

TALKING BACK!
EMPOWERMENT AND MOBILE PHONES IN RURAL BANGLADESH
A Study of the Village Pay Phone of Grameen Bank

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1. THE VILLAGE PAY PHONE – OBJECTIVES, FEATURES OF OPERATION AND ORGANISATION

What happens in a traditional community in a Third World developing country with the introduction of a high-tech mode of communication such as mobile phones? In the average Bangladeshi village most people are dependent upon middlemen of some sort for communication beyond the village border. The great majority of the rural population are illiterate and need the help of for example the village teacher, the *immam*⁴ or other elite persons to write a letter, or the message has to be carried by word of mouth by a traveller. Will access to telephones change this situation of communication dependency and place-boundness substantially? And possibly bring along also other social changes? Or will telephones instead reinforce existing power and dependency relations? Or, perhaps equally likely, given previous experiences with technology-based development projects, will telephone operations fail and the experiment break down? These are the questions asked in this paper.

The paper describes an experiment with mobile telephones in rural Bangladesh. In Bangladesh, the telephone penetration rate is one of the lowest in the world, even the lowest in the South Asian region. The number of phones including both fixed and mobile is only 3 per 1000 people while it is 5 in Nepal, 15 in India, 20 in Sri Lanka and 25 in Pakistan. About 90% of Bangladesh's villages lack any access to a phone. In 1997 when Grameen Telecom launched its rural service, the rural telecom market in Bangladesh could be said to be almost non-existent. The VPP began with just 50 in 1997, as of December 2000; the number had grown up to a total of 3,390 village phone subscribers. During the study period (1999) the number of VPPs was 1180. Grameen Telecom's target is to install 40,000 Village Phones by December 2002.

2. OBJECTIVES AND METHODS OF THE STUDY

The overall aim of the study is to assess the efficacy of the VPP in ameliorating the *information poverty* of the villages that have obtained access to mobile phones. More specifically, the study has sought to describe the ways in which the VPP is operated, how the service is utilised and by whom, and the impacts of the service in terms of economic and social empowerment of individuals and communities.

⁴ Clergyman or religious head of Muslims

At a general level, Coates and Jarrat (1990) have suggested a series of typical social impacts of mobile phones:

- Acceleration of transactions, thereby providing competitive advantages,
- Expansion of scope of short-term transactions, e.g. the convention of on-the-spot meeting,
- Production of more choice (a buyer may e.g. compare prices in one store with those of another with a call from the first location),
- Provision of opportunities for immediate feedback, e.g. phone voting,
- Stimulation of certain kinds of actions (both desirable and undesirable ones),
- Increase in public and individual safety,
- Alteration of concepts of time, space, and distance,
- Raising expectations.

The formulation of more specific research questions has been guided by the notion of *information poverty* (Nafstad and Iversen 1996), which seems a particularly pertinent one as regards rural Bangladesh. Here, the term is meant to denote a situation in which an inadequate telecommunications infrastructure leads to limitations on the choices available to individuals because high costs of communications makes it too costly to seek out information about alternatives courses of action.

The structure of hypotheses spelt out in figure 1 has also been guided by the theory of *asymmetrical information* and *cultural perspectives on collective action* as well as by a review of literature on previous experiences with technology-driven development projects. Asymmetrical information is a characteristic of situations in which the quality of the object of the exchange is fully known to only one of the parties. Familiar situations of this kind are the purchase of a used car, a visit to the doctor, or the services of other specialists. Asymmetrical relations may reduce the volume of transactions that would otherwise take place because of the inherent uncertainty. A number of social mechanisms exist to rectify the problem and thus encourage transactions, e.g. the sale of goods and services with guarantees attached, or the introduction of licensing or quality programmes. Sometimes the utilisation of special information is downright prohibited (insider trading). A reduction of the asymmetry of information distribution is expected to improve the functioning of markets (Olsen 1990). Asymmetrical information may also become the basis of power relations. Such relations can be observed in an extreme form in Bangladesh where an illiterate majority depends on transactions with a literate minority. Cellular phones may

have the potential to even out the distribution of information and thus reduce such asymmetries as those described here.

In recent elaborations of the theory of collective action the cultural foundations of collective action has been emphasised. *Trust* has been shown to be a prerequisite for collective action, i.e. for overcoming the free-rider problem (Putnam 1993, Fukuyama 1995). Interpersonal trust has cultural roots. Societies vary with regard to the inclination of people to trust each other spontaneously. In low-trust societies collective action is difficult to organise beyond the extended family or the village. Such societies tend to be socially fragmented and highly state-centred. State authority provides a substitute for the social cement of the mutual trust of civil society. France is often mentioned as a European example of a low-trust society whereas the Scandinavian ones are regarded as instances of high-trust settings, and so is Britain. In Asia, China is seen as a low-trust culture whereas Japan is the opposite. Bangladesh should probably be classified as a low-trust society (Jamil 1997). The introduction of cellular phones in a low-trust context is expected to facilitate transactions that might otherwise not take place or take place at higher costs. A cellular phone may enable the parties to check out on the spot information given by the other and thus allay fears of being cheated.

The first perspective suggests that access to mobile phones may serve to reduce information asymmetries and thus lead to more transactions being undertaken, increasing the income of individuals as well as that of communities as the total volume of transactions in a community increases. Similarly, an effect of the mobile phone may be to act as a substitute for lack of trust because it allows the user to check out the other party and thus increase willingness to engage in transactions with that person. Consequently, as the number of phones and phone calls grow in a community, the volume of transactions should be expected to grow.

2.1. An analytical model

The basic research issue of the study is the identification of processes that influence the success of the VPP operations. What are the factors that make for success or failure in an intervention of the type that the VPP represents: a technology-driven development initiative? As indicated above, the history of development initiatives is littered with stories of failures of such projects.

The approach adopted here for the analysis of this issue is a demand-and-supply model supplemented with contextual analysis. Basically, we expect the intervention to succeed if it

meets a demand and the supply is adequate technologically and in terms of the costs that the customer is willing or able to bear. However, demand as well as supply may be influenced by contextual factors that also impinge upon the success of the VPP. These contextual factors may be related to the economic, social and cultural make-up of the communities into which the VPPs are introduced. Some economic activities may generate more demand for phones than others; businessmen may have the need for more calls than peasants, for example. Communities with many migrant workers living abroad may grasp the opportunity for better communications more eagerly than settings where there are fewer migrants. And some VPP holders may be more active in promoting the service than others so that the supply side is different; also, the technology may work better in some places than others for geographical reasons. Furthermore, cultural factors may also come into the equation. For example, more conservative communities may take longer in getting used to or accepting new gadgets; they may also object to women as operators; and both situations may hamper demand. Changing the supply-side by letting men take over the day-to-day operations may stimulate demand in such settings. The basic model is indicated by the figure below.

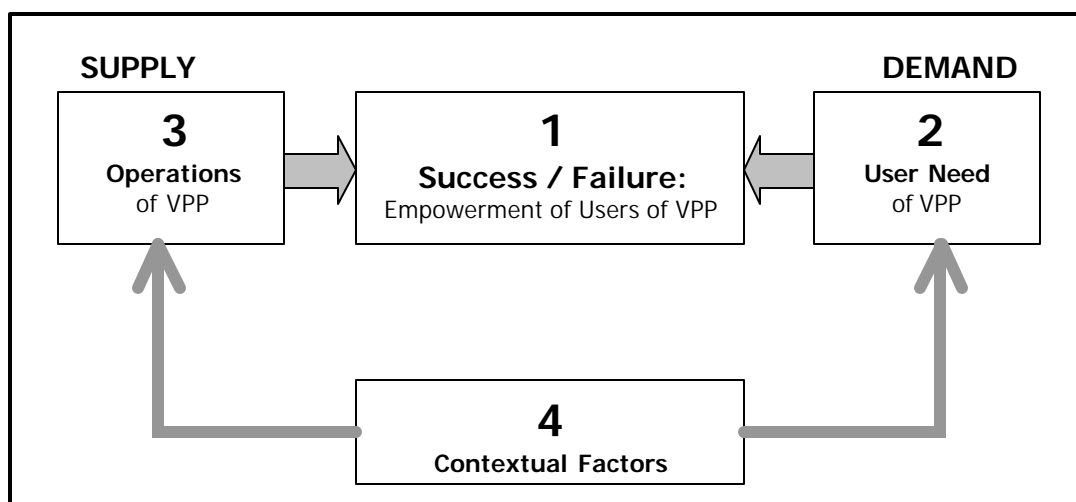


Figure 1 : An Analytical Model of the VPP Intervention

1: *Success and failure* is measured in terms of empowerment of the clients of the VPP. The data for this measure come from the self-reported benefits of VPP use that the clients have indicated in their interviews and also from observations made by others (cfr. below). Empowerment is seen as a relational concept. It implies improvements in the mastery of daily tasks or a reduction of dependency in relations that are of importance to the users of the

telephone services. For farmers in the Bangladeshi context, for example, this may include better information on prices in different markets, so that dependency on one particular buyer is reduced. Because of weakly developed means of transportation it is often not possible to make a journey to more than one market or one buyer in one single day. For traders it means easier access to potential customers and access to a broader band of suppliers. And in the strongly family-oriented culture of Bangladesh the telephone may mean better contact with family members, often migrant workers, living in a big city or making a living as a guest worker abroad. Contacts with political authorities may also be made easier over the telephones, for example making the *tadbir*⁵, the traditional benefit exchange plea, to a politician. For women the telephone may not only improve the earning capacity for those (few) who become VPP operators, it may also help the female users in whatever income generating activities they are engaged in, or provide them with information that make them less dependent on their husbands.

Success or failure of the VPP are assessed based on information in seven different areas:

- General uncertainty reduction as a result of access to telephones
- Improvements related to economic activities or occupation of the client
- Reduced need for transport/travel (to obtain information)
- Improved family contact and relations
- Improved social standing of the client
- Better contact with political-administrative authorities
- Impacts on gender relations

The VPP is expected to work as a *ripple effect technology* rather than as a segmentation impact technology. A ripple effect technology is one with a multi-stranded impact rather than one that creates pockets of modernization in a traditional society. In ripple effect technologies impacts spread cumulatively across many aspects of the life of individuals and communities, starting a transformative process of development.

2: *User need* is an indirect measure arrived at by classifying the users into categories that supposedly have different communication needs, such as housewives, businessmen, peasants, etc., or into age and education groups. The general expectation is that the impacts of the

⁵ A tradition of highly personal lobbying designed to secure individual benefits (Kochanek, 1993: 50).

telephone, as suggested by the list of indicators above, will vary from one group of clients to another. In order to be rated a success the VPP should also have a broad band of client groups. However, in the Bangladeshi context it may be realistically not to expect the most numerous groups, such as peasants or women, to be among the most frequent users. Better-educated people and for example businessmen may be the dominant users, at least at first. However, the numerous absent, migrant workers that have emerged as feature of Bangladesh in recent years may enhance communication needs for family purposes. This should also stimulate female demand for telephone use.

3: According to our observations, *VPP operations* are fairly standardized and are therefore not systematically analyzed in relation to user empowerment; however, some indications of technological and other problems in VPP operations are reported, and so is the holders' perceptions of the impacts of the VPP. Furthermore, the introduction of female operators may represent a general barrier to the widespread use of the VPP for cultural reasons (cfr. below).

4: The *contextual category* is first of all that of rural Bangladesh in general. The null hypothesis of the project based on the fate of previous technology-driven development projects that are reviewed above, is that the use and acceptance of mobile phones will spread very slowly because of cultural and social features of rural villages in Bangladesh. In many cases the VVP may be rejected. The average village is characterized by poverty, high levels of illiteracy, inward-looking traditions, and power-structures that tend to favor a small village elite when it comes to taking advantage of development initiatives, especially those coming from the government. An alternative communication channel such as the VVP may be seen as threatening by the elite in their role as middlemen between the poor majority and the larger world. As mentioned above, the reliance on female VPP operators may render such an outcome even more likely, since men in general may feel provoked by having to seek out a female operator to make a call. This may make it easy for the village elite to block VPP operations. However, the special institutional features of VPP management that GrameenPhone has put in place, may off-set such a chain of rejection.

3. Methods of data collection

The study was based on a sample survey of 350 VPP owners/operators and users (in our project, 20 different locations were chosen for closer study, 158 users were surveyed, and so were 85 operators, 55 key informants, 75 distant beneficiaries and 50 respondents from

control areas). Samples were drawn on the basis of geographical locations and time span of the introduction of VPP in the locality. In addition, a number of distant beneficiaries (persons who had received call from VPP) were interviewed. The study has also interviewed a number of community dwellers as '*key informants*' to investigate how people in general perceived the impact of VPP. Furthermore, respondents from selected *control areas* (respondents from a village which is beyond the command area of VPP) were also interviewed. Five sets of questionnaires were used i.e., for VPP owners, VPP users, key informants of the village covered by VPP, distant beneficiaries (those who receive calls from the VPP), and respondents from control areas. To supplement the survey some case studies were also carried out.

3.1 Profile of the VPP stakeholders

a. Demographic profile

Age: Telephones are for the younger generation

Generally, the users are younger than the owners. Around 75 % of owners are between 35 and 55 years old, with the largest group in the 35-45 age bracket. Among the users the largest age group is the one aged 24-35 years old, with 19 % less than 25. Few users are above 55, so the use of the telephone is definitely something for the younger generation.

Gender and marital status: Owners are married women, users are predominantly men

Most of the owners (92%) are female while the majority of the users (88%) are male. Except one, all of the owners are married. This fact reflects the high marriage rate in rural Bangladesh; it is very rare for mature women to remain unmarried. Fewer of the users (68%) are married, which is natural since they are also younger

b. Socio-economic profile

Education: Users are better educated than owners and both groups are above average

The level of literacy is higher than average for rural Bangladesh (illiteracy is around 70 %). Only 4 % of users and 12 % of owners are illiterate as against an 80 % illiteracy rate for adults in rural Bangladesh in general. More than 80 % of users have education beyond the primary level, while among the owners 47 % are educated beyond the primary level. In terms of education both groups represent something of an elite in rural Bangladesh. The difference in educational levels between users and owners reflects the contrast in school attendance

among boys and girls, the owners being mostly female and users male. Still, the relatively high education of the owners is to be expected given the selection criteria of the VPP.

Occupation: Holders are housewives, users are traders and entrepreneurs

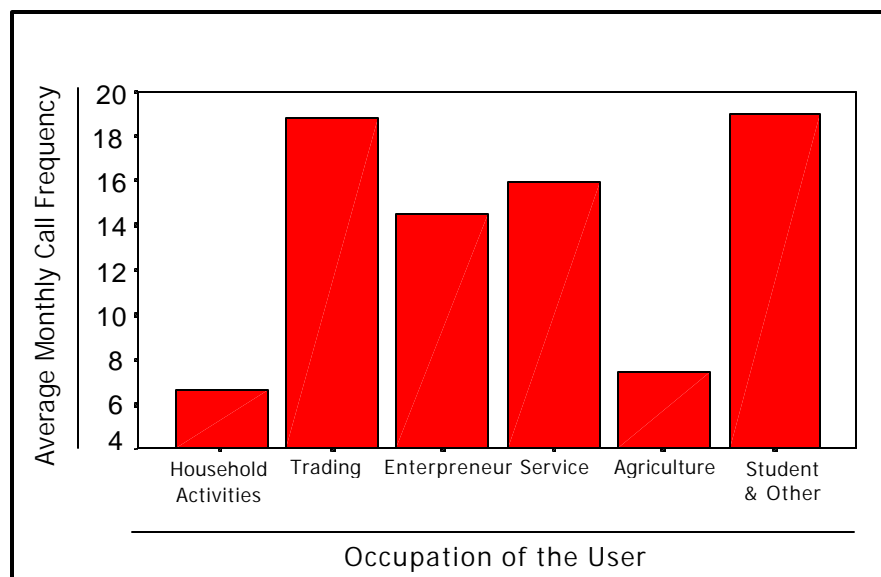
Most of the owners (78%) are primarily housewives engaged in household activities. Users, like the owners, are not a typical sample of socio-economic structures of rural Bangladesh. Agricultural occupations are strongly under-represented while traders and entrepreneurs are over-represented. However, in terms of communication needs the two latter groups are professions that could be expected to feel that the mobile phone was an answer to a long-felt need, while a farmer or a farm-hand might feel they could continue to get along without the telephone.

3.2 Call patterns

Call frequency: Many users call almost every day; traders call more than others

In the figure below the call frequency of various occupational groups is analyzed. As expected there is a conspicuous contrast between the groups as to the number of calls they make. Traders, service providers, entrepreneurs and students are the most frequent users of the VPP, while agricultural occupations and housewives are more intermittent users. The calls are therefore probably driven mostly by professional and economic motives.

Figure 2: Distribution of Average Monthly Call Frequency by Occupation



Purposes of calls: Social and business

Social motives top the list of purposes of the calls made. Of these again it is calls to family members and relatives that dominate. Business purposes come second while official (government-related) and political errands are quite rare. The latter pattern may reflect the limited role that the government plays in the life of the villages.

3.3 Impacts of the VPP

The study has sought to identify the impacts of the VPP in individual and community life.

«Impact» refers to *the difference* that access to the VPP has meant to the individuals in the study areas. Assessments of impacts are based on the self-reported advantages of VPP access that the interviewees have indicated.

a. Business-related impacts

Below, a number of business-related advantages are reported. Access to the VPP has above all meant the creation of more opportunities and choices, but it has also provided help in managing uncertainty. Moreover, existing business relations have been strengthened

Table 1: Business-related advantages of VPP. Pct. of total.

<i>VPP has helped in</i>	<i>Frequency</i>	<i>Percentage</i>
Providing more choices for decision making	124	79
Taking uncertain decisions	108	68
Strengthening relationships with business partners	94	60
Motivating himself in taking new initiatives	85	54
Creating new economic / income generating opportunities	64	41

% based on case, not on responses. Because of Multiple Responses, total exceeded 100%.
Valid Cases = 158

Voice of a user

I call mostly for business purposes. I sell eggs to a middleman. Before having VPP, I had to accept the middleman's price offer for the eggs because I had no other way to know the market price for eggs in the bigger markets. VPP gave me the opportunity to verify the market price of eggs. Now, before I sell eggs to middlemen, I do verify the market price in the nearby

markets and I only agree to sell when I get a good price. Now I feel much more confident as I have gained bargaining power with the middlemen who mostly deprives us from our profit.

Table 2: Advantages of VPP to users as to collection of information. Pct of users

<i>Advantages</i>	<i>Users (%)</i>
Reduced access time to information	44
Feels more secure through transmitting the message instantly	40
Reduced feeling of physical distance to the information center	30
<i>Reduced communication expenses</i>	28
Negates physical presence	26
VPP has become an information center, can easily be shared	18

% based on cases, not on responses. Because of Multiple Responses, total exceeded 100%.

The advantages that the users feel the VPP has given them in business transactions is above all related to the reduced access time to information. Many also mention an enhanced feeling of security by being able to convey messages rapidly. Reduced communication expenses are also important to many.

It has already been mentioned that a number of the community people were interviewed as '*key informants*'. Key informants were questioned about how people in general perceived the impact of VPP. The key informants were teachers, businessmen, members of the elected local body, service providers, village doctors, *matabbar*⁶, and *imam*. Some of these key informants were also users of VPP and some were non-users or potential users. Basically, key informants were questioned on their perception about the impact of VPP. Key informants are generally of the opinion that VPP has played a positive role. When asked about the overall impact of the introduction of VPP, the majority of key informants (49%) stated that VPP had reduced access time to information, and 37% agreed that VPP had reduced the feeling of physical distance of the information center.

Most of the key informants (86%) have opined that VPP eased availability of market information for the rural suppliers. Also, a considerable percent of the key informants (26%)

⁶ Village head

considered that rural suppliers could get price information more easily, and 16% noted that VPP have expanded the market for the traders.

Table 3: Key informant’s opinion regarding VPP’s impact on the rural market. Percent distribution.

<i>Impacts of introduction of VPP on rural market</i>	<i>Key informants (%)</i>
Rural suppliers could more easily get market information	86
Rural suppliers could more easily get price information	26
Market is expanding	16

% based on responses, not on cases. Because of multiple responses, total exceeds 100%.

b. Social and family relationships

In rural areas people remain isolated from their family members and friends who do not live in nearby places. Also, Bangladesh being a manpower exporting country, as many as 3 million Bangladeshi, mostly semi skilled and unskilled laborers, live abroad, many of them in the Middle East and Far East. There is also a good number of non-resident Bangladeshi working both legally and illegally in various European and North American countries. These expatriate Bangladeshi and their relatives mostly stay in touch through letters. As most people in rural areas are not literate, they depend on others to write letters for them. Hence, in letters they cannot maintain privacy and are prevented from instant sharing of joys and sorrows. Thus, VPP has the potential to provide emotional relief for people by allowing them to contact their near and dear ones in situations of privacy. VPP can also be of potential help in situations where medical advice and assistance is needed. Furthermore, rural women are more isolated than men in Bangladesh because of the traditional *pardah* (seclusion of women from men) system. After marriage, many women are deprived of visiting their family because of the prevailing male-dominated cultural practices. They are expected to concentrate on their household duties, and they themselves cannot take the decision to visit their parents since their husbands and in-laws exercise authority over them in such matters.⁷ In such a situation, the VPP represents an opportunity for a woman to maintain contacts with parents, brothers and sisters.

⁷ Women and Society, A Status report on the Women, Dhaka : Women for Women.

VPP has been quite extensively used for making social calls. VPP owners have reported that social calls⁸ dominate among both the incoming calls and outgoing calls. This pattern is also brought out in the table above on the purposes of the last five calls. In many cases these social calls also have business purpose. When a migrant laborer calls to his family members in most of the cases the call includes a message related to monetary transactions, i.e., sending of money, receipt of money, purchase of live stock, land, construction of house, etc.

Voice of a user

After the introduction of VPP, my husband calls me from Saudi Arabia quite often. He mostly inquires about our whereabouts, children's health education and also informs me how much money he has sent to us and also advises me how to spend the money. Last time when he sent money he asked me over the phone to buy three cows so that they can be sold during Eid-ul-azha⁹ so as to get higher price during that time.

VPP has notably affected family relationships. A large majority of users (77%) have voiced highly positive opinions with regard to the VPP's impact on overall family relationships. It has enabled people to keep up contacts with relatives who live apart from them. Many calls have been made to far-away places. As pointed out above, a great number of Bangladeshi nationals work as migrant laborer outside the country. Furthermore, rural urban migration is a common feature in Bangladesh. A substantial proportion of these migrant people live without their spouse and children. VPP has allowed them to keep regular contacts with their family members.

c) Changes in conceptions of time and space

i) Time and cost saving

Most of the users (96%) reported having saved time through VPP. Savings seem to have been substantial for most purposes for which the telephone was used.

Most of the users (96%) have also stated that VPP has enabled them to save on transportation costs. For the majority of the users transportation cost savings have been within Tk. 500

⁸ Social calls refer to calls made or received by the users for exchanging greetings between and among friends, relatives, family members, for knowing whereabouts of the family members, relatives and friends.

⁹ A major religious festival for the Muslims.

(72%) in a month. Only 3% of the users could save transportation costs above Tk. 2000 in a month.

Voice of a user

Before I had access to VPP, I had to go to Dhaka almost 20 days in a month for business purpose. Now I go to Dhaka 5-7 days in a month. Each trip it used to cost me Tk. 200 at least. Hence, VPP has drastically saved my time and transportation cost. It has also reduced tension associated with travelling.

Voice of a user

I supply construction material in this locality. Before the introduction of VPP I had to go to the local dealers quite frequently about purchase of construction materials. Now I mostly make contact with the local dealers over the phone. It has reduced my communication expense and time significantly.

ii) Spontaneous adaptation to situations and availing of opportunities

Nearly half of the users (49%) considered that VPP helped them to prepare better for natural disasters that so often can happen in Bangladesh. However, only 39% of the users have used VPP for seeking medical assistance (against 72% of the owners). The low rate of medical-oriented use could be a reflection the nature of health service seeking behavior of our rural population. People in our rural areas generally visit traditional healers (spiritual healers, homeopathic doctors, village quacks etc.) rather than health service delivery points. The latter cannot, as a rule, be reached via the phone.

iii) Mobility

As VPP has affected users' and owners' time and cost, consequently it has also had an impact on the transportation needs of the users and owners. Most of the users (91%) and owners (95%) have confirmed that VPP has affected travel patterns. For the users, the VPP's impact on transportation costs is significantly correlated ($r = .60$ sig. 001 level) with VPP impact on travels. Fewer trips mean less travel costs. Among the users, 38% have stated that their frequency in traveling for business purposes was reduced and 23% have said that they were not required to travel at all after access to VPP. 16% of the respondents have mentioned that their frequency in traveling for official purpose had been reduced.

3.4 Empowerment

Figure 1 in this paper is a representation of the dynamics of empowerment. Empowerment is the reduction of dependency relations. The figure emphasizes the role of communication and information in producing alternatives and choice and thus breaking cycles of dependency. The VPP is a channel for communication and dissemination of information about alternatives. A by-product is the opportunity for maintaining or widening social networks, which again may produce more information.

In rural Bangladesh, people have very little scope for choice in work or social relation but remained confined to the village and its limited income earning opportunities. The scope of women is even narrower than that of men. In the table below various modes of empowerment are presented along with the extent to which these have had any significance for the respondents.

Table 4: Empowerment: How VPP has changed the life situation of respondents. Percent distribution.

<i>Modes of empowerment via VPP</i>	<i>% of owners</i>	<i>% of users</i>
Income is increased	95	44
Gets opportunities to take part in decision making	55	47
Social networks have been widened	96	87
Considered as a source of information	76	45
Involved in business transactions	72	59
Gets more access to latest information	76	76
Gets to known to more people	96	64

% based on cases, not on responses. Because of Multiple Responses, total exceeded 100%.

Owners as well as users have experienced a variety of changes after their access to the VPP. The changes have been more pronounced for owners than for users, which may be natural since the VPP is a direct income opportunity for the owners. Being mostly women, owners may also have started from a more restricted life situation than the users did. Increased income, widening networks and more business are effects experienced by both groups. Below, more detailed information is presented with regard to the various benefits mentioned.

a. Economic Empowerment

Economic empowerment refers not only to increases in income but also to having control over resource and resource management, decision making power, involvement in and control over economic transactions. Obviously, VPP as a business venture provides an opportunity for financial gain for the owners. VPP as an investment has been found to be profitable for most of the owners (94%). Also, most of the owners (95%) have said their income have increased through VPP. More than half the owners (59%) have stated that their monthly profit margin has been between Tk. 1000-3000¹⁰. However, a notable percent of the owners (24%) have profit margin of Tk. 1000 and below. Very few (5%) have informed of having profit margin of Tk. 5000 and above.

VPP has brought significant changes in the range of average monthly income of the owners, as shown in the table below. Before the introduction of VPP, 20% of the present VPP owners had an average income of Tk. 1500 and below. After the introduction of VPP the proportion of owners belonging to the income range of Tk 1500 and below have been reduced to 7%. Also the proportion of owners belonging to the income level of Tk. 1500-3000 has decreased from 33% to 12%

On the other hand, the proportion of owners belonging to the income level of Tk. 3000-6000 has increased from 24% to 33%. After introduction of VPP, a significant increase has been seen in owners belonging to the income range of Tk. 6000-9000 and Tk. 9000 and above. Before the VPP, only 9% of the present owners had an average monthly income ranging between Tk. 3000-6000. After the introduction of VPP the proportion of owners with an average monthly income of Tk. 3000-6000 has increased to 22%.

In the majority of cases, the income of the owners has increased with the length of the VPP owning period. The greater the length of ownership, the higher has been the increase in income. So apparently, as an income opportunity, the VPP has been a success for the owners.

b. Social Empowerment

i) Widening Contact Group

VPP has had a remarkable effect in widening the network of the beneficiaries. Most of the users (96%) have spoken in favor of VPP with regard to its contribution in widening their

¹⁰ US\$ 1= Tk. 58 (Taka is the name of the Bangladesh currency)

contact/clientele group. Almost two thirds of users (63%) have stated that VPP has helped in widening their contact group to a great extent. The VPP's impact on the expansion of the social circle of the users is significantly correlated ($r = .31$ sig. 0.05 level) with an increase in their incomes. Obviously, gains in social capital are related to financial gain. A similar pattern is found among the owners.

Voice of a user

Use of VPP has led to a significant widening of my business network. Now I can communicate with many people through some one else's reference and can easily establish business relationships. Before having VPP, it was not always possible to establish contact with people because in many cases it was not cost effective on my part.

ii) Social Image

In rural Bangladesh, owning a phone is a symbol of social prestige and power. Hence, the VPP may also be a factor of social prestige for the owners. It is not because VPP owning is related to income earning, rather owning a VPP itself bears the mark of social prestige and honor. As mentioned above, the house of the VPP owner is commonly named as «**Phone Bari**» (house with phone). In some cases the VPP owner is also lightly called **Phone Bibi** (lady with phone).

Most of the owners (93%) held the opinion that owning VPP has brought them social prestige. The majority of owners (60%) have stated that because of VPP people respected them more. Also a significant proportion of owners (39%) say they that because of VPP they have become a «reference personality».

iii) Change in bureaucracy-citizen relationships.

People may have to contact public offices and officials for many different purposes including dispute reporting, information gathering, official reporting, complaining, *tadbir*, political influencing, etc. In Bangladesh, getting a job done or collecting any information can be time consuming, particularly in public offices. People may have to go to the public offices or contact public officials repeatedly even for small errands. It is more difficult for poor people without good connections. The introduction of VPP has made it easier to reach the bureaucracy. Through the VPP users can communicate more easily with the *thana*, (the local administrative center), GOB officials and political leaders, especially with members of

parliament. They do call them for varied reasons. Comparatively more calls are made to GOB officials and political leaders and fewer calls are made to the thana.

c. Women's Empowerment

VPP has created an income generation opportunity for rural women. It has also provided scope for interacting with a wider cross-section of people. Before having VPP, women's access to phones was difficult. To assess if VPP, besides financial gain, could also facilitate the economic empowerment of women, the study in addition to probing VPP owners' feeling about their empowerment, has also taken into account the users' and key informants' perceptions.

When owners were asked about the VPP's role in empowering women, most of them (81%) stated that VPP had added to their social prestige. Now they are known as VPP owners and this has indeed changed their social image. To them, ownership itself is a matter of social dignity even though in most of the cases they are not responsible for the day-to-day operation of the VPP (cfr. below).

From the point of view of women's economic empowerment, it is also vital to take into account who is responsible for the actual operations of the VPP. Because of the very nature of Grameen Bank policy, most of the VPP owners are female (920%). However, only 4% of the VPPs were operated by the female owners themselves. 96% of VPPs are operated by male family members of the female owners. A significant proportion of those who operate the VPP without owning it, happens to be the spouse of the owner (40%). Another group of operators are parents of the owner (28%). In many cases the VPP owner did not keep any records of the VPP operation but only took a percentage of the income generated through the VPP by someone else.

Voice of a VPP operator

I am nephew of this VPP owner. I operate this VPP from my shop. I also make use of VPP for my personal purpose. I operate this VPP because my uncle remains busy with his business and cannot give time to the VPP. My aunt does not keep any record of the VPP, she does not have any connection with this VPP except receiving a portion of the income. Every month I just give her a portion of income generated through this VPP.

3.5 Impact on the distant beneficiary/user

It has been assumed that the introduction of the VPP besides affecting the owners and users also affects people who are the regular contact persons of the VPP users. The study has termed them '*distant beneficiaries or distant users*' of VPP phones. Distant beneficiaries in this study include traders, service owners, students, local political leaders and housewives.

The following section elaborates on the experiences of the distant beneficiaries. All of the distant beneficiaries stated that they had indeed benefited by the introduction of the VPP. The most commonly stated benefits were: reduced communication time (100%), saved communication cost (88%). Also a significant percent of the distant beneficiaries felt that the VPP had extended their communication network (36%), and that the VPP had widened their business network (56%).

Before the introduction of VPP, communicating with the present users was a cumbersome process on their part. The distant beneficiaries were required to go physically themselves or send a representative. Sending letters took a long time. Most of the distant beneficiaries (80%) often contacted the present users by sending their representatives. A significant percent of the distant beneficiaries had relied on non-VPP phones (64%) and sending letters (44%). 28 % of distant beneficiaries were receiving 1-5 calls from the users per week. 44% made 1-5 calls to the users per week.

4. SUMMARY ANALYSIS: WHAT ARE THE MOST IMPORTANT IMPACTS OF THE VPP? WHAT DRIVES THE IMPACTS?

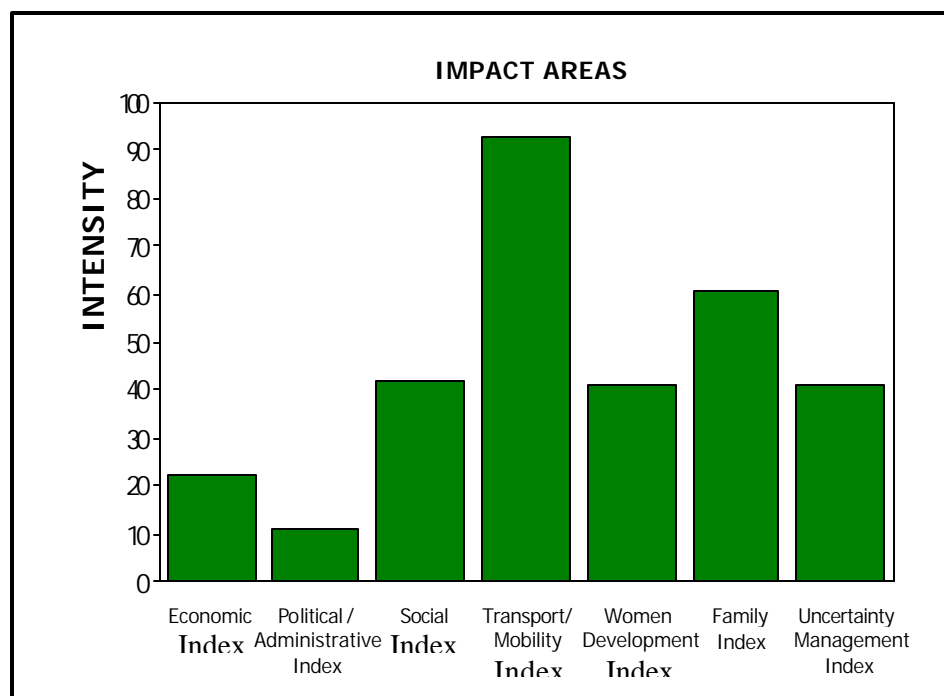
As shown above the VPP has brought changes in social and economic relations of many individuals. So far a quite rich and varied picture has emerged. A series of impacts have been identified, most of them in the expected direction. It is more difficult, however, from the preceding detailed analysis to assess the relative magnitude and significance of the various changes and impacts. In this section the aim is to arrive at a more overall understanding of the impacts of the VPP and the forces that help shape those impacts. Therefore, some summary measures of impact have been constructed. Next, the significance of contextual and demand factors in bringing about those impacts is analyzed. The answer to the last question may help

identify the factors that impinge upon the success or failure of the VPP specifically and upon technology-driven development in general in a context such as rural Bangladesh.

4.1. What are the most important impacts of the VPP?

In order to obtain a summary picture of the impacts of the VPP all the variables seeking to identify such impacts were re-coded into dichotomous variables (cfr. appendix). These variables were then subjected to factor analysis. The factor solution yielded eight different factors. The factors could be interpreted quite readily in terms of the overall objective of the study. The factors were then used as guidelines for the construction of indices for impact dimensions. These indices can also be interpreted as dimensions of empowerment associated with the VPP. The indices were standardized to a scale of 0-100. The figure below shows the results of the analysis. It should be noted that the analysis is based on data about *users* only.

Figure 3: Impacts of VPP as assessed by users. Scale: 1-100.



Pct. of cases with index values=1

The strongest impacts of the VPP are found in the areas of transport and mobility and family relations. The VPP enhances the geographic reach of the users while at the same time reducing the need to travel to obtain information. These are, of course, quite obvious effects

once the VPP becomes operational in an area. However, the ability to make the VPP operational could not be taken for granted; therefore, data have also been collected on seemingly «obvious» aspects of the telephone's benefits. There are also significant effects with regard to the social life and status of users, women's empowerment and uncertainty management in general. Surprisingly, the VPP has had less of an impact on the economic activity of the users. However, it should be remembered that it was previously found that the direct economic benefits were more pronounced for owners than for users; for the users economic benefits were primarily of an indirect nature.

Overall, then, the impacts of the VPP are to allow for a more efficient use of time and to enhance social and family relations by making it possible to stay in touch more frequently and more directly. In a family-oriented society such as Bangladesh this is no small advantage. Easier access to information through the VPP also reduces uncertainties and anxieties in daily life and helps making quicker and better decisions in the various occupations that the users are engaged in. This must be regarded as a step towards a more efficiently functioning society. This has also meant an increase in the volume of social and economic transactions as a result of the VPP, as predicted by the theory of information asymmetry as well as that of social capital.

4.2. Dynamics of empowerment - segmentation or ripple effects?

What is the change or development dynamics flowing from the introduction of mobile phones in a traditional village setting? As suggested in the introduction, the dynamics of change may sometimes lead to highly segmented development or the emergence of modernized pockets, with little further impacts on the surrounding society. A bifurcated development pattern is characteristic of many third world countries: a small modernized strata existing in a sea of (mostly rural) traditional occupations and lifestyles. In contrast, technologies with ripple effects spread their impacts gradually throughout society from the points of their introduction.

Above, the impacts of the VPP have been classified into seven types or areas of empowerment. Of these seven types, impacts with regard to transport and mobility, family relations and female empowerment were the most common. To what extent do these impacts occur in isolation, one by one, or in clusters? If they occur in isolation, i.e. impacts on family ties or female empowerment are unrelated to other types of impacts, then it is suggested that

the VPP drives a segmented pattern of development. If, in contrast, these impacts are highly interrelated, then ripple effects are suggested. The VPP can then be expected to contribute to a more widespread and far-reaching social transformation. The pattern may also be something in-between: a pattern of configurations in which some effects are interrelated whereas others occur more independently.

In order to answer these questions correlation and factor analyses were performed to ascertain how the range of impacts mentioned above group together. The most widespread type of impact, i.e. on transport and mobility, is positively correlated with female empowerment and individual economic improvement, whereas the latter is also correlated with social improvement and ease of political and administrative contacts. Female empowerment is correlated with uncertainty management besides transport and mobility impacts. It should be pointed out, however, that since the data analyzed here are responses of individuals, the configurations identified are those of interrelated impacts for individuals. Impacts at societal levels are inferred from these, not actually observed.

Factor analysis of the seven types of impacts yielded three distinct factors: a socio-economic cluster, a female empowerment cluster, and a family oriented cluster. The first of these suggests that economic improvement go together with enhancement of social standing, smoother political-administrative contacts coupled with changes with regard to transport needs. Female empowerment is closely related to improved uncertainty management (better information in general eases decision-making) and with some connection also to (reduction of cost of) transport. The latter suggests that women who have been restricted by the limited range of information available because of limitations on travels (because of a combination of costs and customs), now can make better choices because of information obtained via phone calls.

The family factor is a largely independent factor, not strongly related to other variables; it is probably mostly a reflection of calls made to relatives living abroad; therefore, the transport and mobility situation is not affected, since traveling instead of calling was not an option in the first place. It also seems that those who feel improvements in family relations as a result of the VPP do not make use of the phone for economic purposes. There is some relationship to political empowerment, however, which suggests that strengthening of family ties may

have political repercussions. Perhaps the feeling of empowerment inherent in the ability to overcome long distances by making an overseas call is transferred into more confidence in relation to office-holders locally. However, this must remain speculative for the time being since the calls to political and administrative agencies are so few. Interestingly, although women often make overseas calls to husbands living abroad or in cities as migrant workers, the family factor is not related to female empowerment. However, the lack of a relationship may also reflect the low proportion of women among the users (12 %).

On the whole, then, the analysis suggests that the VPP has the potential to create social ripple effects rather than a segmented pattern of development. The VPP has a broad range of impacts for individual users. Social, economic and political relations as well as family ties may be affected simultaneously. The sum of these broad-banded impacts is likely to be transmitted to the village setting in a transformative pattern of development rather than a segmented one. However, the prominent place of family related calls and family related impacts also suggests that a significant proportion of users do not make use of the VPP in a manner that drives wider processes of development.

4.3. Explaining variations

It has been noted in the preceding sections that there are variations as to the uses and impacts of the VPP. We have suggested a number of factors that may account for such variations, i.e. supply side, demand side and contextual factors. The purpose of the analysis is to identify factors that may impinge upon the use of and benefits derived from the VPP as regards the local users. The analysis is limited to demand side and contextual factors since the supply side factors are fairly standardized at the local level (cfr. section 2.3 on the selection of VPP operators; also, the preceding analysis in chapter 3 did not highlight any pronounced variations as to the local management of the VPP); therefore, they are not expected to drive variations in VPP use and benefits.

Table 5. Factors affecting impacts of VPP (users): regression analysis. Adj. R sq and significant beta coefficients indicated (method=stepwise).

	Impact areas (dependent variables)							
	General impact index	Trans- port & mobility	Family	Social	Women	Uncer- tainty Manag ement	Economic	Political & adminis- trative
Factors (independent variables):								
Age of user	-.258**							
Gender of user (0=female, 1=male)								
Education of user					-.339***			E***
No. of family members of user								
Monthly family income of user (in Taka)								
Distance from the nearest Thana Town (in Km)								
Occupation: Household					-.481***			
Occupation: Trading	.284**		-.299**				.342***	
Occupation: Entrepreneur		-.250**	-.310**					
Occupation: Service				-.344**				
Occupation: Agriculture								
Occupation: Student								
Zones: Chittagong=1 Dhaka=2			-.272**		-.233**			
Call frequency (monthly)						.284**	.277**	
Period used VPP (months)					.329***			
Adjusted R sq	.114	.052	.135	.002	.275	.070	.186	.120

Levels of significance: * .05 level, ** .01 level, *** .001 level

When the table is read vertically, the columns show how the factors (independent variables) affect the level of users' empowerment in a particular impact area, for example family

relations. The higher the beta coefficients, the stronger the impacts. When read horizontally, a row shows the impact that a given factor has across different impact areas.

When it comes to overall impact (general index) summarized for all areas, the driving forces are the age and occupation of users. It is in particular younger users and users who are occupied as traders that has felt the advantages of the VPP. Both of these effects seem intuitively reasonable ones. Younger people are likely to make use of new gadgets more quickly than older people do. And villagers working as traders are likely to be in greater need of getting easily in touch with customers and suppliers, and may hence welcome phones even more than those in other walks of life.

Impacts regarding transport and mobility are not so well explained by our factors, perhaps because these are impacts of a rather general nature and are therefore felt equally much by most users of the phones. There is not so much variation to explain, although the impacts in this area are strong and important.

Family-oriented impacts are felt less by the entrepreneurs than other occupations. Such impacts are, furthermore, more manifest in the Chittagong zone than in the Dhaka zone. The latter may be a reflection of the larger number of migrant workers in the former area, who use the phone to be in touch with their families. This effect may also be a manifestation of the strong regional identity of the region and therefore the strong pull of regional roots.

Women's empowerment is driven by education, occupation, zone and practice as a VPP user. Surprisingly, the VPP is seen as bringing women empowerment more by those with low education than those with higher education. Those working outside household activities see women as more affected than those who are primarily occupied in the home. And again, Chittagong zone dwellers are more prone to see women empowerment coming from the VPP than the Dhaka dwellers do. Such a perception has also a lot to do with how long the user has had access to the VPP. The impact of (low) education may indicate that the VPP is likely to make more of a difference to people with low education than to those with higher educational achievements who have access to information through other channels also. The negative perceptions of householders (mostly housewives) on the VPP's impact on female empowerment may suggest that individuals confined to the house have more difficulty in seeing the wider benefits of the phones. However, they may perhaps also tend to generalize

from their own confined existence to women empowerment in general. Furthermore, women's empowerment tend to be emphasized more the longer the user has had access to a VPP, which can be given a quite straightforward interpretation.

Improvements in uncertainty management (reduction of risks and quicker decisions) are largely a function of call frequency, i.e. how many calls that are made in a month. This can also be given a straightforward interpretation.

Enhancement of economic opportunities is also related to call frequency and also to occupation: it is first of all traders who feel they have become more economically empowered as a result of the VPP. These findings can also be interpreted quite readily as demand-driven relationships.

Finally, empowerment in relation to political and administrative bodies is related to level of education in a manner that is to be expected: those who use the phone to get more in touch with thana administration and political leaders have more education than those who don't.

Reading the table horizontally, it is apparent that there is no single factor or group of factors that explain variations in impact equally much across the board, in all impact areas. However, occupation is an important factor in the call patterns – some occupations (especially traders) have more need of the phone than others. In some areas age and education turned out to be important but not ubiquitously so. Such presumably demand-driving factors as family income and distance from nearest centre play very little role and so does the size of the family. Cultural context indicated by zone was found to matter in two areas, family affairs and women's empowerment: the Chittagong zone is indeed different. The VPP is more important for family ties and female empowerment in the Chittagong than in the Dhaka zone. The larger number of workers abroad may account for the former relationship whereas the more traditional lifestyle of Chittagong may mean that the VPP makes more of a difference there with regard to the situation of women.

5. CONCLUSIONS

The introduction of the VPP in rural Bangladesh represents a unique experiment in high-tech communication in a traditional, low-tech setting. Access to telephones has been a rarity in rural areas. It could therefore be expected that it would take some time for individuals and

communities to get used to the new modes of communication and that hesitance would characterize its introduction. By the end of 1999 the VPP was in stable operation (for at least six months) in more than 500 localities in the Dhaka and Chittagong zones.

The VPP is operated through a unique combination of commercial, government and voluntary organisations (NGOs) and interests. The interaction of state, market and third sector represents a robust management structure. The VPP was initiated by the Grameen Bank and sponsored by an international consortium in which the Norwegian company Telenor plays a vital part with regard to financial support and technical know-how. Signal transmission relies on the fibre optical cable of Bangladesh Railway.

5.1. Overall assessment of impacts

VPP was found to have largely positive impacts in most areas that were studied. The most pronounced impacts were found with regard to a general reduction of transaction costs and uncertainty (reduced need for travel, quicker access to information, more choice). The isolation of many villages has been reduced. The most frequent user groups were traders and businessmen. Peasants made little use of the VPP. So the stratification of the village community may not have been substantially affected by the mobile phones. For women the VPP was an important channel for family contacts and communications, especially with husbands living abroad as migrant workers. Otherwise, the VPP has had little impact on gender relations. Women represent only a small proportion of users - the telephone remains predominantly an instrument of communication for males. To some extent the operation of the VPP served to maintain traditional gender roles in that a male relative of the female holder often managed the VPP.

5.2. Technology and institutional structure

Fears that the new high-tech instruments of mobile telephony would be unmanageable in the context of rural Bangladesh were unfounded. On the whole, the technological management of the mobile phones presented holders and users with few problems (weak signals might be a problem in some areas). The institutional setting of the VPP was also on the whole unproblematic. However, female operation was in many instances replaced by male management, as mentioned above. The main challenge was to make users understand the necessity of paying for incoming calls. This seems to be difficult to make recipients understand.

5.3. Cultural context

The introduction of a high-tech device in traditional communities has gone remarkably well. There were no cases of rejection of the mobile phones and only a very few cases of problems with the local elite. The expected contrast between the Dhaka zone and traditional Chittagong district did not show up to a large extent. The VPP may have been somewhat more important with regard to family relations and female empowerment in the Chittagong area, though. The first impact may reflect the large proportion of migrant workers from this zone. The second may indicate that where tradition has its strongest hold, impacts of the VPP may also be felt more strongly.

5.4. Techno-driven development

The negative impacts of techno-driven development projects that have frequently been discussed in the literature could not be observed in this case. On the other hand, the VPP could also not be said to have altered life of operators, users or communities in dramatic ways. Perhaps that is also the key to the success of the operation: the unobtrusive and stepwise manner in which it is introduced and operated.

5.5. Does the VPP have built-in success factors?

Have the locations of the VPP, the selected villages and operators, been selected on the basis of criteria that guarantee success? This is to some extent the case. Grameen Bank managers with knowledge of local areas and persons selected VPP operators. Areas were chosen in which a demand for phones was deemed to exist. And operators were picked on the basis of characteristics that were presumed to be necessary for the operation of VPPs, such as financial reliability (a record of paying back loans) and certain knowledge of English. There is therefore no guarantee that the success of the present operations could be repeated anywhere in rural Bangladesh. However, the record of the operations so far also demonstrates the good judgement that have characterised the establishment of the VPP and also what may be the necessary requirements for success.

5.6. VPP is ripple effect technology

Development in the third world has often meant the emergence of isolated pockets of modernization, sheltering strata with a different economy and life style. Large swathes of society remain unaffected by new technologies and opportunities. Observations of impacts of the VPP on the socio-economic and political relations of individuals in Bangladeshi villages

suggest a broader transformative potential of the VPP. Individuals experience multi-stranded empowerment as a result of access to mobile phones. These effects are likely to be transmitted to village life in a broader way. Most social and occupational groups are to be found among the users. Although some groups are more frequent users than others (for example traders versus peasants) these variations may be explained by differences in communication needs or demand. However, cultural factors also clearly impinge upon use patterns, creating segmentation among the ripples. The under-utilization of phones by women is one example of that.

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