

# Myanmar Telecommunication Progress in the Last Fifteen Years and Challenges

Khin Htar Ei

Assistant Director, Information and Media Section, Minister's Office

Yun Seon Kim\*

Graduate School of Global Development and Entrepreneurship, Handong Global University

## Abstract

Information and Communication Technology (ICT) has the potential to provide economic opportunities and help raise the social and political status of countries. For developing countries, ICT can be used as a tool for economic growth and social advancement in a short period of time. The benefits of ICT, however, are not only economic in nature. It can help improve professional skills, teaching quality, job creation, agricultural production, community involvement, and information use, personal relationships, and time use. These benefits are examples of how ICT has become an indispensable part of our lives. Myanmar is a developing country and is ranked low in the ICT Development Index. In terms of ICT development, Myanmar today is facing many issues such as a lack of telecommunication infrastructure, ICT awareness, electricity, and budget for ICT development. Among the economic reforms implemented by the recent government, the telecommunications sector has been opened up as a measure of economic reform. As a result of this reform, the telecommunications sector has been growing rapidly. Myanmar, however, remains behind other Asian countries. This paper discusses Myanmar's ICT infrastructure status, progress that has been made in the country's telecommunications over the last fifteen years, and the challenges that lie ahead.

**Keywords** ICT, ICT infrastructure, ICT for development, Telecommunication infrastructure, Internet penetrations

## 1. Introduction

Information and Communication Technology (ICT) is an umbrella term that includes any communication device or application such as radio, television, cellular phones, computers, network hardware and software, and satellite systems as well as the various services and applications associated with them, such as videoconferencing and distance learning (ICT, 2015).

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\*Corresponding author: [sean0831@handong.edu](mailto:sean0831@handong.edu)

ICT has become a powerful tool for poverty reduction. It has also provided developing countries with opportunities to meet their development targets. It affects almost all aspects of our lives, including education, health, finance, recreation and entertainment, government, careers, and our personal lives (Williams, Sawyer, 2015). ICT is an essential part for business today because it fully supports all business processes (Meghna Nagorao Ghuse, 2015); organizations and companies can reach their business goals more effectively using ICT.

ICT plays a significant role in the development and spread of knowledge. It can help improve access to education, learning and teaching, and education management and administration. ICT also plays an important role for agriculture development, as it can give farmers access to the latest information related to production and sales. ICT is reshaping many aspects of the world's economies, governments, and societies. It is for this reason governments, businesses, and citizens in developing countries are striving to incorporate the transformative power of ICT to make their services more efficient, ultimately supporting economic and social network development (World Bank, 2015).

Computing and telecommunication are the two branches of ICT. These technologies consist of the computer system, Internet/electronic mail (e-mail), the mobile phone, and the fax machine (Ogbomo Monday Obaidjevwe, Esoswo Francisca Ogbomo, 2008). The Internet has become a better way for e-government to deliver public services. Technological infrastructure, such as hardware infrastructure and generic software services, provides the foundation for ICT. These technologies, of course, require human skill in order to be fully utilized. Over the past five years, mobile phones have been used to make voice calls and send short messages. In developing countries, more people use mobile phones rather than computers to access the Internet. Mobile networks can be installed relatively quickly at a comparatively reasonable price. The World Bank (2015) indicated that "more than 75 % of people around the world now have access to a cell phone, with the number of global mobile-cellular subscriptions quickly approaching 7 billion (World Bank, 2015)."

Myanmar is a developing country in South East Asia. Although ICT is a key player in implementing political, economic, and social objectives in Myanmar, the various sectors of ICT have much room for improvement. Myanmar still lacks an ICT infrastructure and is generally behind other Asian countries in telecommunications. The Myanmar government is aware of the importance of an ICT infrastructure and has identified the telecommunications sector as a priority in their plans for economic reform.

This paper focuses on the status of Myanmar's ICT infrastructure and the progress the country has made in telecommunications over the last fifteen years. Myanmar's telecommunications sector grew rapidly between 2014 and 2015, but the number of IT users remains small. In terms of ICT

development, Myanmar faces many issues such as a lack of telecommunications infrastructure, ICT awareness, electricity, and budget for ICT development. This paper also focuses on telecommunication progress the country has made over the last fifteen years (from 2000 to 2015) while discussing the challenges that lie ahead.

## **2. Literature Review**

### **2.1 ICT**

ICT is short for Information Communications Technology. ICT refers to any device or system that allows for the storage, retrieval, manipulation, transmission and receipt of digital information such as personal computers, digital television, email, robots (Meghna Nagorao Ghuse, 2015). According to Williams and Sawyer (2015), “Information technology consists of both computers technology and Communications technology. A computer is a programmable, multiuse machine that accepts data—raw facts and figures—and processes, or manipulates, it into information we can use. Communication technology, also called telecommunications technology, consists of electromagnetic devices and systems for communicating over any distance (Williams and Sawyer, 2015).”

ICT plays an important role nowadays, and it is a powerful tool for economic and social development. Robert Pepper and John Garrity (2015) have said that ICTs support macroeconomic growth by affecting inputs to GDP growth and ICT industries generate positive employment effects. Increasing applications of ICTs (capital deepening) leads to rising labor productivity (Garrity, et al. 2015). The use of ICT in the fields of socioeconomic development, international development, and human rights is referred to as Information and Communication Technologies for Development (ICT4D). ICT infrastructure is a basic requirement for ICT4D.

### **2.2 ICT Infrastructure**

ICT infrastructure is required for basic telecommunication services as well as e-commerce, e-government, and e-learning. The meaning of infrastructure, however, is constantly expanding. ICT infrastructure consists of various aspects of IT: server, storage and network components (hardware and software), operating systems, access devices (computer, PC, tablet, smart phone), network cables, connectors, power supply units, satellites, antennas, routers, aggregators, repeaters, and other devices (Infrastructure definition, 2015).

The Internet is a global collection of many types of computers and computer networks that are linked together (Ogbomo Monday Obaidjevwe, Esoswo Francisca Ogbomo, 2008). Electronic mail (e-mail) is the exchange of text messages and computer files transmitted via communications

networks such as the Internet. Mobile phones are now the most popular medium of ICT in the global communications sector. Their impact on the economic activities of nations, businesses, and small entrepreneurs is phenomenal (Ogbomo Monday Obaidjevwe, Esoswo Francisca Ogbomo, 2008). Most communication between computers, including the majority of local-area networks, takes place over broadband communications. Broadband is a telecommunication means through which a wide band of frequencies is available to transmit information.

A broadband connection is a high-speed Internet connection. The most common type of broadband is ADSL, though cable (using new fiber-optic cables) and mobile broadband (using 3G and 4G mobile reception) are expected to ultimately surpass it. ICT Facts & Figures (2015) stated that mobile-broadband penetration was 47% in 2015 (ICT Facts & Figures, 2015). Internet penetration worldwide increased to 43% in 2015. The Republic of Korea, France, Iceland, Denmark, Andorra, Switzerland, United Kingdom, Belgium, Japan and Sweden are the top ten countries in broadband speed as of early 2014.

### 2.3 Global Telecommunication Infrastructures

Brahima Sanou (2015) stated that, “Over the past 15 years the ICT revolution has driven global development in an unprecedented way. Technological progress, infrastructure deployment, and falling prices have brought unexpected growth in ICT access and connectivity to billions of people around the world (ICT Facts & Figures, 2015).” According to ICT Facts & Figures, published by ITU in 2015, “there are more than 7 billion mobile cellular subscriptions worldwide in 2015, up from less than 1 billion in 2000.” Global telecommunication penetrations of 2015 listed in the table below.

Table 1 shows that the ratio of 2G mobile-cellular network usage increased to 95% in 2015. Between 2000 and 2015, global Internet penetration grew 7 times from 6.5 to 43%, and 35% in developing countries (ICT Facts & Figures, 2015). 3.2 billion people can access the Internet, and 2 billion are from developing countries. However, 4 billion people from developing countries are not able to access the Internet. Only 89 million of the 940 million people who live in the least developed

**Table 1** Global telecommunication penetrations in 2015

<b>2G mobile-cellular network</b>	95%
<b>Internet penetration rate</b>	43% (developing countries stands as 35%)
<b>Internet access</b>	3.2 billion people
<b>Mobile- broadband penetration</b>	47% (highest penetration levels are in Europe and the Americas)
<b>Households with Internet access rate</b>	46% (developing countries stands as 34%)

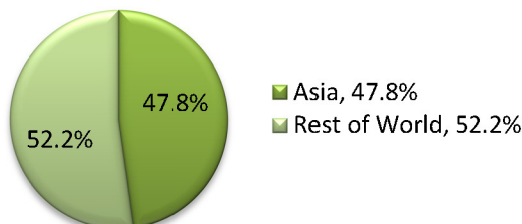
Source: ICT Facts & Figures, 2015

countries (LDCs) have access to the Internet. The penetration rate in these countries is 9.5%. Mobile-broadband penetration was 47% in 2015, a value that represented a drastic increase since 2007. 3G mobile-broadband penetration levels are also highest in Europe and the Americas. ICT Facts & Figures 2015 noted that mobile broadband penetration in Africa remains below 20%. Fixed-broadband penetration, however, is at 11% but at less than 1% in LDCs. The basic fixed-broadband plan price is 1.7 times higher than that of comparable mobile-broadband plans. The average monthly fixed-broadband prices of developing countries are three times higher than in developed countries; mobile broadband prices are twice as expensive as in developed countries. The ratio of households with Internet access reached 46% in 2015. 34% of households in developing countries have Internet access, compared with more than 80% in developed countries. Only 7% of households of LDCs have Internet access, compared with the world average of 46% (ICT Facts & Figures, 2015). Access to mobile and fixed broadband remains prohibitively expensive in some countries, where a lack of ICT infrastructure and regulatory bottlenecks still hamper broadband development (World Bank, 2015).

According to the Internet World Stats, Usage and Population Statistics 2015, the population of Asian countries is more than 4,032 million, 55.5% of the world population. Internet users account for more than 1,563 million, 38.8% of Asia countries' population at the end of June, 2015. The percentage of Internet users of Asia compared to the rest of the world are 47.8 % and 52.2 % respectively (Internet World Stats, Usage and Population Statistics, 2015).

## 2.4 Telecommunication Infrastructures in Asia

According to the Internet World Stats, Usage and Population Statistics (2015), "Singapore has owned a fully digital telephone network. It is a natural hub for submarine cables in the Asia Pacific region and submarine cables; international infrastructure includes a number of satellite networks. The government's strong implementation and bold action in the ongoing deregulation of the



Source: Internet World Stats, Usage and Population Statistics  
[www.internetworldstats.com/stats3.htm](http://www.internetworldstats.com/stats3.htm)

**Figure 1** Internet Users in the World (2015)

industry made the development of ICT. The three major operators of Singapore are SingTel, StarHub and M1. All three operators have provided 3G services since mid-2001 and have launched services in the first half of 2005. For 2010, according to US Census Bureau, the latest population of Singapore is more than 4 million. Internet users of Singapore are more than 3 million, 77.8 percent of the population (Internet World Stats, Singapore, 2015)."

China is the most populous country in the world, and it has one of the fastest growing economies in the world today. According to figures from CNNIC(2015), "the number of Internet users in China is 420 million and mobile internet users is 364 million at the end of June, 2010, including 115.1 million users in the rural areas" (CNNIC, 2015). According to the Internet World Stats statistics, "the Internet penetration rate of China in 2010 is 31.6 percent of the population (Internet World Stats, China, 2015)." In 2012, the number of Internet users and mobile Internet users of China were 564 million and 420 million respectively. The international bandwidth is 1,899,792Mbps (CNNIC, 2015).

Vietnam is the most populous country among the mainland Southeast Asian countries. According to VNNIC report of 2012 (2015), the number of Vietnam's Internet users reached 31,196,878, accounting for 35.49% of the population at the end of the third quarter of 2012. These figures ranked Vietnam Internet use at 18<sup>th</sup> in the world's top 20 countries, 8<sup>th</sup> in Asia, and 3<sup>rd</sup> in ASEAN (Association of South East Asian Nations).

### **3. Myanmar's General ICT Status**

#### **3.1 Country Background**

Myanmar, previously known as Burma, is the largest country in mainland Southeast Asia (Yasuhide Fujii, Satya Ramamurthy, 2013). Its neighboring countries are Bangladesh and India in the west and northwest, China in the north and northeast, and Lao PDR and Thailand in the east and southeast. The 2014 Myanmar Population and Housing Census report shows that the population of Myanmar is 51.49 million (MPHC Report Volume 2, 2015). The economy has been guided by a series of five-year plans with annual plans for select sectors. The plans are based on government's objectives to address political, economic, and social challenges. Myanmar's economy largely depends on its agricultural sector; around 40 to 50% of the country's GDP comes from agriculture. Around 70% of its population lives in the rural areas of Myanmar. Myanmar's major exports are natural gas; precious and semi-precious minerals; agricultural products such as rice and rice products; pulses and bean and maize; forest products such as raw rubber, teak and hard woods; and marine products. (Yasuhide Fujii, Satya Ramamurthy, 2013).

In the country's era of military government (1962-2010), Myanmar's ICT development was very

slow according to the Internet World Stats, Myanmar (2015). At that time, Myanmar’s telecommunications sector was monopolized by the state-owned service provider, Myanmar Posts and Telecommunications (MPT) (Internet World Stats, Myanmar, 2015).” In 1971, the UCC (Universities Computer Center) was established ( UCSY, 2015) and was later renamed as the Institute of Computer Science & Technology (ICST) in 1988. The Myanmar Computer Center (MCC) was established in 1986. Many people from urban areas, such as business people and university students became aware of the benefits of computer and technical knowledge between 1990 and 1992. In 1992, ACE Data System (Software) company Ltd., which is now one of the leading ICT solutions providers in Myanmar, appeared (ACE Data Systems, 2015). In 1994, the Myanmar Oriental Bank (MOB) started banking software usage. In 1998, ICST was changed to the University of Computer Studies, Yangon (UCSY) (UCSY, 2015). Computer Science Development law was introduced in 1996, and the Myanmar Computer Federation (MCF) was established in 1998. The government drew the first ICT Master Plan for 2005-2010 in 2005 as well as the second ICT Master Plan of Myanmar for 2011-2015 in 2010 (Myanmar To Implement ICT Master Plan 2011-15, 2015). The following table indicates that Myanmar’s Internet penetration was at its lowest from 2000 to 2010.

After the elections in November 2010, the new government of Myanmar made a series of reforms with the end of transforming the country into a modern, developed democracy by 2030. The government made the development of the telecommunications sector a priority among its many economic reforms, as it knew that ICT infrastructure was important for economic development. In spite of the government’s invitation of foreign investors to help build the ICT infrastructure, there are still significant gaps in the country’s ICT infrastructure development. The World Bank( 2015) stated that “ICT infrastructure investment and policy reform can support poverty reduction and shared prosperity. A 10 percent increase in high-speed internet connections makes a 1.4 percent increase in economic growth (on average) in developing countries (World Bank, 2015).”

**Table 2 Myanmar Internet Penetration Between 2000 and 2010**

Year	Internet Users	Population	% Internet penetration of the population
2000	1,000	54,021,571	0.002 %
2008	40,000	47,758,181	0.1 %
2009	108,900	48,137,741	0.2 %
2010	110,000	53,414,374	0.2 %

Source: Internet World Stats, Usage and Population Statistics, Asia Internet Stats, Myanmar  
<http://www.internetworldstats.com/asia/mm.htm>

### 3.2 ICT Infrastructures in Myanmar

The government has identified the key barriers to telecommunication access to be high costs and limited infrastructure (Yasuhide Fujii, Satya Ramamurthy, 2013). ICT infrastructure includes a wide range of electronic technologies (e.g., computing, telecommunications, Internet, and broadcasting), related applications and resources (e.g., digital maps and radio spectrums), physical infrastructures (e.g., access devices, fiber cable ducts, masts, and antennae), and physical financial networks (e.g., banks and postal services). Together, these are recognized as enablers of social and economic development, the impact of which affects virtually every other sector (Regional Infrastructure Development Master Plan, 2012). The liberalization of Myanmar's telecommunications

**Table 3** Telecommunication Infrastructures in Myanmar (2013-2014)

National backbone	Fiber between major hubs
International Cross-Border Fiber Cable Link	China-Myanmar, India-Myanmar, Thailand-Myanmar, Vietnam-Myanmar
Cross-border Microwave links	China & Thailand (STM (4+1) SDH)
International Link	Satellite communications, Sea-Me-We 3Submarine Cable
Last Mile Link	Dedicated Link Wireless Broad Band Access MPT Satellite Terminal FTTH
Special networks	Ministry of Science and Technology Network Educational Intranet Medical education network E-government intranet network Industrial network
Internet subscriber	1.5million
Internet Bandwidth	26.74 Gbps
Telephone	Density12% , Total Lines 6.6 M Fixed Lines 0.6 M Mobile lines 6.0 M
Internet Gate Way	2
PTSN Exchanges	915
Transit Exchanges	11
Rural Phone Exchanges	234
Microwave Stations	341
IP Microwave Stations	154

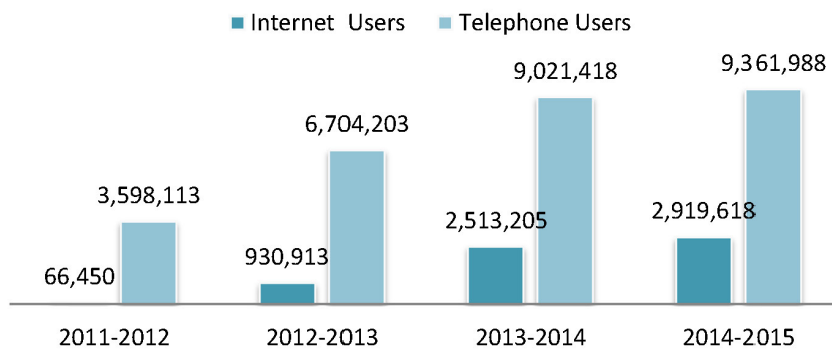
Source: Ministry of Communications and Information Technology in Myanmar



sector is widely seen as one of the country’s most successful reforms since the end of its military rule in 2011. Details of Myanmar’s telecommunication infrastructure are provided in the following table.

The new government, which started in 2011, initiated a significant reform of the telecommunications program by opening up the sector and inviting foreign investors to register their bids for two of the four national telecommunications licenses. The telecommunications sector has been transformed through the flow of Japanese funds and management expertise into the incumbent government operator (MPT) and the issuance of two new foreign-based licenses (i.e., Ooredoo and Telenor). Some foreign companies invested in ICT infrastructure and ISPs during this time. In 2014, the foreign service providers Ooredoo and Telenor Service began to work in Myanmar’s telecommunications (Helani Galpaya et al, 2015). Based on the Ministry of Communications and Information Technology (MCIT), Internet bandwidth was 3.72 Gbps in the budget year of 2011-2012. The bandwidth was increased to 27.36 Gbps in the 2014-2015 budget year and teledensity became 15.60% of the whole country, and mobile Internet service was generally upgraded to 3G (Office of the Minister, 2015). Local businesses started to use computer software systems in the early 1990s. Social media was developed within three years. There has a market for business application software for fields such as accounting, point of sales, management systems, and billing systems for private hospitals and clinics. Myanmar business people, students, office workers, and government staff in Yangon and Mandalay cities use information technology such as mobile banking, online learning/training, online marketing/shopping/advertising, and e-business.

Currently, there are four ISPs operating in Myanmar-MPT, YTP, Telenor (Norway), and Ooredoo (Qatar). There is also a cluster of smaller, sub-ISPs, such as Redlink, Digicel, and SkyNet, which help deliver Internet services to private customers. The network spectrums are GSM- (66%), CDMA-800 & CDMA-450 (20%), WCDMA- (14%) (Yasuhide Fujii, Satya Ramamurthy, 2013).



Source: Ministry of Communications and Information Technology (MCIT), Myanmar website

**Figure 2** Internet Usage and Telephone Usage Between 2011 and 2015

Cross-border fibers connect Myanmar to China, India, Thailand, and Vietnam, with the main international link being the Sea-Me-We-3 Cyber Link through Singapore. Myanmar Internet usage and telephone usage between 2011 and 2015 are shown in the following figure.

Figure 2 above shows that the Myanmar telecommunications sector grew rapidly between 2011 and 2015. Telephone users totaled to 3,598,113 in 2011-2012 and 9,361,988 in 2014-2015 respectively. Similarly, Internet users increased within that four-year time span, from 66,450 to 2,913,618. The government expects that mobile phone penetration will become 80% and Internet penetration will become 50% by the 2015-2016 financial year (Office of the Minister, 2015).

### 3.3 ICT Institutions and Human Resource Development

While the Ministry of Communications and Information Technology (MCIT) is leading the country's ICT sector development, many institutions are also playing a role—the Myanmar Computer Development Council (MCDC), which was established in 1996; the Myanmar Computer Federation (MCF), which was established in 1998; Myanmar Computer Science (MCS); and the Myanmar ICT Development Corporation (MIDC). The Myanmar Computer Professional Association (MCPA), the Myanmar Computer Industry Association (MCIA), and the Myanmar Computer Enthusiasts Association (MCEA) are subordinated by MCF. MICT Park and Yatanarpon Cyber City are the main buildings for ICT development. The Ministry of Science and Technology operates 25 computer universities. The Universities of Computer Studies, Yangon (UCSY) and the University of Computer Studies, Mandalay (UCSM) are the two of most recognized institutions under the Ministry of Science and Technology. The universities offer both undergraduate and postgraduate degrees as well as diploma programs in computer studies (UCSM, 2015). Additionally, many private institutions teach various IT courses, starting from basic computer literacy to advanced programming skills. The private education sector in Myanmar and ICT education institutions have also recently seen considerable growth. Currently, one of the major challenges for the local ICT industry is to prevent the “brain-drain” (i.e., the migration of talented ICT workers to other countries such as Singapore) of skilled professionals to more developed countries. Realizing the importance of ICT education, the Ministry of Education has been trying to introduce IT education into primary school syllabuses, but its efforts have been hampered by a lack of budget and other constraints. Across the sectors in Myanmar, education and human resources present a considerable challenge, as local talent is difficult to find.

### 3.4 ICT Policy and Legal Frameworks

Myanmar's ICT policy has been established by the Ministry of Communications and Information

Technology (MCIT) and is summarized as follows (Yin, 2015):

- (1) To transform from a closed to an open market economy
- (2) To make economic development the first priority
- (3) To provide the government and people more efficient and effective ICT services

Through the first ICT Master plan, the Ministry of Communications and Information Technology envisions:

- (1) **Connecting the people of Myanmar nationally and globally** using mobile, fixed, and satellite technologies to connect over 90% of the population to the Internet by 2020, with 50% having access to high-speed Internet services of at least 7.2 MBps
- (2) **Empowering Myanmar's economy with ICT and innovation** to create a social impact in health, education, and other sectors, overcoming obstacles to national growth through the development of physical facilities and specialized skills, ultimately empowering a broader industry and economic growth
- (3) **Enabling the transition to digital government with infrastructure and mobile applications**, supporting the government's initiatives by creating an information architecture and providing implementation support.

Currently, legal frameworks for telecommunication and ICT sector are comprised of the following:

- (1) Myanmar Telegraph Act (1885)
- (2) Myanmar Wireless Telegraphy Act (1934)
- (3) Computer Science Development Law (1996)
- (4) Electronic Transaction Law (2004)
- (5) Wide Area Network Order (2002)
- (6) Telecommunication Law (2013).

Intellectual Property Rights is currently being drafted. Computer Science Development Law focuses mainly on business license, inspection, prohibition, formation, duties of the computer science development council, computer associations, and computer federation. The promotion of the ICT industry, however, is very weak. Currently, the government has been working closely with the Korean International Cooperation Agency (KOICA) to develop the use of e-government platforms and incorporate ICT into policy-making and legislation primarily through the development of the National ICT Master Plans. While the implementation of these plans has been

behind schedule, and the adoption of technology in practice requires trainings and facilities, the Myanmar government is gradually implementing more and more e-government projects within ministries and with other agencies and citizens.

#### 4. Analysis Results

In this study, we analyze telecommunication progress in Myanmar, especially in terms of telephone and Internet penetration, over the last fifteen years (from 2000 to 2015) and consider some of the challenges that lie ahead.

##### 4.1 Telecommunication Progress

As the ICT infrastructure requires high-tech equipment and personnel, its impact on economic development is also very critical. In Myanmar, the national backbone has a fiber link between major cities. Cross border fiber links connect India and Myanmar, China and Myanmar, and Thailand and Myanmar. International links are Sea-Me-We (3) Cable and Satellite. The Last Mile Links are Dedicated Link, Wireless Broad Band Access, ADSL, and MPT Satellite Terminal. Myanmar's tele-infrastructure can be divided into access networks, switching, transmission, and international connectivity. The access network of Myanmar is relatively weak compared with those of other ASEAN countries. User connectivity consists of dial-up, ADSL, and Broadband. In the past, most of the Internet users were government and military officials, but the Internet is now used widely by citizens. Yangon, Mandalay City, and other towns have more than three hundred and fifty public access centers and cyber cafés, which have allowed ordinary people to use the Internet and e-mail. Satellite is the main means of international connectivity. The country domain is "dot mm." The government has made significant investments in ICT in order to improve governance. As a result of the concentrated efforts of both the public and private sectors in Myanmar, ICT has seen much development over the last two years, but development needs to progress more quickly if the country is to narrow the digital divide.

According to the Table 4, we can see significant increases of Myanmar's telephone and Internet

Table 4 Comparison of Telecommunication Penetrations in Myanmar Between 2000 and 2015

Year	2000			2015		
	Users	Population	% penetration of the population	Users	Population	% penetration of the population
Telephone	n/a	54,021,571	-	9361988	51,486,253	18.18 %
Internet	1,000	54,021,571	0.002 %	2913618	51,486,253	5.66 %

usage between 2000 and 2015. Myanmar’s Internet penetration grew 2,830 times within this fifteen-year time span, from 0.002% to 5.66%. Similarly, telephone user penetration grew 18.18%. In this period of time, the Myanmar government was opening up the telecommunications sector by inviting foreign investors to compete for the telecommunications market and reducing the cost of Internet installation and SIM card fees. As a result of governmental efforts and the implementation of the local IT organization, telecommunications in Myanmar is growing rapidly, but the country remains behind other Asian countries.

**4.2 Telecommunication Status between Some Asian Countries and Myanmar**

A comparison of the ICT status of some Asian countries with that of Myanmar shows a very noticeable difference. In spite of the progress Myanmar has achieved up to now, the country is still behind where other Asian countries were in 2010. In this paper, we compare the Internet usage of some Asian countries with that of Myanmar, as can be seen in Table 5 below.

According to the Table 5, we can see that Myanmar’s telephone and Internet usage is the lowest compared to that of other Asian countries. Due to several limitations, Myanmar has the lowest rate of Internet penetration.

**4.3 Challenges**

Myanmar faces many barriers in terms of ICT development. The first is the instability of the last fifteen years, which has hampered the progress of Myanmar’s national ICT. Rigid policies and an unwillingness to liberalize were other barriers for ICT development. The general economy is in a state of decline, which has negatively impacted the ICT sector. Another factor is a lack of skilled personnel. Even though Myanmar has twenty-five computer universities, a private training sector, and scholarship programs, it still lacks qualified ICT personnel. Although some ICT development institutions in Myanmar have been established, they are insufficient in promoting ICT development as a whole. There are several problems in ICT development: Power blackouts, the high cost of connectivity, and a lack of ICTs skills were ranked as the most significant while

**Table 5** Comparison of Internet Usage Between Myanmar and Some Asian countries

Country	Year	Internet Users	Population	% Internet penetration of the population
Singapore	2010	over 3 Million	over 4 Million	77.8%
China	2010	over 420 Million	over 1330 Million	31.6%
Vietnam	2012	over 31 Million	over 87 Million	35.49%
Myanmar	2015	over 2.9 Million	over 51 Million	5.66%

interconnectivity ranked second. Poor infrastructure, the urban-rural digital divide, a lack of basic education, obsolete equipment, and the high cost of equipment were also mentioned as factors in a past study (Ogbomo Monday Obaidjevwe, Esoswo Francisca Ogbomo, 2008). Myanmar has a severe mismatch between the supply and demand of ICT workers. Other mentioned obstacles include a poor communications infrastructure, an insufficient budget, the rise of fuel prices, and electricity problems. Poor ICT infrastructures cause a significant digital divide between the urban and rural areas. A lack of electricity in the rural areas is also a major barrier in accessing ICT. Therefore, the majority of the population does not have access to computers or the Internet, which again leads to poor communication and a lack of ICT knowledge.

Another challenge in the telecommunications sector is mobile reception and Internet access. While the number of Internet users in Myanmar has grown, the development of Internet connection quality has declined. Another challenge lies in the fact that laws governing the ICT sector are incomplete. Since Intellectual Property Right for IT has not yet been enforced, local software developers face great difficulty in protecting their IP rights.

The software market in Myanmar is still largely underdeveloped, with relatively few companies operating in this arena. At the moment, the finance sector seems to be an early adopter of technology, with banks installing increasingly secure and progressive systems. Within the trading and tourism sectors, IT usage is limited to the larger players such as major airlines and foreign-owned hotels that offer online booking systems and supermarket chains that manage their inventory digitally. Most of the largest sectors in the country (e.g., agriculture, manufacturing, education, and healthy), however, employ very little software solutions if at all. Nevertheless, the demand for sophisticated applications is expected to spike as the country's various industries grow and require more developed solutions, be it custom-made applications or licensed comprehensive systems. The Myanmar ICT market is still largely dominated by hardware companies, due to the relatively low usage of ICT in business and industry.

In the telecommunications sector, companies are struggling to build the necessary infrastructure. Some towers are expected to be built across the country in the next year. Companies building towers must seek permission from those who own the rights to that land and must obtain permits from local governments, which is a considerably slow process. Telenor identified further challenges such as confirming the identity of the land-owner, securing consent from neighbors, and building in heritage zones.

## 5. Discussion

Several actions can be made taken for the sake of ICT development in Myanmar. The first one is to

develop an information infrastructure that is easily accessible for everyone. The Myanmar Government should set aside a large portion of its budget for ICT infrastructure and cooperate with foreign IT companies. Without an adequate ICT infrastructure, the ICT sector will not be able to develop. The second is to improve the number of ICT human resources who are concerned about Myanmar's ICT development. The country needs people who are committed to improving ICT in Myanmar. The brain-drain effect is also threatening local ICT companies.

Myanmar neighbors countries that are considered ICT super powers-India and China. Myanmar can enjoy the benefit of the spillover effect of their development because of this strategic location. The private sector also has the technology, resources, and creativity to turn a more developed Myanmar into a reality. Currently, Myanmar is being supported by international communities such as International Telecommunications Union, the World Bank, and the ADB for ICT infrastructure improvement. In the future, the ICT Master Plan and Action Plan, and e-governance Master Plan will develop ICT infrastructure and increase efficiency in e-government.

For ICT development in Myanmar, we need to study five areas: ICT Infrastructure, ICT Legal Infrastructure, ICT Education, ICT Application, and ICT Industry. Five study teams are formed accordingly. Strengths, weaknesses, opportunities, and problems are identified and recommendations are provided to boost ICT in Myanmar. The main tasks of ICT Infrastructure must be emphasized: Strengthen and extend existing infrastructure including broadband, particularly outside urban areas; improve end user device penetration, especially outside the main cities; develop plans for national capacity building; and attract funding from bi-lateral and multi-lateral aid agencies. Institutional capacity building is also necessary, and the private sector must cooperate in the introduction of liberalization, privatization, and competition. Also, there is the need to address the systems that will allow for both ICT education and the awareness that are needed for ICT4D. Although with many barriers still ahead, Myanmar has considerable opportunities, and the Myanmar people must try to take advantage of them. The last task is to clarify ICT-related law, which will allow the IT industry to develop in a structured way.

## **6. Conclusion**

The creation of digital opportunities within all sectors as a long-term approach is very important for Myanmar. As the capital of Myanmar is moved to Nay Pyi Taw and Yangon continues as a business center, the country has the opportunity to utilize the ICT and e-government applications to support daily transactions and management. The telecommunications industry is one of the fastest growing and lucrative worldwide. Myanmar's telecommunications sector presents a unique investment opportunity as it demands products and services for a large market. ICT has the

potential to improve the quality of community life. Developing countries recognize the need to harness ICT for development. If the Myanmar people put in the effort to develop the ICT sector, ICT will provide them opportunities to catch up with developed countries, and Myanmar will be able to compete effectively in the international ICT industry in the near future.

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