CHAPTER- 8
IMPACT OF E-COMMERCE AND M-COMMERCE TECHNOLOGIES ON DEVELOPING COUNTRIES

ABSTRACT

This chapter discusses the impact of mobile and wireless technologies on developing countries. The new technological advances and capabilities allow developing countries the opportunity to “leapfrog” years of wired technology and infrastructure development. Based on this study, it appears that mobile and wireless technologies will not be enough to truly advance developing countries. In order to truly “leapfrog” and make up for years of technological advancements, developing countries must consider dealing with government corruption, violation of human rights and extremely low literacy rates. These factors may derail the effort to “leapfrog” and gain economic benefits from technological advancements.

INTRODUCTION

Today there are more mobile phones than fixed-line telephone access throughout the world, and the industry still shows a strong growth momentum. Wireless subscription is expected to grow to 1.3 billion by 2004. The mobile technologies and business strategies. In developing countries there is hope that the digital divide, the gap in technology and infrastructure, will be history once access to communication and the Internet is established and available to every citizen. Current studies and literature on the advancement of digital technology
and its impact on developing countries allow us to witness just the beginning of this digital revolution (Aronson). The impact this revolution is imposing on developing countries is multidimensional:

- Traditional businesses such as telecommunication carriers will have to revise their business model and incorporate innovation as a core competency in order to succeed and survive this revolution.
- Governments will need to adjust their approach for taxation and revenue stream in order to compensate for the tidal wave of privatization and dealing with the freedom and evolution of the Internet.
- Dealing with illiteracy will become one of the main focuses, as it poses a barrier for success of this revolution.
- New laws and legal infrastructure will become a key necessity in order to lead and manage rather than control and suppress the digital revolution.
- Society will be transformed by changes in both social framework and inherently changes in social structure, status and norms.

These are a few of the key elements surfacing in response to the digital revolution and the fast paced evolution of mobile technologies. Many organizations are set up to help developing countries narrow the digital divide and deal with the changes detailed above. There is visible evidence of successful countries will continue to “leapfrog” years of wired technology and infrastructure, but they will not be able to “leapfrog” the social and
political changes that will result from this digital revolution and the adoption of innovative technologies and business models.

**Mobile Technology Development**

The concept of “leapfrog” refers to developing countries making a conscious decision not to replicate the evolutionary cycle for infrastructure and business models as based on developed countries. The concept refers to developing countries bypassing years of historical development of wired infrastructure and instead adopting newer standards, business models and change. According to Gavin Jeffery of the Afghan Wireless Communications Company, “What we will have is state of the art technology, straight from the beginning.” His quote captured the essence of “leapfrog” during an interview with the BBC (BBC News Online, 2002).

1) **The Life Cycle of Technology Adoption:** In his book ‘Crossing the Chasm,’ Geoffrey Moore discusses the evolution of technology and how we as a society adopt and mature along with the technological advance. He introduces the ‘Technology Adoption Lifecycle’ as a representation of the population grouped by psychological profile and demographics (Moore, 2002). The bell curve also signifies the lifecycle and the point that each group is willing to accept the technology (see following page). The groups are divided into Innovators, Early Adopters, Early Majority, Late Majority, and Laggards. For many years, developing countries were classified as either a Late Majority or Laggards from the perspective of technology adoptions. There are many reasons why they were classified as such:
• **Education** – Adopting new technology heavily depends on education skill, and the resources needed for support. In some countries up to 170 local languages are spoken, which presents a challenge when delivering content. These developing countries are dealing with a high rate of illiteracy as well as several failed attempts at standardizing the language. Another language barrier is the use of non-Latin alphabets, which are harder to adapt to computers and cell phones.

• **Cost** - As wired infrastructure is maturing, the cost of implementation has decreased, but is still relatively high. A study done by the Canadian National Broadband Taskforce and Info Americas. Organization reveals that it costs over 40,000 dollars to install one mile of optical fiber, not including the cost of support infrastructure. This is a tremendous undertaking for many of the underdeveloped countries, who are still struggling to offer basic necessities for their citizens. Much of the current infrastructure (electricity, running water) is not offered throughout developing countries due to the challenges of funding, regulation, governance, and harsh topology such as mountains, wet and swampy ground, and deserts.

• **Government** – Local government still own and manage many of the companies providing telecommunication services. Landlines are heavily taxed and governments are reluctant to change the business model and lose much of that revenue stream. Many developing countries are faced with political instability, bureaucracy, and corruption, which
slow down the adoption of change and the passing of reforms.

This list is not all-inclusive, but does illustrate why for many years developing counties have been late to adopt technology and are classified as Late Majority or Laggards (Moore, 2002) As a witness to the changes brought on by the evolution of the Internet in the late 1990s, developing countries have made a conscious decision to ‘leapfrog’ generations of technology and move to early stages of the technology adoption lifecycle and become innovators and early adaptors of mobile technologies.

2) Nature Of The Demand of M-Technology: Mobile commerce is viewed as the next generation e-commerce. It refers to any transactions, either direct or indirect, via mobile devices, such as phones or personal digital assistants (PDAs). The most significant features of mobile technology are mobility and portability. The ability to access services ubiquitously, on the move, and through wireless networks and various devices. To date, mobile technologies have been applied to consumer-oriented areas, and most applications focus on voice communication rather than wireless data transformation. Although there is a general notion in which mobile technologies could be applied in business, very little has been done in exploring how to enhance business processes, what the implications of mobile technologies are, or what critical factors affect the success or failure of mobile technology applications.

Adopting mobile technology may create two kinds of impacts on business operations. The first is to facilitate communication among employee, customer and supplier. Through the
enhancement of communicating efficiency and information timeliness, mobile technology can increase organizational productivity and profitability. The second is to re-vitalize business processes through changing data access patterns. For example, insurance agents are able to use mobile technology to provide timely services.

Most of the studies focused on exploring the effect of short message advertising, investigating how to design a proper mobile device, how to enhance the accuracy of contents of short massage via information technology (IT), and how to add value into products and service. Few have studied how a company decides on adopting mobile technology and what factors affect the success or failure of adopting mobile technology.

In an early work, Liang and Wei (2004) proposed a fit-viability model (FVM) that combines the theory of task/technology fit with the general notion of organizational viability of IT.

**M-commerce**

Many different definitions of mobile commerce exist in the literature, but these usually refer to e-commerce activities via mobile devices such as mobile phones and personal digital assistants (PDA). Mobility and reach ability are two main characteristics of m-commerce. Compared with traditional e-commerce, transactions are generally conducted through personal computers (PCs) and laptops. M-commerce applications provide the potential with more freedom for organizations and users to perform various commerce-related tasks without the limitation of time and location (available anytime from anywhere). In addition, the economic value contributed from m-commerce is
more than that from e-commerce, such as product and service localization, personalization, ubiquity enhancement, instant connectivity and convenience.

3.) The Wireless Hype cycle: In order to better illustrate the roadmap from past to present and future perspective of mobile technologies, Gartner Group (a research organization) presents another cycle to complement the technology adoption lifecycle. Much of the technology evolution is dictated by the innovation and adoption of standards throughout the industries. Each standard represents a way of transmission, which can include data, voice or video. Standards are researched and certified by standard bodies such as IEEE (Institute of Electrical and Electronic Engineers). Once they are accepted, they are utilized throughout the industry. Gartner Group presents the “Wireless Hype Cycle” (see Appendix B), which illustrates the marketing hype or visibility of a technology versus its maturity stage and the timeline for the technology to reach plateau of acceptance. The cycle goes through the following stages: Technology Trigger, Peak of Inflated Expectations, Trough of Disillusionment, Slope of Enlightenment, and Plateau of Productivity. Each technology is marked to indicate its position and the time to plateau or adoption speed.

The United States is considered to be behind the rest of the developed world in infrastructure and standards adoption. Asian and European countries have made significant investment into 3G (third generation) networks (see Appendix C). The heavy investment into 3G networks promised higher speed and larger capacity for multimedia transmission. European countries sold licenses in the sum of over 100 billion dollars, but most companies
have found the technology to be extremely difficult to implement and are rethinking their strategies.

Advances in technology since the standardization of 3G have also contributed to companies refocusing their research and development. Wi-Fi – Hotspots are currently at the height of the hype curve. Wi-Fi Hotspots provide high-speed Internet access to equipped devices within approximately 50 meters of a small base-station. This newer technology is much cheaper to implement and has taken the industry in a new direction. The growing popularity of Wi-Fi Hotspots has brought on new business models such as the Starbucks and T-Mobile. The hype and the successful business models forced companies to rethink their 3G strategies and start looking toward the future for 4G (Fourth Generation).

Europe and Asia are considered to be early adopters of technology, while America is considered part of the early majority. Some might even classify the United States as laggards based on the technology adoption lifecycle. Companies in America have not bought into the idea behind 3G, and therefore are still supporting 2 and 2.5G. American companies have spent the last couple of years maturing their infrastructure and providing incremental improvements.

In recent years, developing countries have been more influenced by Europe and Asia and have started to invest directly in 3G networks, therefore by passing generations of infrastructure built up. European and Asian companies have been willing to pay premium prices for 3G licenses and the right to sell wireless services in those countries. The governments of developing countries are still holding on to the state-run telecommunication
firms, focusing strictly on traditional wired services such as fixed phone and low-speed Internet provider.

With the privatization of the wireless market and the large support of European and Asian firms, new business models are forming within those countries based on the newer technologies. The cost of implementing a wireless network could be as much as 90% cheaper than the traditional implementation fixed and wired access (see Appendix A). Local shop owners throughout rural areas in the developing countries are setting up local area networks (LAN) and providing complimentary services to those residing within a radius of a few miles of the shops. In addition to Internet access, the shop owners can offer wireless Internet access, wireless devices and mobile phones. Experts have predicted that 4G (Fourth Generation) networks will not be actualized within the next five years, but in recent months the markets and technology advances have accelerated the timeline. Gartner Group classifies 4G as a technology trigger in the Wireless Hype Cycle. Europe, Asia and America are focusing on the development of 4G standards through research and prototyping (Appendix D). The potential 4G standards bring promise to developing countries in their attempt to narrow the digital divide. The newer standard promises wider coverage area, supported by fewer base stations, and will help developing countries provide services even in remote rural areas, regardless of topology.

4) Business Models for Mobile Technology: Mobile technologies are significantly changing current business models, even with the fast pace evolution of e-commerce. The principles guiding the evolution of m-commerce are anytime, anywhere,
by/for anyone, with anything. Many in the industries like to think of them as representing: multilingual, multicultural, multimodal, multidevice, and so forth. The telecommunication industry has traditionally been about managing cost. Companies invest a tremendous amount of resources in infrastructure and for the rest of the lifecycle, they focus on driving down support and maintenance costs. One of the barriers for change is the high investment or commitment in current infrastructure. Many companies are forced to write off losses in order to refocus their resources on newer standards. The new paradigm will force telecommunication companies to change their business models and focus on innovation and value added services.

a) Value Chain Analysis

Regina Wong, in her presentation to the GSM Congress Asia Pacific 2000 in Singapore, presented a picture comparing the traditional versus the new mobile technologies value chain (see Appendix E). In her view, mobile service providers will simply replace the traditional services throughout the value chain.

In her model, application providers become the enablers while the mobile service providers are responsible for aggregating content and providing functionality. Regina Wong’s value chain representation is linear and does not take into account the new value creation by way of new services or the need for mobile service providers to provide content and transactional services. The newer models promote collaboration and seamless integration as key services as well as enhancement of the end-user experience
In August of 2002, Bror Salmelin presented in a European Union forum about the “Challenges and Opportunities in the E-economy - the Single European E-Business Space”. In his presentation, he depicts a newer business model that focuses on the empowerment, creativity and value creation based on interoperability and open systems. In the new m-commerce business model only several of the key market players will provide vertical integration, meaning they will have control throughout the value chain. Open systems will provide for the involvement of many new players in the market; some focusing on horizontal services, most focusing on niche markets. Traditional telecommunication companies once considered utilities will adopt new business models and transform themselves to value add service providers.

Diamond Cluster International presented an illustration to better explain the new value chain and the sources of revenue. As countries adopt more of the mobile technologies standards and go through deregulation and privatization, more of these revenues will be realized. Developing countries “leapfrog” many of the traditional business models we have created in the developed countries and through small-scale developments they are transforming their industries through the use of mobile technologies.

In developing countries many of the governments still manage and control the entire value chain. Keys to success include market reforms, deregulation and privatization of many of the industries. This will allow outside and local firms
to compete and meet the future demand for m-commerce. The following section provides an example of newly formed enterprises within developing countries that utilize the lower cost and effectiveness of m-commerce.

b) The “Village Mobile Phone” Programme

The per capita income of a Bangladesh worker is one hundredth of that of a US worker. Meaning, you would need 100 Bangladeshis to provide the buying power of one American. This statistic was on the mind of Dr. Iqbal Z. Quadir when he was looking for investors for his idea of a mobile network in Bangladesh. He is now the founder of Grameen Phone, which is built upon the vision to transform poor countries by establishing a wireless network that will be used for production rather then consumption. Dr. Quadir’s company is the sponsor of the “Village Cell Phone” programme, which provides wireless and banking services to over 50,000 Grameen Phone women.

In this program, women living in rural areas of developing countries that lack developed infrastructure, such as fixed line telephones, are buying cell phones financed by bank loans and are selling “talk time,” much like a pay phone. This phenomenon is enabled by the development of mobile technology and entrepreneurs who have a vision of transforming isolated and undeveloped areas into emerging markets. Advances made in mobile technologies in the last few years have made it possible for the realization and formation of business models similar to the scenario of the “Village Cell Phone”. Developing countries and the service
providers are claiming to “leapfrog” the rest of the developed world by offering advanced mobile technologies. “Leapfrog” refers to the fact that the developing countries are bypassing the wired generation and are directing their attention and resources to wireless infrastructure and the newer advanced technologies. Mobile technologies have significantly changed the lives of those living in the rural villages described in this article; but they also have other effects on the social and economic development of those countries. The growth of the “Village Cell Phone” programme has transformed the role of women in their local society as well as their economic status and their contribution to the welfare of the village (BBC News Online, 2002).

Bangladesh has the lowest number of phones in South Asia, which is why the “Village Cell Phone” programme was a key in the transformation of the country. Grameen Bank, a subsidiary of Grameen Phone, provides a low cost bank loan that is used to set up a mobile phone exchange. The bank only lends money to women, which challenges the status quo of the culture. One of the conditions of the loans requires the husband to transfer the deed of his property to his wife; this is done to reduce the chances of abandonment. The bank sees women as less of a credit risk and therefore targets them for their programs. Once the mobile phone exchange is established, the women provide communication services to their village, which in many cases has few to no telephone connections.
This business strategy started out in the late nineties and has grown through the years. The Grameen Phone women have expended their enterprises and are selling other services related to mobile technologies. The cost of the cell phone has decreased significantly, becoming a viable replacement for landlines or pay phones. Companies have created low cost or even disposable cell phones with a prepaid function built into the system. The Grameen Phone women are able to sell those newer phones without having to establish accounts or set up a billing system. This allows the villagers to control their spending and provides an alternative to either establishing a line of credit or meeting the requirements of other mobile service providers. Many of the Grameen Phone women have established their business inside a local coffee shop at the centers of their villages. These relationships led to the creation of the “small-scale telecentres” throughout the developing countries.

c) Tele-centers and Community Access

Starbucks wants their customers to access the Internet while sipping on their premium coffee beverages. This is a new value added service that has rapidly expanded beyond the coffee shop. Wi-Fi is one of the key enabling technologies that allows mobile service provider to set up “hotspots” in highly dense areas, therefore covering a greater customer base within a few mile radius. Even Central Park within New York City now offers a free hotspot for the use of the park’s visitors. While this has become a recent phenomenon in the United States, this concept has been on
the top agenda of many developing countries as a way to link up rural areas and provide communication capability that is otherwise not available.

Using a low cost tower, shop owners in many developing countries are setting up local area networks (LAN) and are providing complimentary services within their community. In the late nineties the focus was on communication between the local villager and those village members who left for a job abroad. In the last few years, those businesses have transformed themselves and are now providing newer service such as Internet access, billing service, and commerce. There are several cited examples of farmers looking for a better location to sell their products based on pricing information they receive through the Internet via PC and cell phones. In the past they were forced to sell for rather cheap to the local companies since they lacked the knowledge about the ongoing rate of their crops. Many of the fishing villages utilize the Internet and mobile technology to improve their fishing efficiency by accessing information about weather, movement of fish, GPS based devices and overall security as they go out early every morning.

d) Worker Migration

Many of the villages were losing their population due to lack of jobs and opportunities. This trend alarmed many of the village leaders and the government of those developing countries. In order to provide opportunity and maintain connectivity with rural areas, many of the villages have set
up training centers for the locals to learn more about the use of personal computer, mobile devices and the application and services that they enable. This approach creates a way for companies to offer more services to the villages and help the villages maintain their infrastructure for developing new capabilities.

The above scenarios have gotten the most attention in recent years due to their success. Many organizations and developing countries that have adopted these business models are utilizing the new mobile technologies to connect all rural areas and provide new services where they were not previously available before. The cost of implementing the infrastructure has declined, and many new business models have formed, providing new value added services that were previously not available for the majority of the population in the developing countries. In order to be successful the local markets must go through further reform and privatization of their businesses. The government should focus on social, health and economic issues as they prepare their countries for the changes the mobile industry will bring about.

5. Development due to Introduction of New Technology

The evolution of the Grameen Phone women has not just created a change in the business strategies, but also a social change. Many of the developing countries are still years behind in social advances. They are faced not only with poverty but also with illiteracy, health concerns, political instability and personal security. Mobile technology is not the panacea to solve all the issues currently facing developing countries, but it does provide the
means to empower individuals and communities. Vanessa Gray
and Michael Minges of the International Telecommunication Union
(ITU) discuss the other variables in the effort to narrow the digital
divide. They focus on human skills and the affordability of
infrastructure as the other variables critical to the success of any
change in those countries. Human skills refer to literacy, language,
and learning as keys to the success of the mobile revolution.

Much of the success of the mobile phone is the fact that it
serves a more basic need of communication. Many of the
breadwinners in these villages end up going abroad to earn more
money to support their families. The only mode of communication
is letters and packages, which are slow to arrive and are an
unprotected mode of transferring money to the families. Mobile
phone satisfied the need to connect with family members and
maintain the close community ties so ingrained in those cultures.
Once mobile phone services were in place, it was easy to build on
the momentum and engage the population. Mobile phone presents
an easier learning curve than a personal computer. It is much
easier to learn the 10 key numbers versus learning how to use a
keyboard regardless of the language used, be it English or the
commonly used local language. Many of the newer devices are
providing much-improved graphical interface with multimedia
capabilities; this allows many to avoid learning the use of the
traditional keyboard altogether.

Education

Developing countries, with the help of world organizations,
are setting up training centers, many based on the Telecentres
and Community Access concepts. This provides a location for
classes as well as a way to generate revenue to further finance current and future expansion of the programmes. This helps elevate computer literacy within rural areas and furthers technology awareness. In more urban areas, the government is relying on universities and private companies to offer training and education opportunities to all citizens. World organizations are monitoring the growth of class enrollment as a measure of progress but there are still many obstacles to overcome.

**Local Languages Going Digital**

Many of the developing countries face the issues of localization and spoken languages. According to studies by Ethnologue, many countries have over 100 local languages spoken; Malaysia and the Philippines both have 139 and 169 spoken languages respectively. This proves to be a challenge for providing content since they cannot achieve economies of scale or apply same level of resources for each language.

Representation of digital characters is one of the biggest challenges facing content providers and application providers in localizing digital displays. UNDP (United Nations Development Programs) cites examples describing the difficulties in adjusting technology standards to serve developing countries. For example, Thai language is not based on the Latin alphabet, has ‘some 44 Thai consonants and around 30 vowels requiring almost 90 different letters on the keyboard (compared to 66 for English)’ according to UNDP.

a) **Social Development:** Given the growing demand for digital technologies, policy makers will have to take decisions that adjust technological potential to the requirements of social
development. Yet the digital landscape is kaleidoscopic. On the one hand, there are strong expectations that digital technologies will create a bright future. On the other hand, there are very pessimistic projections that point to serious social and economic problems. And empirical reality completely supports neither the utopians nor the dystopians. The question in this confusing situation is thus how one can arrive at defensible policy choices.

Technology serves humans collectively as well as individually and is dependent on social structure. The institutional framework that emerges from this influences our comprehension of technology. The more useful the technology, the greater the change it can bring to behavioural patterns and social structure. Society has become very dependent on technologies, and for the most part cannot function without them. However, by their very presence, technologies often lead us to search for solutions to problems that are perceived as technological, even though the problem may not have been technological to begin with.

Technologies are not just tools that we put to good or bad use. They reflect our cultural values and have altered the nature of human consciousness. The history of human endeavour is often characterised by the struggle to overcome physical limitations. As a result, success in reaching beyond natural limitations forms the cultural tradition of many societies. For example, some view technology as a means to control nature. They believe that the problems created by one technology can be solved by
another. Yet humans are both part of and dependent on nature. The human and environmental consequences of technological choices and the extent to which we are shaped by technology needs to be recognised.

Grameen Phone women are gaining status by owning businesses and are becoming the breadwinners of their households; this trend is contrary to the traditional cultural norms practiced in those countries. There are many questions and concerns about the role of women within the technology revolution. Several organizations were established to address the many issues facing women in the developing countries and the narrowing of the gender divide (among many others):

- Office of Women in Development Bureau for Global Programs, Field Support and Research United States Agency for International Development.
- Women’s Learning Partnership (WLP)
- Women in Global Science and Technology (WIGSAT)

Regardless of technology advancement these women are dealing with basic human rights and equality. Many believe that thanks to programs such as the “Village Cell Phone,” women will be empowered and be in a better position to overcome cultural and political norms. In June 2001, Nancy Hafkin and Nancy Taggart of the Academy for Educational Development (AED) released their study on the topic of “Gender, Information Technology, and Developing countries: An Analytic Study”. The study deals with the role
of women in developing countries and the impact of new technology on their lives. Cultural and social progress starts with the freedom to make choices; this is not a reality for many of the women in developing countries. Many women lack the basic human rights such as walking in public venues, owning properties, having a job, personal security from physical and mental abuses and many other rights commonplace in the developed countries.

In order to address not only the digital divide, but also the gender divide, organizations such as Grameen Phone are taking the counter-culture approach. Grameen Phone made a conscious decision to make the “Village Cell Phone” program available only to women. In order to ensure the education of women, many institutions have started to hold “women-only days”. Many women complained that they were feeling uncomfortable attending classes or cyber cafés frequented predominantly by men. This is attributed to the physical presence and the public interaction with men, which is prohibited in many countries. This would prove to be an issue when organizations were looking for instructors and support personnel. Women were uncomfortable asking for help or support from a man.

b) Political Development:

Changes in the Political Landscape

Developing countries have not done enough reform to open up their markets and enable the growth of small business and the entry of outside firms into the market. State-run companies, health care systems, and farms are
slow to adapt to the changes needed to benefit from the new advances in technology. This stagnation is due to the potential loss of revenue from the traditional stream, for example, phone line usage fees, taxes, tariffs, and lack of competition. Much of that fear is unwarranted and is an inhibiting process.

Governments of developing countries must reform in order to spur market growth; not only to bridge the digital divide, but also to reduce the extremely high levels of poverty and health concerns. The governments are not keeping up with the change of technology and are late to adopt new governing approaches. There is a missed opportunity to manage and generate growth within the developing countries. In the late 1990s European governments auctioned off licenses for 3G networks. The auction produced revenues amounting to tens of billion of dollars. Developing countries have the opportunity to invite outside investors and local companies to bid for licenses and generate revenue. This is also an opportunity for the government to let someone else manage the network and provide better quality of products and services.

All over the world, there are new initiatives with the goal of redefining the way people interact with the government through the e-government efforts. This is done for the purpose of eliminating bottlenecks within the systems and making the government more efficient. This is just one of the newer collaboration business models that have evolved by the enablement of e-commerce. Mobile technologies
extend the business model toward other applications such as billing for a variety of services from phone bills, movie tickets, grocery stores, vending machines, and so forth. The mobile phone serves as a virtual purse and based on a well-developed security model, a user can pay for any type of service. The success of mobile technology is due to its shorter learning curve versus learning to access the Internet via the traditional keyboard.

Mobile technology applications are already a reality, but in order for developing countries to partake there must be reform in the banking systems. Many of the citizens in developing countries, especially in rural areas, do not hold a bank account. This is a barrier for the growth of mobile services since they rely on established accounts to solidify relationships with their customers. One of the alternatives has been the growth of the prepaid calling plans; but those users do not benefit from the same security and legal protection as those with an established relationship with a bank and a service provider.

**Regulation**

Companies entering into the developing countries’ markets lobby for the formation of an independent regulatory body rather than government regulation. Many of the countries have yet to relinquish control of the governing bodies regulating the telecommunication industry. Without the knowledge of how to regulate under the new standards any progress made economically could be diminished. With government deregulation and the privatization of industries, the legal systems must be
updated to deal with anti-competitive practices, copyright infringement regarding digital content, technology patents and many other related laws. The development of a new legal system privatization and independent regulation would create a free market where competition would lead to better pricing and quality mobile services for the citizens.

Implementing Change

Developing countries have bolstered their ability to “leapfrog” years of technological advances straight into the wireless age. Many have heavily depended on outside firms and organizations for assistance in implementing and managing the programs. In order to maintain the momentum, developing countries must aspire to “leapfrog” years of social and political development. Implementing mobile technology without the development of human capital and organizational infrastructure would derail the effort of world organizations and private companies entering the new markets. Without the readiness for new technological advances, only a few would benefit and the gap between developed and developing countries would widen. The willingness to “leapfrog” years of technological advances has many benefits as detailed so far, but there are also risks such as implementing standards that have not fully matured and might fall out of favour. Developing countries adopting 3G networks are at risk of investing large sums of resources while the rest of the world adopts more promising 4G networks or Wi-Fi standards.

Investments in mobile and wireless technologies must be complemented with investments in education and health. Issues such as illiteracy, lack of health care services and other basic
human services must be addressed in order to improve the lives of those living in developing countries. Mobile and wireless technologies are not the panacea for all those issues, but rather the enablers for developing countries to narrow the gap and improve the lives of their citizens.