

Government Policies & Regulations: Impact on Mobile Commerce in Indian Context

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Abstract

Mobile Commerce is the subset of e-commerce, which includes all e-commerce transactions, carried out using a mobile (hand held) device. This paper attempts at figuring out the relevance and potential role that m-commerce can play in the development of Indian business environment, in particular rural India. M-Commerce in India is at its infancy, with significant uncertainties and complexities due to evolving business and regulatory models, which are further complicated by the involvement of large number of interrelated players in it. Timely and correct public policy interventions are needed to allow it to unravel its potential and help the country to reap the benefits. The traditional tools and techniques of analysis and forecasting (for e.g., econometric models and regression analysis approaches) seem to be inadequate to study the dynamic nature of interrelatedness among the entities in the m-commerce domain to draft a policy framework. System Dynamics based modeling approach will help in dealing with the complex interrelatedness and to develop a policy model. In this paper, the authors developed a causal loop diagram based on the analysis of various players and their interests who are the stakeholders in the M-commerce space to facilitate the policy makers to infer the impact of various policy options to decide on policies that can foster both technology and business in India for public good.

Keywords

M-commerce, Policies & Regulations, System dynamics, Causal loop diagrams, Delphi Technique

1.0 Introduction

After the internet revolution the mobile revolution is all set to sweep the Indian soil. When e-commerce emerged as an improvement in traditional business it was said, “businesses will be e-commerce, or no business at all” [1]. These phrases have lost meaning with the emergence of m-commerce. In Indian context too the way of conducting business is due to witness an upturn not only due to technological developments that have revolutionized business to a plastic money enabled 24x7 concept but also due to the shifted business focus on the ‘bottom of the pyramid’ [2]. This concept has guided the Indian business world to shift their focus towards the ignored rural markets. There is tremendous opportunity for mobile technologies based business models to explore the market around the rural poor, and translate it into a business opportunity to serve around 75 million rural population in the country. Unlike the e-commerce based business models, mobile technology based businesses can overcome barriers of literacy, availability and cost. The new mobile devices are feature rich and user friendly so as to enable an illiterate to operate. The mobile service charges are at an all time low in India compared to the world, enabling even the low-income groups to own and operate mobile phone. Pro-active rather than reactive public policy and regulatory initiatives are needed in India to fully utilize the opportunities offered by mobile technologies and facilitate an exponential growth of this sector.

1.1 M-commerce: An overview

Any use of a handheld device – a mobile phone, a communicator or a PDA to do business whether it is sharing information, transferring data, voice, video, making payments, granting credits, playing quiz or conducting contests falls within the purview of m-commerce. M-commerce has been defined as “*any transaction with a monetary value that is conducted via a mobile telecommunication network*”[3]. The scope of m-commerce can be extended to include all business related communications among individuals and companies, which do not necessarily involve financial transactions [4]. In a very broad sense m-commerce includes all services that can

be initiated over mobile devices such as voice telephony, communication-based services (messaging, bulletin boards etc.), internet access on mobile, payments for goods and services through mobile, services over local radio systems like Bluetooth [3]. The newer arguments for including business done while on the move, irrespective of whether a wired or a handheld device is used, in m-commerce or mobile commerce is the fact that business is being conducted while in a state of motion. This can also include a transporter who starts with goods and delivers them based on information received on the way [5]. This broadened gamut is interesting to study but in this paper the authors considered only the transactions done using a hand held wireless device.

1.2 Business Model of M-commerce

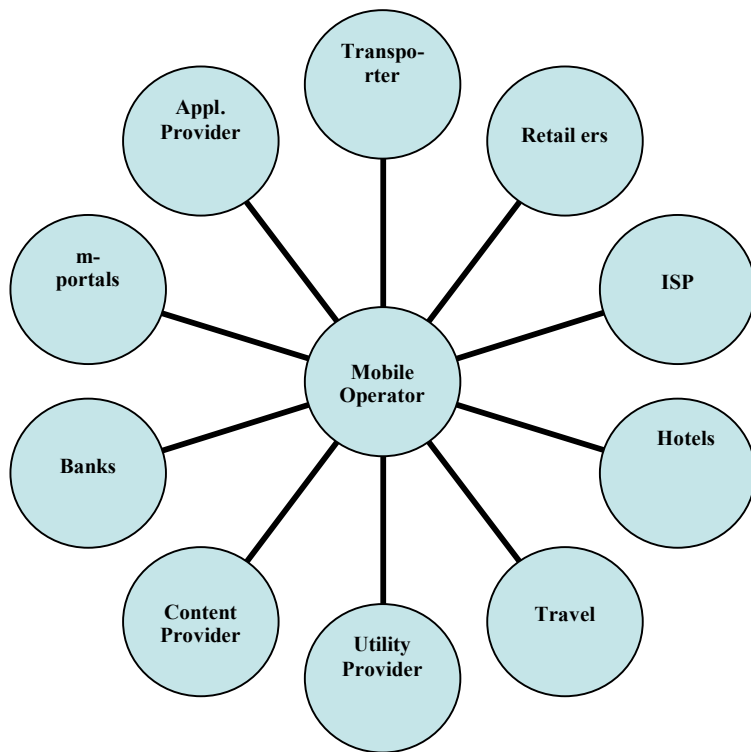


Figure 1. M-Commerce: The service providers web

payments are primarily made by the mobile operator who later recovers the amount with some additional service charges from the user in his monthly bill [7]. Subscribing to the interest group theory [8] fair share of revenues between different parties is a major enabler in success of m-commerce for which policy interventions, regulations and sound legal framework are necessary.

2.0 Mobile Commerce in the Indian Context

2.1 Mobile Usages in India

In India mobiles are currently used primarily for passing and sharing information using SMS⁴ and voice. However, the inclination to use value added services is evident from the increase in share of revenues generated from value added services as a proportion of total revenues of mobile industry increased from 7.26% in June '05 to 9.58% in September '05; which amounts to more than 2% rise within a quarter. The corresponding figures for revenues for SMS show a rise from 5.25% to 5.4% [9]. This rise has resulted from introduction of voting based participative TV Programs, voting on some socio-economic-political issues in Newspapers, SMS based quiz/contests on mobile, MMS etc. Student clientele of mobile companies are major

The 3G¹ mobile services include video calls, transfer of video images, m-portals, retail goods sale, micro payments, m-banking, location based services etc. The business model of m-commerce places the mobile operator at the hub and other service providers reach mobile users through this hub. The service provider gamut includes banks, mobile operators, retailers, content providers, small and large business enterprises, application developers, hotels, travel etc. The application developers or aggregators develop m-portals, m-games, translate content suitable to mobile downloads etc., and are a major link between content industry and mobile operators. Presently in India the content services are being offered through m-portals of aggregators or of mobile operators. However the GPRS² and MMS³ are being offered directly through operators [6]. For all transactions through mobile,

¹ 3G Third generation networks

² GPRS Global Packet Radio Switching

³ MMS Multimedia Messaging Services

⁴ SMS Short Messaging Service

consumers of wallpaper, ring tone, mobile games, music and video clip download services available on e-portals as well as mobile portals. Other services like micro payment facility are also being offered though only by one or two operators. GPRS based services are being offered by mobile operators on a limited scale. However, wide ranges of new services are on the anvil as more and more operators upgrade to 3G networks.

2.2 Relevance and potential of m-commerce in rural India

The mobile subscription base stood at 76 million in Jan'06, surpassing that of China, and is increasing at a rate of 5 million per month. It is expected to reach 210 million by 2009-10 representing a CAGR⁵ of 32.1% over a period of five years. The telecom industry revenues are expected to grow at a CAGR of 11% driven mainly by revenue growths in mobile revenues at a CAGR of 20% in next five years. This growth is expected to infuse investments worth Rs. 600-650 billion in mobile networks [10]. The overall profitability of mobile operators and ROCE⁶ is expected to increase due to reduction in regulatory expenses, lower capital expenditure per subscriber due to economies of scale.

Bridging the digital divide and promoting trade and commerce in rural areas to accelerate development & growth are the main m-commerce growth drivers in India. The Indian rural population is much devoid of information and mobile technology can bridge this gap. Thousands of geographically scattered village have never attracted telephone companies as they failed to make a good business case for them. But a right mix of wireless technology, newer business models and directed policy initiatives can overcome these hurdles.

The concept of localized services has always been restrictively thought of in terms of provisioning information related to travel, hotel, shopping, weather and other facilities. However for rural India the meaning of localized services could include information and consultation related to agriculture, such as advice on suitable crop for the area, timing of various agricultural activities, quality, information on cost of seed and prices of agricultural produces, future trading option in agricultural commodities, obtaining comparative rates in various mandis (local place of auction), disaster warning for coastal areas etc. Paucity of information which led to exploitation of the rural farmers at the hands of the middlemen could be easily overcome by wireless technology based new business model like that of 'e-choupal' [11].

Other relevant usages of m-commerce would include giving short-term credits to rural farmers and small entrepreneurs. Micro credit is a large market in India. It is estimated that the trade sector needs around Rs 2.1 lakh crores of credit out of which around Rs. 61,000 crores is met by banking sector and rest by non banking informal sector [12]. Charmed by the figures many banks are interested in entering the sector but are often constrained by their limited reach. However collaboration between mobile operators and banks, postal department, or financial institutions interested in extending their operations to micro credits in far-flung areas can work wonders. For example in the boat markets of Bangkok one can make payments through charged cards provided by mobile operators. Other example could be Bangladesh's 'Gramin Phone' [13] working on a similar principal. Taking conservative estimates even if only Rs 50,000 crore of non formal credit market is tapped by mobile operators in the next five years at an interest rate of 20 percent (though the retail credit in the 'open' market is at around 60 per cent today) the sum that is expected to be earned is Rs. 10,000 crore which is around six months revenue of all operators combined.

Central and state governments can use the networks to provide public information to masses, leading to better governance. Once the small farmers get perceived benefits from m-commerce services the propensity to go mobile will increase. This would trigger an increase in subscriber base, which will pull down the fixed costs of services. This would further snowball into rise in subscriber base making rural markets a good business case for mobile operators. Thus the mobile technologies can prove to be a win-win situation for all stakeholders, particularly the rural population, mobile- operators, and the government.

3.0 Policies and Regulations in Mobile Industry in India

All the arguments above converge on the existence of large potential for the mobile markets and hence mobile commerce in India. But the success of market depends on faith all the players have in the functioning of the market. The telecom sector in India has witnessed successful implementation of an independent regulatory body and dissociation of government from regulations. However there have been no initiatives either from the government or the telecom regulator in defining the codes of conduct or setting standards for mobile

⁵ CAGR Compounded Average Growth Rate

⁶ ROCE Return On Capital Expenditure

commerce⁷. The question that arises obviously is whether the self-regulatory system that has evolved with time is adequate to deal with the increasing mobile-based business or needs improvement. It is the right time to discuss the issues related to the regulatory system and appropriate policy support from government that should be adapted to play a catalytic role in building faith of all stakeholders in the system.

3.1 Regulatory Issues in M-commerce:

A sectoral regulatory authority system has evolved in India over a period of time. But the increased blurring of telecom and financial services besides convergence of technologies has added to the confusion on the regulatory purview of various sectoral authorities. For example in case of m-commerce both the mobile operators and banks can provide banking services bringing in an overlap in the authority of the telecom and banking regulators. With the growing services and revenues in banking sector there is an increased inclination of telecom companies all over the globe to provide financial services. A classic example is of Germany's MobilCom AG, partly owned by France Telecom's Orange Mobile group has applied for a banking license [14]. The new developments have not only placed banks and telecom companies opposite to each other but have also increased confusion and chaos in the market. The tussle on authority is expected to be intensified once the Competition Commission of India proposed under the provisions of Competition Act of India 2002 will start functioning.

Other regulatory issues include consumer privacy and security while trading on net. These concerns are logical looking at the rising number of frauds in e-commerce. The same concern can be extended to any information sharing on mobile networks, which is more vulnerable to hacking due to introduction of a wireless link in the chain.

The regulatory issues in mobile-based business are further complicated by the possibility of content provision on mobile, which brings in Intellectual Property Rights and Digital Rights management. Generally content is regulated by a separate regulator with a few exceptions like Malaysia and UK where there is a multi-sector regulator to regulate carriage and content. In India Ministry of Information and Broadcasting (MIB) regulates the content and earlier attempts on bringing in carriage and content regulation under one umbrella (Communications Commission of India) had faced resistance from MIB clearly indicating its reservations in parting with content regulatory powers.

The regulatory governance in India in case of m-commerce will fall under the purview of numerous sectoral regulators, mainly Ministry of Information and Broadcasting (content), Reserve Bank of India (Finance), Telecom Regulatory Authority of India (carriage), Advertising Council of India (advertisements), Securities and Exchange Board of India (capital markets), the Indian Information Technology Act 2000 and bodies constituted under it and the proposed Competition Commission. The regulatory situation is expected to worsen in cases where sectoral authorities will differ in opinion on an issue or where there is lack of a formal coordination mechanism among them. As on date there exists no formal policies and coordination mechanism among the various sectoral authorities/regulation agencies in India. Presently all the controversial regulatory issues involving more than one regulator are resolved on case-to-case basis. This may not prove effective and efficient in the long run especially in case of m-commerce, which has high interrelatedness.

Convergence of issues will be an argument in favor of a multi sectoral regulatory authority or a super regulator since there will be high level coordination required among the various regulatory authorities. Though there are well established regulatory system in most of the areas but the competition laws, IT laws and laws to deal with cyber crime are still in nascent stage and those to tackle issues arising from m-commerce are yet to take off. For proper development of an industry it is very essential to have proper laws and regulations in place so that the development of new technology and services is promoted unhindered. This becomes more difficult for ICT related sectors where it is very difficult to forecast the direction of technological developments, which largely depends on market success of a technology, which is in turn determined by technological developments and government policies. Further, as the mobile markets and services grow the mobile operators and service providers will tend to integrate backwards in the value chain through mergers or acquisitions and in such cases it becomes imperative on the part of the policy makers to prevent concentration of market power, ensure healthy competition in the sector and check any abuse of market power. So the policies and regulatory structure should be flexible enough to take into account future possibilities of mergers.

⁷ Except for few Reserve Bank of India guidelines on network and system requirements essential for banks to extend their services through internet.

Looking at the prospects of m-commerce there is no doubt that policy support is essential for the industry to develop. However, a simple lopsided support to only the operators or service providers is not enough to give the right boost to the sector and certain policy interventions are needed on the receiving side of the services i.e. towards the Mobile Terminal Industry. A boost to the industry can be given by policy interventions aiming at reducing the cost of handset, which will give a push to subscriber base. India is already a very huge handset market and it would be a better alternative to encourage handset assembling or manufacturing in India by giving appropriate policy support and other relevant concessions to investments and capacity building projects as compared to giving duty concessions on import of handsets.

3.2 Regulatory Model for m-commerce: Stake Holder analysis

The regulatory framework that sweeps a wide range of issues should have a sound structure. The standards and rules that are a prerequisite for developing m-commerce in India include those on financial aspects related to payments and micro payments; security aspects related to payment, information transfer within and beyond the access network; privacy aspects related to data security, email, virus, location based privacy, transaction details privacy; consumer protection related to cost control, information disclosure on tariffs and services, protection of minors, appeal for grievances; and others like taxation policies, e money policies etc.

While designing the regulatory framework it is very essential that the interests of all stakeholders is factored in and it is also essential to build flexibility in the system to accommodate fast changing technology and markets. Seven main stakeholders have been identified as – Mobile users, Content Providers, Retailers, Banks/Financial Institutions, Mobile Service Provider, Government and Application Developers or Aggregators and an attempt has been made to figure out their interests vis a vis any conflict of interest among them. The details of various stakeholders' interest are given in Appendix 1.

There are issues where conflict of interest happens especially when there is a revenue sharing issue. For example in case of content provisioning on mobile the sharing ratios are 60:30:10 between mobile operator, media companies and aggregators. Mobile operators argue to keep the major share owing to their high investments, reach to the subscribers and capability to control users, where as content developers feel deceived and demand for a higher share. The revenue share of mobile operators is comparatively low in developed markets ranging from 10-20% for example in Japan it is only 9%. Comparing India with developed m-commerce economies it can be inferred that as data market will improve the revenues and dependence of mobile operators on content providers will also rise. This might result in enhanced bargaining power of media companies forcing a reduction in the share of mobile operators in the generated revenues [16]. The authors feel that a proper regulatory initiative in facilitating fair-share mechanisms, contract law enforcement will facilitate a level playing field for all the stakeholders in the m-commerce domain. The regulatory interventions in revenue sharing can be short timed and as the market develops regulators may withdraw and leave it to markets as was done in case of tariff regulations in India.

4. System Dynamics

Interrelatedness among various players and complexity of issues involved in m-commerce has been discussed in Appendix 1. Looking at the socio-economic and political relation of evolution of m-commerce it is inappropriate and difficult to analyze this using qualitative and intuitive judgments. Econometric analysis and regression analysis, though can provide explanation to past behavior, is inappropriate for explaining socioeconomic changes, nonlinear relationships and various interrelated factors [17,18,19]. To understand and analyze the effect of changes in one or more variables on the whole system in the present context of mobile commerce, concepts of system dynamics can be applied effectively.

System Dynamics is a blend of traditional art of management, the concepts of feedback control and the science of computer simulation (19). "*System Dynamics deals with the time dependent behavior of managed systems with the aim of describing the system and understanding, through qualitative and quantitative models, how information feedback governs its behavior, and designing robust information feedback structures and control policies through simulation and optimization*"[20]. System dynamics appears to be more suitable for analyzing systems with varied interrelatedness as it allows using mental databases besides quantitative data to form causal relationships, which form the basis of policy models. These models can be used to study the impact that various policy changes will have on the environment. SD modeling gives generic and robust policy models as it calls for extensive testing of models before implementation. It is capable of explaining why the superficially designed good policies often flounder [19].

The first step starts with identifying all the factors that can influence the system, here mobile commerce. The next step is to identify causal relationship between various factors based on past trends and intuitions. This is followed by preparation of stock flow diagram and the model. The model is tested extensively and can then be used to study and understand the effect of different policies on the factors and their implications.

4.1 The echo-system of M-Commerce: Causal Loops and impact of Policies and Regulation:

In this paper we develop casual loop diagrams for the mobile industry (Figure 3) and m-commerce industry (Figure 4) in India taking the various stakeholders and factors that will be affected by and affect the system into consideration as outlined in section 3 and Appendix 1.

4.2 Mobile Industry

The Indian telecom industry saw a rapid development phase after involvement of the private sector in 1993-94. Mobile services were launched in India in 1998 with two private operators. An independent telecom regulatory authority 'Telecom Regulatory Authority of India' was formed in 1997 to regulate the sector erstwhile regulated by Department of Telecommunications. The sector has witnessed various policy interventions in the past decade, which have influenced its growth in many ways. Based on past affects future influences can be analysed as represented in the causal loop diagram in Figure 3:

4.2.1 Government policies and regulations will influence the mobile operators to

- Improve service versatility and technology diffusion for example introduction of 3G Technology is expected to lead to a rise in the number of mobile users. Similar trend was observed in year 2001 with the introduction of WLL, which resulted in a rise in mobile subscriber base. (Figure 2)

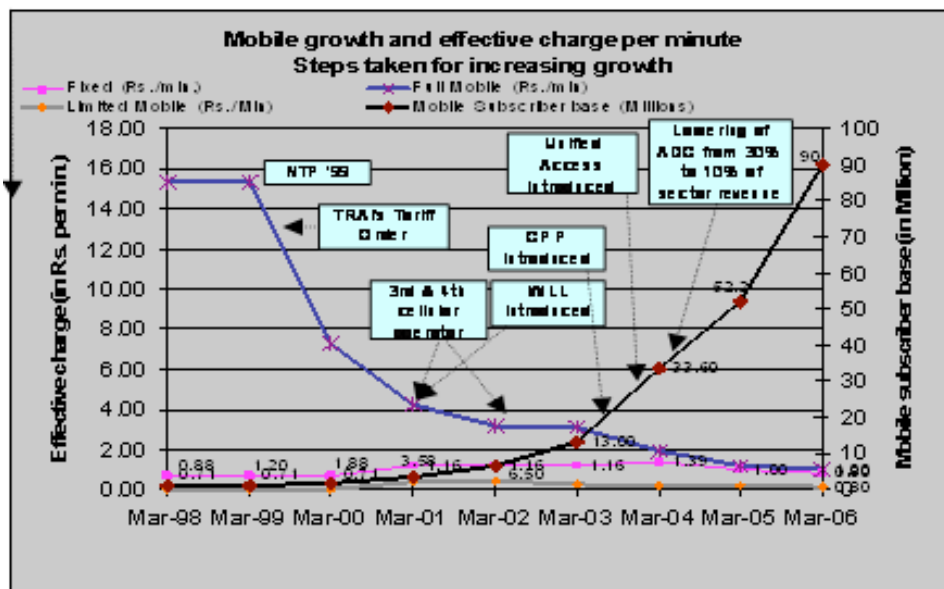


Figure 2: Impact of various regulatory policies on subscriber base and cost of service (Source: TRAI)

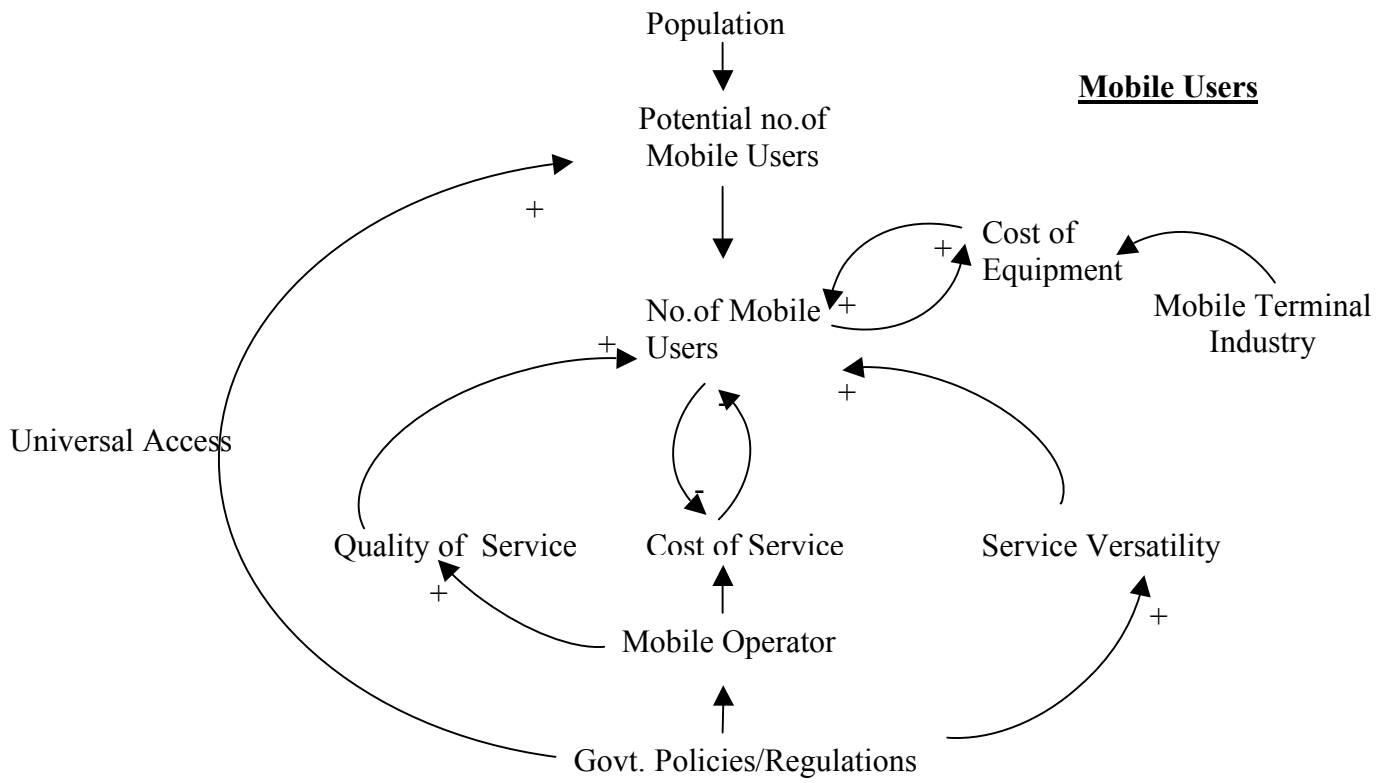
It can be inferred intuitively that such an effort would attract an increasing number of subscribers.

- Improve the quality of service, by defining standards on acceptable call dropping rates, congestion, signal strength etc.

4.2.2 Government policies aimed at Universal access will positively influence (increase) the number of potential mobile subscribers.

4.2.3 Government policies related to the Mobile Terminal Industry (MTI) will play an important role in the mobile diffusion. A reduction in the cost of handset will increase the number of potential as well as actual mobile users. MTI industry can be influenced either by bringing down import duties or promoting domestic industries. In India the domestic manufacturing/assembling capacity is very low whereas it is perceived to be a very good market for MTIs.

Figure 3. Causal Loop Diagram for the Mobile Industry



4.3 M-Commerce Industry

3G network services involve several stakeholders and their inter-relationships will define the course of m-commerce diffusion. However government policies can positively influence these interactions to the benefit of m-commerce. The Mobile Commerce scenario would witness mobile operators and aggregators/ application developers being at the centre stage. All service providers, such as, banks, content-providers, retailers, travel agencies, hotels will be peripheral to them. As m-commerce is very new in India, the causal loops as given in Figure 4 are developed based on intuitions and experiences in other industry with inputs from experts from various policy making and regulatory agencies in India.

4.3.1 A stable legal environment with availability and enforcement of contract laws will build faith in the system among the various players and foster the industry as a whole.

4.3.2 Government by putting in place consumer protection laws and grievance redressal mechanism will foster consumer trust and faith in Mobile commerce and hence would attract more users towards it. This can be inferred by extending the results of consumer trust studies on e-commerce [15].

4.3.3 Mobile Terminal Industry will attract more mobile users and m-commerce users by introducing advance functionalities and compatibility in local languages. Availability in local languages will surely attract the non-English speaking rural users thus increasing the number of m-commerce users.

4.3.4 The content production can be promoted through government policies in several ways. Reduced duties on electronic and audio-video production equipments will bring down the costs of production. This will bring the costs of content on mobile down, raising its demand and ultimately pushing up mobile commerce figures.

4.3.5 The other way government can influence Content Industry is by ensuring enforceability of intellectual property rights (IPR) and digital rights management (DRM) laws. Content Piracy is a major problem in media, which brings down the profitability of the industry. A profitable industry would attract more developers and thus make more content available, which will bring in tougher competition resulting in a drop in rates. One of the things that goes in favor of Indian mobile industry is presence of two collecting societies- The Indian Performing Rights Society and Phonographic Performance Limited, which has helped mobile operators to quickly hook on to music without needing separate agreements with individual media companies [16].

4.3.6 Another major issue that will affect m-commerce is the revenue sharing agreements between mobile operators, aggregators and other service providers like banks, utilities, content providers, travel agencies, hotel industry, retailers etc. Banks can extend their services through aggregators or can enter into direct agreements with mobile companies to form joint ventures for micro credits and other services. Fair revenue sharing mechanisms shall make industry attractive for all players.

4.3.7 Similarly government policies on retail industry, such as permitting international retailers and introduction of appropriate taxation policies for trade conducted using mobile will positively influence retail trade enabled by mobile devices. There is definitely a perceived benefit of procuring while on move, especially travel and hotel bookings, which when introduced with low cost business models will drive users to make use of such services.

5.0 Conclusions:

Government policies and Regulations positively influence service versatility and in turn influence the mobile operators service offerings in terms of variety, quality, coverage and the tariffs besides facilitating increase in the number of potential users. Appropriate policy support and regulatory mechanisms accelerate technology diffusion and redundancy in a fast developing economy like India. Proposed future work on this preliminary work is collection of views from experts based on the Delphi approach, summarizing these as inputs to the defined causal loop relationships, further data collection and fine tuning of the relationships in the system dynamics simulation model and using the model to simulate the effects of various policy interventions using ithink software [21].