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The Digital Divide in Asia: Cases from Yemen, Bangladesh, Pakistan and China

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Abstract

This article explores the digital divide in four Asian countries: Yemen, Bangladesh, Pakistan and China. The research the article reports on is done by researchers who come from these countries making it possible to ground the results of this study within the context of those studied. To allow the reader the opportunity to see the results of this research from multiple sources, the researchers selected four different groups of people to study. The groups of people studied come from interesting backgrounds, yet not typically paid attention to in the literature. The groups of people that will be discussed here are Women in political online forums in Yemen, Rural Students in Bangladesh, Cyber Activists and Virtual Protesters in Pakistan, and Farmers in China. This research will show that the reasons these groups of people are standing on the "have not" side is not just because of, as often thought, economic reasons but could also be due to cultural, technological or political reasons, providing fuel for further research on the digital divide. A discussion about any digital divide is not complete if it did not include a philosophical analysis which is what this article does towards the end when it addresses the moral significance of the digital divide in these countries.

1.0 Introduction

Widening of the gap between so called 'haves' and 'have-nots' is a problem for people even in western countries. In Asia this gap is even bigger and more worrying making any research that looks into it a significant contribution to the dialogue about the topic. This article presents an unusual approach to the digital divide for several reasons. While research done on the digital divide in Asia is often conducted by scholars who come from western nations, this article reports on research done by researchers who come from Asia. In addition, quite often researchers focus on only one country when they study the digital divide, this article focuses on four Asian countries to give a reader the opportunity to compare situations in more than one country. Within these four countries the article looks at four different groups of people not just the same group of people as sometimes found in the literature to allow a reader the opportunity to see the results relating to the digital divide from different perspectives. The groups of people studied come from interesting backgrounds, yet not typically paid attention to in the literature. The groups of people that will be discussed here are Women in political online forums in Yemen, Rural Students in Bangladesh, Cyber Activists and Virtual Protesters in Pakistan, and Farmers in China. Finally, this research will show that the reasons these groups of people are standing on the "have not" side is not just because of, as often thought, economic reasons but could also be due to cultural, technological or political reasons, providing fuel for further research on the digital divide. Towards the end, this article also offers a very brief philosophical analysis to shed light on the moral significance of the digital divide in these countries.

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2.0 Country Profiles

Yemen (officially the Republic of Yemen,) which is composed of former North Yemen and South Yemen, is located on the Arabian Peninsula; bordering Saudi Arabia to the north, the Arab Sea and the Gulf of Aden to the south, Sultanate of Oman to the east and the Red Sea to the west. Yemen is one of the oldest civilizations in the world dating back to ninth century BC and known then as ("Happy Arabia") due to its rich and fertile soil. Yemen is also one of the fastest growing democracies in the Arab world holding elections that have always been judged by international observers as being "free and fair". Yemen is one of the poorest countries in the Arab world, where 45.2% of the total population (23,013,376 people, July 2008 est) is below poverty line. Although the population, which is predominately Muslims (Sunnis and Shiaa), is relatively young (46.2% between 0-14 years and 51.2% between 15-64 years), the unemployment rate is still as high as 35% (CIA World Fact Book 2009).

Bangladesh is an extremely poor and densely populated third world country situated in South East Asia (USAID 2007 and Atlapedia 2008). It has more than 150 million people and only 133,910 sq km of land area resulting in a high population density, which is 1,150 people per sq km whereas the population density of China and India are 142 and 386 people per sq km, respectively. To make things even worse, about one third of the country floods every year causing serious damage to the already poor economy. GDP per capita (PPP) is only $1,300 whereas, in Australia it is $36,300. Almost half (45%) of the total population live below poverty line (CIA World Fact Book 2008). Most of the people (around 85% of total population) live in rural areas. Around 20% of rural population lives in extreme poverty. They do not have any cultivable land or assets, and often suffer from serious illness and persistent food insecurity. Another 29% people are moderately poor meaning that they suffer from lack of protein and other nutritional elements in their diets (Rural Poverty Portal 2007).

Islamic Republic of Pakistan emerged on the map of the world as an independent sovereign state on 14th August 1947. Pakistan is bounded by Iran in the west, Afghanistan in the north-west, China in North, India in the east and south east and Arabian Sea in the south. Geographically, Pakistan was originally in two parts. The east wing, present-day Bangladesh and the west wing, present-day Pakistan. Since its independence Pakistan has been tarnished by political corruption, inefficiencies, instability and military rule for more than three decades which has left the country instable (CIA World Fact Book 2008) and (About Pakistan, Country Profile 2008). Religiously, Pakistan is an Islamic country where 97% of the population is Muslim and 3% is Christian, Hindus and other religions. Pakistan population is 167,762,040 million (CIA World Fact Book, July 2008 est).

As part of East Asia and with land boundaries of 14 other nations, China has a total area of nearly 9,596,960 square kilometres. Based on 2005 estimates, 14.86 % (about 1.4 million sq km) of China's land is arable. China has over 1.3 billion people (CIA World Fact Book, July 2008 est) . The nation's overall population density was 135 persons per sq km in 2003. The most densely populated provinces are in the east and the least densely populated areas are in the west, where Tibet has the lowest density of only 2 persons per sq km. 62% of the population live in rural areas, while 38 % live in urban settings. About 94 % of population live on approximately 46 % of the land. Besides the majority Han Chinese, China recognizes 55 other nationalities or ethnic groups, numbering about 105 million people, mostly concentrated in the north, south, and some parts in central areas. The traditional faiths in China are Confucianism, Daoism, and Buddhism. Some people try to imbue Confucianism with rituals and religious qualities, although it is not a religion, It is rather regarded as a philosophy and system of ethical conduct since the fifth century B.C. has guided China's society (Country Profile: China 2006).

3.0 The digital divide in the literature

3.1 Definitions

The literature reveals the term digital divide means different things for different people. Some view the digital divide as a divide between users and non-users of internet, telecommunication, and communication technologies; or as a gap between technology adopters and non adopters. Others, especially in Asia, view the digital divide as a gap in the percentage of people in a country which are technologically literate and can use ICT technologies such as the internet and those who are technology illiterate. Some view the gap from the point of view of the financial and economical impact on people, while others see it from the perspective of its impact on depriving people from necessary knowledge. Yet others such as Fink and Kenny (2003) take a global perspective in the sense that the digital divide is a growing gap between the rich and poor, because only 6 % of the world's population has used the internet out of which 85% to 90% of these people are from industrial economies.

The above implies that there are multiple divides as Tavani (2007) suggests, and the digital divide does not exist only in developing countries, it also affects developed countries. Vargas (2007) reports that there exist "two Americas"; an America for the rich and an America for the poor. The rich America has access to the high speed Internet; people access the internet to pay their bills, socialise on YouTube and MySpace while people from poor America can not. The author argued that the digital divide in America is now worse than ten years ago. Although broadband usage among African American adults increased from 14% in 2005 to 40 % in 2007, blacks continue to lag behind than whites and English speaking Latinos. A great number of households, especially in rural areas and poor parts of cities such as Charleston are without broadband.

While there are many definitions of the digital divide in the literature, as seen from the above discussion, two definitions stand out. One is that it refers to disparities in Internet access to, and usage of, information and communication technologies between rich countries and poor countries. The other is that it refers to the difference in access to, and usage of, information and communications technologies between people within the same country (Tavani, 2007). For the purpose of this article, both definitions are used. The first definition is used because the article looks at differences in access to, and usage of, the Internet among people within the same country. While the second definition is used because the article also offers cross country comparisons in relation to the digital divide.

3.2 The importance of context

The context under which the digital divide issue can be grounded is not mentioned in the two definitions which may suggest that the context, i.e. social, cultural, political, economical, western, is not very important when deliberating on the issue of the digital divide. However, identifying the context is important for understanding the notion of the digital divide because the literature reveals that several studies about the digital divide considered the issue from a specific context, such as a western perspective, without giving much attention to other perspectives. This issue becomes problematic when the researchers and the people researched are coming from different cultures. In that case the perspective of the people whose situation is studied should also be included.

In his philosophical account about the digital divide Hongladarom (2004) discusses the issue from a number of perspectives, including social, educational and non-western cultural philosophy. Recognising the role cultural context plays in shedding light on the digital divide, he makes the point that not everyone considers access to information technology a "good thing" and thus thinking about the digital divide as a social inequality may not be relevant in the case of some people who, for example, come from different cultural backgrounds. Confronted with this he raises the question "how non-western philosophies, such as the Buddhist or Chinese, can shed light on the digital divide problem?" (Hongladarom, 2004: 88).

Interestingly, Kitiyadisai (2004) offers an answer to Hongladarom's last question regarding providing a Buddhist perspective on the digital divide. Kitiyadisai notes that while Western values encourage people to conquer the frontiers, Buddhist values emphasise spiritual development and living in moderation and harmony. Arguing from the view that different cultural contexts are very important

when debating the digital divide, she notes that different groups of people encounter different types of problems depending on their social context. Thus, while teachers, researchers and students maybe seriously at a disadvantage if the digital divide is not bridged, to groups of people suffering from malnutrition, disease and poverty, the digital divide is not relevant to their suffering. Towards the end of her article, Kitiyadisai suggests that Thai public policy makers should bridge the digital divide in the country from within a Buddhist perspective.

While perhaps Hongladarom is right in saying that not everyone considers access to information technology a "good thing", there is an underlying assumption that inequalities in access to technologies such as the Internet are a very serious matter and need immediate attention from everyone particularly governments. It is true that inequalities in access to a technology such as the Internet, for example, may deny people or groups of people such as women, the elderly or the disabled the opportunity to acquire knowledge, participate in the economy and in the civil and political society (Moss, 2005), but this assumption fails to see the significance of the digital divide in these people's lives as compared to their other needs and pursuits in life, for example, for some just staying alive.

There is also another underlying assumption regarding inequalities in access, in particular, to the Internet. Many assume that the problem of the digital divide will end when people are given access to the Internet. It is true that access to the Internet is an essential step towards alleviating the problem, but this assumption fails to take into account other factors, such as knowledge of how to use the Internet, which could be as important as the access to the technology. For example the undereducated despite the availability of access may not still be able to use the technology to obtain the information that one could use to enhance his/her plan for life (Hongladarom, 2004). While in the case of Saudi Arabia, for example, access to the Internet is one of the problems that is causing the digital divide among the people within the country, and so is knowledge of how to best use it, the biggest problem, however (as will be discussed below), lies in other factors such as culture. In the face of this, the situation of the digital divide should not then be looked at only from the perspective of access to communication technologies, but also from the perspective of other significant factors such as usage of communication technologies and/or culture.

3.3 Factors contributing to the digital divide

Chinn and Fairlie (2006) investigated factors responsible for computer and internet digital divide among 161 countries. They obtained data for the years between 1999 and 2001 from various reliable sources such as World Telecommunication Indicators Database of International Telecommunications Union (ITU) and World Development Indicator Database of World bank. They performed a number of analyses revealing several factors such as income, human capital, telecommunications, electricity and regulatory quality responsible for global digital divide. They also investigated relative influences of these factors.

The study conducted by Chinn and Fairlie indicated that per capita income was the single most significant factor towards computer and internet digital divide among the nations. For example, the difference between per capita income in USA and per capita income in South Asia contributed to 67.6% of the internet penetration rate gap between these two regions. The difference also contributed to 53.2% of the computer penetration rate gap between these regions. Among other important factors including telecommunication infrastructure, years of schooling, electric power consumption, demography and regulatory quality, the last one had the highest impact on internet digital divide. Regulatory quality difference between USA, and Middle East and North Africa contributed to almost one third of the internet penetration rate gap between these two regions. The impact of regulatory quality (on internet penetration rate gap) was almost double the impact of low education rate - in most of the areas of the world. The influence of education on computer and internet digital divide did not appear to be very high. For example, the average year of schooling in Sub-Saharan Africa and USA were 3.7 and 12.1 years, respectively. However, this contributed to only 14.4% of computer penetration rate gap and 17.8% of internet penetration rate gap between the regions.

According to the study, access to telephone lines had significant influence on computer penetration rate gap, but (surprisingly) had a very little impact on internet penetration rate gap. It also revealed that telecommunication access cost did not have a significant impact on digital divide although it is often considered as a crucial factor. Chinn and Fairlie further noted that computer and internet penetration rate gap between USA and other regions of the world could have been even bigger if USA had had a different demographic distribution and/or urban-rural population distribution. In fact, USA had a lower percentage of children and a higher percentage of aged people than the rest of the world (except Europe and Central Asia). USA also had a relatively higher percentage of urban population than other parts of the world. Both of these facts have reduced the gaps which otherwise could have been even bigger.

3.4 Solutions to the digital divide

Some writers state that there is no digital divide to solve, arguing that lack of access to ICT by people with lower income is not a new problem because it merely reflects the difference that already exists between the rich and the poor. The authors of this article take the view that there exists a digital divide between rich and poor countries and that this problem is not just because of lower income; there are other factors involved as will be seen later.

So what can be done to bridge the digital divide? Although there are numerous studies that offer solutions to the problem (Hongladarom, 2004), there is, unfortunately, little agreement in the literature on what should be done about it (Fallis, 2004). Fallis regards the digital divide as inequalities in access to information technology which, according to him, have implication for people's ability to acquire knowledge. He argues that the solution to the digital divide lies in identifying polices that address the problem. He also argues that in order to decide on an appropriate digital divide policy, we need to know exactly what our goal is with respect to the distribution of knowledge. Building on ideas from the theory of justice and social epistemology, he proposes that rather than distributing knowledge "equally" among the members of society, knowledge should be distributed "equitably" or "fairly". According to him, distributing knowledge "equally" would completely eliminate the digital divide but doing so may not necessarily benefit those less fortunate. To demonstrate his point, Fallis uses the example of the need to have more than one level of service in trains. He says that doing so, means that the service can be provided to more people as some may not be able to afford some of the levels of service. Thus, a digital divide policy that aims for a distribution of knowledge where the information 'have-nots' have as much knowledge as possible is the most acceptable.

4.0 The internet in Asia: the current situation

Although Yemen started using the internet in September 1996, the number of internet users in the country is still very low. March 2008 figures indicated that the number of internet users in the country was only 320,000 (Internet World Stats, 2008), which is about 1.4 % of the total population. While this figure is low in comparison with the number of internet users in most of the Arab countries, it should still be considered significant given in December 2000 the number of internet users was just 15,000; putting the user growth rate, for the period 2000-2007, at 920.2%. There are only two ISPs operating in the country and both of which are controlled by the government which is the ultimate arbiter of what is permissible online and what is not. The internet users in Yemen are predominantly male (86%) who are mostly young (47% between 18 – 24 years old) and single (66%). The majority of the internet users are also relatively educated, with 68% having finished high school, and come from middle class families (43%), whose income is between US$100 and US$200 a month (Noman, 2008). Interestingly, these demographic characteristics of the internet users in Yemen do in fact match the profile of the internet users in the Arab world in general (Al-Saggaf, 2007). The Internet population in Yemen is concentrated in the five major cities with almost 60% in the capital city of Sana'a alone.

Access to computer and internet in Bangladesh is very limited. Only 12 out of every thousand people own a computer and 3 out of every thousand people have access to Internet, whereas in Australia the numbers are 682 and 646, respectively (CIA World Fact Book 2008 and Rashid 2006). In 2001, internet bandwidth in Bangladesh was only 40 Mbps, while the same in Australia was 7000 Mbps (International Telecommunication Union 2002). The estimated national bandwidth, in 2007, within the country increased to 68 Mbps. Number of ISPs was 205 in 2007 increasing from only 10 in 2001 (CIA World Fact Book 2008 and Kundu 2007). However, almost 80% of the ISPs are located in the capital city Dhaka (Hossain 2004), whereas around 80% of population live in rural areas (Rural Poverty Portal 2007). Cost of unlimited access to internet in Bangladesh is around US$ 15 per month, which is very high if GDP per capita is taken into consideration (Kundu 2007). For 1 Mbps bandwidth an ISP now pays BTTB (Bangladesh Telegraph and Telephone Board) around US$400 per month while the cost in 2006 was around US$ 4000 (AViDMAX 2008).

The first international internet service in Pakistan was launched by Digicom in 1995. In 1996 licensing of commercial internet service providers began. By mid 1999, licences were issued to over 100 internet service providers of which 40 were offering services. In 2000, there were only 133,900 users while in 2007 this number reached 17,500,000. However, still only 10.4% of total population has access to the internet and only 128,700 people, around 7% of the total internet users are subscribed to the high speed broadband (Internet World Stats 2008). Although Internet usage in Pakistan has grown rapidly, however, 90% of the users live in three major cities; Karachi, Lahore and Islamabad which is only 12% of the population; rest 88% has no or very little internet access.

In 1997 the number of internet users in China was 0.6 million but in 2008 the number reached 253 million (Internet World Stats, 2009). The China Internet Network Information Center figures out that China's Internet population grew 28% in 2004 to 94 million. The number of PCs sold in China in 2008 reached 22 million (2nd after U.S.). The number of broadband users has reached 31.10 million in 2004, an increase of 13.70 million in 2003 (an increase of 78.7% over a 6 month period). According to a new survey on internet usage in the world's most populous nation, nearly 94 million people in China were internet users at the end of 2004. The number represents yearly growth of 18.2 %. Among Chinese internet users, men accounted for 60.6% of the total while women made up 39.4 %. More than half of the Chinese internet users were below 25 years of age. Out of the total users, 32 % are students, 12 % are professionals and nine % are from business and service sectors. Nearly 67.9 % of netizen (cybercitizen) surf the web mainly at home while about 40 % loggon in offices, Internet Cafes and schools (Internet World Stats 2008). People use the internet mostly for e-mail, reading news and searching for information. Nearly nine out of 10 users believe e-mail service is the most important function of the internet and about 65 % of them consider obtaining news is the second most important benefit. The survey also found that a large number of internet users rely on it to gain knowledge. About 6.3 % use the internet as an education tool (Internet World Stats 2008).

	Country size (CIA World Fact Book, 2008)	**GDP per capita** (CIA World Fact Book, 2008)	**Population below poverty line** (CIA World Fact Book, 2008)	**Country ranking based on Human development index** (Human Development Reports 2008)	**Literacy rate** (Index Mundi 2008)	**Economic Freedom index** (The Heritage Foundation 2008)
Yemen	527,970 sq km	$2,600	45.2% (2003)	153[i]	50.2%	103
Bangladesh	144,000 sq km	$1,500	45% (2004 est.)	140	43.1%	160
Pakistan	803,940 sq km	$2,600	24% (FY05/06 est)	136	49.9%	102
China	9,596,960 sq km	$ 6,100	8% (2006 est)	81	90.9%	132

Table 1. Country statistics

5.0 Factors Contributing to the Digital Divide in Asia

Yemenis access the internet primarily through Internet Cafés (61%) (Noman, 2008). There are more than 1500 Internet Cafés in the country (OpenArab.net, 2008) with the majority being in the major cities such as Sana. One reason why so many people in Yemen access the internet through Internet Cafés is because these people, do not own personal computers due to their high cost. According to OpenArab.net (2008) there are only 250,000[ii] personal computers in use in Yemen, making it again among the lowest in the Arab World region in terms of personal computers ownership. This should not be surprising given more than 45% of the population are below poverty line. The fact that the majority of internet users access the internet through Internet Cafés probably explains why there are fewer females in Yemen online. The segregation between the genders which is prescribed by the strictly conservative Yemeni society will no doubt make it difficult for females to access the internet in public places. This factor must be even more significant in rural areas where the culture is expected to be strictly observed. Another reason why so many Yemenis access the internet through Internet Cafés is because of the high cost of the internet. According to one of the two ISPs in the country the internet access costs between US$2247 and US$3246 a year; depending on the internet speed customers choose. Again this is understandable given the country suffers from extreme poverty as the statistics in Table 1 show. The main reasons why the majority of people in Yemen are offline, in addition of course to the high cost of the internet which is met by severe poverty among people, must be because of illiteracy among them i.e. reading and writing, lack of language skills i.e. English, lack of computer literacy, their conservative attitude towards the internet, strict internet censorship by the government, government corruption, and political instability i.e. civil wars and political divisions.

Poor economic condition of Bangladesh is one of the major factors for existing digital divide. Almost 20% of rural population lives in extreme poverty struggling to have food for survival. They even do not have any cultivable land or assets (Rural Poverty Portal 2007). When almost half of the population lives below poverty line (CIA World Fact Book 2008) they perhaps even do not have any idea about internet. Another major contributing factor is weak data communication infrastructure. According to Ineternational Telecommunication Union report, teledensity (number of main telephone lines per 100 inhabitants) of Bangladesh in 2003 was only 0.55, whereas teledensity of Australia was 54.23 (Teledensity of Countries/Territories 2004). According to Bangladesh Telecommunication Regulatory Commission (BTRC), out of total 64 districts in Bangladesh only a few have fiber optic link (Hossain 2004). Huge electricity deficiency is another major contributing factor. Only 32% of the population has access to electricity. Bangladesh has one of the lowest per capita electricity generations (about 155 kwh) of the world (Energy Information Administration 2006). Illiteracy is another factor contributing to Digital Divide. However, Bangladesh government has taken some positive steps. For example, they are planning to establish internet services in most areas of the country within 10 years. The country has also been connected to submarine cable allowing high speed internet access. The government is planning to get more such connections (The Daily Star, 2006). They are also planning to establish fibre optic link between all districts of the country (Hossain 2004).

Factors which contribute to digital divide in Pakistan are: unequal geographic dispersion, sector absorption, connectivity infrastructure, affordability, government policies and regulatory control. Unequal geographic dispersion describes the inequalities in physical dispersion of the internet. Only a handful of urban community (12% population) has access to the high speed internet, while majority of rural areas have no or less connectivity. Sectoral absorption recognises the differing impacts of the degrees to which four major potential internet using sectors of society have taken up the technology: the academic, commercial, health, and public sectors (Wolcott and Goodman, 2000). Internet usage in each of these sectors is rated as rare, moderate, or normal according to Wolcott and Goodman guidelines of internet usage. Connectivity infrastructure is the aggregate of national and international bandwidth and individual access to the infrastructure. According to [UNDP-APDIP, 2003], national bandwidth is 68Mbps and international bandwidth is over 600Mbps. There are 0.78 internet hosts per 10,000 inhabitants; computer ownership is 0.41 per 100 inhabitants and internet users are 1.16 per 100 inhabitants. Internet access must be accessible at an affordable price. The households in Pakistan are classified into various income categories starting with US$20 per month. According to Wall Street

Journal (2005), the average household monthly income is US$41 while broadband access costs over US$100 per month.

Even though 253 million users have access to the internet in China, internet use is still underdeveloped in terms of China's overall development. Majority of Chinese living in rural areas suffer from low income and few opportunities of education and jobs. 62 % of the population lives in rural areas in 2004, while 38% lived in urban areas. About 94 % of population lives in approximately 46% of land. With comparatively little land (About 1.3 %, 116,580 sq km) to plant crops, intensive agricultural techniques are used to reap harvests that are sufficient to feed the world's largest population. China's employed labour force in 2005 totalled 791.4 million people. During 2003, 49% of the labor force worked in agriculture, forestry, and fishing. The population has had on average only 6.2 years of schooling, but in 1986 the goal of nine years of compulsory education by 2000 was established. In 2003, China had 116,390 kindergartens with 613,000 teachers and 20 million students. The literacy rate in China is 90.9%, based on 2002 estimates (Country Profile: China, 2006). From the regional perspective of Internet development, it is highly unequal between different areas in China. Insufficient Internet infrastructure in rural areas has become the major bottleneck that blocks the development of the internet usage in Chinese rural areas. Comparing with urban users, the application level of rural internet users is less advanced. The standard of telecommunications was uneven across the country. The regional distribution of internet users corresponds to resource disparity of different geographical areas. Income, education, location are three main factors that influence internet usage and widens digital divide gap. Social-economic factors and the internet policy also contribute to the widening of the digital divide gap.

6.0 Groups Facing the Digital Divide in Asia

6.1 Women in political online forums in Yemen

The following discussion about women in political online forums in Yemen is based on a small study. The study analysed all contributions of women[iii] within a pool of 3000 articles posted to a Yemeni forum between 2000 and 2008. The selected articles were designated randomly but chosen from within three periods; that is, the start of the forum (year 2000), the middle year (2004) and most recently (2008). During analysis, observational field notes were recorded in a journal, along with the researchers' comments, reflections and interpretations.

The site selected for analysis is the most popular political site in Yemen according to Alexa (2008). According to Alexa (2008) also only (29%) of the users of the forum come from Yemen; the rest of the users come from other countries like Saudi Arabia (there are about one million Yemenis in Saudi Arabia). This suggests that many of the members of this forum must be expatriates. There are 58069 registered members in this forum who, so far, contributed 279627 articles and 4,792,031 replies to these articles, which are statistics that suggest that this forum is indeed very popular.

The study revealed a notable absence of females in the observed forum. The vast majority of topics and discussions were dominated by men. During the process of analysis, only a handful of female participants were noted. At least three of these few females were actually columnists working for local newspapers and using their real names. The absence of women in the political forum was not also witnessed in the other forums within this Yemeni site such as the kitchen, the family and society and the beauty and fashion forums. This suggests that only in political forums the vast majority of topics and discussions were dominated by men.

While the majority of the male members responded positively to the participation of these few women in the observed political forum, other men were very critical and in some cases very attacking of these women making their experience unpleasant. The following quotation from one of the male members towards one of these women demonstrates this point: "… this stage you are in is called menopause. Pray for your sister to get married. And dowries oh you parents. And there is no need to lie you drum". This comment should be read as very sarcastic. The male writer here is saying to this female

that she was in the online forum because she was old and could not find a husband hinting the forum was not the ideal place for married women. He also accused her of not only lying but also of being a drum. A drum in the context of the Yemeni culture is someone who 'sucks up' to the President.

One obvious reason for the notable absence of females in the political forum is the fact that females in Yemen are known to be less interested in discussing politics and public affairs than men. Discussing these topics is rarely among their favourite topics (Islam Memo, 2004). In fact, to them it is considered a 'male thing'. Perhaps because discussing politics sometimes involves "talking back" and engaging in confrontations and upfront arguments which are things Yemeni women normally try to avoid as these things do not go along with the traditions of Arab women (Al-Saggaf and Weckert, 2004).

Another related point is the cultural demand on women to be shy and modest, which are attitudes that men are also highly encouraged to uphold[iv]. Arab virgins in general are expected to be shy, reserved, and modest. Arabs use the proverb "more shy than a virgin in her private room" to describe someone who is very shy. For women, being shy means that they should not stare at someone of the opposite gender, should not be too outgoing and should not utter obscenities. For Arabs shyness in general should be considered a good thing because it puts pressure on people to behave themselves. In other words, Arabs see shyness as a value that should be adopted because it regulates behaviour. Therefore, women try to be shy and chose not to participate in online political discussions as they often become unpleasant. The above cultural factors make women stand among the 'have-nots' when it comes to equal access to political participation.

6.2 Rural Students in Bangladesh

There are various groups within Bangladesh having even less access to internet and computer facilities than other groups. For example, internet facilities outside the major cities, such as Dhaka (the capital city) and Chittagong (the 2nd biggest city), are a lot inferior to the facilities in those major cities. Almost 80% of the ISPs in Bangladesh are located in Dhaka (Hossain 2004), whereas around 80% of the total population live in rural areas (Rural Poverty Portal 2007) having very little or almost no internet facilities. We studied AViDMAX (an ISP) Facebook in order to get some idea on the real situation of internet speed and availability in country towns of Bangladesh. It is evident from the Facebook study that often people living in country towns do not get high speed broadband connection. For example, a participant reported that he contacted six ISPs for an internet broadband connection at his place at Shahjadpur (a country town), but was unable to get any since none of the ISPs provided service in Shahjadpur (AViDMAX 2008). Another participant added that at Rajshahi (a divisional head quarter) internet speed in general is less than 6kbps and the maximum speed is around 50kbps. He considers people living in Dhaka as very lucky since they have a higher internet speed which is roughly 128 kbps to 256 kbps according to an ISP (AViDMAX 2008). While district towns outside Dhaka have slow internet connections, the neglected rural areas remain unconnected. It will take another 8 to 10 years to connect most rural areas of Bangladesh to internet (Muzi.com 2006).

Due to inadequate internet facilities people living outside the major cities have less access to online information causing some obvious disadvantages for them. For example, school students (living in rural areas or even in smaller towns) are deprived from accessing online information that could be helpful in their study. They need to depend on their text books heavily as their access to online materials is limited. Since all high school students sit for the same HSC examination and University Admission tests the group of students not having good internet access is clearly disadvantaged. If students living outside major cities do not get the equal opportunity for good quality education then it can disturb the overall development of the country in many ways. For example, the regional areas will remain underdeveloped and the population of major cities will continue to increase making it almost unmanageable. The population of Dhaka is already over 12 million.

This is also evident in a recent story reported by an association called the Volunteers Association for Bangladesh, New Jersey, USA who has sponsored a computer learning centre for a high school in a

village of Bangladesh (Computer Literacy Programme: Transforming Bangladesh 2008). The students of the school never saw a computer before in their life. However, they used to memorise the concepts and definitions of computer for their high school "Computer Science" subject only through their text book. Their only exposure to a computer was the images of CPU and Monitor in their text book. Naturally these students never used to score more than 70% in their practical exams. However, after the establishment of the computer centre some students started to score as high as 100% suggesting that they had been heavily disadvantaged before. There are thousands other students in Bangladesh who have never seen a computer and never used internet in their life.

There are all together around 31 public universities in Bangladesh out of which around 16 universities are either located or operate outside Dhaka and Chittagong city area. There are also around 53 private and international universities out of which 4 are located outside the two major cities (University Grants Commission of Bangladesh, 2009). Due to poor internet facilities outside Dhaka and Chittagong city areas, the students studying in the universities located outside the two major cities are disadvantaged in the sense that they have less access to possible online study materials such as journals, white papers, statistics, data and downloadable software. This disadvantage can potentially restrict them from acquiring very useful study related knowledge and therefore they can find it difficult to compete with other group of students having better internet facilities. They need to compete with the other group because in Bangladesh all university graduates take the same BCS (Bangladesh Civil Service) examination in order to get government jobs. They also compete for the same non government job market all over the country.

In order to explore the existence of any other form of digital divide among the university students we compare the websites of six universities; three of them are located in Dhaka while the rest are located in Rajshahi, Sylhet and Bogra. It is evident that the websites of universities in Dhaka are generally interactive and informative. For example the website of North South University contains various information such as subject availability list with brief information about each subject, list of academics and list of courses. It also has links to browse library catalogue and check availability of books, journals etc. We also visited American International University and BRAC University (both located in Dhaka) websites and found their quality to be very good. On the other hand the websites of the universities located outside the two major cities, that we visited, are not interactive, informative or useful. They do not contain information on schools, courses, subjects, academics, library catalogue etc. They mostly look like a static poster rather than a modern university website. We visited websites of Leading University located in Sylhet, Pundra University of Science and Technology located in Bogra and Rajshahi University of Engineering and Technology located in Rajshahi. A good quality website provides useful information and study materials including links to online study materials, library catalogue, alumni connection, lecture notes and tutorial questions/solutions. Therefore, not having such useful websites is a disadvantage for the students studying in universities outside the major cities. These disadvantaged students are possibly not getting quality education compared to those studying in major cities. The pattern that universities outside the major cities do not have good quality websites also increases our suspicion about the overall facilities and practice of internet usage by those students. Having less access to internet restricts them from a wider range of study materials. As a result these students will possibly suffer when they need to compete with students studying in major cities.

6.3 Cyber Activists and Virtual Protesters in Pakistan

Cyber Activists and Virtual Protesters in Pakistan are on rise. This group of people is well educated and have access to the internet. Unlike traditional activists and protesters who have to go in streets to protest on a political issue, cyber activists and virtual protesters stay indoor but express their views in blogs and several websites which have been developed for opinion gathering purpose. This is a safe and secure mode for freedom of speech while remaining anonymous. In a recent movement against the government of Pakistan educated political activists, students, and lawyers living in urban areas used the internet to raise their concerns and for the first time in Pakistan's history formed *cyber activism* and *virtual protests* group. A study initiated by Saeed, Rohde and Wulf (2008) found that

"when the former President of Pakistan, Pervez Musharraf declared the state of emergency on the 3rd November 2007 suspending the country's constitution, intervening in judiciary and blacking out all the private television news channels - educated and urban citizen used internet to disseminate information, live webcasts, and audio news.

The use of social networking sites likes 'Facebook" and "Orkut" was visible to mobilize individuals. Video sharing websites like "You Tube" and "Google Videos" were also used to share videos of discussion programs and clips of organised protests. Activists also used blogs, online petitions, emails, yahoo groups, and wikis to coordinate and disseminate the information about protests. In order to counter these *cyber activists* and *virtual protests* government blocked most of the blogs in the country but people used free online anonymizer tools to access these blogs. Saeed, Rohde and Wulf (2008) further added that most of the online activities were initiated by Pakistanis living abroad suggesting another group of digital divide because websites hosted in foreign countries were not subject to government scrutiny and administration has very little or no control in blocking the contents of those websites. This creates another group of cyber activities who are Pakistanis by origin but settled in abroad. These people have more access to the internet and are not threatened if there opinions will be blocked. The majority of the population which lives in rural regions which lacks the education and access to high speed internet is disadvantaged because they are unable to voice out their opinions on political and social issues in the country.

If internet was widely available within the country and majority of population had the access to it, the magnitude of cyber protests will be much higher. Internet in Pakistan is mainly accessed through cybercafés and due to a conservative society; only males can freely go to the cybercafés. Lack of access to the internet by the majority of population reduces the impact of *virtual protests*. Population which has the access to the internet is very small; approximately 70% of Pakistan's population lives in rural areas, however, nearly 90% of the ICT related infrastructure is in urban area leaving a larger population with no or little access to the internet (Siegmann, 2007).

6.4 Farmers in China

In China, only 0.25 billion people out of 1.31 billion live in cities. Given that the majority of Chinese live in the countryside, such a divide suffered by farmers who live in rural areas is astounding as well as worrying. According to the statistics available from the Ministry of Science and Technology, there are only 600,000 internet users in rural area in 2003. Till to 2008, China's rural areas have more than 37 million internet users, 17,822 agriculture-related sites. The figure is in sharp contrast to the country's entire number of internet users which currently stands at more than 253 million. Geographical location and lower income, including the lack of infrastructure and funds, lack of education, contribute to the digital divide difference between rural/country and those in the city in China. There are two different groups of rural people. One get much more benefit from internet and the other is poor to access high-tech technology (NBSC2008).

Established internet networks and sites help some rural areas such as south part of China to obtain more opportunities for development. Farmers in the south of China are much richer than eastern farmers because of multiple product variants and mild climate. Internet penetration rate is much higher in these areas as well. Internet helps farmers change their traditional business ways. Just a few keyboard strokes can make farmers send the information out on the internet to find buyers from all over the world. And a vast amount of market information can be obtained very quickly and cheaply. Farmers can sell their products such as peanuts, bamboo shoots, plums, peaches and clamworms to other national provinces and cities and even somewhere overseas. "Huaxi Village" (east Jiangsu Province, China) was the richest village in China. The villagers earned as much as 25 times the national average for farmers. The Internet is changing the way their farm products are marketed. E-commerce helps them to sell their products around the world several enterprises, domestic enterprises. "Huaxi Village model" gave farmers a wealth of new ideas about making transactions online.

However, most Chinese farmers still rely on books, TV, face-to-face talks and other traditional means to acquire information. Official statistics showed about 30 million people in 1,061 townships, mainly in remote rural areas in the vast northwest region, did not have access to electricity until 2003. A far greater number of rural people suffer from an inadequate supply of electricity and substandard power networks. Therefore, internet still is new for them. Several reasons contribute to this problem.

Firstly, there is big difference of farmers' income between the south region and the northwest region of China. For example, in Guangdong province which is in the south region average GDP reached 32,142 RMB (Renminbi yuan) while in Gansu (in northwest region) average GDP was only 6,742 RMB (NBSC 2007). Whereas, in some areas the average annual income of farmers is even less than 1000 RMB. It greatly restricts the use of high-tech products such as PCs and the internet by people living in rural areas. They are still considered to be an extravagant purchase by rural people. Secondly, owing to low education levels and the lack of a sufficient channel to get information, words like "internet" and "surfing" are still new concepts to many rural people. On average 87.6% of villages has primary school located within 3km and 69.4% was within 5km (NBSC2008). The education level is pretty low in rural region. Finally, poor access to the internet definitely shuts the doors of the latest technology and information to farmers, causing barriers for the modernization of agriculture and the increase in the incomes of farmers (China Dairy 2003).

7.0 Discussion

This article began by offering a very short profile about the four countries studied to enable the reader who is unfamiliar with these countries to gain a feeling of what these countries are like. After a brief overview of the digital divide in the literature, the article provided a discussion about the internet in these countries, followed by a discussion of the factors that could be blamed for the digital divide in these countries, to give the reader the chance to get a feel of how people in these countries compare in terms of their countries internet infrastructure and the factors that limit their ability to access the internet. Next, a discussion of some the examples of groups of people who stand among the 'have-nots' in terms of their ability to access the internet was presented to get a clearer picture of how lack of access to the internet can significantly disadvantage some groups of people. The purpose of the below brief philosophical analysis is to shed light on the moral significance of the digital divide in these countries and raise the question: what is the role of rich countries with regards to digital divide problem?

As can be seen above although this article has shown that there were several factors that could be blamed for the digital divide in the countries studied, poverty on one hand and high cost of access to the internet on the other was a common theme in the case of all of these countries. This was the case also with selected groups of people i.e. Women in political online forums in Yemen, Rural Students in Bangladesh, Cyber Activists and Virtual Protesters in Pakistan and Farmers in China. While poverty and the high cost of access to the internet are major contributors to the digital divide these groups are facing, there were also others factors that play important roles in widening the gap between those with access and those without. In the case of women in political online forums in Yemen, it was found that culture also stood a barrier that prevented them from going online. In the case of rural students in Bangladesh and farmers in China, it was found that the technological infrastructure which affected mainly rural areas in these countries shut the doors in front of them. In the case of cyber activists and virtual protesters in Pakistan it was found that government control and limitation on freedom of expression stood in the way of these.

With the above in mind, does the digital divide discussed raise an ethical issue? Tavani (2007) argues that not every kind of unequal access to goods or services raises an ethical issue. While Tavani agrees that there is a divide between those, for example, who own a Mercedes-Benz car and those who don't that divide is not morally significant. Building on ideas from the theory of distributive justice he argues that only divisions between those who do and those who don't have access to vital resources such as food and health care should be considered significant. (Distributive justice refers to the fair distribution of primary goods and services among people). Tavani then asks the question: is unequal

access to ICT closer to the Mercedes-Benz division or to the division involving access to food and health care?

Moss (2005) would say that it is closer to food and health. He argues that people who don't have access to ICT are deprived of resources that are vital for their wellbeing. According to him lack of access to a technology such as the Internet may deny people the opportunity to acquire knowledge and participate in the civil and political society and also hinders their economic prospects (Moss, 2005). Rooksby and Weckert (2004), in a similar vein, argue that a digital divide relative to ICT is morally undesirable if it creates morally undesirable social impacts. Some of the social impacts Rooksby and Weckert discuss include material deprivation, abridgement of liberty, i.e. political participation, and procedural unfairness that is, it undermines the possibility of fairness in other areas, equality of opportunity for competition for resources.

Perhaps the strongest case for ICT being more like food and health than like owning a Mercedes-Benz, is presented by Van den Hoven and Rooksby (2008). They provide an answer by arguing that access to information is a primary good in the sense discussed by Rawls (1971) and therefore is something that ought to be promoted. A primary good is, for the purposes here, something that is necessary in order to live a good life. Access to information is now greatly enhanced by ICT and for many that is now the main source of information. Those without adequate access to the Internet are, it can plausibly argued, deprived to adequate access to information and therefore lack a primary good.

If there exists a digital divide between rich and poor countries and that this inequality between the rich and the poor is, from an ethical point of view, unfair, what is the role of rich countries with regards to the elimination of this gap? That is, do they have to share their wealth, for example, with the poor countries to close this gap or it is just not their problem? Canellopoulou-Bottis and Himma (2008) provide an interesting answer to this last question. Canellopoulou-Bottis and Himma argue that there is a difference between 'it is good to do something' and 'you are morally obligated to do it'. Failure to do something morally good is not morally bad and does not merit blame and punishment. To illustrate their point they use this example:

> It would be good if I were to run into a burning building to try to rescue someone, but it is not morally wrong for me to refrain from doing so; risking my life to safe another is supererogatory, that is to say, morally good but beyond the call of obligation.

Failure to do something morally obligatory is, on the other hand, wrong, according to them, and merits blame and punishment. It appears, from Canellopoulou-Bottis and Himma's argument that while it is good for rich countries to help poor countries overcome the digital divide problem they are not morally obligated to do so.

Two lines of attack against this argument are possible. First, from a utilitarian point of view, the morally right action is that which produces the greatest good. If helping a poor country produces considerable good in that country and does little if any harm in the rich country that provided the help, then the right thing to do is help the poor country (see Singer 2009). A second approach is to consider more carefully the distinction between positive and negative duties or obligations. Positive duties are duties to do good, for example running into the building to rescue someone, and are not always obligatory. Negative duties are duties not to harm and are always obligatory. Positive duties are generally thought to be weaker than negative duties, duties not to do harm. The duty not to kill is stronger than the duty to save a life. Suppose that the only way to save the life of Tom is to kill Harry and transplant his heart into Tom. While saving the life of Tom is good, killing Harry to achieve it is not justifiable. Doing nothing will result in the death of Tom but Harry's death would be the result of an action. Letting Tom die is not good, but killing Harry is clearly worse. To this extent Canellopoulou-Bottis and Himma are right.

The situation is not quite so straightforward, however, because there are intermediate cases. Suppose that Thomasina is injured by a careless action of Harriet. Harriet then does have a duty to do some good to Thomasina as a result of the action that caused the harm in the first place. These kinds of duties are what Pogge calls intermediate duties and while stronger than positive duties are weaker that

negative duties (Pogge, 2005, p. 34). If we harm someone, we have a duty to do good to that person; an intermediate duty. Many of the problems that poor countries face are at least partly the result of past actions of rich countries, for example, exploitation of resources and unjust trading regulations. There is a duty therefore to attempt to solve them, so the situation is not like that of Tom and Harry but rather like that of Tomasina and Harriet. If this is correct, there is a moral obligation for rich countries to help poor countries overcome the digital divide.

8.0 Conclusion

While for many countries digital divide is caused by factors like poverty, weak data communication infrastructure, electricity deficiency and illiteracy, it is evident from this study that in some parts of Asia the divide is also caused by influences of culture and government control over internet. Some of these factors can be solved relatively easily through social awareness, education, democracy and change of attitude. Governments need to take appropriate action in the right direction. Some other factors which cause digital divide may require huge monetary investments. For example, establishing data communication infrastructure and generating electricity may require huge financial investment that may not be within the reach of a developing country.

Male dominance on the Internet in Yemen, poor economic conditions in Bangladesh, unequal geographic dispersion and government hostile control on the media in Pakistan, low affordability and lack of internet infrastructure in rural China are just some of the factors which cause digital divide in these countries.

Women being deprived of their right to equally participate in mass media are discouraged by their male internet users in Arab countries. This has created a gender digital divide on the internet. Cultural conservatism suppresses women participation in political discussion and public affairs, and fuels digital divide. On the other side of the region, in Pakistan, government's stronger control on the internet in the country has created group of cyber activists and virtual protesters who are well educated citizens as well as people of Pakistani origin in overseas. Should the internet be available to a wider population and people have access to freedom of free speech, the response from cyber activists on political unrest would be much higher. Lack of telecommunication infrastructure and electricity in Bangladesh are depriving huge number of rural students, both rich and poor, from having access to internet. Even university students, who do not study in the major cities such as Dhaka and Chittagong, have less access to internet compared to those who study in the major cities. Since, both urban and non-urban students sit for same exams (such as HSC, university admission tests and BCS exams for government jobs) the rural students are clearly facing a disadvantage. Along with many other reasons this is also causing people to migrate to the major cities making things unmanageable in the major cities. The divide between urban and rural students is a serious problem, which is leaving a vast majority of the population less developed since around 85% of the total population live in rural areas.

Farmers not having access to internet are being deprived from their right price. Students sitting in the wrong side of the divide are being deprived from the opportunity to get ready for their real life. Citizen being barred from internet access are facing obstacles in giving their opinions on their own society to move it forward. These problems can cause frustration, worse poverty, and inhuman living condition.

These days we live in a global community rather than isolated individual countries. As a result whenever there is a natural calamity such as earth quake, bush fire and flood, international community comes forward to help the affected people. International community also steps in to solve political

unrest in order to help people of a politically disturbed country. Often various expensive actions are taken such as sending humanitarian aids and peace keeping force. We argue that Digital Divide is also a problem that deserves actions from international community to help disadvantaged people of our world. Even if someone fails to agree with us that the situation is more like "Tomasina and Harriet" than "Tom and Harry" example discussed in Section 7, we believe that many of us will agree that when we support poor countries for food, education, health and shelter we should also support them to bridge digital divide. Through the case studies presented in this study, it has initiated an open discussion on digital divide, its ethical and moral implications.

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[i] Out of 177 countries with data

[ii] These are July 2005 figures

[iii] While it is possible for members to lie about their gender, by informally observing the forum for more than a year, it was noted that gender switching among regular and committed participants was difficult. This is because when participants claim to be males, their male friends in the community may discover if they are not males when they seek to call them on the phone or meet them outside the community, as is often the case. The same applies when participants claim to be females. The fact that the aim of participation in this forum is not to socialise or develop friendships, but rather to discuss the Yemeni public affairs, makes this claim plausible.

[iv] Shyness in women is more stressed than in men.