What is the digital divide?

One of the worlds most serious problems is the ever increasing gap between the rich and the poor. A small percentage of the world’s population enjoys luxuries while global poverty seems to be increasing. A key aspect of this divide is the digital divide where a large difference in terms of access to information communication technology. Throughout developing nations in Africa, Asia and Latin America access to such technology is limited whereas in developed nations members enjoy the convenience provided by such technology and is more efficient and effective through usage of such technology and also takes advantage of the educational opportunities made available by ICT (Tiene, 2002).

The concept of the digital divide can be explained from two perspectives: (1) the distance between countries who have access to electronic information and those that do not, (2) the difference in internet literacy between citizens of developing and developed nation (Brooks, Donovan, & Rumble, 2005). (http://www. ebscohost. com/uploads/imported/thisTopic-dbTopic-873. pdf) The second scenario is often considered as a direct result of the former where the lack of infrastructure made available does not create an environment suitable to encourage a higher literacy rate of usage of the internet. The digital divide refers mainly to the division between the information rich and the information poor and is also used to divide the globe geographically similar to the “ NorthSouth dichotomy (Gudmonsdottir, 2005). The difference in the divide can be attributed to 5 factors, socioeconomic, geographical, educational, attitudinal and generational factors. Information Communication Technology (ICT) has played a major role in the 21st century. However, usage of such technology remains poles apart when compared

between developing and developed nations. The term digital divide is used to describe situations where there are gaps in the market in terms of access to the use of ICT devices (Singh, 2012). The measure of the digital divide is not limited to access of the internet and measures other gaps such as access to mobile technology and other forms of communicative technology. According to OECD (2001), the term ‘ digital divide’ refers to “ the gap between individuals, households, business and geographic areas at the different socio-economic levels with regard to their opportunities to access of ICT’s and their use of the internet. It reflects the differences between and within countries”. For the purpose of this paper, it will examine the digital divide using the concept of the ‘ haves’ (represented by developed countries) and ‘ have nots’ (developing nations) along with the key assumptions as to how the digital divide determines the future of class, education and economic capacity with long-term and social political consequences. The paper will further examine the efforts made by global agencies and the policies that they have developed to overcome this divide and examines the level of success of these policies.

The digital divide exists between countries with different levels of progress and even within the country between urban and rural areas (ITU, 2002). It is a result of the disparities of society and is likened to the divides created by income, health and education. The primary reason for the disparity is poverty where when a country’s citizens have less money it is less likely that they would use ICT (Figure 3). Difference in access to ICT has created a difference in the measure of power in society with the digital divide reflecting how power is being distributed. The digital divide in reference to

figures 1 and 2, can be seen that developed nations are among those with the highest internet penetration boasting penetration of over 60%. Developing nations represent the lower half in terms of internet penetration and do not even have a . 25% penetration among the 10 countries with the lowest internet penetration. Internet usage among those countries is largely associated with the more developed cities and usage of internet in rural areas is almost unheard of.]

Recent efforts by organizations have shown evidence that the digital divide is shrinking. Developing nations have been able to increase the number of internet users by 2% in 1991 to 23% in2001. However, advancements in technology has led to a new form of digital divide where shifts have been made from basic to advanced communciations. This is harder to measure as it measures the quality of ICT used. For example, international internet bandwidth is a good measure of users' experiences as the greater the bandwidth the quicker the response time improving efficiency. Comparisons between developed and developing nations can be illustrated where the 400, 000 citizens in Luxembourg have more international internet bandwidth compared to Africa's 760 million citizens. The highspeed internet access made available in developed nations allows internet users to better quality access and allows them access to more advanced sites that allow video streaming rather than basic usage like checking emails.

Impact of the Digital Divide

The digital divide and its impact on developing nations economies is that of a spiral where they do not have the economy to support the infrastructure

necessary to allow developing nations to utilize technology to level the competitive advantages with developed nations. Primary concerns among developing nations is that poor countries have more pressing concerns such as focusing on food, healthcare and basic needs of the people rather than focusing on technological advancement (http://www. masternewmedia. org/news/2007/01/27/the_digital_divide_issues_and. htm). As a result of this, developing nations lack the capabilities of establishing the infrastructure necessary to allow their nations to have wide enough coverage to be effective. This puts their country in a position where they schools are unable to teach IT skills necessary in more industrialized industries which would help move a country beyond an agricultural themed economy. Also, it puts students from these schools at a disadvantage as they are unable to take advantage of the vast amounts of information available on the web. In comparison, developed nations have the ability to recruit highly trained individuals who are equipped which enables them to produce more giving the country a higher economic growth. Also, countries that lack the IT infrastructure will be unable to carry out e-commerce or e-businesses putting themselves at a disadvantage in the global market. With e-commerce representing 12% of retail sales in the United States, it indicates the impact of technology in the market. It also helps improve overall growth of an economy by reducing costs of some processes such as the elimination of the brick and mortar stores, ease of advertising, reducing search costs and improving efficiency of doing business. Also, access to mobile technology has a significant impact on economies of developed and developing countries. In developing countries the impact is more pronounced as in Waverman’s model a developing country an increase of 10 mobile phones per 100 people

helps boost the GDP growth by . 6 percentage points. To illustrate this, in Bangladesh, farmers and fishermen use these mobile phones as a means of identifying the best prices they can get for their goods. Small businesses can use mobile phones as a means to shop around for products. Use of technology in this manner reduces transaction costs, broadens trade networks and helps reduce the need for transportation and broadens the trade network (http://www. economist. com/node/3742817? story_id= 3742817). However, as developing nations do not have the infrastructure in place to allow broad usage of such technology, it reduces the production capability of the individuals in their country reducing their competitiveness on the global scale.

One of the most important effects of the digital divide is the impact it has on educational efforts in developing nations. With the use of digital technology, it grants access for students to large amounts of information provoking thoughts in dynamic ways and encourages them to work more efficiently. Without access to ICT, developing nations face the possibility of being unable to keep up with their peers. The United Nations Development Program in its Human Development Report for 2001, noted that the technology divide is consistent with the trend of following the income divide across the globe. A lack of education in ICT puts citizens of a developing nation in a weaker position of benefitting from new technologies reinforcing the economic disparities between the rich and poor (Henry, 2012).

The digital divide in the societal sense can be likened to events in the past, similar to the industrial revolution. Taking a look at the Meiji Restoration in Japan, it can be observed that with the industrialization it enabled

international competitiveness and economic benefits which in turn led to Japan being able to compete on a global scale. Introducing industrialization has led Japan to become a globally recognized force in the world with great technological advancement in manufacturing and information technology. In comparison however, nations who have yet to adopt industrialization can see their GDP per capita and living standards at rate considerably lower compared to Japan. ICT adoption of nations in the developed world is considerably greater in comparison to developing nations as they have better access in terms of resources and have the existing infrastructure to support it. ICT adoption in terms of the digital divide can create a parallel collapse to an even greater degree in comparison with the industrial revolution. The ICT “ revolution” creates barriers such as access to information, restructuring society and creating horizontal networks divided by access to information technology. Differences in the scale of technology adoption restructures society by altering class structure to create a new degree of equality in the potential it gives to access to common knowledge via technology such as the internet. Limited adoption of ICT by developing countries further exasperates the divide as it creates a new class system of access. It creates a division of the ‘ haves’ and ‘ have nots’. The divide could lead to unemployment in more advanced industries which adopt technology as new skills are required and could lead on through generations if members of society are not trained. This could force members of developing nations to focus on primary industries such as agriculture and mining which would lead to such nations being left behind in terms of competitiveness in other industries.

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Source: OECD Communications Outlook 2011 [www. oecd. org/sti/telecom/outlook]

Bridging the Digital Divide

This section of the paper examines the causes of the digital divide and the efforts put forward by organizations towards bridging the gap. The relationship between ICT and lifelong learning and policies and objectives by governments towards improving the economic competitiveness and reducing the social exclusion are complex. The figure below illustrates the complexity and the road towards bridging the digital divide. Policies made by governments and organizations have to support both competitiveness and inclusion and also at the same time use digital technologies to support lifelong learning. By creating the center of the diagram larger, the digital divide can be overcome with the right policy objectives. The following will identify the objectives needed to be met in order to bridge the divide.

http://www. oecd. org/site/schoolingfortomorrowknowledgebase/themes/ict/41232069. jpg

Guide to Bridging the Digital Divide

Sourced from Mcnair, 2000

An important objective is to secure access for all to ICT as one of the major causes of the digital divide is the difference between the technologically advanced and technologically poor nations (Mcnair, 2000). A good indicator of the level of the digital divide is the number of access lines and access paths per 100 inhabitants. As the graph below indicates the total communication paths in OECD countries has steadily increased over the years however, it is still not evenly distributed as the highest ratios of access paths are still being held by developed nations. The digital divide is even deeper for internet access with China, Taipei, Singapore, Hong Kong and

Israel accounting for 52% of all internet hosts outside the OECD and Argentina, Brazil, Malaysia and South Africa representing a further 24%. This indicates that there is the distribution even among developing nations is skewed such that approximately 76% of internet hosts outside the OECD nations are in 9 countries (OECD, 2001). A solution to this issue is to consider liberalizing the telecommunications market. The liberalization of telecommunications services helps improve the competition forcing existing firms to improve on their service quality; it will lead to price reductions, better service coverage and improve access to ICT (OECD, 2001). As the affordability of access to ICTs reduce, it encourages usage of ICTs (Pena-Lopez, 2003). In Europe for example, it can be observed that with liberalization, the average cost of telephone charges continue to decline. The average price for bundle services dropped by 32% after liberalization of the telecommunications industry in Europe in 1998. Similar circumstances occur with bandwidth prices in Europe where competition and a rapid drop in bandwidth prices occurred as can be observed in the figure below. The increased competition on a global scale has led to several key factors in addressing the digital divide (1) Computing costs have steadily decreased and capacity is increasing in a variety of devices to prices where many users can afford. (2) Competition among technology firms has led to improvements in technology such as the new wireless protocols which are able to overcome technical and financial problems when expanding into rural communities in developing nations. (Smyth, 2006) (http://www. intel. com/it/pdf/wireless-technologies-and-e-learning-bridging-the-digital-divide. pdf)

Source: OECD Communications Outlook 2011

Developing infrastructure necessary to facilitate the usage of ICT is also crucial in bridging the digital divide. The responsibilities of this however falls on, local governments, private institutions and also international organizations with the technological expertise in helping facilitate the construction of the infrastructure. Among the key projects which have been launched is the optical fibre network being deployed throughout South and East Africa. As part of a project by national and cellphone operators, national research and education networks are emerging in African countries as part of a consortia to link their major institutions by purchasing internet bandwidth. This project SANREN, is being funded by the Meraka institute as well as the tertiary education network to create a broadband system for its higher education and research institutes. The project aims to be the ‘ Geant’ of Africa and is expected to be at least 1, 000 times faster than the current infrastructure made available. The Eastern Africa Submarine Cable System (EASSy) is another initiative considered to be a milestone in the region. The objective of which is to connect the countries of Eastern Africa with the rest of the world via an optical cabling system. This allows countries in the region to no longer rely on expensive satellite systems as a means for connectivity. This project is being funded by the Developmental Bank of Southern Africa and the World Bank. (http://www. saao. ac. za/fileadmin/files/Publications/Quest_Digital_Divide. pdf) Having the infrastructure in place helps increase access paths reducing the barriers to access to ICTs.

Another key would be using education as a means to bridge the digital divide. Disparities in the level of education explain 9. 9-14. 4% in computer

penetration gaps with the average number of years of school in the Sub-Saharan region of Africa being 3. 7 years and 8. 3 years in Europe and Central Asia. In comparison, the average years of schooling in the United States is 12. 1 years. Having computers requires a certain degree of education to be used therefore countries with low levels of human capital have limited demand for computers(http://cgirs. ucsc. edu/publications/wp/wp2004-3. pdf) (Caselli and Coleman (2001) and Pohjola (2003)). It is imperative therefore that for organizations to create a ‘ learning economy’ within developing nations where individuals, firms and countries will be able to create wealth in proportion to their capacity to learn and share. Creating a learning economy places emphasis on life-long learning to foster dissemination, circles of discovery and an emergence of shared understandings. The World Bank has implemented several measures to help develop developing nations towards a knowledge economy http://www. worldbank. org/education/digitaldivide/DD_EXT. pdf. The Human Development Network (HDN) provides knowledge management, training resources and technical assistance for developing countries in areas such as education and the use of technology for educational purposes. It has also developed a program that provides training for teaching staff and students in developing countries known as the Developmental program. Another initiative by the World Bank is setting up Global Distance Learning Centers which aim to provide tailored learning programs and state of the art facilities for internet-based learning (http://gdln. org/about). The Bank has also developed financing instruments for education based programs. The number of education technology activities increased by 20 and 90% in 1997 and

1999. 1/3 of this financing went towards developing nations in Latin America and the Caribbean.

Building on the initiatives taken, the World Bank has set up a specific task force with the aim of bridging the digital divide through education. The objective of the task force is to assist developing countries in developing strategies with regards to technology in education. The task force is also assigned to promote projects that help address key issues in terms of education such as quality and increased access to ICT. This task force will work hand in hand with another division of the World Bank, the Global Distance Education Network which has similar goals in reducing the digital divide. By providing its expertise in these areas and helping set up a proper mapping guide as to how to improve education, it creates better environments to educate citizens of developing nations. The higher the level of education, the higher the demand for computers resulting in better usage of ICTs in these developing nations (Fairlie, 2003). These initiatives also help educate citizens of developing nations and trains up a workforce able to develop, maintain and provide value-added products and services required by the knowledge economy which will in turn help improve the countries competitive capabilities (Hudson, 2000)_(http://mitpress. mit. edu/books/BRYUH/12. hudson. pdf).

Examining the digital divide, it can be observed that the digital divide is getting smaller, however it is still not equal across all borders. Certain developing nations still face more pressing issues such as fulfilling basic needs of their people particularly in countries with the lowest digital access index such as Niger, Mali and Chad. Political turmoil in these countries make

it difficult for international organizations such as the World Bank to assist in narrowing the digital divide. Progress can definitely be seen as some key points are examined. In 2010 there were approximately 2 billion internet users worldwide having doubled from 1 billion in 2005 with China leading the charge at 418. 9 million. Information based development in China has exceeded the world’s average level as a result of its initiatives in bridging the divide.

Lack of access to ICT leads to a lack of education, wealth and income, in turn leading to lack of access to ICT infrastructure and services and so continues the digital divide. Several socio-economic groups, especially within the developed world, have benefited enormously from the innovative creations of the ICT industry, not least in the arenas of learning and collaboration. By sharing this experience and expanding the key uses of ICT in education to other groups within our own society and in the developing world we can kick-start the beginning of the end for the digital divide. To date, communications equipment has been expensive and requires good infrastructure to be in place. Rural communities and developing countries often do not have either the necessary infrastructure or the available funding to put such infrastructure in place. With the advent of the new wireless technologies, there is an unprecedented opportunity to remedy this situation at a fraction of the cost, and in a fraction of the time, that would previously have been required.

The digital divide must then be fought on at least two battlefields: economy and education. Regarding the possibility to allow more people to be able to afford a computer or a mobile phone, a good accomplishment is represented

by the fact that the cost of digital technologies lowers year after year. The UN are currently helping eliminating the digital divide in developing countries by promoting international initiatives, and also private institutions are contributing with ideas such as the “ One Laptop Per Child” project.

On the other hand, there is still a lot to do to make sure everyone can properly use digital technologies; for example, the Internet – which is the expression of the new media world – is still not completely accessible and interactive to most of its users. Starting with web design, a big accomplishment would represent a more distributed adoption of the W3C accessibility guidelines, let alone the use of a writing style that is based on simple grammar and makes content easily searchable and readable.

The major issue, however, remains the lack of education that influences many people and does not allow them to access certain information sources that are only reachable via digital technologies. In this case, the progressive spread of mobile phones and the expansion of mobile networks (as stated in a recent report by Word Bank) might certainly represent a significant improvement in the lives of all those individuals whose access to the digital era is still denied.

Link: http://www. masternewmedia. org/news/2007/01/27/the_digital_divide_issues_and. htm#ixzz28RyJWlzR