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Developing Services for Rural India

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1. INTRODUCTION

While most developing countries lag behind developed countries in terms of ICT usage the level of penetration of mobile telephony in some of the developing countries it is at par with that of developed countries (Rashid, 2009; Heeks, 2008). Mobile telephony is an attractive solution for the communication needs of the developing countries because of its ability to transcend barriers posed by geography and terrain, lower installation cost and operating costs (Dholakia). Furthermore, mobile phones have been successful in reaching out to a large section of illiterate population, hitherto untouched by legacy communication technology (Townsend, 2000). As such, mobile telephony presents itself as a potential solution for reducing the digital divide by enabling two-way communication for a vast number of marginalized communities in the world (Sinha, 2005).

As a result of continuous research, mobile phones are rapidly morphing into full fledged computers. Peripheral devices like mobile printers, thin folding screens, gesture key boards are further reducing the difference between mobile phones and computers. Further advances in technology resulting in reduction in prices will lead to greater adoption by the poor (Lehr). The lower costs of mobile telephone service, lesser requirement of electricity and rapid blurring of differences between mobiles and personal computers makes mobile telephony a potential solution to digital divide (Dholakia).

Mobile telephony not only presents a probable solution to digital divide but it also has strong economic impact. Studies show that mobile telephony has direct, indirect and intangible economic impacts (Bhavnani et. al. 2008). In fact the net economic impact of indirect benefits is far more than the direct economic benefits (McKinsey, 2006). Although a large number cases of exhibiting the economic benefit of mobiles have been reported (Rashid, 2009; Lehr, 2008) very little thematic research has been carried out to identify the spheres where mobile telephony can have significant impact on economic development (Rashid, 2009). Studies by Heeks (2008) and Frempong (2007) indicate that the economic

potential of mobile telephony cannot be fully realised unless appropriate services and institutions are developed.

Mobile telephony not only allows speedy and cheaper communication (Norton 1992) but also improves the quality of information (Bedi 1999). As a result, it can be expected that mobile telephony will reduce the time, cost and risk involved in trading (Muller-Falcke 2001). It has further been posited that greater information flow will reduce the geographical barrier and lead to geographical spread (Bedi 1999). Cheaper and better quality information is also expected to reduce the role of intermediaries and thereby enable the producers to earn more and buyers to buy and lower price (Bayes, 2001; Rahman, 2007).

However, micro studies in Nigeria (Heeks, 2008) reveal that instead of reducing the role of intermediaries, introduction of mobile telephony has resulted in strengthening their position and has created a new class of intermediaries. In fact dis-intermediation-re-intermediation phenomenon (Figure 1) is quite common in ICT markets (Klievink and Janssen, 2008). In the initial phase the traditional intermediation process is disrupted, leading to disintermediation. This is followed by a stage where new intermediaries appear in the value chain, leading to re-intermediation.

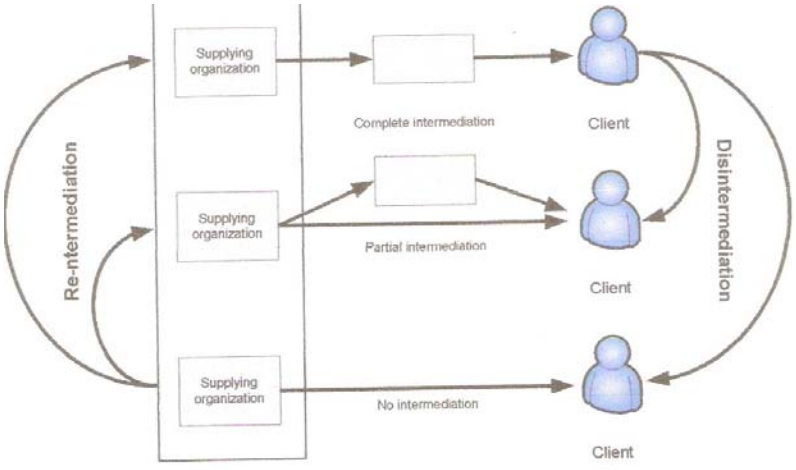


Figure 1

The reported preference of face to face communication for economic transactions in developing countries (Zainuddin, 2008) is mainly due to lack of trust

between the transacting parties. These studies point to the fact that mere availability of mobile telephony will not lead to realisation of its developmental potential, unless specific services are developed which are adopted by the target population. Similarly, despite the much touted potential of mobile banking, the service is yet to succeed in most developing countries (Donner and Tellez, 2008).. Thus, the need of the hour is development of new services which will enable the poor to use mobile telephony for economic development.

2. DEVELOPING NEW SERVICES

It is a common experience that technology driven innovation is often too focussed on the technological feasibility, with user requirements and capabilities taking the backseat. For example, Computerised Rural Information System Project (CRISP), though succesfully piloted, suffered replication failure because of design-reality gap in terms of actual processes and capability gap in terms of user level skill requirement (Madan, 2002). The P-info project, which was supposed to provide access to information in police database, failed because the service was not suited to the structure and culture of the Dutch police department (Reuver and Steen, 2008). The experience from ICT4D initiatives tells us that for the success of a project, user acceptance and community involvement are more critical than technological feasibility. For example, the users are not aware of many of the modules present in Gyandoot (Scott and Cecchini, 2003) while in cases like Akshaya (Akshaya.com) and IVRP (Arunachalam, 2002) there is intense community participation. Thus, in order to prevent wastage of limited resources on development of products and services which are not accepted by target user groups a more user centric view has to be taken (Roggenkamp,2003).

Diffusion researchers have identified relative advantage, compatibility, complexity, observability, and trialability as the five factors that affect the speed of adoption of a new technology (Rogers 1983). As a result of these diffusion barriers the diffusion process follows a S-shaped curve (Figure 2)

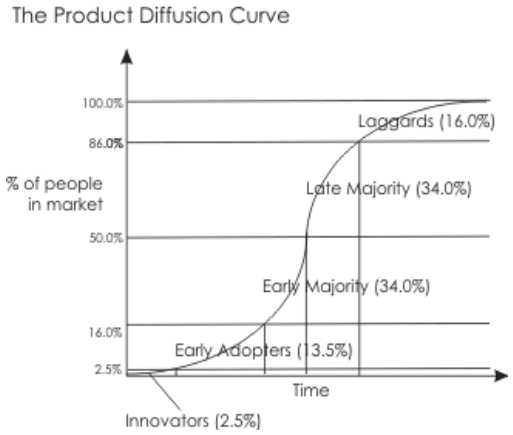
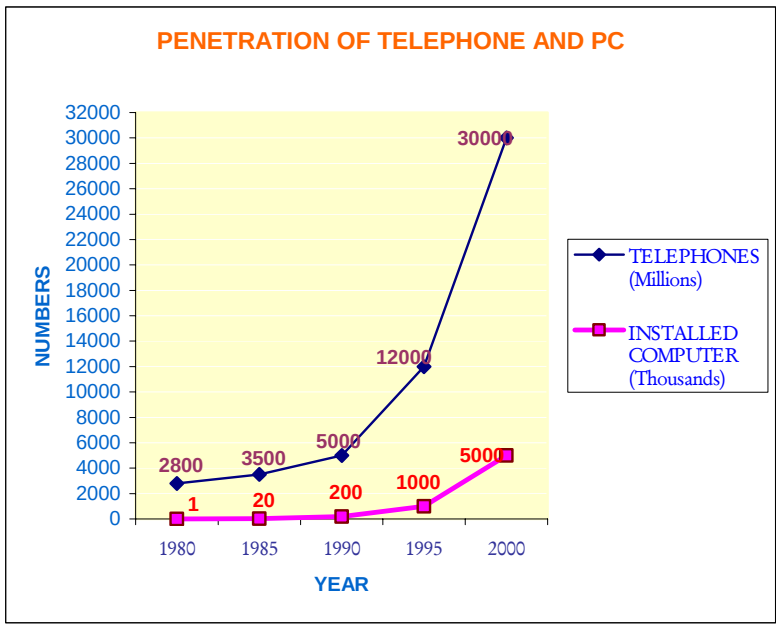


Figure 2

The diffusion of personal computers and telephones in India (Graph 1) (Singhal, 2001) indicate that while diffusion of telephones is on the verge of crossing the early majority phase, in case of computers we are still yet to reach early majority phase.



Graph 1

The involvement of a steep learning curve means that, for any new service to be successful it must first satisfy the condition that the value of the service as perceived by the end-user must be more than the cost of using the service (Bouwman,2008). Thus, understanding what the customer really values is the first step in designing any new service. The identification of customer needs should lead to technologically feasible solutions. Since the development and delivery of the service may involve collaboration among a number of

organisations the distribution of resources and revenues among them should be such that the venture becomes viable for each of the stakeholders.

3. MODELS OF NEW SERVICE DEVELOPMENT:

A number of different methods are available for designing new services. The approach of these methods can be broadly classified as : engeneering approach (Service Engineering, Service System Planning and Service Blueprinting) and marketing approach (Service Concept Definition, Augmented Service Offering, Quality Function Ceployment and Service Bundle Design). While the engineering approach focuses mainly on the components of service and its delivery, the marketing approach adopts a more customer centric method in developing new services.

While the Service Engineering Method provides a rigorous sequence of steps that covers all aspects of service design, starting from problem definition to service design, it focusses mainly on the technical design of service and its delivery. Since customer acceptance and customer participation are essential ingredients of any succesful service offering, by ignoring the customer requirements this model develops a plan which can at best be described as partial (Clausing, 1994). The Service System Planning attempts to overcome this limitation by adopting a service system approach where there is place for customer needs and expectations, service concept, value of service as percieved by customers and service providers. It also takes into account the corporate values and cultures of the service provider because these are essential determinants of service offering, quality and price. The route adopted by this method explicitly evaluates the impact of the service on each of the above service sub-systems. Although it focuses on the right areas, the Service System Planning approach does not provide a stepwise approach to service design. Thus, although it can be used to develop a check list for evaluating a particular service design, it offers little help in the design process iteslf. Compared to these two methods, the Service Blueprinting approach adopts a much more systematic design oriented approach. However, this method ignores the role of customers and the impact of organisational structure and culture in service design. Thus, the engineering approaches to service design fail to adopt a comprehensive approach to service design.

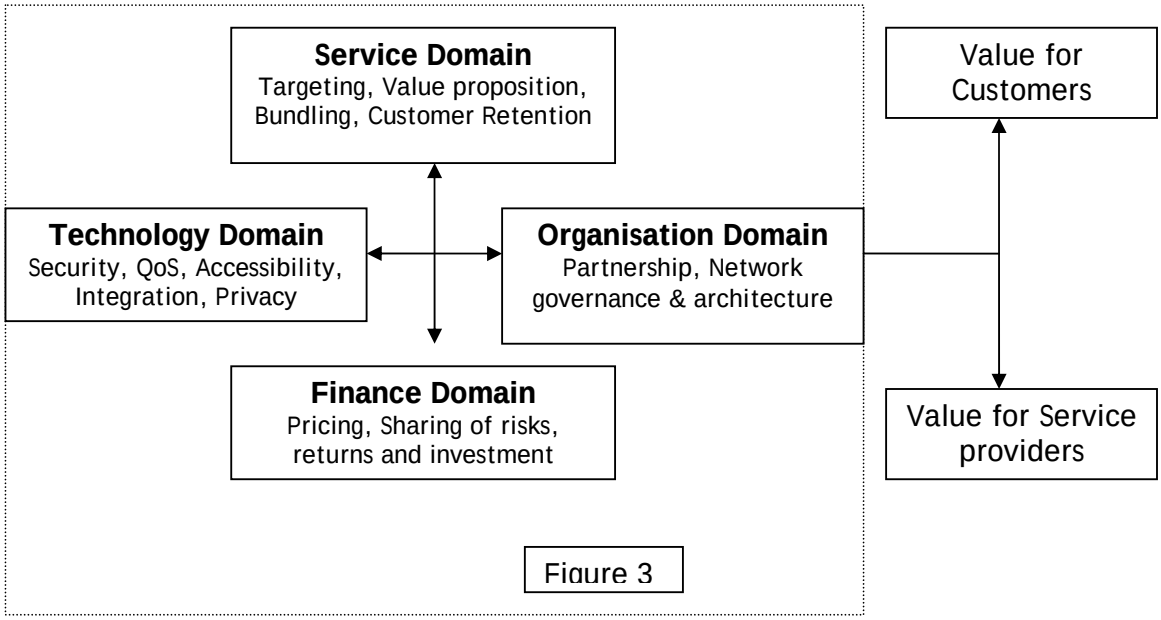
Unlike the above approaches, the Service Concept Definition tries to find out "what" the customer needs and "how" these needs can be satisfied. Although the method leads to better mapping of customer requirements with service design, it ignores the details of service delivery, technological feasibility and other details relating to production and rollout of services. Taking the service concept as an input, the Augmented Service Offering (Gronroos, 2007) not only tries to distinguish the core service, essential service and supporting services but also delivery of such services. Thus, accessibility, costomer participation and service providing organisation occupy important position in this approach. However, by not focussing on the value percieved by the customer and the value intended to be delivered by the service provider, it ignores one of the essential elements of a successful service. The Quality Function Deployment method tries to use customer priorities as yardsticks for evaluating the service quality and in prioritising services. However, it involves a system of interlinked matrices which makes it difficult to operate. The complication is further increased if we include the possibility of a number of services in one bundle. The complexity of the method makes it difficult to adopt.

Compared to the above methods the STOF approach (Bouwman, 2008) presents an elegant and yet comprehensive approach to service design that encompasses Service (S), Technology (T), Organisation (O) and Finance (F) associated with a new service design. The model attempts to develop a service by an iterative method that acknowledges the intricate relationship between the above four elements of service design and delivery. The next section presents a brief outline of the STOF method.

4. THE STOF MODEL:

The STOF model (Figure 3) present four inter-related concepts: the intended and delivered value on the part of the provider, and expected and perceived value on the part of customer/end-user. The value that the service provider intends to deliver may differ from the value that is actually delivered and the value that the service provider delivers may differ from the value perceived by the end-user. Thus identification of the factors which affect the value of the service is essential for successful design of a new service. The factors that affect the value of the service are clearly the Critical Design Issues (CDI). By analysing a large

number of cases Bouwman (2008) identifies a number of Critical Design Issues (CDIs) and Critical Success Factors in the Service, Technology, Organisational and Finance domains.



The STOF method consists of four steps, which are represented in the figure 4.

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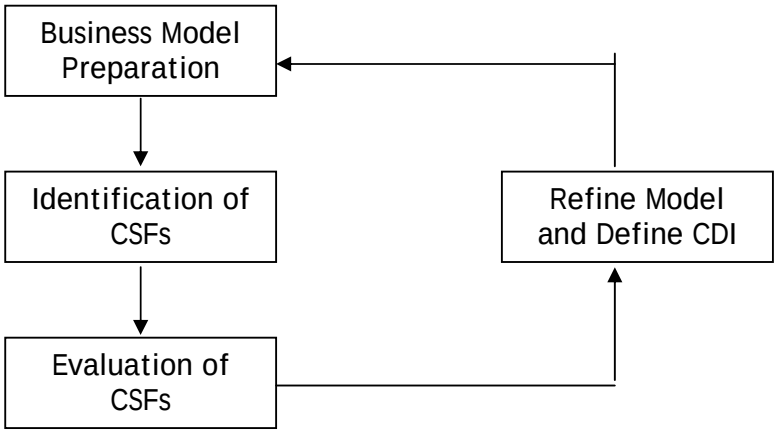

Figure 4

The rough business model is prepared in the first step. Based on the rough model the CSFs are identified in step 2 and evaluated in step 3. Depending on the evaluation of the CSFs, the business model is refined in step 4. The CDIs also get defined at this stage. The iteration

of these four steps leads to viable business model. Finally, the model is tested for its robustness. The most important step in the STOF method is the identification of the CDIs and CSFs.

4.1 CRITICAL DESIGN ISSUES (CDIS):

In the Service Domain the most important factors are: Targeting a profitable market segment, creating a compelling value proposition for the target customer segment, branding the service to increase its visibility and trustworthiness, and retaining customers by versioning, bundling, personalising, etc.

The CDIs in the technology domain are Security, Quality of service, System Integration, Accessibility and Management of user Profiles. Very often, these CDIs are associated with trade-offs. Thus, security often requires a trade-off between ease of use, privacy and preventing abuse. Although the quality of service has profound impact on the perceived value however, the cost of maintaining the quality has to be commensurate with the perceived value of the service. System Integration has to be traded off with flexibility and costs of integration. The accessibility of the service is influenced by the choice of platform, devices and architecture.

The CDIs associated with the Organisational Domain are Partner Selection, Network Openness, Network Governance and Network Complexity. Although the service may be offered by a single organisation, but the organisation has to collaborate with others in order to provide all the necessary resources and capabilities that are required for developing and offering the service to the market and to develop a viable business model for involved actors. Depending on the nature of such collaboration, partners can be classified into three types (Hawkins, 2002). Structural or Tier-I partners provide the essential and non-substitutable components,

Contributing or Tier-II partners provide goods/services which cater to specific needs that do not form essential part of the business model, Support or Tier-III partners provide generic goods and services which are not specific to the service/business model but no service can be provided without the presence of these elements. Partner selection is also

important because not only does it lead to sharing of risks and investments but in certain cases it is essential for building trust. Tie-up between service providers and social entrepreneurs have been found to be of critical importance in case of socially desirable projects (Rangan, 2007), the most prominent example being the Grameen Bank's involvement in rural development.

The Openness of the Network determines the ease with which new actors can join the value network. While entry of new entrants is not possible in a closed network, in a walled garden environment any new partner can join provided the service provided is in accordance with certain pre-defined norms. This leads the issue of network governance. In all cases there is a dominant partner who either has access to end-users or has developed the service. The dominant actor lays down the rules for collaboration and monitors their compliance.

The CDIs associated with the Finance Domain are: Pricing, Division of Investment, Division of Costs and Revenues and Valuation of Contribution and Benefits. Revenue models adopted by service providers can be broadly categorised as: transaction based payment, payment for information and advice, payment for services and commission and advertisement income (Weill and Vitale 2001).

Revenues from services are dependent on the price. Price not only refers to the money that the customer has to pay but also includes the cost of sacrifices that he has to make in order to avail the service. While recovery of costs is an important determinant of pricing decision, as far as consumers are concerned, there is no relationship between the cost of service and perceived value of the service. The consumer is only concerned with the value that he gets. This makes it impossible to set an initial price which will result in recovery of costs. This leads to initial "give-away strategies" followed by higher prices when the perceived value increases.

The risks associated with investment in a new service can be reduced by adopting a phased rollout and collaboration with other firms. However, division of investment has to be commensurate with the partner's risk and profitability profile. The

risk and profitability profile of a partner is dependent on its organisational goals. For example, an organisation whose goal is to achieve certain socially desirable outcomes, the requirement for profit is lower.

4.2 CRITICAL SUCCESS FACTORS (CSFS):

CSFs refer to the "limited number of areas in which satisfactory results will ensure that the business model creates value for the customer and the business network" Based on the analysis of a number of cases Bouwman (2008) identifies eight CSFs for mobile service business models. These CSFs are: Creating a Compelling Value Proposition for the end-user, having a clearly defined target group, Unobtrusive Customer Retention, acceptable quality of service, Acceptable Profitability, Acceptable Risks, Acceptable Division of Roles and a Sustainable Network Strategy. Each of these CSFs contains a number of CDIs pertaining to the different domains of the STOF model.

4.3 EVALUATION OF THE STOF MODEL:

The STOF method adopts a comprehensive approach to service design which tries to explore the inter-linkages between the S,T,O and F domains. Although the model offers a very comprehensive and systematic approach to service design, it has two critical deficiencies. First, although it places maximum emphasis on value perception of customers it offers no solution to how the value perception can be ascertained. Also, it focuses only on the factors that are involved in creation, delivery and consumption of services. It ignores the impact of the new service on constituents who will be adversely affected by the new service. The attitude of these elements is of great importance, particularly so, if such elements have sufficient market power. It also ignores the situation where satisfaction of one set of needs leads to creation of new customer requirements. That is, the customer requirements are not static, it evolves with time. Thus, any model of service designing should include the possibility of incorporating customer inputs after the service is launched. While the STOF method adopts an iterative approach to establishing the initial service design it does not have any provision for dynamic iteration which takes care of the changes in customer needs. Finally, by placing overwhelming importance on value to customers it closes the possibility of introducing any service that aims to introduce radical changes in the society.

These aspects become particularly important for development of services aimed at the poor and marginalised sections of society in India. Any new service that attempts to alter the pace of development is bound to face socio-cultural barriers and opposition from vested interest groups. Moreover, the low economic standing of this section means that while satisfaction of low order needs will be more important, higher order needs will become more and more visible with passage of time. Furthermore, economic development may also involve introduction of totally new practices. Thus, while adopting the STOF Model for developing services for the poor in India we need to introduce these elements in the design process.

5. DESIGNING SERVICES FOR M-GOVERNANCE

Mobile Government refers to a wide range of services and applications that can be delivered through mobile network. The fact that mobile communication not only addresses the communication needs but also the mobility needs of the people is perhaps less .important for developing countries, where, in many cases mobile communication system is the only communication channel available. Depending on the degree of sophistication, mobile services can be categorised as mobile access, mobile content and mobile applications.

The lowest level of sophistication is mobile access. In this case, the available information is accessible through mobile phones. In this case neither the content nor the process is modified; only the presentation of the information is adapted to suit the requirement of mobile communication devices. In case of mobile content, the available information is modified to suit the requirement of mobile communication device. In case of mobile applications, the process itself is modified to suit the requirement of mobile communication devices (Roggenkamp, 2003). Thus, while making available information relating to market prices of agricultural products (Lehr, 2008) or railway passenger reservation through mobile phones exemplify mobile access and informing tourists about nearby tourist spots through GPS tracking of tourists in Netherlands (Vos and Haaker, 2008: 119-136) are examples of mobile access and content, respectively; the application of G-Cash for micro-finance activities in Philippines (Bouwman, 20008; Shareideas.org) or use of

mobile phones for documenting micro-finance transactions in Kenya (Lehr, 2008) are examples of true mobile applications.

Considering, the lack of communication infrastructure and difficulties of the Government to reach out to the rural population living in remote rural areas, any of the above three types of M-Government applications will serve the purpose, as long as it is adopted by a large number of rural population. Potential areas where mobile communication system can have an impact are: (a) enabling the government to talk to the citizens, (b) enabling the citizens to talk to the government, (c) improving the efficiency of government by enhancing internal communication, (d) enhancing the capabilities of the rural poor. The next section is devoted to identifying some of the potential applications under each of these heads.

6. IDENTIFYING THE POTENTIALS:

6.1 GOOD GOVERNANCE:

Good governance is one of the most fundamental requirements for any society, more so for rural India where governance is not only linked to development but also with subsistence. Transparency and public participation in governance are two of the most important conditions of good governance. Lack of transparency not only breeds corruption but at the same time alienates the government from the civil society. Lack of participation by citizens results in poor formulation and implementation of policies (Thampi, 2008).

Although it may not be feasible to incorporate all the micro level requirements in the broader plan document, but micro level development plans can be prepared in consultation with the citizens living at the grass roots. The involvement of citizens is also important in another way. The expansion of the State to remote areas and the multifareousness of developmental activities has made the task of monitoring policy implementation virtually impossible. The involvement of citizens' groups in monitoring of policy implementation will not only result in effective implementation but at the same time it will also ensure that the benefits reach the intended beneficiaries.

The critical ingredients for such citizen's participation are: availability of institutional mechanisms for involving the citizens in public policy and providing a means of

communication between the government and citizens. The institutional mechanism has already been created by way of Panchayati Raj Institutions. What is now needed is to utilize this institutional framework for greater participation of people in policy formulation and implementation. Mobile telephony can be of immense use in providing the means of communication. The two way communication channel provided by mobile telephony can not only enable the government to inform the people about its policies (push services) but at the same time the policy makers can ascertain the needs of the people and get feedback regarding implementation issues. Such inputs and feedbacks will lead to better policy formulation and course correction in implementation process.

6.2 MICRO ENTERPRISE:

Rural micro-enterprises form a very important part of Indian economy and so development of micro-enterprises occupies a very important role in poverty alleviation and economic development (Palmer, 2008). However, these micro-enterprises suffer from an number of information constraints which hinders their development (Heeks, 2008). Introduction of mobile based services which connect these producers to buyers can result in significant positive impact. However, in case of enterprises in the manufacturing sector, the possibility of buyers not honouring oral contracts act as a potential barrier. As a result of which the use of mobile phones gets restricted to communicating with existing trading partners. In conventional trading, contract with new trading partner is secured by way of advance payments. In such case, unless mobile communication solves the issue of trust and advance payments the impact on micro-enterprises will be marginal.

However, while mobile service based advance payment ensures good conduct on the part of the purchaser, but it does not take care of the apprehensions that the purchaser harbours about the conduct of an unknown seller. Thus, what is needed is an introducer who introduces the two parties and assures both parties about the good conduct of the other. One way of assuring the purchaser is by organising the producers, so that the purchaser is not dealing with one individual producer but an organisation consisting of large number of producers. So, mere availability of mobile communication system is not enough for ensuring development of micro-enterprises. There are genuine need for mobile payment applications, assured flow of credit and institutions guaranteeing fairplay.

6.3 MICROFINANCE AND MOBILE BANKING:

Despite the development of banking system, access to credit continues to be one of the major constraints facing the rural economy. Furthermore, the absence of banking channel in disbursement of funds relating to rural employment generation schemes results in large scale diversion of funds. Thus, the expansion of rural banking is not only important to address the credit needs of rural population but also for effective utilisation of funds spent on welfare schemes.

Although the banks have opened rural branches, a large number of rural households are still not accessible to banking system because they do not have bank accounts. Although there are policies related to target sector lending, such schemes are aimed at asset creation and do not cater to the short term credit needs arising out of medical or social factors. Consequently, the village money lender continues to be an important source of rural credit.

Under the circumstances, Microfinace can act as an effective solution to the credit needs of the rural poor. However, the effectiveness of microfinance institutions is limited by funds available with them. While collaboration between such microfinance institutions and commercial banks can take care of this problem (Prahlad, 2006), mobile communication can lead to substantial lowering of transaction costs for banks (as in Jami Bora Trust in Kenya) (Lehr, 2008) as well as customers (as in G-Cash in Philippunes) (Bouwman, 2008). However, microfinance does not offer a solution to the problem of diversion of development funds. Mobile telephony can offer a potential solution to this problem by way of mobile money transfer.

7. DESIGNING SERVICES FOR RURAL INDIA:

Having identified three potential areas where mobile telephony can play a significant role, we now proceed to develop a service model that delivers these services. While developing the service model one has to keep in mind that ICT can only address issues relating to the flow of information. The effective utilisation of information requires availability of suitable infrastructure and institutional mechanisms. Also, any new service will be met with opposition from individuals who are adversely affected by the adoption of such services.

Thus, development of any model of service will involve the identification of these elements and integrate them into one cohesive formulation.

Fortunately, the three services that have been identified can be interlinked into a virtuous cycle as depicted in figure 4. The inter-linkage can arise as follows: deficiencies in rural infrastructure leads to formulation of micro-level plans, execution of micro-level plans lead to creation of rural infrastructure on one hand and rural employment on the other. Rural employment leads to higher level of economic standard, which coupled with better infrastructure leads to higher level of micro-enterprise activities.

The establishment of this inter-linkage is dependent on (a) how well the infrastructure requirements get communicated to the policy makers, (b) how well the policy accommodates the citizens' inputs, (c) how well the project is implemented, (d) how efficiently the fund reaches its target segments, (e) how well the micro-enterprises are able to make use of enhanced capabilities to get access to new markets, (f) how well the credit flows support the higher level of economic activities. As the discussion in the preceding section indicates, mobile communication can have significant impact on each of these factors. On closer scrutiny, the above factors get reduced to two issues: flow of information and flow of funds. While role of mobile communication in flow of information is easily understood, it is not so straight forward in case of flow of funds. Thus, the main focus of the subsequent discussion will be on the latter.

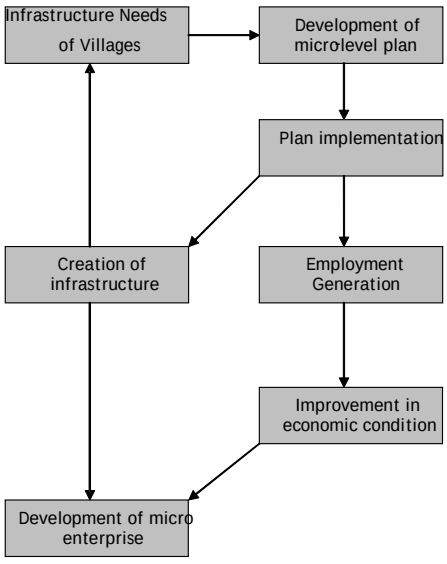

Figure 5

Instead of instituting separate mechanisms for the different information flows one can conceive an all encompassing model of rural help line in line with pallytathya (www.pallytathya.org). This model essentially creates a platform where the government agencies, non-governmental organisations, farmers, micro-entrepreneurs and probable buyers meet and communicate with each other through mobile communication and internet. The availability of such a service will not only enable the villagers to communicate their needs but also provide them the opportunity to give feedback on project implementation. They can register themselves with government agencies for availing benefits of welfare schemes and the government can intimate them about acceptance of such request through mobile communication. The producers (farmers and micro-enterprises) can advertise their products on the internet, through internet enabled mobile phones, and buyers can contact them through mobile phones. The service can not only be used to provide market information but can also be used for providing a number of critical services like: contacting a doctor/health worker, getting information regarding admission to educational institutions, getting legal advice and contacting government agencies. The inclusion of a large number of disparate groups not only creates the possibility of economy of scale but also of economies of scope. However, the success of the model depends on wide-spread availability of mobile phones in rural areas. But mere availability of mobile telephone is not sufficient unless it is possible to transact business over phone. This brings us back to the centrality of issue of electronic fund transfer.

8. ELECTRONIC FUND TRANSFER:

One of the most successful models of electronic fund transfer using communication system is G-Cash in Philippines. In case of India, however, the predominant use of mobile phones for shared access, the dependence on physical cash for transaction and absence of bank accounts are potential bottlenecks which make G-Cash type solution unattractive. Similarly, the low economic status of the target market makes any form of banking difficult to concieve. From diffusion point of view also, any process that involves a significantly high learning curve will not succeed in penetratig the mass market. Fortunately, while the rural population may not be adapted to conventional banking operations, they are well conversant with pre-paid

recharging. Recharging of pre-paid mobiles is nothing but conversion of cash into air-time. Thus, air-time is nothing but one form of virtual money. In such case can it not be used as a currency? In fact transfer of airtime from one mobile to another is permitted. Although data regarding P2P airtime transfer is not readily available, such transfer is the most common mechanism by which prepaid mobiles are recharged by franchisees of mobile service operators.

The most common form of recharging involves the following steps: (a) the main dealer deposits money with the mobile service operator and purchases airtime (b) the airtime purchased by the main dealer is transferred to designated mobile numbers of sub-dealers against payment of money, (c) the sub-dealer transfers airtime to the customers' mobile against payment by the customer. The mobile service operators also allow transfer of airtime from one person to another. Other forms of recharging include scratch card, through bank ATMs and through internet against payment through debit/credit card. However, the mass market penetration of mobiles coupled with the difficulties of managing physical inventories of scratch cards make these options less popular.

Apart from pre-paid mobiles, the recharging of DTH also involves conversion of physical money to electronic currency. While these are examples of operator specific transactions, the 'itzcash' card service caters to a wide basket of service that not only includes utility bill payment but also payment to government in the form of railway reservation. Thus, conversion of physical currency to electronic currency and use of sms in making transferring such electronic cuurrency is a reasonably established practice. Similarly, the use of virtual currency in the form of credit card and debit cards is widely practised. With launch of Kisan Credit Cards, the concept of virtual money has also penetrated to rural India. Thus, the use of virtual currency and electronic currency is not new to rural India (Table 1).

TABLE 1

ITEM	NUMBER (Millions)
DEBIT CARDS*	27
CREDIT CARDS*	12
ITZ CASH CARD**	10
KISAN CREDIT CARD***	71

* AS ON 31.03.2006, Economic Times
** TRANSACTIONS PER MONTH AS ON JULY 2009, http://www.medianama.com
*** Million as on 31.03.2008, nabard

However, the limitation of the existing model is that while conversion of physical money to electronic money is possible, the reverse is not. This limitation acts as a severe constraint in electronic currency being used for a wider variety of transactions, although there are unconfirmed reports of such conversion taking place in grey market. Assuming that it is possible to convert airtime to physical currency, airtime transfer offers an excellent solution to the problem of fund transfer. Before examining the issue in greater details let us first see how such transaction can affect the development model described in figure 5.

Airtime transfer can be used for making payment to BPL labourers, thereby obviting the need of a bank account while at the same time reducing the possibility of diversion of funds. The potential buyers can enter into a verbal contract with the village producer and make advance payment to demonstrate his commitment to the oral contract. The airtime thus transferred, can be either encashed or be used to make other transactions via further transfer of airtime. Airtime transfer can also be used for disbursement of credit, repayment of loans, and in transactions within the self help groups formed by micro-finance institutions. This can have a powerful impact on micro-finance and banking services aimed at the rural poor. In fact, the service is so general in its scope that it is equally, if not more, applicable to urban life. Thus, although simple as a concept, it has the potential to affect all segments of society. Having identified the importance of airtime transfer, we now attempt to apply the STOF method to create a viable business model.

8. APPLICATION OF STOF METHOD:

8.1 The Rough Model:

The rough model of the proposed service envisages a service provider who provides electronic currency in leiu of cash and vice verca. The conversion of physical currency to electronic form is done by the franchisee of the service provider. Once a customer buys the elecronic currency he can utilise it for transacting business and for transfer to other persons. The transfer of funds can take place through sms, voice message (involving IVRS). The electronic currency can also be converted to physical currency by the franchisee network or deposited in regular bank accounts.

8.2 Identification of CSFs:

Thus, the model involves a main service provider, telecom service providers (who may or may not act as the main service provider), franchisees of the service providers, buyers of electronic currency, retailers and merchant establishments who sell goods against electronic currency. Since the service targets the mass market, where the value placed on convenience is likely to be very low, so a substantial difference between the value of physical currency and electronic currency will make the service unattractive. Thus, the customer will essentially want a free conversion from physical to electronic currency. The only concievable charge that can be levied is the cost of sms or phone call. So, increasing the number of transaction becomes more important than increasing the value of transactions. Thus, increasing the number of transactions is the first CSF.

In order to increase the number of transactions it becomes essential to bring within its ambit small traders, even upto the level of neighbourhood grocery shops and vegetable markets. A peculiar feature of these traders is that although they sell on credit they do not accept payment through credit / debit cards. The charges associated with credit / debit cards and unfamiliarity with the technology are probable reasons why they do not accept such transactions. This leads us to the second CSF: the P2P fund transfer should have no transaction charge and conversion of electronic currency to physical currency should be readily available.

Since the service results in virtualisation of money so it is extremely important to acquire the trust of the users. While the security concerns of the end users is taken care of by secured transaction, the security concerns of merchant establishment will be taken care of by a speedy and efficient settlment system. In addition to the security concerns of the end users and

traders, the service has to address the security concerns of the financial system as a whole. Unless the service model addresses the security concerns of all the stake holders it will not be able to win their trust. Thus, security and trust are the two other CSF.

The involvement of security makes involvement of the banking sector essential. The banking sector, with its expertise in regulating financial system, can play a significant role in ensuring security and settlement efficiency. The involvement of banks is also essential for winning the trust of end users. Banks' role also become essential because of another reason. Since the service essentially involves bye-passing of conventional banking system so the service design has to take into account the potential opposition from the banking sector. Thus, unless a suitable role for banking sector is found, the service will not only run into opposition but also become risky from fiscal management point of view. Thus, an agreement between the main service provider and banks is another CSF.

Considering the fact that this model is being developed primarily for the rural poor, involvement of government is a very important factor. The involvement of government arises in multiple ways. First, the government has to agree to transfer funds for rural employment generation schemes through this mode. Second, the BPL category forms the target of these schemes so it is safe to assume that they do not subscribe to mobile telephony. In such case providing the intended beneficiaries with mobile communication becomes integral to the successful operation of this scheme. The fund at the disposal of the Universal Service Obligation Fund (USOF) can be utilised for providing life time mobile connections to the beneficiaries of these schemes. Involvement of the government is also essential because of the necessity to regulate the service so that economy as a whole does not suffer. Thus, involvement of government is another CSF.

8.3 Identifying the Critical Design Issues:

Having identified the CSF's we now attempt to identify the CDIs. The first CDI that needs to be settled is who should provide the service. There are three possibilities:. First, the conversion of form of currency is done by the bank. Second, it is done by the telecom service provider. Third, it is done by a third party.

Since it is not possible for banks to make its presence felt in every neighborhood so the first possibility is not financially and practically feasible. The telecom service providers have an established dealer network which is available in every neighborhood. Thus, a large number of points are aleardy available where currency conversion can be done. However, revenue earned by these franchisees (2-5% of recharge value) is not possible in the revenue model that is being discussed. In this connection we should also take into account three factors: (1) excepting the main dealer, mobile service franchisee is a side business for other sub dealres, (2) generally any given sub-dealer acts as a franchisee for multiple operators, (3) the revenue earned also compensates for the cost of capital that the franchisee has to pay upfront while purchasing airtime. In such case, if cost of capital can be reduced then a much lower commission will be sufficient to take care of the franchisee interest because of the manifold increase in transaction volume. However, since the franchisee has to maintain airtime from a number of mobile service providers so the capital that gets locked up is considerable. In such a scenario, if currency conversion is done by a third party then it will lead to more efficient utilisation of capital and lower cost of capital.. In this scheme there is no necessity for maintaining franchisee network for recharging. Rather, a part of the electronic currency is utilised for recharging mobiles. Thus, the third party acts as an agent of the mobile service provider. Similarly, the third party acts as agents to all other utility service providers for which payment is made through electronic currency. Thus, the third party can earn substantial commission from these utility service providers and mobile service providers, which can be distributed among its franchisees. However, involvement of third party is also associated with a number of difficulties. First, unlike banks and telecom service providers, it will be a new entrant. Hence, it will have to establish its credibility first. Second, unless it has expertise in financial system it will find it very difficult to manage an efficient settlment system. Third, since the telecom industry has numerous tariff plans (even under pre-paid schemes), recharging itself will become highly complicated. Thus, each of the possibilities discussed above has some merits and demerits. On the other hand, a tie up between the telecom service provider and banks appears to solve many of these issues.

In this alliance model, while the telecom service provider will produce and market the electronic currency, the banks will handle the settlement process and conversion from

physical to electronic currency and vice-verca. A mobile customer will have two types of accounts: (a) the normal pre-paid mobile account, (b) the virtual mobile bank account (which is linked to his mobile number). While the pre-paid account will be maintained by the MSP, the virtual bank account will be maintained by the banking partner. Transfer of funds from one virtual account to another is done by the bank, through the intermediation of mobile telephone network.

The chain starts with the Mobile Service Provider (MSP) depositing money (or other form of security) with bank and getting authority to issue electronic currency. This currency is transferred to the mobile subscribers through the franschisee network, against cash payment. The currency thus purchased is credited to the virtual mobile account. When the customer wants to recharge his prepaid mobile account he follows the usual procedure of recharging. The only difference being that on completion of his actions the MSP sends an electronic advise to the bank for transferring of funds from virtual mobile account to pre-paid mobile account. The bank transfers the fund to the MSP's account, after deducting the service tax, and the MSP credits the pre-paid account.. Similarly, when the customer wants to pay someone he sends an sms to a designated number. The payment instruction issued by the customer is transmitted to the bank. The bank acts on the advise of the customer and transfers funds to the recipient, after deducting applicable service tax. Thus, the settlement takes place instantaneously. When the trader wants to convert electronic currency to physical currency, he goes to the franchisee and gets physical currency by transferring electronic currency to the franchisees' virtual mobile bank. Since the bank deducts applicable service tax before transferring funds so, collection of service tax becomes centralised. The banks transfer the service tax to government account and sends a confirmation to the utility provider. When the government wants to transfer money to the beneficiaries of the employment generation scheme, it purchases electronic currency from the MSP and transfers the same to the beneficiaries. The proposed model is described in Figure 6.

The issue that crops up next is how to address the revenue expectations of the telecom service provider, its franchisee and the bank. While deciding on the revenue model one should not lose sight of the investment made by these stakeholders. While investment of MSP is only restricted to advance deposited with bank to get electronic currency, the franchisee

needs to maintain a minimum level of cash so that conversion from electronic to physical currency is unrestricted, the investment on the part of bank is restricted to maintaining the virtual mobile accounts and running the settlement process.

While the MSP is partially compensated by way of higher revenues resulting from larger mobile subscriber base, the bank is compensated by not only investing its higher cash reserves but also by earning commission from utility service providers, the franchisee's condition is the worst. First, he has to deposit cash with MSP to get electronic currency and then he has to maintain cash reserve to encash electronic currency. Since the cost of sms is the only charge that gets levied so, 2-5% commission for the franchisee appears to be improbable. However, on closer examination and with one crucial restriction, the revenue model becomes feasible.

The normal cost of an sms is about Rs. 1. In case of premium services, the charge varies from Rs. 2 to Rs. 30. The normal charges levied by credit card / debit card providers is about 1.8% of transaction amount. Considering the fact that the service is aimed at rural markets, it is reasonable to expect that transactions exceeding Rs. 100 will be small and transactions exceeding Rs.200 will be rare. Hence, if the service is restricted to transactions below Rs.200 then it will not have an adverse impact. This restriction will also ensure better security. With this restriction in place, Rs. 2 per sms translates into minimum 1% transaction charge. Taking into account the possibility of lower denomination transactions, the effective transaction charge becomes higher. In order to make the system more flexible, higher value transactions may be allowed against payment of a nominal monthly charge and transaction charges as a percentage of transaction amount. Since the the MSP and banks have other means of compensation so the major part of this revenue has to be given to the franchisee. Considering the higher volume of transactions, a commission rate of about 1% should generate enough revenue for the franchisee. Moreover, since the franchisee also earns commission against new mobile connections so he will also benefit from the increase in subscriber base. Thus, even with transaction charge limited to cost of sms the model can generate adequate revenues provided the volume of transactions is large.

The advantage of the model is that it builds on existing customer practice and the major process changes are not visible to the customers. It also builds on the existing value chain of MSPs and utilises the strength of parties involved in the model. It also offers a solution to a critical gap in utilisation of mobile communication system for e-government activities and in realisation of the full potential of mobile telephony in economic development.

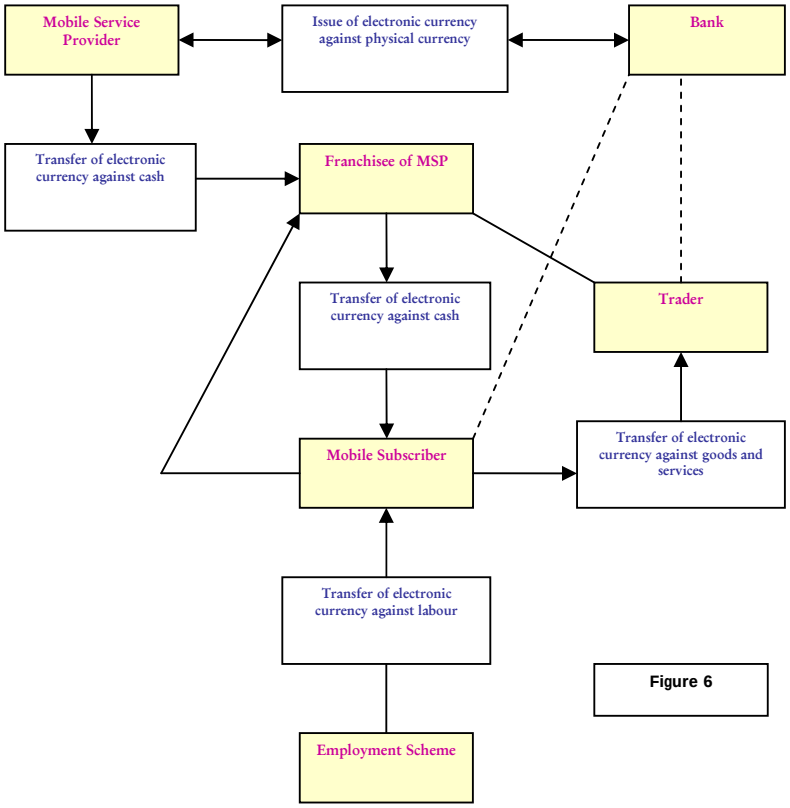

Figure 6

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