ADDRESSING THE DIGITAL DIVIDE: E-GOVERNANCE AND M-GOVERNANCE IN A HUB AND SPOKE MODEL

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ABSTRACT

E-governance has been perceived as a key to better governance. Though e-governance is capable enough of reaching to its objective, the problem of last mile connection is still persistent in developing countries due to unavailability of required infrastructure to provide e-governance with required depth. It has been witnessed that developing countries have deeper telephonic/mobile penetration than the internet penetration. Hence the use of telephone/mobile as a tool to supplement e-governance in its last leg becomes imperative. The higher level penetration of mobile connection makes the problem of last mile connectivity somehow redundant. Mobile-governance (m-governance) may be used as supplement to e-governance in a spoke and hub model. It will be helpful in bridging the digital divide particularly in rural areas and also in developing parts of world mainly Asia and Africa. This paper discusses e-governance and m-governance in a spoke and hub model. A generic process will be helpful for faster replication of services and greater penetration.

Keywords: E-governance, M-governance, Digital Divide, Spoke and Hub model, Developing Countries, ICUM, IDM

1. INTRODUCTION

Arrival of internet has a positive impact on different facets of life including business, personal and also at government level. Information and Communication Technologies (ICT) have played a major role in late 20th century and will continue their role in 21st century as well. However technology percolation at the lower level has not been as drastic as improvement in technology itself. Heated debates on digital divide remains a testimony for this. The level of access to internet has remained at poles apart in different parts of the world. As obvious from charts 1 & 2; the digital divide is very large to say the least. Among bottom level internet penetration, last 10 countries do not have even a 0.25% penetration while those in better part of digital divide boast of a penetration rate in excess of 60%. Even among poorly penetrated countries (largely from Least Developed Countries (LDC)) the access is more or less concentrated in relatively developed cities.

As expected, the bottom 10 countries are from Asia and Africa. There are many hindrances to wider availability of internet. Important among them are poor income level, poor educational level, social class and nationality. This has lead to another problem. In studies ITU (2002) it has been found out that there is a strong positive correlation between wealth of nation (measured by Gross Domestic Product (GDP)) and internet penetration level. So with lower penetration level, least developed countries are unable to exploit there existing resources in better way which leads to inefficient use and hence poor level of wealth which in turn prevents expense on relatively sophisticated services like internet as there existing resources are already tied up with social welfare, debt and interest payment and worst in some case purchase of weapons. From the same study it has been found out that the gap between developing countries and least developing countries is increasing in terms of access of internet.
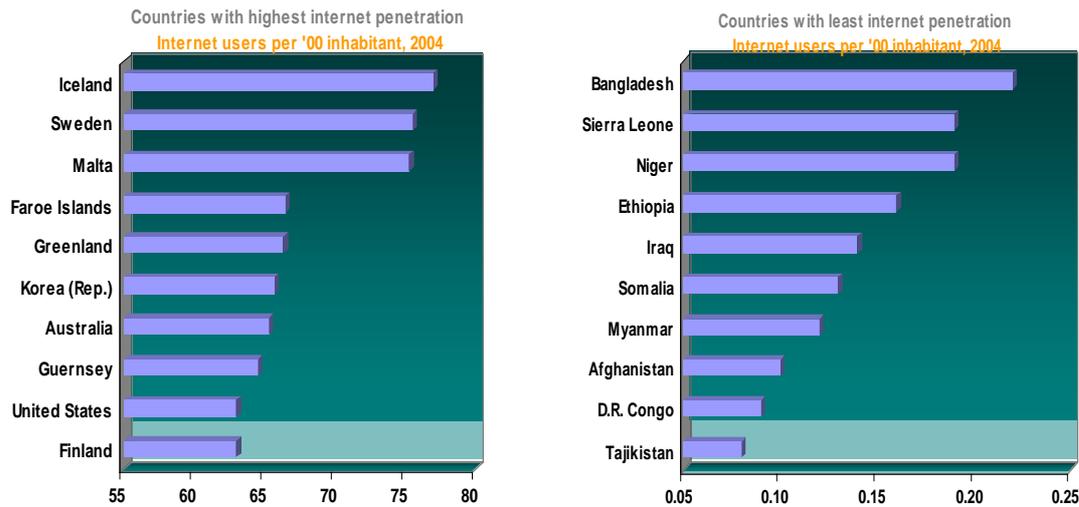
Countries with highest internet penetration
Internet users per '00 inhabitant, 2004

Iceland	
Sweden	
Malta	
Faroe Islands	
Greenland	
Korea (Rep.)	
Australia	
Guernsey	
United States	
Finland	

(55 60 65 70 75 80)

Countries with least internet penetration
Internet users per '00 inhabitant, 2004

Bangladesh	
Sierra Leone	
Niger	
Ethiopia	
Iraq	
Somalia	
Myanmar	
Afghanistan	
D.R. Congo	
Tajikistan	

(0.05 0.10 0.15 0.20 0.25)

Chart based on data of year 2004 from www.itu.int

(ITU: International Telecommunication Union)

Chart [1] & [2]: Internet-Penetration in Top and Bottom 10 Countries,

As it is obvious that the large part of the world remains unconnected and mainly those countries which desperately need e-governance to address lack of development and rampant corruption. While Asia has almost 61% population of world and Africa 14%, their share of internet penetration is very low.

Continent	Internet penetration %
Asia	10.4%
Middle East	9.6%
North America	68.6%
South America	14.7%
Europe	36.4%
Africa	2.6%
Oceania	52.6%

Source: www.internetworldstats.com, as on 30th June 2006

Table 1: Internet Penetration Across Geographies

Continent	Population as % of world population
Asia	60.67%
Africa	13.82%
Europe	11.31%
North America	7.94%
South America	5.76%
Oceania	0.51%

Source: U.S. Census Bureau, International Programs Center, 2000

Table 2: World Population Distribution

Digital divide is becoming evident (Devraj, 2000) in developing countries. Due to poor purchasing power even the same or lowered cost remains a cause for digital divide. Slow speed of internet penetration of internet and disappointing growth-rate of broadband adoption is also an important aspect of the whole scenario.

Modeling the causes of lower penetration of internet; four prominent obvious but mutually dependent reasons could be cited as cost, infrastructure, breadth & depth and social issues.

2.   QUADRA-FRAMEWORK FOR ASSESSMENT OF SERVICE AVAILABILITY

2.1   Social Issues

Internet uses are abysmal in developing countries. Also even in developed world it is dominated by male users in current as well as prospective user's categories. (Katz and Aspden, 1997). In many developing countries and LDC, surfing internet requires dedicated hours and a good deal of travel to nearest cyber café or community center. So the availability is tough for males leave alone the case of females. Also the prohibitive fixed cost and operational cost keep the lower strata of the society out of the loop which hamstrings the purpose of social inclusion. Learning process on internet is slow because of lack of localized content in many cases. Also the various options provided by internet and computer leave the user more confused than confident. Perception of computer as a highly sophisticated machine (mainly due to poor penetration of computers) is still lingering in many parts of the society hence an inherent fear while using it.

2.2   Infrastructure

Except few parts of most developed nations, a good wireless internet infrastructure is present only in few of rest of the world. Hence this necessitates the need of connectivity for accessing the internet. As has been case of many developing countries that the internet connectivity in wired from is not omnipresent. Though mobile/telephone connection is relatively higher; the cost of wireless infrastructure is very high and in most of the cases it is only in capability demonstration phase. The connectivity with the world is a great advantage of the internet, however at the same time it is also one of the biggest factor responsible for poor growth of internet. Putting cables in hinterland where there is significantly very less demand in near foreseeable future, it doesn't make economic sense for most of the players in private sector. Where there is lack of basic infrastructure (fixed telephone lines) rolling out internet facility is tough (Bazar and Boalch, 1997). Further cost of computer hasn't gone down much drastically to justify such a kind of investment at the individual level. Expenditure in tune of $1,000 per person or a small group of people is almost impossible in most of the developing countries. Some breakthrough were made in this sector by few player who tried to provide desktop at the entry price level of $200 in India however efforts were not fruitful as the thin wafer margin required huge demand for sustainability.

2.3   Cost

Even if the infrastructure is somehow present, the operating cost has ensured that the internet remains out of reach from the bottom of the pyramid. Poor speed, erratic connection-drops and pathetic electricity supply has buttressed the cause for no use of internet even in the areas which are advanced in relative terms. Taking into consideration these factor economic costs of satisfactory internet use comes out to be prohibitively high.

2.4   Breadth and Depth

Though it may seem a derivative of above mentioned factors, the dominos effect can not be ignored. With breadth, we mean reach and access to the significant geographical area of particular country while depth may deal with the penetration at the local level in the strata of the society. It may be noticed that given any country some parts are financially and socially affluent than the other part. Also in most of the developing countries the concentration of

good services are in few particular geographical areas. Though reasons may be hundreds e.g. economies of scale; the last word is same 'the accessibility remains poor'. Similar to other expansive services internet also started penetrating through the higher class of the society(mainly technology savvy, academia, industry and high income individuals) after certain time, as and when prices went down, it included more people in its fold. Hence this spread in depth gave greater acceptability of the internet to the different strata of the society.

In the context of developing countries and in particular in rural areas we will discuss the service dissemination parameters to understand the model in a broader sense. Table 3 captures this comparison in brief. The four parameters are Infrastructure, Breadth and depth of services, Cost and Social Issues. Mobile penetration in the world is higher than the internet connectivity. There are several reasons for higher connection. Firstly the need to be in touch has increased considerably. A physiological shift about connectivity has increased the penetration. This fact might have been overlooked earlier due to higher cost of maintaining a mobile but in recent years the drop in cost of calls and mobile connection has made things easier. Further the networking effect of positive network externalities which may be called bandwagon effect has propelled the need of connection. The cost of infrastructure has come down heavily in recent times hence more penetration by mobile operators to generate revenue. Despite so much advances in computer technology the minimum cost of a computer is still in '00s of US$. Also in developing countries there is no infrastructure like accessibility to computers or stable power supply which is required for internet connectivity. The poor narrowband speed has only worsened the situation. Also computers require greater degree of effort to be well versed but on the other hand due to smaller features learning basics of mobile is easier. On this discussion we can see the Table 3 which has captured all aspects.
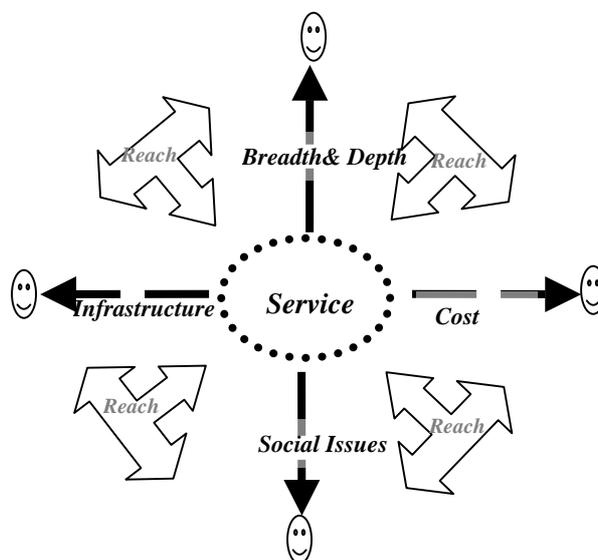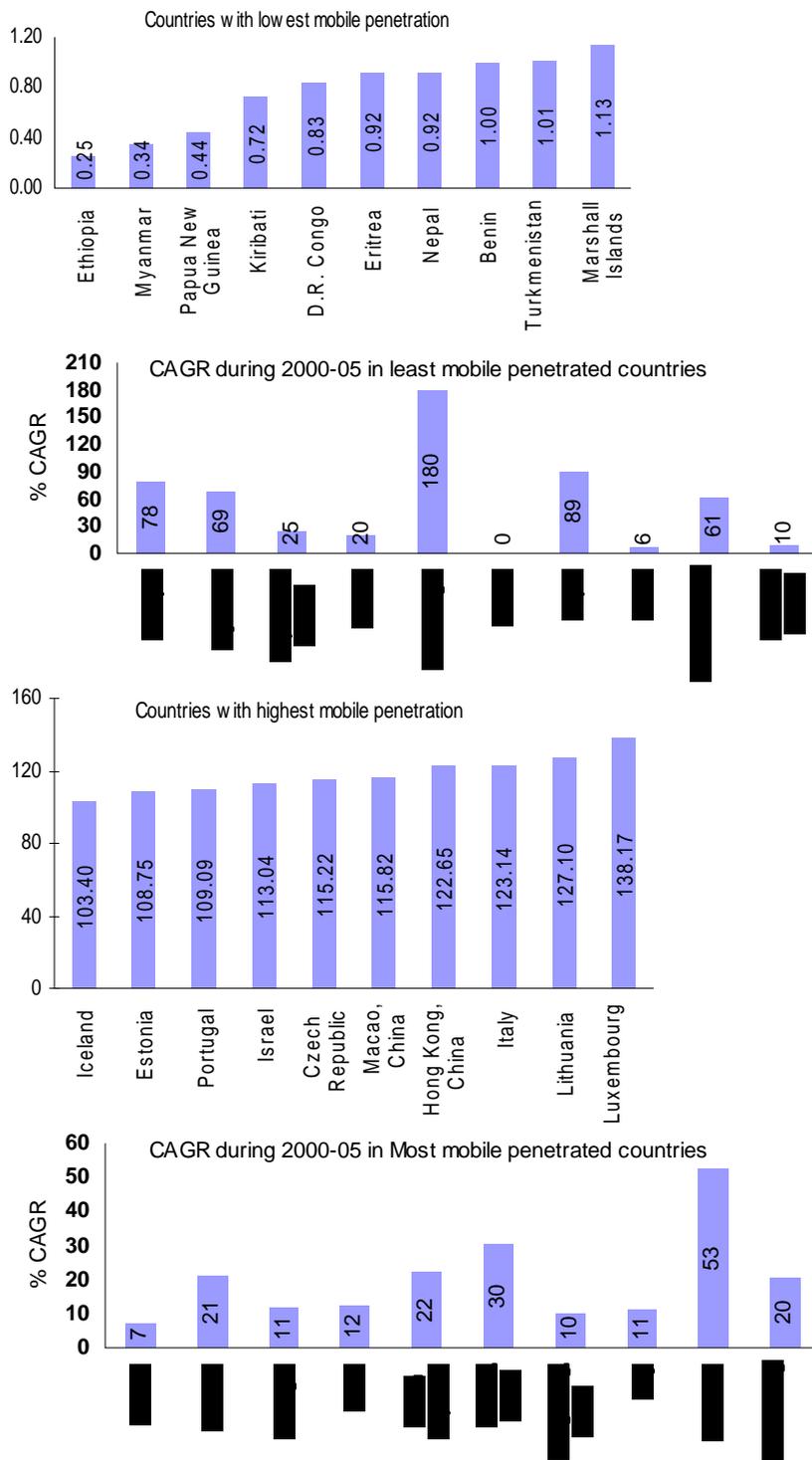

Figure 1: Factors Influencing Service Dissemination

Service Parameter	Internet Based Connectivity	Mobile Based Connectivity
Infrastructure	Low	Medium to Good
Breadth and Depth	Very Low	High
Cost	High	Relatively Low
Social Issues	Computer literacy and acceptance	Mobile is a household gadget.

Table 3: Comparison of Service Dissemination Parameters of Internet and Mobile Based Connectivity

3.   MOBILE CONNECTIVITY OF THE WORLD

Though internet penetration is very poor, the case is quite different when we take into consideration the mobile penetration.

Countries with lowest mobile penetration

Country	Value
Ethiopia	0.25
Myanmar	0.34
Papua New Guinea	0.44
Kiribati	0.72
D.R. Congo	0.83
Eritrea	0.92
Nepal	0.92
Benin	1.00
Turkmenistan	1.01
Marshall Islands	1.13

CAGR during 2000-05 in least mobile penetrated countries

% CAGR: 78, 69, 25, 20, 180, 0, 89, 6, 61, 10

Countries with highest mobile penetration

Country	Value
Iceland	103.40
Estonia	108.75
Portugal	109.09
Israel	113.04
Czech Republic	115.22
Macao, China	115.82
Hong Kong, China	122.65
Italy	123.14
Lithuania	127.10
Luxembourg	138.17

CAGR during 2000-05 in Most mobile penetrated countries

% CAGR: 7, 21, 11, 12, 22, 30, 10, 11, 53, 20

Source: Mobile Penetration in the world 2005, www.itu.int

Chart 3 & 3.1, 4 & 4.1: Countries with Lowest and Highest Mobile Penetration & CAGR during 5 Years

One interesting point to note is that the internet penetration was not even 0.5 in many countries, whereas mobile (not fixed telephone lines) penetration is less than 1% in only 8

countries (for which data could be collated). A stark difference is very much obvious. The effect is pronounced in developed countries also however the multiplicity is not very high due to previous maturity in mobile and internet penetration in developed world.

4. ADVANTAGE MOBILE

We will assess/compare the advantages of mobile services on the same Quadra-framework of service availability.

4.1 Social Issues

Social issues are still the same but have gone relatively down in their impact in the case of mobile phones. In most of the cases internet requires dedicated hours for surfing and in many developing countries it requires a good deal of travel, if at all the service is available. In the case of this author, availing internet in ancestral place needs travel of a simple 17 kilometers. So, the availability of internet is big dream for males leave alone females. Case is different for mobiles. Firstly it doesn't require any type of travel. In case mobile is not available in home, given the healthy growth rates, possibilities are, it will be available in near by houses. Secondly, it doesn't require devoted hours. Few minutes, any time in a day, are more than enough. Thirdly, learning process for using the mobile phone is faster than internet due to higher degree of exposure. Fourthly, while computer and internet gives freedom for development of content and variety; it also causes a threat to new users who find themselves overwhelmed by the process. Simply putting, so many keys, clicks and different meanings leave the new user especially illiterate or poorly literate bewildering and fumbling. The simplicity of mobile is great relief for the user which requires dealing with only few buttons and standard selection models. Lower cost and consistent exposure of mobile makes it more relaxing for the user.

4.2 Infrastructure

Unlike internet mobile doesn't require paraphernalia for the uses. Tower sharing and increasing reach/power of towers are taking all geographies in the consideration, hence cost has plummeted down heavily giving operators' incentive to put more towers and add more customers. Power requirement is relatively low. In developing countries it is an important aspect. Lower marginal cost for acquiring customer in a given territory is also unique characteristic of mobile services.

4.3 Cost

With new technologies the cost of mobile phones has reached to a price level of USD 20-25 (in India). And perhaps it is not the last price point. It may further decline with new technologies and greater push by mobile operators and mobile manufacturers. Whatever is the reason, the ultimate beneficiary is the user. However operating cost per mobile is either equal or higher than the computer. But given the obvious benefits of connectivity and facility to make calls; benefits put the marginally higher cost at a very aggressive value front. With introduction of new technology in the market the cost per connection is getting down. At the same time this benefit is being passed to customers so leading to lower cost of service. Average Revenue per User (ARPU) has decreased considerably in last few years.

4.4 Breadth and Depth

Due to combined impact of previous three parameters the breadth and depth of mobile services are higher than the computers and internet. With dropping cost for making calls and lower rentals people across the strata are in position to avail the service. New players are coming up in the market. The covering up of geographical area has increased manifold. Even

in a particular geography there are many players. It is leading to mobile penetration at the lower strata of the society. Existing players are covering all possible geographical sectors (Breadth of service) and entry of new players leading to more connection in a region (Depth).The initial fixed cost of acquiring a mobile is getting down with arrival of cheaper mobile and aggressive combined offers from mobile operators and mobile manufacturers.

5.   PROPOSED SPOKE AND HUB MODEL

As it is obvious from the name the model requires search for the appropriate spoke and its suitability for the application in the concern. Also definition of hubs in terms of their functionality and domain need to be refined in the proper context. To adequately define the spoke and hub model we sub-divide our model in tow sub-models based on the traditional characteristics of hub and spoke. Defining spoke and hub in terms of the process of e-governance services will be suitable for the boundary delineation. It would be apt to discuss two stark natures of processes in the e-governance services. We describe them as the Information Dissemination Model (IDM) and the Information Creation/Update Model (ICUM).The IDM is the spoke part of our model while the ICUM is the hub for our model. This model tries to capture issues at rural or semi-urban level implementation.

5.1   Information Dissemination Model (IDM)

The model is at variance with the traditional broadcasting models which focus on providing useful government information (already available) to the wider public domain through the use of ICT and convergent media. (www.digitalgovernance.org). The information may not be necessarily the information available in the public domain. In this paper, the Information Dissemination model is concerned with the information which is aiming at providing citizen's information only. The variance from traditional model is the nature of information. Information about the government scheme may come in the broadcasting model but the information about particular plot of land belonging to somebody is private in nature. It should be available to people who are stakeholder in the process and have consent of the owner of the plot. For example land records which need to be produced frequently for different reasons in the developing countries. Though registration for land record happens only once in a while the need for reproduction of the land record is more frequent. This requirement is only information retrieval subject to confirmation of the identity of the citizen demanding the information. As we have seen in mobile banking, most of the initial services are read-only or non-transaction in nature is started first, similarly the model with a twist can be applied here. Here are few illustrative steps which may lead to development of the IDM

- Establishment of e-governance service
- Identification of information suitable for distribution on mobile platform
- Establishment of authenticity identification
- Laying down of trigger process and consequent process
- Collaboration with mobile service providers
- Awareness drive and training for self-service
- Information distribution process refinement

The e-governance service needs to be designed in such a manner that it is can be segregated in two fundamental parts i.e. ICUM and IDM. The need is imperative as many a times the mechanism is very much built as fixed module to a particular location thus raising the issue of scalability. Different states in federal structure do try to have their own land record system or some other healthcare system and so on. It leads to lack of standard as well as problems in scalability. Hence a standard format needs to be developed for the segregation

model. At the same time it must be ensured that it should not become too generic hence compromising on the efficiency and cost structure. Also the need to customize the service according the relevant personal details is necessary. For example, in some areas almost all eligible people might be holding the voter ID (Identification) card or relevant government identification document thus facilitating a single unique identification technique, at the same time there may be few areas with absence of a common document prevailing among majority of the population. Hence the built-in flexibility in the e-governance service is necessary for the customized deployment according to particular area.

Identification of information suitable for distribution on mobile platform is a necessary step. Depending on the social context there might be some kind of information which should not be delivered via this platform while some may be common across geographies. Hence this step is very subjective and will depend heavily on the judgment of the people deploying the system at the ground level. Apart from the social concern, financial concern may be given due attention for the same.

As we discussed in previous sections, during design of e-governance service the need for establishing authenticity identification is necessary for unique matching of information with the right owner. Hence the need of proper mapping. Also depending upon the local availability of suitable information for identification the service may be modified. Same information may be perceived differently at different geographical location or in different context. Hence these need to be taken care of at the grass root level. As some of the information may be sensitive, sometimes the content of information may depend upon the authenticity identification process and its inputs.

Once authenticity has been identified a proper trigger process should initiate the process for information retrieval and also dissemination in proper format (to be sent on the mobile itself or via the postal mail or need any other clarification due to unforeseen reasons). The point to be noticed here is the assignment of responsibility and putting a system for automatic alerts for the person concerned. Also reporting of violation of deadlines for information dissemination may be forwarded up in the administrative hierarchy for greater accountability. This step is necessary for infusing trust in the service. As the concept is novel; the lacking seriousness in government employees for mobile transaction may leave the service without any credibility and reliability. Hence it may be nipped down it in the bud.

Though collaboration with mobile service provider may look a very obvious step it is not necessarily a non-serious step. As the process heavily depends on the mobile operators, the credibility and reliability is also in the hands of the mobile operators. Two important aspects need to be considered here is the transfer of request from the citizen to request capturing platform and also billing the citizen for the service via mobile operators. For capturing the information one need to have proper software, effective request transfer mechanism from the citizen to the mobile operator and from operator to the e-governance service platform. The development of software itself is a complex process as it requires collaborative effort even at the local level for the proper user interface and other required functionalities (such as dedicated number for e-governance services, standard format for navigation which remains suitable across varying mobiles and mobile operators). Afterwards the request transfer from mobile operator to e-governance service requires development of standard for communication. Apart from this the billing is also an important aspect. The charge which might be levied to citizen for requesting the service might be charged via mobile operators through their subscription or other charges hence obviating any need for a particular and dedicated cash/money transfer channel which might further complicate the issue. The revenue sharing procedures and conditions need to be laid down for the same.

Awareness drive and training for self-service is the last mile need to be covered for greater acceptability of the service. As it has been the case in many areas; it is perceived that unless a proper paper based receipt is not provided the transaction lacks the required credibility. The awareness drive is a push factor for the service. Greater acceptability may not come without wider knowledge about the service. The fundamental aspect is to build a critical mass of users which will bring the economies of scale and also the creation of self-learning groups which will autocorrect itself in the case of deviation of its member. The training needs to be imparted and the focus group may be the opinion leaders or relative innovators in the community. A localized and highly touch based campaign and training module need to be prepared while keeping this in mind. It is virtually impossible to train all people and mistakes will be rampant in initial stages hence the focus on innovators and opinion leaders will be good because they pose the required enthusiasm and also do feel good while teaching others about their experience.

Information distribution refinement needs to be done as how the information needs to be provided so that it remains usable. For example providing land records on mobile phone will be futile as it will be useless for all practical purposes however at the same time tracking the application for license may be very much relevant at the mobile phone level. Once the mode of information delivery is finalized a better understanding may require to be developed with channel partner, say post office, for providing the record or information.

5.2   Information Creation/Update Model (ICUM)

This model is necessarily a traditional model of e-governance service points with internet connection and dedicated terminals. The need for this model arises from the relatively higher fixed cost of the system. And operating cost can go high due to training, linguistic differences, requirement of power and good environment for keeping the system. Also the last mile connection for internet is not available in many developing countries. The aim is to keep this model to the lowest extent possible hence eliminating major cost segments. However, this step requires a substantial level of planning. As the ICU is supposed to be part of larger e-governance plan hence conformity with the objectives of the latter needs to be looked into with greater detail. The presence of this model is necessary at the lower level (though less in numbers) due to limitations of the spoke model which is also being called Information Dissemination Model (IDM). In following sections; major factors which need to be looked into while considering for ICUM have been discussed.

- Alignment with national e-governance objective
- Flexibility of interoperability with peer-services
- Collaborative platform for the synchronization with channel partners
- Appreciation of local aspirations and needs
- Elimination of physical interaction at lower level

Though service may start at experimental level in any limited geography or constrained by any other parameters in concern; ultimate goal of the alignment with the national e-governance objective should be the focus. The existence of several objectively incompatible services operating in different domains and geographies has left little scope for flow of national objective in a structured way. Initial ad-hoc efforts, consequential popularity of service and the presence of individual champion (instead of national ones) at the local level as well as absence of guidelines at the central level has lead to dispersion of services in several directions thus militating against the a holistic objective of national e-government.

Flexibility of interoperability with peer-services leaves scope of further addition, enhancement and synchronization with existing as well as forthcoming services. The lack of

national standard and adherence to any particular pattern leaves all systems going in their own direction thus negating the concept of national e-governance plan. The issue of isolation of services, repeated similar efforts for similar objectives and involved cost (direct, indirect) for almost all stakeholders renders the aim of universal consolidation of a country's e-governance services a mere statement. The openness in formulation of objective of a particular service with consideration of a mutually exhaustive and collaborative framework with peer services will multifold the acceptance as well as hasten the process of realization of the objective.

Effective rendering of services to the citizen by e-governance is largely governed by other channel partners in the service. For example in some cases governmental postal services are channel partner.

In some cases other partners may be supposed to take necessary action on the request (e.g. an enquiry for the status of passport will require generation of trigger for seeking of status-report from different department (Home, Police, other local authorities)) so there is a requirement of a cordial and harmonious relationship building at the ground level is must and acceptance of the system in its format is necessary. The best could be the case where in all stakeholder embraces the new system as their own; however this has not been the case in majority of situations where a natural resistances have been observed. Hence provision for a collaborative platform seeking for a cordial and effective relationship is necessary for the success of system in particular and e-governance as a whole.

Appreciation of local needs and aspiration is necessary for the better understanding of requirements of system. The acceptability of system also depends on the customization of system for catering to the needs at the lower level. The emergence of various e-governance services seeking to reach the same objective in different manner is a testimony of the same. It will be apt to say that the appreciation and amalgamation of local need is not necessary a mere change in interface of the software; rather it should be observed as a change in the process which intends to be inclusive with stakeholders in general and citizens in the particular. So the development of system should be portrayed in a way to give the message of alignment with local values and needs. Inclusion of senior, respected people from the society in the initial phase itself will remove a large amount of barrier in the acceptance of the service. The communication rather than alienation is a major factor deciding the fates of different initiatives in different domains and at different levels.

E-governance also aims for efficiency though this is not the only one paradigm to which one need to subscribe. Still efficiency has been perceived to be sole factor by many. Sometimes elimination of physical interaction has supposedly been proposed as a measure of efficiency. It still may be the case but in this paper the intention is elimination of inconvenience to the citizen. To put it into the context; it is observable that our model proposes lesser number of ICUM because of cost consideration and achievement of better standards. Further given the context of developing world and in particular rural areas the distance becomes prohibitively demotivating for the people to avail the service hence the emphasis on lesser physical interaction. At the same time removing the hassle of frequent visits prompts faster acceptance because of ease of use.

5.3   Integration of Both Models

ICUM and IDM are complementary to each other. Major part of ICUM is handled by IDM and IDM cannot exist without ICUM. The integration of both models is a simple step as the development of the ICUM and IDM itself was from the joint framework. The ICUM is established in accordance with the national e-governance objectives. One of the secondary

issues of consideration is the extensibility and synchronization with other e-governance services. ICUM is supposed to have relatively lower user interaction as data creation and update are not very frequent in nature. The output from ICUM, in case of read request or any other information request, gets delivered via the existing mobile platform, provided by mobile service operators, to the end user (citizens). Though initially this model may have more time-to-public but time-in-public (Narayan and Nerurkar, 2006) will remain higher due to wider acceptance and higher anticipated uses.

5.4   Extending IDM

Extension of IDM for other services is very much possible. In our model IDM dealt with only citizen's information but it can be extended to normal information which is available in public domain. This information may not need a separate dedicated ICUM as the information is static in a short time period and generated by government agencies. E.g. arrival of ration at local public distribution system, rain forecast, prohibitive warnings for storms etc are few to name.
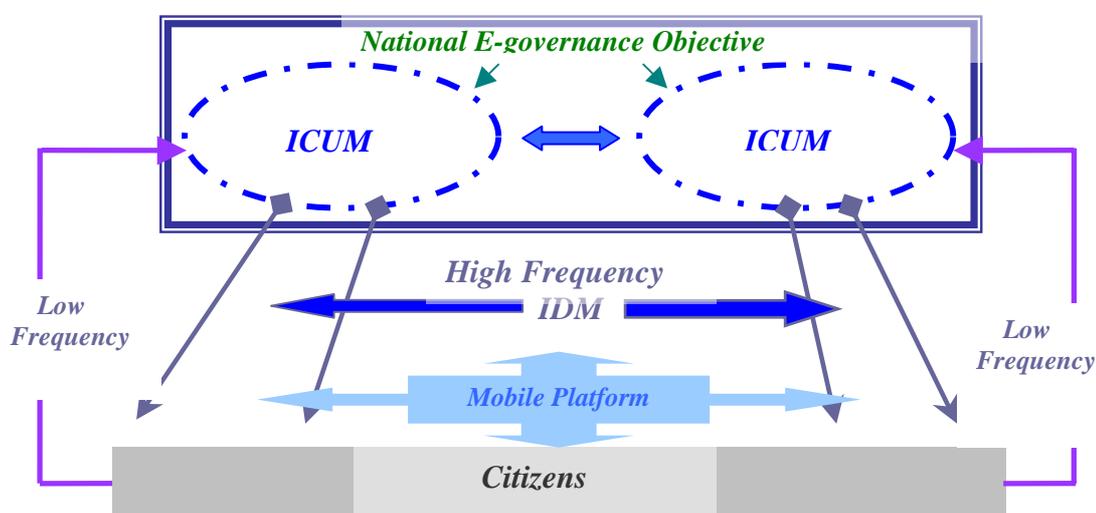

Figure 2: The Hub and Spoke Model

6.   ROLE OF OTHER STAKEHOLDERS

Given the level of computer literacy and perception of superiority of a paper over mere e-information; there is a need to get other stakeholders involved. The capability of e-governance services need to be demonstrated. Hence the role of NGOs (Non-Government Organizations) and Private Sector becomes crucial for sustaining the model.

6.1   Role of NGO

Most of the NGOs are deeply attached with the people wherein they work. It has been observed that after passage of some time they become advisor and voice of local populace. Given the high level of trust quotient with them NGO needs to be made part of the whole plan that we discussed above. Support of NGO can be garnered by accepting their true and rationale demands at local level. Hence solving the problem of populace and providing an image boost of NGOs which will help in getting NGOs on the boards. For teaching the capability of e-governance services and making people aware of existence, process of service will help in greater accessibility and acceptability of e-governance services.

6.2   Role of Private Sector

Private sector has a major role to play. In the case of India, a leading private sector firm ITC has established e-chaupal (In Hindi Language Chaupal means a place of gathering of senior local people). E-chaupal was meant to provide real time information about the crop-prices and pesticide, fertilizers etc. It removed the middlemen between farmer and market; thus providing value to ITC and farmers. Now it has been extended to provide many other services. The private sector may be pitched in for a revenue sharing agreement in public-private partnership model. This will ease out capital burden on the government; but at the same time providing e-governance at local level and value to people and private sector.

7.   OTHER ASPECTS OF THE MODEL

E-governance services are very much in the customer contact. High degree of involvement at the grass root level requires delicate handling of the process. The intended user group may vary due to educational, social, racial or even geographical reason. All these produce issue of cultural and human capital compatibility. In this section discussion about other aspects viz. cultural, social and human capital has been provided.

7.1   Human Resource Capacity

To have greater acceptance of service at the lowest level requires an assuring and familiar face also. Human resource sourcing at the lower level will be helpful in this concern. But at the same time quality of human resource is also an issue which needs to be taken care of. In many parts of the geography it may happen that there is no suitable candidate to man the job. The decision must be taken considering local feelings and social compatibility with the intended user group.

7.2   Training

Training is required at the operator as well as the user level. While operator level training may be demanding in nature due to compulsion of faster turnaround; the same may not hold true at the user level group. A patient approach should be taken. Further while designing steps must be taken to have the Graphical User Interface (GUI) as simple as possible.

7.3   Cultural Compatibility

Many e-governance services have failed because they didn't consider this issue at all. Cultural compatibility is an issue. For example in some countries where in parda system is quite prevalent asking for removing parda for identification may be a issue. Hence these delicate issues must be well thought with the community interaction and to be addressed in the training and operation both modes.

8.   LIMITATION OF MODEL

Due to inherent nature of mobiles and concern about the security may prevent the m-governance model to march into new and complex territories of e-governance. On technical front small screen size, relatively higher cost of communication (when compared with internet) and difficulties in data entry may be cause of concern but with advent of good software and intuitive GUI the problem can be mitigated to a large extent, if not wiped out completely. The hesitation and resistance which came while making transition from paper based system to computer based system may be repeated albeit in mild manner due to increased maturity level of technological enlightenment of people in past few years; but may be cause of serious concern in technologically extreme backward regions. Sensitive transaction related process will need a greater degree of deliberation for implementation.

Acceptance may require considerable effort for persuasion as well as motivation for early adopters.

9.   CONCLUSION

Poor penetration of internet, especially in developing countries and LDC, is a cause of concern for dissemination of e-governance services traditionally perceived to be empowered by internet. In case of availability of internet among few countries, the connections are not reliable, speed is pathetic and costs are still high on both fronts: fixed costs and operational costs. Hence effectiveness and impact of e-governance services may be jeopardized due to connectivity issues. Hence there is a need for supplementary model which can provide support for breadth and depth of e-governance services. So, in view of higher mobile penetration, governance services delivered via mobile becomes a choice. The paper present two innovative but very simple and intuitive models called ICUM and IDM for delivery of service. This largely addresses the implementation issues and wider reach. However congestion of spectrum and late arrival of new services (3G, Wi-Max) may not be favorable in future. Due to its inherent nature m-governance can not be substitute of e-governance but abodes well in short terms for debut in unexplored, unconnected areas.

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