the subscriber base is increasing, (urban markets are not yet saturated at the lower end, rural markets are untapped), it is the decreasing ARPU of service providers that is driving the innovative services.

2. *Type of Services*: Services in Europe, Japan, focus on "entertainment", discretionary consumption services (high end services, paying for clothes, etc), in India (as in Africa), focus has been at providing services that are critical/core to the generation of livelihood.

3. *Lead Providers*: Telecom service providers (Safaricom, i-mode) have taken the lead in proliferating new applications. In India, it is third party service providers that are deploying innovative services.

4. *Integration with Handset Providers*: Third party service providers typically require extensive developments in the interface between the handset and delivery platforms (POS, web portals, finger printing devices), unlike in Japan where service providers have tight integration with handset developers.

5. *Nature of Financial Transactions*: Prevalence of physical transactions and spread out nature of population have led to the need for development of physical networks as well as electronic networks. For the applications to succeed, there is a need for extensive development and integration of the physical delivery channel with the mobile delivery channel (For example, development of retail outlets, providing POS, feet on street: Oxigen; Development of BC, physical locker box, system for authentication: ALW; Development of CC, traders: ML) in comparison to applications in European countries/Japan, where delivery of physical goods for orders placed on mobiles is being done through existing retail chains such as 7-11).

6. Such developments and applications may requires third party competencies as telecom service providers do not have the skills in "application development", and on the other hand, the actual service providers (banks) do not have the understanding of the technology required to deploy applications.

7. SMS Literacy: Since literacy levels are low in India, and SMS is not very extensively used service, therefore, intermediaries who have the required capabilities are necessary. A system to deploy such intermediaries also needs to be developed (e.g., CSPs in Oxigen and ALW). Their training and incentive systems are important determinants of success.
8. Such applications may require a wide variety of handset capabilities. But most people in the target group are likely to have lower level handset capabilities. On the other hand network operators have upgraded networks to offer VAS through GPRS. Therefore, third party intervention may be required by providing the intermediary (and not necessarily all the participants) with the requisite handsets.

DRAFT

Appendix 1: Using Mobiles as a Network Platform to Deepen and Broaden Reach: Oxigen

"Our business model has changed very rapidly to incorporate more and more services to an ever widening customer base. Our challenge today is to be able to leverage effectively all the opportunities available to us. How do we scale up fast enough? How do we find partners to provide more and more services? How do we find finances to grow? We can not grow through borrowings, as we are in a small margin distribution business and the interest cost on debt repayment can eat in to our profits. How do we constantly enhance our services to be financially more inclusive? Financial inclusion should not just mean the ability to do transactions through a formal financial channel like a bank but creation of opportunities for economic growth".

Mr Pramod Saxena, Founder Oxigen

Background

Oxigen started as a distributor of prepaid services of telecom in India. Indian telecom sector, especially, mobile services, as elsewhere in the world, had taken off very significantly since 2001. As in many other developing countries, pre paid services constituted a large majority of subscription (80 per cent). As telecom service providers encountered increasing saturation in metros and large cities, they looked for subscribers in smaller towns and rural areas.

Prepaid subscribers could buy subscriptions using recharge coupons which were available from a large number of retailers in different denominations for various service providers. Some times the recharge coupons were specific to the tariff plans. Prepaid subscribers were particular about the denomination of the recharge coupons, especially if these were tied to a particular rate for local, long distance, and SMS services.

In an effort to deepen the market reach, service providers had come out with a large variety of recharge coupons including extremely small value ones. For example, Vodafone had a recharge coupon of Rs 10 ($0.25). This reflected an attempt leverage the profile of subscriber who were not willing to or could not afford to buy recharge coupons of higher denominations. However, if a particular denomination recharge coupon was not available, then subscribers would look for another retailer having the required denomination. This resulted in a loss of revenue for the first retailer.

There were six to seven telecom service providers in each of the licensed service areas. Each had a number of tariff plans designed to woo as many subscriber as they could, to tap new customer schemes, and also to leverage the subscribers' propensity to spend especially in the festive season. This variety resulted in a retailer having to stock a large number of denominations of recharge coupons. Another issue was that since service areas were recognized on the basis of states, distributors and retailers often did not have

the recharge coupons of other states in their shops. For example, subscriber visiting another state would find it difficult to buy recharge coupons as there was no mechanism to do so.

This variety made it difficult to predict demand. To overcome the gap between supply and demand distributors and retailers would overstock often leading to higher locked working capital

The Distribution Chain for Recharge Coupons: The distribution chain for recharge coupons consisted of service providers, distributors, and retailers. Distributors of prepaid coupons bought for specific denominations recharge coupons from service providers. The distributor made payment for the entire value of the recharge coupons to the service provider. The retailers would then buy them from the distributors, making the entire payment at the time of purchase. A service provider did not reimburse the unsold recharge coupons values to distributors, and further, distributors did the same with respect to the retailers. The retailers' commission was two to four per cent whereas the distributors' commission was one to two per cent.

Retailers of recharge coupons ranged from full service shops in high end markets to small shop owners that were single person run outlets, stocking a variety of snacks, soft drinks, etc. In case the small retailers ran out of specific denomination of recharge coupons, it was not possible for him/her to leave the shops to buy additional recharge coupons. Slightly larger retailers did not have this problem. Service provider franchised retail shops also provided recharge coupons. In order to stock a minimum level of SKUs, a typical investment of about Rs.50,000 was required in the recharge coupons at the retailer end, if the average sale at the counter was Rs 5000 per day.

Oxigen's Intervention in the Distribution Chain: Oxigen recognized the problems in the distribution of recharge coupons chain as a gap in the supply and demand of specific recharge coupons. This uncertainty led to both distributors and retailers making non-optimal stocking decisions.

Recognizing these gaps, Oxigen came out with a point of sale (POS) machine that did not require any recharge coupons to be stocked at either the distributor or retailer*. Oxigen tied up with all telecom service providers so that the POS could print "scratch" cards of all service providers. Initially, service providers had insisted on exclusive tie ups with Oxigen. However, the top management at Oxigen recognized that the real value of their POS terminal was if it could give recharge coupons of all service providers for all denominations.

This terminal communicated with the Oxigen servers. Oxigen distributors were given a magnetic swipe card to verify their authenticity. when their fund collector boys ('Feet on Street') were doing cash collection from their respective retailers as well as it was a unique mechanism devised specifically for Indian environment to manage the cash risk, that Oxigen distributor was having with the low wage fund collector boys, he was employing to service its retailers.

Using the POS terminal the retailer/distributor input the user's requirement. The Oxigen server would check the authenticity of the request, available advance and if both were acceptable print the required recharge coupon on the POS terminal. The POS terminal was both an input and an output device very much like credit card terminals (Figure).

Source: VeriFone

This system dramatically reduced the upfront investments required by the retailer and distributors in keeping recharge coupons for future use (as they could simply print them as per demand. It also very significantly reduced the "wastage" due to mismatch between supply and demand of recharge coupons. This reduction from a "minimum" requirement of Rs 50,000 for a reasonable scale of business to Rs 5,000. (Upfront investment cost of POS + an advance equal to the average daily sale on the counter) would allow many retailers to become vendors of recharge coupons. The elimination of the physical aspect of collection of recharge coupons for retailers/distributors was an additional benefit. The daily collections by the "Feet on Street" reduced the liability of retailer/distributor to the daily value of business.

Telecom Service Provider subsequently launched flexible Mobile based e-Top-up facility which did reduce retailers investment "within" a service provider's recharge coupons, but still had to keep one mobile per telecom service provider (there were seven providers in several states) with specific investment of "Airtime inventory" within each handset, giving same issue like recharge coupons. Addition of more service providers and

introduction of DTH operators like TataSky/DISH TV etc. further added to retailers' investment issues.

Current Operations:

The entire Oxigen business model is prepaid end to end. It had set-up IT enabled distribution network with a set of retailers connected to one Retail Management Unit, appointed by Oxigen. There were over 250 Retail Management Units (RMU) appointed by Oxigen serving these 50,000 Oxigen touch points, with over 2000 feet on street. These RMUs pay advance to Oxigen through banking channel for getting daily limits for cash collection for its set of retailers. Using IT back end, they could collect cash from each retail points only to the extent of the payment made by them to Oxigen. Using Magnetic Stripe Cards configured by Oxigen, the retailers advance account was instantaneously credited and RMUs account debited, when they collected cash from the retail point. Retailer could then do transaction up to this limit. Entire transaction of retailers, RMUs and Oxigen was kept on Oxigen server. Each retailer signed up Oxigen retail sign-up form with address/identity proof.

Services Diversification: Being driven on IT platform, Oxigen quickly added Telecom Bill Payments to its services enabling all its retailers to collects mobile bills accepting cash and submitting the bills using Oxigen platform online to service providers billing system. This provided a great relief to consumers who did not have many options of paying bills. New services on Direct to Home (DTH) and World Space Radio found great value in prepaid services delivered by Oxigen and had quickly tied-up with Oxigen. As of the time of this writing, Oxigen platform supported prepaid mobile, domestic and international calling cards, bill payments, DTH and Radio and many non telecom services. It has setup partnership with Internet kiosk chains such as Sify's i-way corporate retail chains such as Big Bazaar, Chroma, BPCL In & Out Stores etc. . (www.myoxigen.com

> *"Since my shop is in a location where there are several guest houses where people from different cities and states come and stay for short periods of time. I decided that the Oxigen terminal is a good option since I do not have to stock location specific cards any more. I also do significant business of bill payments for my customers."*
>
> *- A retailer of Oxigen*

> *Investment in the business had increased. Earlier the turnover was Rs 8 to 9 lakhs per month and now around it is over 15 lakhs. Of this Rs 10 to 11 lakhs is on the Oxigen platform. The remaining is on physical coupons. We have to keep some physical coupons as customers are concerned about confidentiality in a printed receipt. Since the PIN is printed on paper in Oxigen, it is open and some customers do not like that.*
>
> *- A retailer of Oxigen*

> *Per day I am able to sell about two thousand rupees worth of recharge coupons. I make bill payments of Rs.1 to 1.5 lakhs per month through Oxigen.*
>
> *- A retailer of Oxigen*

Later on, Oxigen came out with a web based solution using a laptop instead of/in addition to the POS terminal. There are now 15,000 outlets which give recharge only through web and therefore, no print outs are required. Of this 35 per cent of recharge value was by giving printed receipts.

Oxigen also developed a mobile wallet called OxiCash. This could be used to transact for a variety of services such as bill payment, buying prepaid services such as DTH, etc. Consumers could buy this card and avail all benefits of Oxigen's own or contracted services. The OxiCash VAS card was associated with a mobile number and worked like mobile prepaid card. OxiCash could be bought through retail agents by paying cash or downloaded on the Internet using banking or credit card channels.

Oxigen provided access through mobile, fixed line or internet using IVR/SMS/WAP/USSD/GPRS/EDGE/3G/CDMA/WiFi/DSL etc and backup of full audit trail of all the transactions maintained by Oxigen. By regulation it cannot be encashed by consumer or transferred from one consumer to another consumer

Business model for enabling eTailing for Masses

- The POS terminal may be used for a variety of retail services. By providing wireless connectivity at small retail/*kirana* stores equipped with wireless devices, aggregation of services and standard products of mass consumption could be done by leveraging IT, both on the access device and the back end server. The small retail/kirana store also act as a cash collection point. The retailer thus gets single point access to multiple services without any investment on these services, such as hiring an agent to pay bills.

Future Operations:

- Oxigen envisaged that its platform could be an effective vehicle for mobile banking for the rural people as well as a platform for doing businesses by a wide variety f people. "We see financial inclusion not only as a mechanism that can be implemented through mobile banking, but also through providing facilities for growing economically. Our platform can enable a large number of individuals to give services to the community. For example, a lady in Thane transferred Rs.5,00,000 to Oxicash and then collected bills for payment from other people. She used a cybercafé to pay the bills through Oxicash, thus getting a commission on them." (Mr. Pramod Saxena).

- Oxigen platform was designed to be particularly convenient for small value transactions. For such transactions, generally people would not like to make payments online as it is not perceived to be secure. Doing such transactions on line may be a perceived as risky as doing so exposes the customers bank account or credit card details with a possibility that a potential hacker could have access to their entire value of deposit or credit card limits. For example, for booking an unreserved ticket that cost Rs.10 to 20 would not be the situation where people would normally use electronic payments on the web. However, they may be willing to do such transactions on their mobiles using OxiCash, as then their liability is limited to the amount they downloaded on the mobile wallet. Doing such transactions on mobile also left a trail that could be very useful for understanding consumer preferences and behavior.

- Oxigen envisaged that it could be a platform for remittances for Indians abroad who wanted to send money to India. Oxigen envisaged that if its retailers could become business correspondents for banks, then it could participate in the remittance over mobile phones, generating additional revenues.

- Since Oxigen's retailers communicated with Oxigen all the time using their POS, and mobile, Oxigen could become the platform for gathering a lot of information, say for example, companies could design loyalty programs for any product using this platform.

Financial

Oxigen had started with an equity of Rs.17 million, 50 per cent contribution by Indians led by the founder and 50 per cent by a South African company, Blue Label which had an established virtual distribution network in South Africa. One and a half years later, Citi Group invested at a premium towards the equity, the value which was nearly 15 times. Since at the time, Oxigen was EBITDA negative, investors needed to have trust in them. Some of our cost such as IT infrastructure and people related had to be incurred even before they could start generating revenues. Oxigen took well qualified people, and paid them more than the market price, even though it was not generating profits and were

at an early stage of growth. Citi Group then invested another $10 - 11 million. In January 2008, Microsoft bought over Citi Group shares at a premium and now owns 35 per cent of Oxigen. Their involvement with Microsoft allowed them to tightly integrate the Oxicash web platform with the Windows platform through hotmail.

This gave an opportunity to Oxigen to be able to grow fast, and for Microsoft, it was an opportunity to be able to find another channel for the use of its software. As Oxigen customers start using the internet on mobile phones, there is the opportunity to incorporate Microsoft's Live services email. There are also significant advertising opportunities   for   Microsoft. http://www.microsoftstartupzone.com/Blogs/india/default.aspx accessed on November 10, 2008.

Oxigen has become a part of a Microsoft Unlimited Potential Growth Initiative, a program aimed at nurturing high potential projects.

Challenges

1. Most retailers were interested in working through telecom service providers as they perceived visible and quantifiable advantage in doing so. When they worked with service providers, they had an additional incentive which came due to the facility of providing new connections for which the service provider usually gave cash incentives. However, Oxigen was not involved in new service provision as it was not a service provider.
2. Retailers could/did not completely switch to the Oxigen platform as customers and retailers saw value in physical transactions. In some cases, as in the case of physical recharge coupon of small value Rs10, customers and retailers wanted coupons. For the retailer, for small value coupons, printing a recharge voucher was not economically justified. The recharge coupon carried a margin of Rs 0.25. The cost of print out was Rs 0.20.
3. Oxigen's RMUs have to quickly ramp-up volume to become viable. This would not be possible in all areas especially non-metros due to long initial period to sign-up retailers in sub-urban areas. As a result they would cut cost by deploying lower manpower for servicing only big retailers. This would impact servicing of small retailers leading to either retailer stopping the business or reducing dependence on Oxigen drastically.
4. Retailers who did small amounts of business did not want to invest in the terminals.
5. Sometimes information on all available recharge coupons was not there on the web, and therefore, retailers preferred physical coupons.
6. Time taken to do transaction was more when using a terminal/PC which was a deterrent to switching entirely on the electronic chain.
7. Some times there were complaints because the Oxigen transaction id it was not recognized by billing system at the other end, when Oxigen platform was used to pay bills.
8. POS terminals were getting old as they had been in the field for nearly three years. Some times Oxigen was not able to load all types coupons in the central

server due to limitations of memory at POS end. The limit on the transactions per day for which the machine was designed had exceeded as the number of different types of recharge coupons and volumes of transactions has grown very fast.

9. Retailers could perceive that they got better incentives from telecom Service Providers without factoring in the cost they incurred due to gap in supply and demand of recharge coupons.

10. In cases where the end customer did not transact directly on the Oxigen platform, the role of the retailer in understanding and communicating about new products was important. Often the small retailers did not have the capacity to understand the different products that were being made available on the Oxigen platform.

11. Oxigen has to operationalize the tariff plans of all the service providers. Therefore, its task was more complex than that of a service provider who had to computerize only its own plans.

12. To operationalize the physical system of cash collection through its "Feet on Street" or collection agents who need to physically visit the Retailers to collect cash, since subscribers pay cash.

13. Users resistance to change in a sensitive area such as payments.

Drivers for Adoption

Oxigen:

1. Ability to leverage the growing mobile base
2. Ability to create a "platform" for providing a variety of growing prepaid services
3. Create a platform to leverage policy initiatives of government such as "financial inclusion" norms of banks

Distributor:

1. Dramatic reduction in amount of investments required
2. Reduction in money lost due to "wastage" of unused cards
3. Ease of use
4. Flexibility in offering a variety of options

Retailers:

1. Dramatic reduction in amount of investments required
2. Reduction in money lost due to "wastage" of unused cards
3. Ease of use
4. Flexibility in offering a variety of options

Where is the Innovation?

1. Design and Deployment of POS terminal
2. Using POS, Oxigen replaced a physical chain with an electronic chain, thus dramatically changing the cost structure in the supply chain of selling recharge coupons.
3. Leveraging the POS platform it became a platform for a variety of pre paid services.
4. Leveraging the technology and its retailers and network of "Feet on Street" for providing new services such as bill payments.

Critical Success Factors:

1. Ability to spot a critical "need" and disintermediate the supply chain.
2. Technical expertise within Oxigen to design the POS, web interfaces and interfaces to windows platform.
3. Ability to raise finances
4. Forming partnerships and alliances with banks, telecom service providers, various other service providers (for bill payment, etc.).
5. Making the Oxigen platform technology agnostic.
6. Designing a complementary system of "Feet on street" and cash collection and management system.

Figure : Oxigen Operations
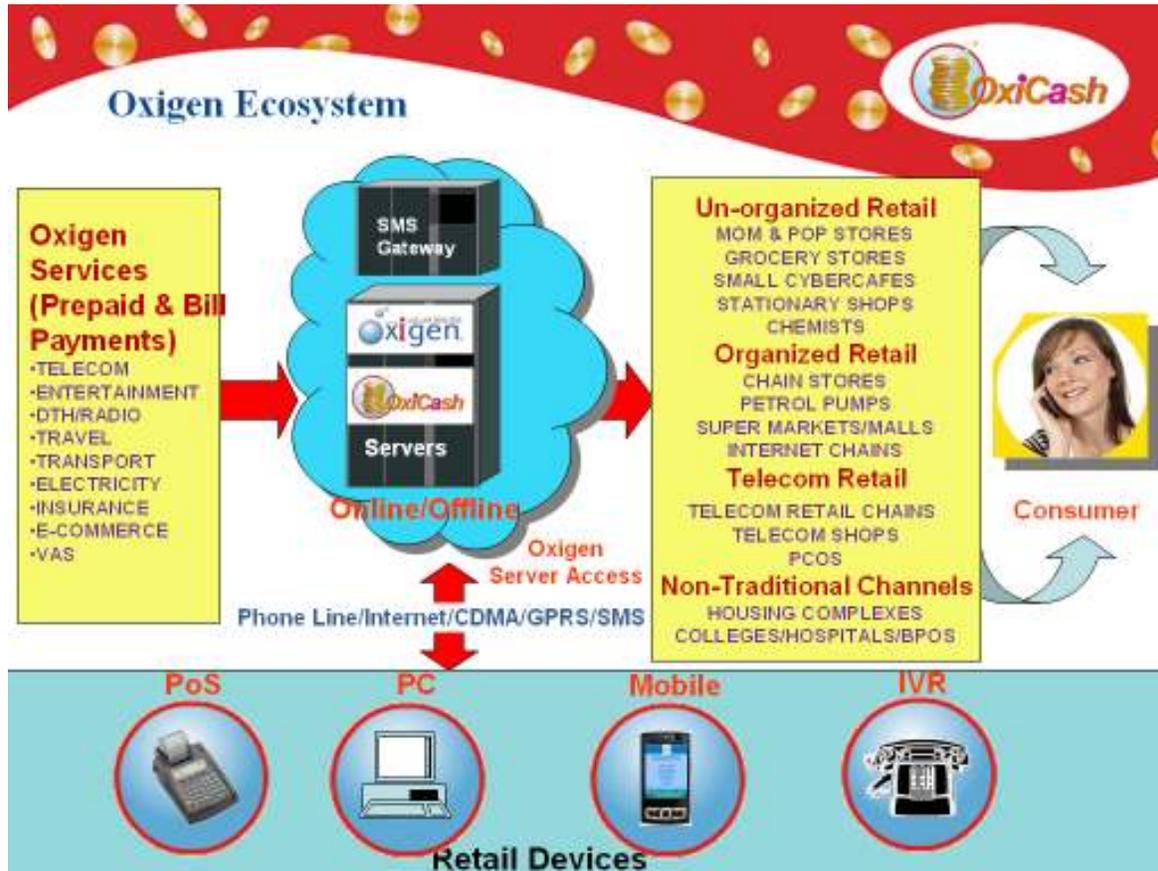
Source: www.myoxigen.com

Policy Framework for Financial Inclusion

Background

Currently in India, it is estimated that 134 million households are financially excluded, which is 60 per cent of country's population. Financial exclusion in urban India is about 44 per cent and that in rural India is about 76 per cent. A vast majority of transactions were cash based (Figure ..).

Figure 1 gives the extent of adoption of different payment systems.
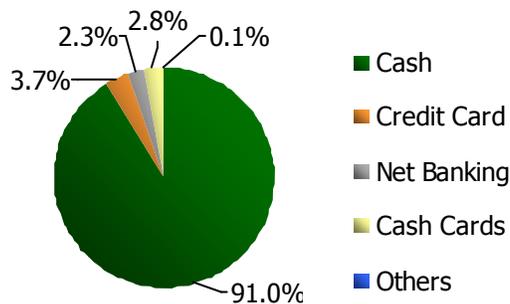
Source: bda: Overview of Mobile Banking and Convergence, FICCI Communications & Digital Economy Committee, September 2008.

Given the low levels of participation of a large part of the population in the formal and the electronic system is going to lead to ever increasing levels and depth of exclusion. Recognizing the grave implications of this exclusion, the government came out with a policy framework for financial inclusion.

Recognizing financial exclusion as a national issue, the Government of India constituted a Committee on Financial Inclusion (CFI) in June 2006 that proposed a strategy and financial inclusion targets for various banks.

Proposed Strategy

The CFI strategy had four components:

- *Effecting improvements* within the existing formal credit delivery mechanism;
- *Suggesting measures* for improving credit absorption capacity, especially amongst marginal and sub-marginal farmers and poor non-cultivator households;
- *Evolving new* models for effective outreach; and
- *Leveraging on* technology-based solutions.

(http://www.thehindubusinessline.com/2008/05/13/stories/2008051350090800.htm)

Initiatives
- Since bank branches are usually far from rural locations, the RBI identified the concept of "Business Correspondents" (BC) as bank agents. It identified NGOs, post offices, e-kiosks, ex servicemen to act as BC (Khan Committee, 2007). In 2008, RBI set a limit of 15 km for operation of a bank through BC.

- Two funds, each of nearly Rs 5000 million were announced for

  - developmental and promotional interventions and
  - to meet cost of technology adoption.

Using the Window of Opportunity

Given the existing scope of operations, most banks find/will find it extremely difficult to reach the financial inclusion targets. One issue is how to reach the target population, as they are geographically dispersed. The other challenges are getting the (i) mandated documentation as per the KYC requirements of RBI, (ii) users to use banking facility as a habit, and (iii) educating them about new products. Even when these issues are addressed, most in the target population have very little money to put in the account. For example, the average amount in such accounts is (SBI, internal sources) Rs 4.75. These figures have implications for the cost of service provision and the need to deploy really low cost technologies.

Even if bank accounts could be opened (after fulfilling the mandatory KYC requirements), it would be difficult for banks to ensure that such people actually had knowledge and awareness about the benefits of banking and used their accounts for transactions. Another concern was how to make such business commercially viable.

ALW had a mobile banking product that it felt it could deploy that could help banks reach their financial inclusion targets in a cost effective way.

Another related driver of moving towards the business model adopted by ALW was the announcement of the National Rural Employment Guarantee Scheme (NREGS), which guarantees 100 days of employment to all eligible workers. Central government mandate to states requires that they need to pay wages through savings bank accounts of all workers involved in NREGS. This was done with the aim of bringing in transparency and ensuring that there were no irregularities due to the presence of intermediaries. Prior to this mandate, there had been reports of corruption and reduced or non payments to workers. From October 1, the "payment of wages in cash would be considered illegal". (http://www.empowerpoor.com/print.asp?report=815) accessed on 6th November 2008.

This turned out to be massive initiative to include all the NREGS workers, most of whom were below the poverty line (BPL), under the formal banking system. Such accounts could be opened in post offices or banks. The BC model could also be used in those cases where formal channels were not available. The requirements of any initial deposits at the time of opening the account was waived.

To get a feel for the magnitude of the extent of initiatives, following are illustrative: nearly, 29 million savings accounts with banks and post offices have already been opened across the country. While 14 million savings accounts have been opened with state-

owned or cooperative banks, 15 million accounts have been opened with post offices. This is the largest number of bank accounts linked to a development programme, across the globe.

During 2007-8, Rs 107,384.7 million, out of the total expenditure of Rs 158,568.9 million, was paid as wages under NREGS, to more than 33 million households. More than Rs 200,000 million has been spent under NREGS since its launch in February 2008, out of which, more than Rs 150,000 million is the wage component. During the current year, the expenditure under NREGA may go up to Rs 240,000 million, as the scheme has been extended to cover the entire country. http://www.jrf.org.uk/knowledge/findings/socialpolicy/2234.asp accessed on 2nd November 2008.

A Little World (ALW)

ALW is the developer of ZERO and mZERO, payment system with specific focus on reaching out to masses claiming that it has lowest available communication infrastructure*. The ZERO and mZERO platforms enable timely disbursements of cash benefits, under various government schemes such as housing assistance, employee guarantee disbursements, pensions, scholarships etc. in the village to the underprivileged.

Zero Microfinance and Savings Support Foundation, a Section 25 Company closely affiliated to ALW, has been appointed as a Business Correspondent by 15 Banks, and provides field operations for the ZERO platform. ZMF manages the field force, account creation, appointment of Customer Service Points (CSPs), management of cash and other logistics at the last mile. ZMF in turn collaborates with strongly placed local organizations, district and state administration to ensure smooth deployment and operations. ZMF creates the last mile operations network in villages, under pre-defined service agreements with Banks and front-ends the delivery of full-featured transactional services on behalf of Banks.

Scope of Services (ZMF)

The scope of services provided by ZMF included enrolment of customers for no-frills zero-balance savings accounts and other account types that may be specified by the designated bank and for disbursements of money. This included:
- Enrolling, training, equipping and engagement of Customer Service Points (CSPs) in villages to provide various kinds of transaction services including but not limited to enrolment for no frill account, cash deposit, cash withdrawal, transfer of money, payment of utility bills, disbursal of loans, collection of loan installments, and cashless payments at local and remote merchant establishments.
- Third party cash collection
- Cashless payments at local and remote merchant establishments.
- Management of cash
- Lending activities on behalf of the bank (as an MFI).

This was made possible by key features of Mobile Banking Solution provided by ALW as follows

- Mobile phone used for opening accounts on-the-spot by local CSP
- Smart cards not needed for biometric authentication in local service area
- Voice prompts during enrolment and transactions
- Printout of each transaction

Zero solution envisaged NFC enabled smart card solution, biometric authentication where the beneficiary data (including amount of deposit) was stored in the smart card. Government/politicians favored the smart card solution as the villager had something tangible and they (politicians) could leverage implementation for political gains.

There is also a mobile based solution that did not envisage a smart card: m:Zero available on the SIMs of customers. This was also being implemented.

Business Model

The business model for ALW is that even though most individual account deposits in rural areas are likely to be small, the huge base of such accounts will justify a business case. Moreover, the increasing base of mobile will ensure volumes. First mover advantages are significant.

Enrollment Process: Before undertaking the enrollment process, ZMF undertakes a village level survey to select the CSP. Selected CSPs are trained on the kit and in cash management. Government departments dealing with the NREGS Schemes collect data on the likely individual beneficiaries. The list of such beneficiaries is sent to the head office of the identified bank. Printed enrollment forms with part of the data related to specific beneficiaries is sent to ZMF.

Such forms do not have the photograph and the biometric data of the intended beneficiaries. The compliance with KYC norms include the requirement of photograph and verification with existing documents such as a ration card or electoral card. Bio metric identification helps in security of transactions.

ZMF used a digital fingerprint capture device and camera for the enrollment process including a mobile phone. The chosen handset model has special software and hardware and an in-built camera.

The intended beneficiaries come to a specified location, where the ZMF team has partly filled in forms (Figure ….). After a physical verification of the required documents, ZMF team captures the facial photograph using the mobile phone camera (1.3 Megapixel resolution), six fingerprints and the photograph of the form, which now also has a unique bar coded card that includes the selected bank name. Since each form has a unique number, the photograph of the individual card uniquely links the data captured with the beneficiary. The beneficiary keeps the bar coded card as a reference. The entire data (up

to 2 MB per person) is stored in the mobile device. At the time of the enrollment, a high resolution photograph (7 megapixel) for back up is taken.

The data of enrollment is stored on the mobile and is later downloaded to the servers of ZMF. The textual data is later transmitted to the respective banks' central branch. The servers bank would pass the data to the link branch with the validated data of beneficiaries.   Figure 2 gives the details of the enrollment and disbursement.

Disbursement Process: Once the data about disbursements is made available from government agencies to the central branch of the designated banks, it is transmitted to the link branches from where it is transmitted to the BC's mobile. The BC's mobile has the details of the beneficiaries account (from the enrolment process). When the beneficiary comes to withdraw money, the biometric checking is done via the finger print verification device using the attachment to the mobile phone. The stored photograph at the bank end is sent via the server to the mobile phone, allowing the CSP to confirm the identity of the person. The amount held by the beneficiary is then displayed. Credit/debit transactions happen over 128 SSL secure channel using the GPRS enabled mobile network.   This protocol was selected as SMS based services do not have the required and mandated security.

Financial Aspects

Cost to serve a customer: Rs 150-200 for smart cards. Governments are willing to bear this cost as they see this as a vote getting process. Governments are not willing to bear cost of equipment. To breakeven, ZMF requires 2000 customer per CSP. Cost of acquisition in first year (manual process) Rs 300. With smart card, the cost to serve is Rs 150-200 and subsequent cost (maintaining the account, etc) Rs 60-70. If there are 5000 customers per CSP, then, the electronic costs reduce to Rs 120.   Thus volumes are important for ZMF and the CSP.

It has been able to get VC financing from Legatum Ventures, Dubai and Enam.

Annexure 1 provides a schematic data flows for a specific implementation of ALW solution with the State Bank of India. This should not be taken as representative across all banks and across the country.

Implementation and Outcomes

So far ZMF has been able to set up partnerships with 22 banks, 15 of them in the public sector, three in the private sector, 3 RRBs and one cooperative bank. It operates in 21 states and 83 districts. There are currently 5800 CSP and 1.96 million customers, current rate of enrollment is 20,000 pre day. However, given the profile of population it works with and the partners it works with government department and public sector banks, there are bound to be implementation delays.

The process of identifying and enrolling is a time-consuming process and may be difficult to manage within timelines estimated for various reasons like beneficiary not turning up etc.

After the enrollment it takes seven to ten days in which the accounts are opened in the bank. In the case of government disbursements, the government releases the funds to the bank for all beneficiaries together. Therefore, the request for opening accounts of all beneficiaries must be applied for together which necessitates that all beneficiaries be enrolled and provided with a card.

There is also an acceptability issue at the first place in the beginning in a state. Once the results of the first implementation are seen, understood and broadcast by the beneficiaries, the enrollment at other places in the state becomes much faster and smoother.

It has successfully partnered with Nokia and NXP.

Annexure 1: Schematic Flow of Data

Government Department

Link Branch

Selected bank Head Office

ZMF Server

Village level enrollment team

BC's mobile

Beneficiary

BC

Village level survey result

1

2 *List of NREGA beneficiaries*

3 *NREGA Enrollment form with some data fields filled in*

Textual data as per KYC

7

4 *Printed forms with unique ZMF id*

KYC compliant data

6

5a (with ZMF id) *Photograph of physical form*

5b *Physical bar coded card given to beneficiary for record keeping purpose*

+ barcode card (specific bank id)
+ photograph using mobile
+ 6 finger prints
+ details of physical id (ration card etc)

laptop + camera
+ fingerprint capture device
+ pre bar coded physical cards of select banks
+ specially equipped mobile (2GB memory + enrollment software)

8 *KYC compliant data*

13 *Update beneficiary account*

12 *Updated beneficiary account at Head office*

Scanned copy of barcode on beneficiary card + authentication

10a *Stored photograph of beneficiary*

11 *Debit/credit transaction*

9 *Beneficiary data on disbursement updates BC's mobile*

BC's mobile

10b *Finger print authentication via special device*

barcode from beneficiary

Collect Disburse cash

a

b

c

1. Numbers indicate sequence of data flow

2. Processes operated within the mobile:

(a) Match stored beneficiary with photograph (b) Display amount held by beneficiary (c) Do the debit/credit transaction

Where is the Innovation?

- *Envisaging and Implementing a Banking Solution for the Unbanked:* While mobile solutions for banking have been proposed, most of these involve customers of banking channels as per the RBI guidelines. While some payment systems in Africa have been proposed and implemented for the unbanked in Africa (M-Pesa), these are person to person money transfer mechanisms, not currently allowed within the RBI framework.

- *Developing and Integrating the Various Functions*: ALW successfully developed and integrated the various functionalities and the devices to provide a workable solution in the field for solving an existing problem: that of extending the reach of the formal banking systems to the BOP individuals, who otherwise are not a part of a formal banking system. To avail the benefits of the existing NREGS scheme, it would be necessary for the beneficiaries to have bank accounts. ALW has made this possible.

- *Developing and Deploying an End to End Solution*: This involved working through the entire business process of the enrollment and disbursement. This required setting up ZMF as a BC, deploying village level CSP team, identification of a BC at the village level, and working with leading banks.

Benefits to Rural Population

1. Availability of a solution that lets them leverage benefits of government schemes.
2. They get used to working in a banking context. Although they may not have large amounts of money, they may learn that they do not have to withdraw the entire amount, as they may have had to do in a physical bank, either due to limits on the value of transactions or due to the difficulty in making repeated trips to the branch.
3. Trust in the system as they get printed receipts

Benefits to ALW
1. A source of revenue for the hardware and software innovation
2. As it gains more experience and its scope of activities could increase to cover a variety of new services, say in the micro finance or insurance sector. While the revenues and profits from each transaction are small, the large base of potential mobile owners in villages can be used to drive a profitable business model.
3. First mover advantage: In services such as banking, switching costs for customers are high due to having to go through the initial process of enrollment. Therefore, it is important for service providers to be the first to offer services. ALW has recognized this.

CSF:
1. A product and service model that works on the ground
2. An ability to work with a variety of partners: government departments, banks, technology providers, village level institutions
3. Organizational capabilities for sustaining growth
4. Acquiring the initial finance and the working capital requirements.

5. Top management teams ability to deliver the solution, establish partnerships and manage the financing

Challenges:
1. Acceptability of the solution by the villagers. In the case of NREGS they do not have a choice. But if ALW is to work on other services, this could be an issue.
2. Developing adequate systems for future growth. In the past ALW has been able to create commercially viable innovative technology solutions that have been hived off as separate entities after receiving investment from renowned investors:
   a. MCHQ (now mChek): Mobile to mobile payment solution developed by ALW was sold off in mid 2006 to an independent SPV formed through a co-investment from Draper Fisher Jurvetson, Rajesh Jain and Dr. Syed A.R. Zaidi (former Angel Investors in ALW)
   b. Go-Mumbai: Low cost contact-less smart cards (branded GO-Mumbai) for automatic fare collection used on high-tech validaters in BEST buses and platforms of local suburban railway stations sold to an independent SPV formed by Khaleej Financial Investments (KFI, Bahrain – now Capivest) in May 2006. Over 600,000 Go-Mumbai cards have been issued in Mumbai until March 2008. ALW continues to retain exclusive rights for use of the Go-Mumbai in NFC mobile phones and Dual Interface SIMs.

      Such initiatives could be required in this case.

3. Maintaining partnerships and establishing new ones as ALW grows. Identifying new business segments.

Draft

**Appendix 3: Facilitating Disintermediation through Mobile Phones:
The Copra Buying Process at Marico India Ltd.**

Background[*]

Marico Limited (ML) is a leading Indian firm in consumer products and services in the global beauty and wellness space. ML had a turnover of USD 455 million during 2007-08. It produces and markets some of the nationally well-known and leading brands in the Indian FMCG and specifically beauty and wellness space. Its brands: Parachute, Saffola, Kaya, etc. were leading brands (Number 1 or 2) with significant market shares. It also operated and managed Kaya Skin Clinics and Kaya Life (Weight management segment).

ML had a widespread distribution network both, for procurement of raw material and distribution. Coconut oil is an important product for ML and therefore, copra (dried kernel of coconut) procurement is a critical activity for ML.

Supply Chain of Copra

ML sourced copra predominantly from Tamil Nadu and Kerala, states which were amongst the largest producers of coconut. As of 2005-2006, majority of copra was sourced from Tamil Nadu and Kerala. The remaining was from Andhra Pradesh, Karnataka and other states.

The supply chain for copra consisted of farmers, who either converted coconut to copra or sold it to Copra Converters. The Copra Converters, in turn, sold it to a broker (Vandikkaran), who coordinated the supply across several Copra Converters to arrange for transportation and helped them to sell in the terminal markets to traders. The broker got a commission both from the Copra Converters and the traders.

Traders bought copra in the terminal markets for millers, as most millers did not have offices in the terminal market towns. There were also some "interior traders" who directly bought copra from local farmers and CCs and supplied it to millers. They typically had higher volumes of supply than local traders.

Figure 1 gives the details of the supply chain.

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[*] The case study is based on indepth interviews and meeting with senior executives at Marico Industries Limited. Some of the data has been excerpted from "Marico: Disintermediating the Copra Supply Chain" IIMA Case No.PROD 0293 by Professors Saral Mukherjee and G. Raghuram.

The Disintermediation Initiative

Re-engineering the Physical Supply Chain: Although ML started by having contracts with Mumbai based traders, it recognized that in order to manage costs and quality, it would have to be directly involved in the procurement process. Therefore, it opened buying offices in Kerala. To enhance its role in the supply chain, it supported vendors by supplying them copra drying machines and directly procuring copra from them. In addition, it also established linkages with traders in terminal markets. Over time, ML shifted to directly procuring from traders. Thus, traders brought full truckloads to ML factories. This not only eliminated the transaction fee but also reduced multiple loading and unloading costs.

ML also developed traders and Copra Converters in several other parts. Simultaneously, it integrated the copra and coconut oil suppliers using an in-house ML owned online portal (Marico Connect) (with SAP as the back end system). Figure 2 gives the Re-engineered supply chain.

ML set up its own Collection Centres (CC). Over time, ML had been increasing the number of ML owned CCs. Interactions with managers at ML confirmed that this was a model to assure quantity assurance and better prices to farmers.

Superimposing the "Electronic Markets": In 2002, ML changed the buying process, in which the ML buying team accepted quotes from copra traders, only during prespecified three one hour slots. The traders were required to specify the quantity and price when they offered sell quotes. However, there were problems for the buying team at ML, as they had to manually aggregate all sell offers over the phone and then take decisions. This was further complicated by the fact that sometimes traders would typically wait until near the end of the designated slot before placing the call. This system was, therefore, replaced by a web based system. To get suppliers to accept this system, ML had to take significant initiatives like opening email accounts for them, investing in their training and incentivising users of email. Those suppliers who participated in web based systems were encouraged. While earlier it took nearly nine days from copra receipt to payments, the web based system reduced it to one day. Vendors could place bids, review transaction summary, details of purchase orders on line. The buying team was also provided with PDAs that allowed viewing and accepting the bid, while on the move due to the seamless integration developed between the web based system and mobile.

During this implementation, ML realized it was very difficult for suppliers to log on to the portal in the designated time slots as their business required them to be on move. To overcome this, the suppliers had to rely upon the cyber cafes to place sell offers.

Consequently, ML intervened by providing an alternative for placing the sell offers by a simple SMS based system. This allowed the suppliers to travel and not rely upon the cyber cafes for placing their sell offers; they could now place sell offers and receive confirmation status through the SMS service from their mobile phones. The ease of use and convenience saw widespread adoption

At it's end, ML was able to see whether a bid has been placed over a mobile or through a cybercafé. A recent trend that ML has witnessed is the farmers, traders using GPRS phones for logging into the ML portal.

Analysis: The disintermediation of the supply chain has definitely helped ML by allowing it to:

- Reduce management time for purchasing
- Develop profiles of suppliers which helps in decisions regarding vendor development
- Deepen the reach to traders, copra converters and farmers

Benefits to Traders/Copra Converters/Farmers:

1. Direct dealing with "ML, the end customer "
2. Reduction in turnaround time for payments leading to efficient working capital deployment
3. Direct access of small scale trader/copra converter/farmers to the ML buying process
4. Better account management
5. Better monitoring of trucks

CSF:

1. A company wide initiative to "re-engineer the supply chain" was essential prior to ML being able to leverage the efficiencies in electronic market space.
2. Development of the web based electronic "market" place was essential before the bidding on mobile could be implemented.
3. Investment in education and IT literacy
4. Design of new processes to complement the newly designed processes (for example, being able to switch to mobile based bids on the portal)
5. Ability to tie up various complementary business processes (procurement and payment)
6. Being open to the views/requirements of traders/farmers
7. Tri lingual web site design
8. Design of SMS interface for both GSM and CDMA on its web portal, thus covering all traders/copra converters/farmers who owned mobiles, irrespective of their technology choices for mobiles.

Where is the innovation:

1. Process innovation where mobiles have been used to leverage the benefits
2. Recognizing the role of complementary processes in pushing the innovation (education, IT literacy, payment systems)
3. Developing a technology independent (GSM/CDMA) platform for the ML portal

Figure 1: Initial Supply Chain


```
┌─────────────────────────────────────────┐
│ The farmer grows, harvests and dehusks   │
│ the nuts.                                 │
│ ─────────────────────────────────────    │
│ Large and financially capable farmers    │
│ convert the nuts to copra.                │
│ ─────────────────────────────────────    │
│ Other farmers sell the nuts to CCs.       │
└─────────────────────────────────────────┘

┌─────────────────────────────────────────┐
│ The CCs convert the nuts to copra.        │
└─────────────────────────────────────────┘

┌─────────────────────────────────────────┐
│ The Vandikkaran consolidates the          │
│ copra of a few CCs to a truckload         │
│ and has it brought to the terminal        │
│ markets. The CCs accompany the            │
│ product. The Vandikkaran takes            │
│ the CCs to various traders' shops         │
│ in the market.                            │
└─────────────────────────────────────────┘

┌─────────────────────┐
│ Interior traders buy │
│ copra directly from  │
│ farmers and CCs.     │
└─────────────────────┘

┌─────────────────────────────────────────┐
│ The traders in the terminal market        │
│ assess the quality based on copra         │
│ type and moisture content. They           │
│ quote a price and transaction is          │
│ completed with cash payment to            │
│ the CCs.                                   │
└─────────────────────────────────────────┘

┌─────────────────────┐
│ Some traders buy nuts│
│ directly from farmers │
│ and convert to copra. │
└─────────────────────┘

┌─────────────────────────────────────────┐
│ Local brokers, operating on               │
│ behalf of upcountry millers and           │
│ some local millers, buy from the          │
│ traders at the terminal market.           │
└─────────────────────────────────────────┘

┌─────────────────────┐
│ Local and upcountry  │
│ millers buy from the │
│ traders.             │
└─────────────────────┘

┌─────────────────────┐
│ Local millers buy    │
│ from the interior    │
│ traders.             │
└─────────────────────┘

┌─────────────────────┐
│ Local millers buy    │
│ from the traders at  │
│ the terminal market. │
└─────────────────────┘

┌─────────────────────┐
│ Upcountry and certain│
│ local millers receive│
│ the copra as         │
│ despatched by their  │
│ local brokers.       │
└─────────────────────┘
```
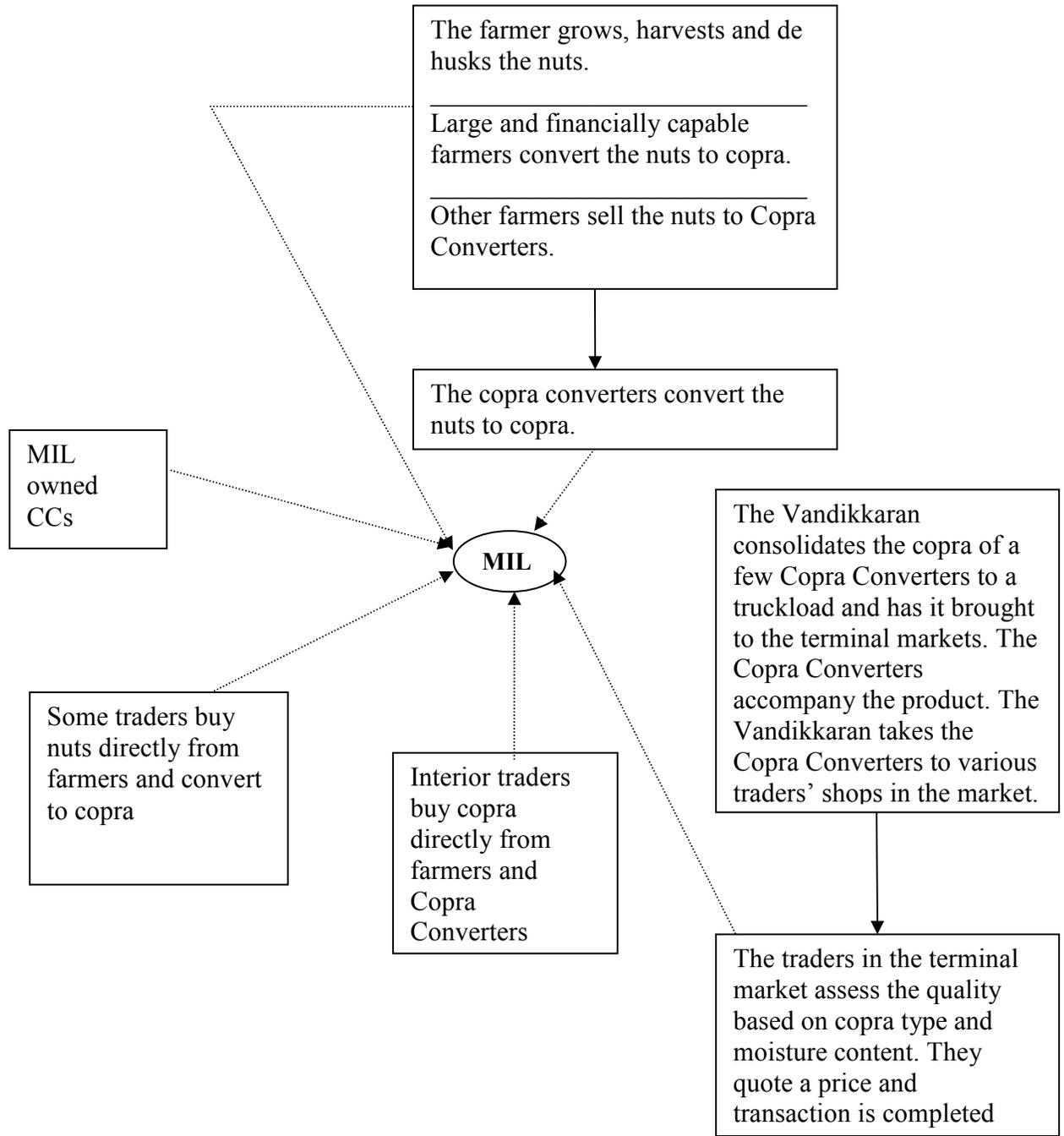
Source: Marico: Disintermediating the Copra Supply Chain. Case prepared by Professors Saral Mukherjee and G Raghuram. Indian Institute of Management Ahmedabad.

Figure 2: Re-engineered Supply Chain

The farmer grows, harvests and de husks the nuts.

Large and financially capable farmers convert the nuts to copra.

Other farmers sell the nuts to Copra Converters.

The copra converters convert the nuts to copra.

MIL owned CCs

MIL

The Vandikkaran consolidates the copra of a few Copra Converters to a truckload and has it brought to the terminal markets. The Copra Converters accompany the product. The Vandikkaran takes the Copra Converters to various traders' shops in the market.

Some traders buy nuts directly from farmers and convert to copra

Interior traders buy copra directly from farmers and Copra Converters

The traders in the terminal market assess the quality based on copra type and moisture content. They quote a price and transaction is completed

Table 1: Sourcing from copra collection centers

Year	Number of copra collection centers	Quantity (tons)
2003-04	2	1674
2004-05	5	4158
2005-06	9	7873
2006-07	15	11556

Source: Marico: Disintermediating the Copra Supply Chain. Case prepared by Professors Saral Mukherjee and G Raghuram. Indian Institute of Management Ahmedabad.

Table 2: Per centage share of sourcing through copra collection centers

	Share of Kerala buying	Share of Tamil Nadu buying	Share of Total Buying	Kerala share of Total buying	Tamil Nadu share of Total buying
Nov 2006	40 per cent	No Sourcing	15 per cent	38 per cent	60 per cent
2011 (Projections)	76 per cent	3 per cent	25 per cent	33 per cent	65 per cent

Source: Marico: Disintermediating the Copra Supply Chain. Case prepared by Professors Saral Mukherjee and G Raghuram. Indian Institute of Management Ahmedabad.

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Additional Material

A number of studies have focused on adoption and diffusion of marketing-enabling technology (Daghfous, Petrof, & Pons, 1999; Holak & Lehman, 1990; Labay & Kinnear, 1981; Plouffe, Vandenbosch & Hulland, 2001; Rogers, 1995), previous work has focused mainly on the adoption of products and technology (Au & Enderwick, 2000; Davis, 1989; Eastlick & Lotz, 1999; Verhoef & Langerak, 2001). Although, there is considerable less research on services and service-enabling technologies.

Appendix 2: Using Mobile Phones for Financial Inclusion

Financial Exclusion and its Implications

Financial exclusion is the inability, difficulty or reluctance to access appropriate, so-called mainstream, financial services. The reduction of financial exclusion is a priority for national governments because it can lead to and often leads to social exclusion. In an increasingly cashless future economy the consequences of not holding a bank account are ever more exclusionary.

According to CGAP, "Underpinning financial exclusion are problems of poverty, ignorance and environment": (http://www.cpag.org.uk/info/Povertyarticles/Poverty114/financial.htm). Further these factors create a vicious cycle that exacerbates the exclusion as depicted below:
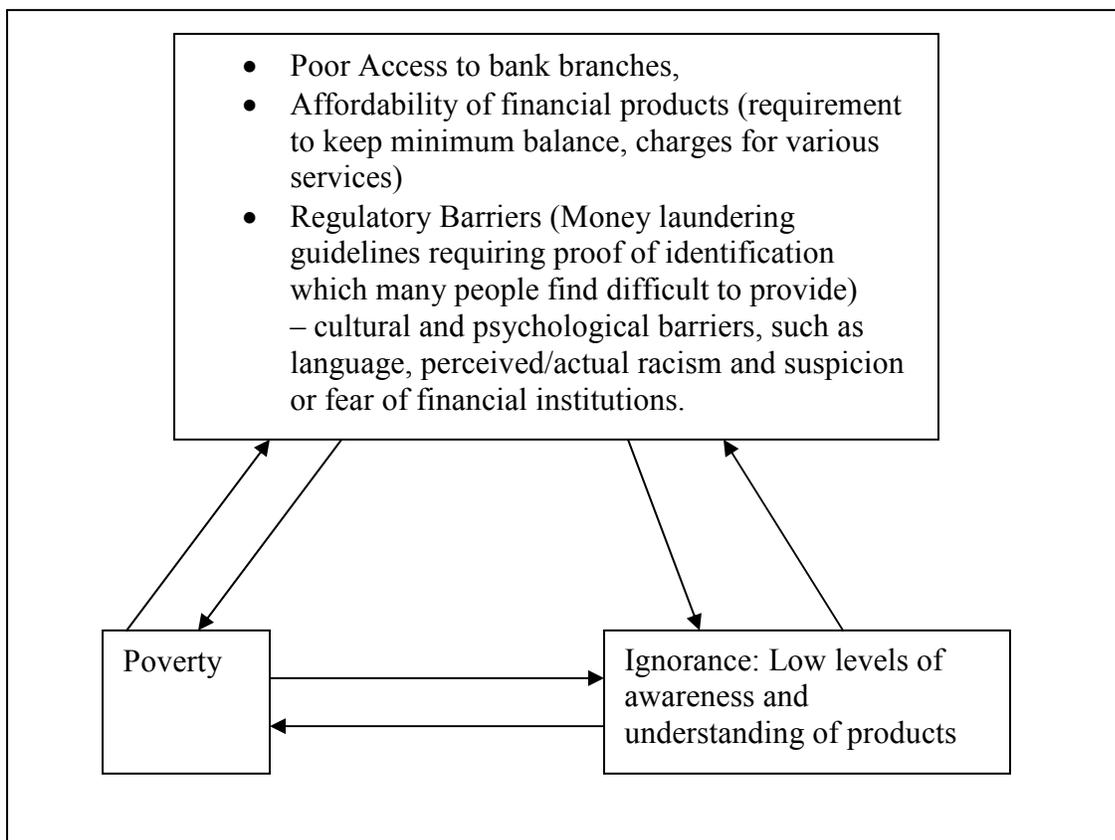
The National Sample Survey Organisation estimated that about 46 million farmer households in the country, accounting for 51.4 per cent of total farming families (89.3 million) do not access credit, either from institutional or non-institutional sources. Some 22 per cent borrow from informal sources and 27 per cent are indebted to formal sources, with a third of them also borrowing from informal sources (based on 2003 data). The accessing ratios for formal sources differ significantly across regions, and are especially low in the case of the North-East and the eastern regions at just 4 per cent and 9 per cent respectively.

Next growth of 300 million mobile subscribers will come from sub-urban/rural unbanked/underbanked India. These are predominantly (over 85 per cent) prepaid subscribers dealing mainly in cash transactions.

The proportion of the population engaged in any form of electronic payments is miniscule. This is both a challenge and an opportunity. There are close to 100 million debit/credit cards today largely from banked population. But there is extremely poor card issuance to usage ratio. Average spend per debit card is Rs 86 per month. Debit cards used predominantly to withdraw cash from ATMs leave no trail of these transactions. Also "no frills account" have been expensive to maintain as per few leading private banks. Business Correspondence model of RBI currently is applicable to MFIs, NGOs, Co-operative Societies, Sec 25 companies & Post Offices only. Most e/m-commerce is restricted to banked populations who also have shown reservation to use their credit card/debit card account on net.

While **only 59 per cent of population owns a bank account (Check), over 50 per cent are expected to own a mobile phone** in a couple of years from now, and more people will have mobile phones than have access to formal credit. Although it may appear that mobile banking payment systems could work, there are major hurdles in the growth of mobile payments as:

- Mobile payment mechanisms appear to be primarily supply driven efforts by mobile payment platform vendors and carriers in some instances
    - Airtel bill payments with mChek
- Mobile payments currently remain limited to low-risk micro-transactions (e.g. utility bill payments) due to evolving risk sharing models (banks, providers & telcos)
- Consumer adoption of mobile payments for physical transactions still unclear

Payment through mobiles still perceived to be insecure.