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Technologies and Migration**

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Abstract

Surveying existing literature, this paper starts by identifying links between attainments in human development and the presence of ICTs. The research then looks at instances where ICTs affect the opportunity for migration and how they affect its outcomes. We will see how migrants are making use of ICTs and the importance that these technologies have come to occupy in their life. Attempting to illustrate both positive and negative implications of the roles of ICTs in human mobility, this paper surveys research that demonstrates how ICTs are used in both regular and irregular migration, in maintaining family relations, in sustaining cultural identities, and in supporting a family from abroad. We will see that ICTs have not replaced older forms of communication but that they have greatly increased the range of available options for communications. Throughout the text, this paper also includes the roles of governments and civil society in working to increase access and use of ICTs while also making mention of instances where they actively pursue the opposite. As we will see, the skills necessary for use of ICTs and the infrastructure necessary for their access can be found in all countries of the world, albeit in unequal distribution.

Keywords: Information and communication technologies, diaspora, migration.

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1 Information and Communication Technologies and Migration

Information and Communication Technologies (ICTs) have drastically changed the world in which we live. With increased interconnections in financial markets, media, knowledge sharing and archiving, billions of people around the world today are logging on, surfing the web, browsing, and posting information that is accessible irrespective of geographic location or time. Linear patterns of information sharing have effectively been replaced by circular patterns of information gathering. This is the Information Age (Castells, 2000). This transformation does not reach the entire world's population but for instance, in little more than two decades, public use of the Internet has grown from a small network of academics in the United States to include more than 20% of the world population. The region with the largest online community is now Asia and China ranks second in the size of national online communities around the world (ITU, 2009). Mobile phone subscribers are a much larger group and have passed the 50% mark (ibid). It is predicted that another billion of the world's population will use ICTs in the next four years (mainly mobile phones) and most of these new subscribers and users will be in developing countries (MIT, 2009). With growing access to ICTs and the current state of mobility of people around the world, it is easy to imagine that there exist relationships between access and sharing of information and the outcomes of migration. As IOM (2005a) states, migration is not only influenced by ICTs, ICTs have become global drivers of migration. Castles (2007: 2) explains this by suggesting that new communication technologies coupled with developments in transportation and cultural change are "making it normal for people to think beyond borders." Technological innovations and social changes linked to ICTs are validating and reinforcing human capabilities of rapid information sharing (Castells, 2000). Awareness of proximity between countries and regions through media images and personal experiences of the world mean that ICTs are in fact "bringing the world closer together" (Pries, 2005: 167). Despite the current geographical limitations of ICT diffusion, it is the pervasiveness of the changes triggered by their rapid spread that marks the new age.

Surveying existing literature, this paper starts by identifying links between attainments in human development and the presence of ICTs. The research then looks at instances where ICTs affect the opportunity for migration and how they affect its outcomes. We will see how migrants are making use of ICTs and the importance that these technologies have come to occupy in their

life. Attempting to illustrate both positive and negative implications of the roles of ICTs in human mobility, this paper surveys research that demonstrates how ICTs are used in both regular and irregular migration, in maintaining family relations, in sustaining cultural identities, and in supporting a family from abroad. We will see that ICTs have not replaced older forms of communication but that they have greatly increased the range of available options for communications. Throughout the text, this paper also includes the roles of governments and civil society in working to increase access and use of ICTs while also making mention of instances where they actively pursue the opposite. As we will see, the skills necessary for use of ICTs and the infrastructure necessary for their access can be found in all countries of the world, albeit in unequal distribution. It is common to state that ICTs have facilitated the advent of globalization (Castells, 2000). Now we see that they have also changed the context of migration around the world (Karim, 2003).

2 The Information Age: Some theoretical foundations

Brought about by the development of ICTs, the world is going through a major shift. The Information Age, otherwise referred to as the network society, is a contemporary meta-narrative that guides many studies in all fields of the social sciences. As a theoretical space within which to conduct contemporary research, the Information Age suggests we are moving beyond the Industrial Age and into an era where the sharing of knowledge and ideas is the new driver of power and the world economy. Castells (2000) demonstrates the economic repercussions of the network society and the ways it binds national economies throughout the world. Whether one discusses the emergence of global financial systems or growing citizen solidarity networks, one thing remains common and is at the core of the new society, the solicitation and exchange of the world's most valuable resource: information. Defined as the "new social morphology of our society" (ibid: 501), networking logic is both a structure and a process that enables the exchange, the redirection, and the reception of information, on a global scale, without restraints of space or time. When one is part of these new networks, distance is in fact rendered irrelevant, allowing direct, simultaneous, decentralized, and expanding relations of collaboration, advocacy, trade, production, and innovation, generating new forms of power constellation and distribution. This is the dominant organizational form of the Information Age, one that has displaced centres of

power and influence into the space of flows (meaning the channels by which digital information is shared), beyond the control of any yet accessible to all. The space of flows represents the new “material organization of time-sharing practices” and greatly impacts our daily lives, both materially and symbolically (ibid: 442).

As tools that allow immense exchanges of information, ICTs impact many realms. The use of Internet in the quest to promote and defend human rights, international law, and democratic governance, is well documented and is perhaps the strongest asset for civil society struggles around the world today and one of the most positive examples of the space of flows. Civil society groups and in particular transnational advocacy networks, including diaspora communities, have been some of the most active users of ICTs such as the Internet for information sharing, mobilization and social change (Norris, 2001). Civil society groups who are present online are powerful actors and facilitators that promote interaction, deliberation, and the sharing of information, effectively expanding the concept of public sphere (Bohman, 2004), and creating what Norris (2001) refers to as *communities of choice*, in contrast to the traditional *communities of places* that we all know and experience.

ICTs are being developed and used around the world in a way that is blurring, through networked processes and structures, the distinction between here and there, in and out. Expressed both locally and internationally through ICTs, people’s sense of self are increasingly generating a shared sense of experience, beyond the confines of geographic space. Intercontinental networks of migrants have truly given birth to new forms of media that are unique to the Information Age and allow the birth of global cultures that link people through ideas and identity (Appadurai, 1996). Through ICTs, we are experiencing increased exposure to external influences which have deep impacts on our culture and identity (Greig, 2002: 236). The links between these elements is fundamental to the study of the network society and the uses of Internet (Castells, 2004).

We can now experience what Castells (2000) refers to as timeless time: the capacity to function in real-time across the world without delay and at our convenience, with blurred distinction between physical and digital experiences. The Information Age also affects us through its media and images, which alter our lives, communities, nations and states, and have tremendous impacts on our identities and our imagination (Appadurai, 1996). Cultural flows are travelling in all directions, to and from both developed and developing countries. Because of the

digital divide, the use and benefits of ICTs are a reality and a strategy that still remain out of the reach of many people in the world (Shields, 2003), but we can imagine that few are truly sheltered from the impacts of ICTs. The communications that occur through these channels do spread beyond their initial medium through other means and therefore tend to reach much wider audiences. As described by Lim (2003) the contents of online communications have the ability of travelling between the physical and virtual worlds, and back again, both in developed and developing countries.

3 Human Development and the Digital Divide

Studies of the digital divide keep us aware that access and use of ICTs are unequally distributed both across geographic areas and within communities. The digital divide is the disparity that exists in access to ICTs between, for example, countries or regions, communities, ethnicities, the sexes, or age groups. It can manifest itself internationally and within communities and is shaped by the "economic, political, and sociological context in which it occurs" (Guillén and Suárez, 2005: 683). The digital divide is especially relevant to those who value and advocate the fundamental role of ICTs today. Research shows that access to ICTs such as the Internet and mobile phones is most common amongst the high-income countries and even more so amongst young urban segments of those populations (Roberts, 2008). Interesting parallels can be made by coupling the country classification contained in the 2009 ICT Development Index (IDI) compiled by the International Telecommunications Union (ITU) to the Human Development Index (HDI). This juxtaposition illustrates the geographic distribution of access and use of ICTs and the link that can be made with attainments in human development. For example, all the countries ranked high in the IDI are also ranked high in the HDI, and more specifically, are located in the top quarter of the HDI in what can be termed the very high HD group (0.9 and above). All the countries ranked low in the IDI are in parallel ranked medium-low or low in terms of human development. The low IDI ranks represent exclusively countries located in the bottom third of the HDI (ITU, 2009, and UNDP, 2008). Looking at ICT indicators from the ITU World Telecommunications/ICT database (WTI) for the year 2007, allows us to see with even more clarity the digital divide that exists between countries. For example, in the highest ranked 33 countries of the HDI (the very high group), Internet users represent an average of 61.4% of the

population whereas they represent an average of 1.8% for the 24 countries that are classified as low human development (ITU, 2009 and UNDP, 2008). Telephone subscribers for these same 33 countries with high human development hover at 157.5% of the population (telephones are so prevalent in these countries that it is common for individuals to have more than one line). This figure again creates a sharp contrast when juxtaposed to the average of 15% for those countries with low human development (ibid). With such disparities, we can expect that average knowledge and skills relating to ICTs will be far less in a significant segment of the population in countries of low human development as compared to those at the top of the HDI. Low financial resources and high illiteracy are commonalities between all countries with low human development and these are the types of obstacles that will severely affect spread and benefits of ICTs. Norris (2001) concludes that economic dimensions and wealth are the most impactful dimensions that determine the digital divide between countries.

When discussing the relationships and impacts of human development, migration, and ICTs, we therefore need to be very cognisant of the disparities and inequalities on access and use that exist between groups and amongst countries because these have serious implications on many migrants' access to ICTs and their ability to use these tools; as they do for their families and friends that reside in their country of origin. These considerations are especially relevant in the discussion of international migration since the level of development of both origin and destination countries will have significant implications on the availability and use of ICTs. For example, the bilateral matrixes of migrant stocks of the Migration Development Research Centre (2007) reveals that over 14% of all international migrants both originate from and migrate to very high human development countries, that less than 1% of international migrants going to these destinations originate from low human development countries. Migration to these very high human development countries represents 51% of total international migration. Given the high HDI ranks of this group, we can safely assume that ICTs will be readily available to those who wish to make use of these tools and that use (as we will see below) will be influenced by social and economic factors. For the 49% of international migrants who immigrate to high, medium or low human development countries, the overwhelming majority come from those same groups of countries. We need to be aware of these figures when discussing the benefits of

ICTs for migration so that we do not wrongfully attribute even access and use of ICTs across the world and across migrant populations.

From the human development perspective, ICTs entail a set of capabilities that can be harnessed and fostered to further human development through access to information and increased potentials for communication. As Haq (1995: 14) wrote, "The basic purpose of development is to enlarge people's choices," which as he furthered also includes access to information that leads to knowledge. Drèze and Sen (1989) had made the link between access to information and development by putting forward the idea that the first step in overcoming challenges in our life consists of evaluating our predicament and identifying the alternatives that would make our life better. Knowledge of those alternatives is central to the outcome of such a reflection. Knowledge can therefore be liberating and as such it has the potential of changing "traditional understandings and ways of doing things" (Hill, 2007: 273). ICTs and access to the wealth of knowledge available through the Internet as we will see can be powerful sources of such information and in this sense; such information can be highly beneficial and influential for migrants. As will be discussed below, this capability is differentiated by the varying levels of income and origins of migrants. "The application of ICT technologies requires human capabilities to handle such technologies" (Lee, 2001: 128).

Scopsi (2004) considers ICTs to be enablers that allow migrants to accomplish a wide set of actions such as the ability to: read in their mother tongue, be involved in cultural and national events, promote positive cultural and national role models that challenge stereotypes, have access to information that assists them in their migration experience, and overcome the distances that separate them from their families and friends left behind. Although the author does not use the discourse of human development, in effect, all of these impacts of ICTs in the lives of migrants can easily be termed capabilities and functionings that are tied to ICTs. In a sense, ICTs are increasing the capabilities of migrants by augmenting their "human capacity of information processing and communication" (Ros et al, 2006:30). Despite the fact that these benefits are especially available to highly skilled migrants and migrants that have formal education (ECLAC, 2002), and that access to ICTs is mostly widespread in countries with high human development, the *connected migrant*, as proposed by Diminescu (2007), has the capability of sharing and accessing important information while virtually inhabiting multiple distant geographical spaces.

This is a benefit that is experienced throughout the world, as the following research will demonstrate, despite these capabilities being unequally distributed across countries and amongst groups.

The digital divide does not manifest equally in all countries and communities but there are some global trends that may be linked to human development and the financial resources of countries. Nanthikesan (2000) classifies the global digital divide as a three tiered scale where at the top of the pyramid we find the high income countries for which investment in ICTs and related skills has been an ongoing project for several decades. In the second group we find most middle income countries. This group mostly includes those located in Latin America, East Asia, and Eastern Europe. These countries are likely to make significant investments and progress in ICT diffusion permitting them to catch-up with the top tier in the very near future. The group that is likely to fall behind and therefore require more substantial assistance and investment is the low-income group of countries concentrated in Sub-Saharan Africa. These regional disparities are likely to impact the capabilities of migrants depending on their country of origin. Supporting this hypothesis, Fairlie et al (2006) report that use of ICTs by international migrants is heavily impacted by diffusion and use of ICTs in their country of origin. Their research in the United States suggests that the disparity in use between international migrants and native born can very often be explained by this fact. Based on the relationship established above between ICT diffusion (as defined in the IDI), the digital divide would therefore privilege immigrants who migrate between high human development countries and disadvantage migrants from medium and low human development countries irrespective of their country of destination. To know if this is correct, we firstly need to know if there is evidence of disparity between the uses of ICTs such as the Internet by international migrants in relation to the native born. In the United States, the research by Fairlie et al (2006) found a gap between the use of Internet by native born and immigrants. They found that immigrants are 20% less-likely to make use Internet at home. One subset of the group that breaks the trend is immigrant Asian youth. This group has access rates equivalent to native born Asian youth, which rank higher than the national average. Anomalies to this statistic are Indian and Filipino migrants which top of the list in terms of immigrant use of Internet and surpass the national average with 77.3% and 75.3% respectively as opposed to the ITU (2009) national average of 72.5%. Mexican immigrants on the other hand, the most

prominent international migrants in the United States, report one of the lowest percentages of access and use of the Internet, 33.5%. According to the authors, the most significant factors contributing to differences in access to Internet are family income and education, with education being the most significant variable and accounting for 33.8% of the differences in access to Internet (Fairlie et al, 2006). Ono and Zavodny (2007) isolate language as a determining variable of Internet use in the United States and discovered that households where Spanish is the only language spoken exhibit lower access rates by a factor of 15% to those households that also speak English.

Similar research conducted in New Zealand found that 59% of immigrants interviewed used ICTs such as Internet (as opposed to the ITU (2009) national average of 70%). Despite overall agreement on the usefulness of ICTs, respondents who did not make use of ICTs stated that they did so because of limited education, limited command of the English language, limited experience using computers, and the perception that they were too old to learn. The majority of respondents who use ICTs report that they acquired the skills necessary through friends and family members who taught them how to use a computer and browse the Internet once settled in the New Zealand. They report that their primary online activity is communicating with distant friends and relatives (Kabbar and Crump, 2006). A study conducted amongst university students in Israel contrasted Internet use amongst its three main student populations: native born, immigrants from Europe and North America, and immigrants from Asia and Africa. Despite the public availability of computers and the Internet on campus, they found that students originating from Asia and Africa were 8.5% less likely to use computers than their peers from Europe and North America (Soker, 2005), therefore also suggesting that the conclusions of Fairlie et al are observable in other contexts than in the United States.

Studies conducted in Australia, Canada, and Europe however reveal different results. Chiswick and Miller (2005) show that average rates of computer and Internet access and use are higher amongst many international migrants than for Australian native born. The disparity between the two is most significant between native born and immigrants from China, India, Indonesia, Germany, Korea, and the Philippines by an average of 27%. The authors highlight the fact that Australian immigration policies have been primarily targeting highly skilled and educated migrants and this most likely explains the disparity between these groups. In Canada,

the story is rather similar. Statistics Canada reports that 75% of Canadians use the Internet while 78% of immigrants who arrived in the last ten years on the other hand are active online. They also report that immigrants who speak a language other than English at home are online, contrary to the results in the United States, an additional 30 hours or more per month as compared to the native born. Use of email among immigrants follows similar patterns as does the use of Internet to communicate with family and friends. The survey found that 75% of immigrants use the Internet to access news as compared to 62.1% for native born, and found that 26.8% use the Internet to make phone calls as compared to 6.4% amongst the native born. They conclude that the necessity to communicate with family and friends abroad and the relative affordability of Internet as a tool of communication explain the significant differences of use amongst native born Canadians and recent immigrants to the country (Statistics Canada, 2008). A case study of Mexican seasonal migrant workers coming to Canada revealed that ICT use for this group drastically increases with the years of participation in the work programme. Only 25% of respondents made use of ICTs in their first four years of the programme while 82% of those in the programme for more than five years had invested in ICTs both in Canada and in Mexico (Hennebry, 2006). An extensive study of the European Union concluded that, contrary to the results in the United States, international migrants who are often less financially endowed than native born are using ICTs at rates equivalent with regional and national averages. Often younger than the average native born segment of the population, their conclusions suggest that immigrants are more likely to use the Internet since they desire to communicate with their families, they need to access the Web for school, and they seek news and cultural content from their country of origin, which is in most contexts only available online. The EU's positive outcomes are also partly due to their extensive mobilization and financing of ICT training and public Internet access points designed specifically for immigrants, such as in immigration offices, public libraries, and vocational training programmes. The 2006 Riga Declaration on eInclusion is a driver of many such recent initiatives (Kluzer et al, 2008). As these surveys reveal, it is difficult to conclude if the origin of the immigrant alone can determine their likelihood of access and use of ICTs. Detailed case studies reviewed in this paper will demonstrate that access and use of ICTs is incredibly context specific and that general trends are

showing positive use of ICTs and outcomes irrespective of origin and destination for many migrants.

4 ICTs and Opportunities for Migration

The act of migration begins in the mind. Global media and their representations of foreign lands through news, advertisement, film and entertainment, are amongst the important sources of information available to people who are considering migration (Wood and King, 2001). The media deliver images concerning host countries, which in the case of the developed countries may include stereotypes of prosperity, comfort, wealth and opportunity and for the developing countries, poverty, instability, and a much idolised paradise. ICTs supplement the traditional channels of information such as word of mouth, locally advertised work opportunities and the shared experiences of family and friends who have themselves migrated. For better or for worse, these images can have tremendous impacts on the final decision to migrate and the destination chosen (ibid), especially in those for whom migration is already an option (Hargreaves and Mahdjoub, 2006). As detailed in an interview conducted by Schapendonk and Moppes (2007), a Senegalese migrant confirms this notion by stating that European images of beauty, wealth, and luxury, are predominant in the media. This fuels the interest of young males towards migration. From the perspective of people in a host country, the same point of view may be found but flipped on its head. In the following example published in London's Daily Mail (11 March 2000), the author writes about migration in a negative light and mentions the role of media as a lure for potential migrants. The quote is nevertheless revealing. "The pool of potential beggar criminals... is deep. Some of them have not yet heard of Britain. But they will, they will" (Wood and King, 2001: 8). The use of this example does not suggest that ICTs and media promote migration or that migrants are criminals, the point of this quote is to show that as Appadurai (1996) suggests, media and images have a tremendous impact on the imagination of people who are both at the sending and receiving end of the migration experience. A revealing example is the fact that the vast majority of African migrants who are illegal in Europe did not arrive by boat but rather arrived legally and simply overstayed their visas (de Haas, 2006). The recurring media images however are of Africans arriving illegally in Europe by boat. This is an example of the press exaggerating the circumstances of migrant populations and the truth of migration (Schapendonk and Moppes, 2007).

Research conducted in Jamaica suggests that increased telecommunication through ICTs help people acquire a more balanced understanding of the migration experience and therefore help them understand the implications and repercussions of migrating (Horst, 2006). A very successful project in India established Migration Information Centres (MIC) which served as information points for potential migrants. These NGO run centres offer migrant workers information on job opportunities and conditions in order to assist them in their migration experience and therefore reduce the risks they face, such as the uncertainty of finding work and the lack of guarantees in receiving wages for their work. Equipped with a telephone line, access to the Web, and employment databases where new opportunities are registered, MICs offer placement services to migrant workers for a nominal membership fee. These centres have therefore effectively reduced the costs of internal migration in India and established concrete safety nets for migrant workers. The projects have been so successful that the government of the province of Gujarat has proceeded to mirror these services. It is reported that the key to their success is largely the use of "participatory rural appraisal techniques" and a 'rightly sized ICT architecture" (Hiremath and Misra, 2006). From a receiving country perspective, an Australian project sought to map the resources and information that exists online and is accessible to potential international migrants. Their findings revealed that the dominant source of information concerning migration to Australia was originating from private agents offering migration consultation services. Government websites were predominantly marketing portals that exist as a means to "compete for skilled migrants who might otherwise go to Canada or the US" (Ackland and Gray, 2002: 20). Very few websites existed that were authored by migrants offering views on their experience in Australia or that targeted low skill labour or other types of migrants. The clear benefit of these sites however is the very thorough explanation of migration rules and procedures thereby assisting potential migrants assess their eligibility and requirements for migration (ibid). Statistics Canada (2008) also revealed that immigrants to the country report using the Internet in the decision making process that led them to chose not only Canada as a destination but also chose the specific city where they would settle.

ICTs do not only serve as channels of information that lead to migration, they may be the reason for migration. There exists a whole sector of highly skilled professionals that work to design and engineer the technologies that have permitted the information revolution. There is

therefore a relevance to this field, the ICT sector, in the migration of highly skilled labour. Data from Europe and the United States show an interesting correlation between increases in the ratio of skilled versus unskilled migrant labour which coincides with the growth of the ICT market in the world. The appearance since the 1990s of migration policies that target specifically ICT workers such as engineers and computer scientists are also part of this trend (IOM, 2008). The world's leading IT departments are now seeing their students recruited internationally. These graduates' choice of studies introduces the possibility of migration and diminishes their obstacles to migrate in many countries. Contrary to 'blue-collar' occupations, where the "quality of experience is critical", IT students, such as those of the Indian Institutes of Technology, are receiving offers of employment around the world based on the reputation of the school and the performance of previous graduates within foreign enterprises (IOM, 2008: 262). Indeed, as of 2000, more than 30% of Silicon Valley's workers are high skilled migrants predominantly originating from Asia (Saxenian, 2006). Furthermore, permanent residence is increasingly given to workers of this much sought out field as many host countries are unable to fill the needs of this important sector with their own national graduates. Labour shortages of this type are not easily corrected as the sector continuously grows. On another note, ICTs such as the Internet are also assisting countless people around the world search for and find jobs which, as was the case for this author, will lead many to migrate as a consequence. Online job postings are another simple yet innovative gateway to migration for those who have access and the skills necessary for using the Internet. This is a practice increasingly used by governments around the world in order to coordinate international labour programmes (IOM, 2005b), and help reduce the uncertainty of irregular migration by making available reliable and accurate information on opportunities for work and international migration (IOM, 2005a). ICTs are also circumventing migration laws by facilitating the outsourcing of work around the world. Many jobs which used to be done by employees within organizations and enterprises are now done through ICTs, which effectively allows the migration of work instead of migration of the labourer. Call centres, claims and payments processing units, and software programming firms in India are great examples of the migration of work (Chandrasekhar, 2001).

Highly-skilled labourers specialized in IT have yet another advantage, their skills, qualifications and experience tends to be valued irrespective of geographic location, unlike other

skilled migrants who face the potential of being denied licence to work in their field once they leave their home country. This further promotes their potential to migrate and the likelihood of migration. IT skills are for many a "'passport' within global labour markets" (Weiss, 2006: 6). Norway, the UK, and Spain are examples of countries where 'labour market tests' for ICT workers have been suspended or diminished to maximize the entry of such professionals into their economy (IOM, 2008). The United States and Germany are other examples where restrictions have been lowered specifically for this group (Solimano, 2006). In the case of the United States, reform of immigration policy was spearheaded by the private sector through companies such as Microsoft, Texas Instruments, and Sun Micro Systems. Combined, they successfully lobbied the American government in order to have access to the growing pool of IT talent found abroad (Ros et al, 2006), an important change in immigration policy given the fact that throughout the 1990s, three quarters of all ICT production was in developed countries (Arocena and Senker, 2003). Although research demonstrates the negative impacts that migration can have on a country (brain drain) which in many ways can diminish or slow down their development outcomes (Solimano, 2006), IT professionals have also been at the forefront of ICT development in developing countries. Research demonstrates that strong links exist between the international mobility of IT experts originating from developing countries and their investment in this sector at home. Examples from China and India abound that show strong links between a home grown ICT sector that has benefited from the work and networks of their nationals abroad. India's modern image as a hub for IT and computer programming is largely due to the success of its diaspora and the resulting networks that were created through these movements of highly skilled workers (Kapur, 2001). Their success and experience is in many instances the reassurance that foreign capital needs to invest and conduct business in developing countries. This can best be described as a "two-way flow of skill, capital, and technology between differently specialized regional economies" (Saxenian, 2006: 21).

In IT sectors, it is not enough to talk of Silicon Valley. We have to take into account Bangalore and Shanghai (amongst others) as the many centres of technological innovation around the world today. In this sense, we can look at the migration of highly skilled workers as the creation of "brain banks" where a country's human capital is calculated by its share of skilled workers abroad. Solimano (2006: 2) suggests that brain banks are a significant resource for many

countries including "India, China, Russia, Ukraine, Belarus, Hungary, and Poland" and that highly skilled citizens working in the domain of IT abroad is in many instances beneficial to the country of origin in stimulating networks and initiatives back home. Looking again at the example of India, successful IT professionals living as diaspora are responsible for the creation of IndUS Entrepreneur (TiE). This organization has for its goal the expansion of Indian influence and importance within fields of IT. Initially a link between India and the United States, this network is now active in several countries around the world and attracts venture capital to invest in IT projects in India (Kapur, 2001). As is evident by the fact that in 2005, 19 of the 20 top IT firms in India were either managed or had been founded by members of the Indian diaspora (IOM, 2005b), experience abroad can be highly beneficial.

These are examples of brain circulation that can greatly benefit developing countries where the right conditions for investment exist. As Saxenian (2006) rightly highlights, not all countries are positioned to benefit from this exchange. Governments that discourage foreign investment, states that experience political and financial instability, or states where there is little support for infrastructure development, do not lure these types of synergies between centres of innovation. This is how the author explains the void that exists between Iranian and Vietnamese IT experts in Silicon Valley and their countries of origin. A large part of the synergy that can exist between centres of innovation is dependent on the reasons for migration and the conditions back home. Whether one migrates with the support of their state or if one migrates as a refugee will have direct consequences on these ties and the potential for co-development, as defined by Nair (1997). The same is true of Russia, several countries of Eastern Europe and Latin America where financial resources and the economic climate hinders the establishment of strong networks of technological development linked to other centres of innovation, as was the case in China until recent years. Of course, these facts are constantly and quickly changing (ibid). As part of the World Summit on the Information Society (WSIS) a working group has designed a strategy for reducing the digital divide through diaspora networks. The corner stone of the project is the Digital Diaspora Network for the Caribbean (DDN-C). Equivalent networks were designed for Africa (DDN-A) and Latin America (DDN-LA). The projects intend to "provide a rich source of ideas, skills and support and to act as a platform for the exchange of information" (Nurse, 2003: 4). A private online network that is targeting the least connected segment of the global

community is MIRAUI (Mouvement international pour la renaissance d'une Afrique unie). Seeking to mobilize Africans around the world (with a dominant focus on francophone African nations), this online network promotes African unity through freedom and democratization. Their work is an example of a migrant founded networking initiative where members can get informed, enlist, participate in various projects, advocate for a social cause, and stimulate a transnational dialogue where the diaspora seeks to collaborate with other nationals in a model that closely resembles co-development, albeit with political aims. Panagakos and Horst (2006: 120) state that, "There is no doubt that new technologies have an impact on how transnational migrants imagine, negotiate and create their social worlds across broad transnational fields." The broadcasting of conversations with emigrants on the radio waves in Nepal as means to demonstrate the success of migration for the Nepalese diaspora is another example of this (Kunreuther, 2006). In some contexts, the act of migration itself entails a social prestige and a sense of accomplishment. Migrants are in a sense 'new national heroes' (Riccio, 2006), and they are seen as ideal candidates in the co-development of their countries of origin (Naïr, 1997). There is some link here as migrants very often acquire new skills and increase their financial resources through their experiences abroad, which they in turn share with peers at home (Mansour Tall, 2004).

5 Migration and Access to Information

Migration, both within and beyond borders, necessarily entails risks. These risks can be mitigated by access to information both prior to and during the migration journey (Tilly, 1990). Access to information concerning destinations, conditions of migration, and the maintenance of contact with family and friends are important factors, especially for international migrants (Ros et al, 2006). Schapendonk and Moppes (2007) have confirmed the importance of communications in their interviews with migrants in Morocco, Spain and Senegal. The interviewed migrants all confirmed that they owned and regularly used mobile phones to remain connected with their friends and family abroad, both during the migration journey and once they reached their final destination. This applied to both regular and irregular migrants. Many also confirmed use of Internet services both as preparation for the journey and throughout its process. Recent research following the major regional and trans-continental migration routes of Africa

and Europe have revealed that migration is in fact big business. The quantity of people making the journey from various corners of Africa towards other African countries or Europe is substantial enough to have generated clear markets and substantive profits for services that target migrants embarking on these missions. As Moppes and Schapendonk (2007: 9) note, "many of these services facilitate communication and remittances between areas of origin and destination, such as internet cafés or money transfer agencies." As their research shows, these services are not only important to migrants who have reached their final destination. These services are being used every step of the way and are serving to reduce many of the risks involved, especially with irregular international migration. Opening up doors to employment, transportation, and money transfers, services offered along the way, very often through ICTs (such as access to computers and the Internet or mobile phones), mean that migrants are for example less likely to be victims of theft since they no longer need to carry large sums of money with them to cover all expenses of their crossing. "The availability of services reflects migrants' demands and facilitates the step-by-step migration process that characterises the journeys of most migrants" (ibid: 3). What is particular of this trend is the fact that these hubs are not only present in major cities that characterise major migration destinations and points of departure, such as Dakar in Senegal. Equipped with communications technology, smaller towns, many of which are located in rather isolated desert regions such as Tamanrasset in Algeria, Gao in Mali, and Agadez in Niger, are emerging as important mid-points for regional and international migration. The authors report that Western Union, a company that has been incredibly savvy in offering remittance services to migrants, are now present in most of these locations. The authors report that in The Gambia, Western Union has used migration as a marketing message by including the text "Another reason to be proud of your son" alongside an image of a woman holding money and juxtaposed to a young man dressed in a suit (ibid: 11). Due to the importance of access to information, migration has effectively become an important source of income for many enterprises present along these routes. The business model of the one-stop communication shop (offering a wide range of services) has been replicated all over Africa. Migrants are therefore able to coordinate their journey and mobilize resources by visiting small businesses that act as both internet café and telephone booths. Another technology that is reportedly used in migration is the global positioning system (GPS). There are reports that Senegalese fishermen are using the technology

to navigate the high seas between Senegal, Mauritania, and the Canary Islands, while smuggling irregular migrants into Spanish territory. Their traditional fishing boats are serving to substantially increase their incomes through this lucrative illegal trade of smuggled persons (ibid).

Schapendonk and Moppes (2007) have furthermore identified websites that promote irregular migration. One such site is www.senegalaisement.com and is reported to be under investigation by the International Organization of Migration (IOM). The contents of such websites are apparently widely distributed and openly discussed in online forums. Reviewing the content of the site, which is completely in French, reveals very detailed information including seasonal considerations, starting points, drop off points, and guidelines to accomplish the incredibly dangerous irregular journey to Europe. The authors of the website discourage those who are illiterate from embarking on this journey and highlight the importance of understanding GPS systems, which are apparently important to the successful sea leg of the journey to Europe (as demonstrated by the story of Senegalese fishermen). The website even hosts audio files meant to help francophone irregular migrants learn to communicate simple information in various languages along the way to *Europe libre* (free Europe) via Eastern European countries such as Albania, Moldova, and Slovakia. Guidelines include tips on the availability of Internet services along the way and links to useful websites worth consulting prior to departure, such as government websites detailing visa requirements.¹

An interview conducted for the Human Development Report with an irregular migrant living in New York, United States, revealed yet other uses of ICTs in irregular migration. The migrant, in this case a young woman from Latin America, shared her story of a truly dangerous journey. Her irregular migration began at home, where she was placed into contact with an organization that facilitates entry into the United States from various points in South America. Her first contacts with the group were always done through video cameras, relaying the signal from a room where she sat alone and hearing the voice the entrepreneurs through audio speakers. Only once she had obtained the trust of the organization did she begin to meet people face to face, yet the organizers were always dressed in costumes to hide their true identities. Once embarked on the long journey to the United States, the organizers distributed to all participants international

¹ Information concerning www.senegalaisement.com where obtained on their website on 27 February 2009 and are subject to change.

calling cards and asked them to memorize series of phone numbers they would have to contact at various points of the journey. Only after successful completion of each leg of the voyage were fees paid to the organizers. The most arduous part of the journey was the crossing of the desert between Cananea, Mexico, into the state of Arizona in the United States. For this part of the crossing, the group was divided into smaller units of approximately 40 migrants. A leader within each group was equipped with a mobile phone. The phones were important to coordinate between all the groups and make sure that no one would get lost as they were crossing the desert. Communication was vital to assure that they maintain proper course towards the United States in a landscape that offers very little in the sense of bearings. As we can see through these many examples, ICTs are proving to be important to many migrants who are otherwise embarking on dangerous and illegal international border crossings.

Migration can be dangerous even for regular migrants. There are reports of abuse of migrants where not only are passports confiscated but mobile phones as well. In instances of abuse, such as the reported cases of Filipina domestic workers in Saudi Arabia, the denial of communication with families and friends (both written and by telephone) is imposed to keep the migrant in the state of abuse. Prohibited from using mobile phones, migrant workers were not capable to inform their families of their ill fate or degrading work circumstance (HRW, 2008). Some employers have defended the practice by stating that the worker needs to focus on their job and not be wasting time talking on the telephone. For some of these women, isolation lasted for months and in some employment contracts, the prohibition of mobile phones was overtly specified. Unable to call for help, Filipina workers have testified to Human Rights Watch that they have been victims of abuse and in many of these settings, controlling lines of communication was a component used to prevent them from seeking help. Similar cases in other Gulf countries have been reported by ITUC (2007), one of which resulted in the death of a young Filipina migrant worker who resisted surrendering her mobile phone to her employer. A group of Filipino migrant workers have decided to address these problems by creating a hotline where victims of abuse can reach out and request assistance. "They publicize this [mobile telephone] number through informal community networks. When a domestic worker in trouble gets a chance, either through a hidden or borrowed mobile phone, she may send a text message to the hotline and her message goes to a local migrant, an NGO in the Philippines, and the Filipino

embassy" (HRW, 2008: 26). Through ICTs, these networks are then able to extend support to the woman in need and potentially repatriate the victim to her family through the assistance of the embassy. Human Rights Watch advocates that all migrant workers should be given mobile phones containing the important telephones numbers they can turn to if in need.

Furthermore, ICTs have enabled the establishment of highly sophisticated monitoring systems that are used to manage the entry and exist of people in many countries. Crossing a border now increasingly entails scanning official documents and bar codes, registering into databases, verifying the accuracy of information in international security databases, and even collecting biometric information such as finger prints and facial scans. As IOM (2005a) states, the rise of ICTs and their use for border control and national security now entails serious costs and investments in every country's IT infrastructure coupled with information sharing agreements amongst states. These in turn have beneficial impacts on the availability of migration data yet entail serious concerns of privacy. In a post September 11th world where terrorism is a serious concern of many governments, advancements in this field frequently surface in the press. For example, The London Guardian in October 2008 reported that Interpol (the International Criminal Police Organization) is actively pursuing the creation of a global biometrics facial scan database that is said to be vital in the fight against terrorism. Through ICTs, international border controls could effectively monitor all regular entry into their country and stop suspects that use official entry points (Bowcott, 2008). In further response to the fear of terrorism, ICTs can and are being used to track and monitor the movements of people and in some instance the views of migrants in particular, through the surveillance of websites, newsgroups, blogs, and even personal email (Panagakos and Horst, 2006). A recent bombing in Mumbai is believed to demonstrate a stark example of terrorists' use of ICTs to establish their networks and facilitate their violent acts. The New York Times reported on 8 December 2008 that terrorists responsible for the Mumbai attacks of that month had made use of GPS technology to navigate the sea from Pakistan to Mumbai and used satellite and Internet telephones to remain in contact with their network right up until the moment of the attack. Furthermore, Google Earth had supplied them the satellite imagery of the ground which further helped them plan their routes.²

² Retrieved December 9, 2008, from <http://www.nytimes.com>.

6 Information Systems for Remittances

While transfer of knowledge between diasporas and their countries of origin mostly occurs through highly skilled migrants and the creation of professional networks (IOM, 2008), remittances are statistically more significant as a share of income amongst temporary migrants (Ghosh, 2006), and most regular amongst illegal (or irregular) migrants who are under the constant threat of deportation, as in the case study of Senegalese migrants to Europe (Mansour Tall, 2004). In previous years, there existed many fears when it came to sending money abroad. Computer systems were less reliable and if the digital service was not available in the recipient's location, there was no choice but to send money by mail or bring it in person. These obstacles posed serious limitations to the timely use of remittances since sending money in the mail could easily be intercepted and lost or simply did not reach the recipient in time for them to make effective use of the sum sent. The Internet has greatly changed this. Communications through ICTs are keeping open the channels that bind people together and allow them to call upon each other for support in times of need (Wilding, 2006). The efficient and quickness of communication through ICTs and services such as Money Gram and Western Union make remittances in times of extreme need such as illness, birth, or death much more timely and likely than in the past (Mansour Tall, 2004 and Horst, 2006).

The interface between banking systems and the mobile phone is further developing this resource and giving access to financial services to many people in developing countries (Jenkins, 2008). As demonstrated in the recent Cairo Summit, mobile money is an innovative and ground breaking use of existing technologies facilitated by the collaboration of multiple stakeholders and private interests. For example, the agreement signed between Western Union, national service providers and MasterCard in the Philippines, is effectively bridging all realms of financial transactions and allowing remittances to be converted to credit that can be spent through debit and credit card systems. SMART Padala in the Philippines currently offers its service in most countries that are major hosts to Filipino works (Australia, Canada, Brunei, United Kingdom, Saudi Arabia, Singapore, Spain, UAE, United States, etc)³. Money that can be transferred internationally in this way is greatly reducing the transaction costs of remittances and allowing increased autonomy in the reception and use of that money while diminishing risks previously

³ Retrieved December 2, 2008, from <http://smart.com.ph>.

associated with sending money abroad. It is reported that in as early as November 2005, SMART Padala had already more than 2.5 million subscribers in the Philippines and transferred more than USD 100 million per month, 50% of which were international remittances (Kramer et al, 2008).

Although international remittances are the initial driver of this new market, the use of these services is not limited to international transactions. Mobile money can also be used locally as an alternative to traditional banking systems. With potentially much lower service fees than traditional bank accounts, mobile money is marketed as being highly beneficial to the poor and increasing their access to formal financial systems while allowing migrant workers to send money to their families (from one mobile phone to the other) even if they do not leave the country.⁴ Some of these services are actually managed by traditional banks that are expanding in this new market in order to reach remote clients otherwise beyond their commercial reach (Kramer et al, 2008). Bill payments through these systems also represent savings of time since as research in Bangladesh demonstrates, "people typically take three to four hours off work to travel back and forth and queue at designated banks" (ibid: 12). A CEO of one of these mobile money service providers states that their aim is to help people make the most of the remittances they receive and reduce the barriers that exist in moving money around the world. He says, "We face not only an exciting business opportunity but also a heavy social responsibility" (ibid: 26).

According to GSMWorld.com⁵ the principle is simple, with many more mobile phones than ATMs in the world, mobile money can revolutionise the way we use currency. With no need for physical service counters or service personnel, mobile money service providers can easily offer lower rates per transaction than competing banks and money transfer service providers. They quote the World Bank as saying that a reduction of less than 5% in the fees associated with money transfers could increase their total size by as much as 50% and would greatly encourage the transfer of smaller but more regular sums of money. They state once again that the objective is quite simple, facilitate the transfer of money and bring the poor into the formal banking

⁴ There is a large array of costs associated with mobile money services. For example, MTN Banking in South Africa charges as much as USD 6.15 for twelve transactions, as compared to SMART Money in the Philippines which charges only USD 0.61 for the same amount of transactions. The Philippines is the country where the lowest fees for mobile money transactions are found in the world. FinMark Trust defines such services as affordable for the poor if they represent 2% or less of their household income. Retrieved November 25, 2008, from <http://technology.cgap.org>.

⁵ Retrieved December 2, 2008, from <http://www.gsmworld.com>.

system. With over 50% of the world population having access to mobile phones (ITU, 2009), this will surely be very impactful to development. But, until the costs of digital money transfers are reduced to small fractions of the value sent, migrants will continue to use traditional means of transferring money (i.e. in person) as services are still very expensive in many parts of the world (Ros et al, 2006).

Research shows that such developments of ICTs also create heightened responsibly and potential stress on the migrant who is now more easily reachable despite the geographic distance. Families can now easily call upon a friend or relative in times of need and demand financial assistance, such as in the Akuei (2005) case study of Dinka refugees living in the United States who, by virtue of 'traditional kinship rights' are obliged to send money irrespective of their own financial situation. The channels of communication facilitated by ICTS "generates new expectations of communication and support", which is not necessarily desired by the migrant (Wilding, 2006: 138). The hope of successfully receiving money from a relative abroad can also be a gamble for people in developing countries who may decide to use what little financial resources they have left in order to beg for help with little or no guarantee that their requests will be accepted (Horst, 2006).

7 ICTs and Cultural Identities

Migration offers a unique opportunity to reinvent oneself. As Rouse (1995:356) wrote, migration involves "asserting and organising around either revalorized versions of ascribed identities or new ones that the (im)migrants develop for themselves." In this sense, the impacts of migration and ICTs can therefore be understood as promoting a certain Westernization of source countries and a creolization of host countries, effectively impacting the dominant culture and facilitating cultural diversity within many societies (Shibanai, Yasuno, and Ishiguro, 2001, and Greig, 2002). This process is not new. Diffusionist theories have existed in the social sciences since the early 20th century through the work of Alfred L. Kroeber⁶. The interesting contemporary debate lies in the final outcome of increased communications on a global scale.

⁶ Kroeber (1940) describes the process by which ideas and technologies spread throughout the world, therefore affecting and changing cultures. He termed this process 'stimulus-diffusion' or 'idea-diffusion'. His work conveyed a certain evolutionary tone and served as the theoretical foundation on which was built many theories of social and cultural change within the fields of sociology and anthropology in the early 20th century.

Hamelink (1983) sees the effects of increased communication and connection as the Westernization of the world. A variant of this theory, proposed by Nederveen Pieterse (1995) suggests that the world will increasingly be homogenized into a hybrid global culture. Elkins (1997) believes the opposite will happen since given the opportunity, especially with ICTs, diaspora communities tend to increase their ties with their countries of origin therefore reinforcing their cultural identities, which will further reinforce heterogeneous cultural pockets around the world, and therefore mitigate the cross-cultural effects of global communications. Another group, influenced by Alejandro Portes, have a somewhat different view of migrants, whom they see as inhabiting two worlds and living within two cultures (Portes, 1999).

Despite these theoretical divergences, research does suggest that the hybridization or creolization theory is most probable. Greig (2002: 239) has modelled the effects of communications in communities and on dominant cultures by compiling lists of cultural attributes and concludes that "the expansion of communications results in unexpected consequences in which the most common cultural values before interaction are not necessarily those that will be the most prevalent after agents interact with each other over time". In this research, migrants and communication technologies clearly have an impact on the cultures of their host countries, and their own. We can say that ICTs have significant impacts on cultures throughout the world, without making obsolete identities that are geographically bound but rather reinforcing them while transforming them (Van Den Bos and Nell, 2006). Levitt (1998: 926), interested in what happens to the family and friends of those who migrate, terms this exchange that is the result of migration as social remittance, a variation of the concept of financial remittance in which what is sent home is not merely money but is rather " ideas, behaviours, identities, and social capital that flow from receiving to sending country communities". These types of remittances are according to the author at the core of the individual transformation that results from migration. Family members of migrants construct an idea and an awareness of distant lands not by travelling but rather through the experiences and stories that are shared with them (ibid). As Levitt (2006) states, contrary to cultural flows which are experienced through media or any other such medium, social remittance is best seen as the intentional communication of values and ideas that originate from host countries through direct networks of family and friends. This makes them a much more systematic and controlled

diffusion of ideas as opposed to cultural diffusion as typically theorized since they are filtered by the personal views and intensions of the "transporter" of ideas (Levitt, 2008).

Diasporas are often at the forefront of technological use and media production due to their special needs within host countries (Karim, 2003). With satellite television available throughout the world, subscribers can easily access content that originates from major cultural producers. Bollywood films in Southeast Asia, Italian television in the Canada, Middle-Eastern news in Europe, cinema and entertainment in general has a strong impact on culture and identity (ibid). ICTs permit the distribution and consumption of these products and have a visible impact on the sustainability of cultural identities within diaspora communities around the world, and vice-versa (Wood and King, 2001). The use of the Internet by members of diasporas can change the reality of living abroad through "qualitatively and quantitatively enhanced linkages", which can allow migrants to maintain traditions while abroad, such as celebrating a cultural festival or religious ceremony, making friends or finding a spouse of shared cultural origins or religious background, or simply finding the products that are dear to them and originate from their countries of origins (Karim, 2003). Online communities of Palestinians are example of this phenomenon and demonstrate an even more complex problem since the geographic link between members of these networks has been ruptured by political turmoil to the extent that their virtual meeting is the only point of convergence for people who are prohibited from traveling to their country of origin (Hanafi, 2006). A well researched example is the Turkish diaspora in Europe and its relationship with events occurring in Turkey. Through ICTs and satellite television, the Turkish diaspora is maintaining a coherent group identity and sense of belonging that may not exist for them in relation to their physical community (Ogan, 2006). ICTs can help migrants construct a feeling of home away from home (Tsagarousianou, 2006), despite the fact that images and experiences that are mediated may have a stark contrast to those same images on the ground by virtue of their mediatisation (Wood and King, 2001). In a sense, ICTs are bringing the migrant home and bringing home to the migrant. These technologies allow them to feel synchronized. "Transnational television has introduced completely new dynamics into the management of separation and distance" (Aksoy and Robins, 2002: 7), while also facilitating the creation of new

forms of "transnational imagined communities"⁷ (ibid: 2). Milikowski (2000) suggests that migrants' access to contemporary media from their country of origin can show them and particularly their children how cultural values and social norms change over time. In this sense, ICTs may help migrants "liberate themselves from certain outdated and culturally imprisoning notions... which had survived in the isolation of migration" (ibid: 244). Going back to the case of Turkish migrants, Aksoy and Robins (2002) report that their informants either tend to forget that television exaggerates or reversely blame the media for exaggerating what is happening in Turkey. The authors interpret this divergence as "the detextualization of the migrant viewing situation" and the consequential difficulty in understanding the cultural significance of images due to the geographical distance of the migrant and the multi-cultural references that migrants accumulate through their experience of migration (ibid: 19).

There exist in all of this generational differences in the use and significance of ICTs. For example, older members of the Greek community in Canada are reported to consume higher levels of Greek satellite television and radio than younger generations, therefore maintaining their Greek identity through Greek cultural products and at times abandoning Canadian television altogether, while the younger generations are more active in online Greek communities that create links with Greek identities in several countries around the world and are therefore increasingly hybrid identities (Panagakos and Horst, 2006). The former is referred to by Hoffman (1991) as a deep nostalgia that is fuelled by images of home. The latter, as Graham and Khosravi (2002) suggest, is a form of online cultural identity building that reinforces distant ties and one's reputation online but does not increase the sense of belonging of the migrant in their host country. Other research reinforces these conclusions and demonstrate how first-generation migrants use of the Internet mirrors their pre-existing social networks, while second-generation migrants (which are also younger and more technologically apt) are expanding this base and participating in online communities that have cultural ties and include individuals living in similar circumstances abroad (Van Den Bos and Nell, 2006). It therefore seems correct to state that ICTs are permitting the construction of transnational identities, which can be defined as "the cultural, economic, and political linking of people and institutions [that] de-emphasizes the role

⁷ The concept of imagined community was developed by Benedict R.O. Anderson (1991) and symbolises the bonds that exist, both real and imagined, between people who form a network or community. His work was especially impactful to the study of nationalism and identity in the social sciences.

of geography in the formation of identity and collectivity and creates new possibilities for membership across boundaries" (Levitt, 2001: 202).

8 Technologically Mediated Relations

The use of ICTs entails the acquisition of skills and resources. It follows that for different families and for various cultural, social, political, or economic reasons, some ICTs are "more desirable than others at specific points in time" (Wilding, 2006: 15). The concept itself of family is quite diverse when compared cross-culturally. The patterns of communication between family members also change over time and depending on the context that family members find themselves in. These relations are greatly impacted upon by technology the moment a member of the group migrates. Research done on the choice of medium of communication used by migrants demonstrates that prior to the 1990s letter-writing was considered the most dependable and cost efficient means to contact family members abroad (ibid). International telephone calls were also used, but since they were done, as in the case of Jamaica, from kiosks and public phones, they offered very little privacy (Horst, 2006). As many studies on the topic of ICT and migration demonstrate, this is no longer the case.

The emergence of cheap international phone calls through pre-paid calling cards represents for migrants one of the most important advances in the maintenance of family and personal relationships with people who reside in their country of origin (Vertovec, 2004). Combined with the incredible growth of mobile phone usage around the world, migrants are now able to maintain an almost constant channel of communication despite their geographical distance (Ito and Okabe, 2005). Contrary to the exchange of letters, which can incur weeks of wait time between exchanges, the rise of international telephone services coupled with cheap calling cards makes it possible for families to be in touch on a regular basis, even if it is simply to say hello, a true 'miracle' of technology (Wilding, 2006). Cheap phone cards also reduce the financial strain on migrants who were previously often contacted by their family by means of collect call (Horst, 2006). Prepaid phone services, such as those offered in Jamaica, have also positively impacted families of migrants by allowing them to effectively control the amount of money they spend on telecommunications. Prepaid services limit the costs incurred and avoid the unpleasant surprises of speaking beyond their means. Her research also suggests that cheap telecommunications

greatly impact the involvement of migrant parents into the lives of their children and their spouses. Through ICTs, these parents are able to offer support, reassurance, and be part of their children's "academic and emotional growth" while participating in the decision-making processes within the household (ibid: 149).

It is interesting to note that some report that migrants are at times very influential in the adoption of technologies such as mobile phones in their communities of origin as they introduce the need for and importance of maintaining long-distance relationships (Benítez, 2006). The same effect has been demonstrated in rural communities of Senegal through investments made by local migrants who left to work in Italy and then used their income to purchase telephones and fund the installation of electricity and telephone services in their communities back home (Mansour Tall, 2004). Research done amongst Mexican seasonal workers who travel each year to work in Canada has also demonstrates this trend and shows that amongst this group, there is significant investment done in communication technologies within families that have a seasonal worker. The research reports that for people involved in the program for less than four years, about 25% of families used remittances to invest in ICTs. For those families who have been in the program more than 5 years, the figure jumps to 50% and for those who have been seasonally working in Canada for more than 10 years, the figure reaches 90% and up to 100% for those travelling to Canada for more than 16 years (Hennebry, 2006). Benítez (2006) also documents the powerful impact of ICTs such as videoconferencing in the lives of Salvadorians living in Washington DC. With the ability to have visual as well as audio meetings, despite the geographical distance, these families and friends are able to share together a group event in order to celebrate a special occasion thereby increasing the emotional impact of the connection, which is difficult to share as a group through any other technological medium. This can be a crucial dimension of maintaining family relations. In such situations, ICTs can act as channels for emotions and intimacy (Panagakos and Horst, 2006).

The Internet, emails, webcams, instant chat applications, blogs and personal websites have diversified the possibilities for interaction across distances. Emails in particular allow many migrants to stay in regular communication with family members and have for many significantly increased the quantity of messages exchanged with family members abroad (Wilding, 2006). Online photo albums, where users can upload and share images, are also allowing migrants to

document their lives abroad and give a glimpse of their daily life to family members. 'Connected relationships', where physically distant members of a family have a sense of proximity through technological mediums, is blurring the distinction between 'absence and presence', and developing a sense of being at home away from home (ibid: 132). With the instantaneous delivery of email and affordable international phone calls, migrants can be involved in the daily happenings of their family to the contrary of letter writing which delivers old news. Irrespective of the details or quality of communication exchanges, migrants interviewed affirmed the importance of 'shared time'. "[Email] sort of gives me more of a feeling of being part of it, because sometimes you get news before other people, you know, people who are there" (ibid: 133). Websites have the potential of achieving similar outcomes in as much as they can serve to aggregate information, images, history, and serve as a bridge between migrants and source communities so that over time they may resemble a sort of 'cyber village' where experiences are shared and exchanged (Benítez, 2006). In this sense, ICTs can be means of establishing networks of professionals to turn brain drain into brain gain and promote participation into the economic life of one's country of origin (IOM, 2008).

The ability to hear a person's voice and to exchange communications in real time, without the delays of international postal services, is expressed by migrants and their families are important aspects in maintaining relations at a distance (Horst, 2006). The same effect can be observed in the circulation of religious sermons on audio cassettes and consequently broadcast on the radio (or the Internet) for diaspora audiences (Richman, 2005). This is a strategy that finds its parallel in the activities of Al-Qaeda and their dissemination of messages originating from its leaders, such as the tapes of Bin Laden that are broadcast on satellite television and various websites. ICTs can therefore also represent negative empowerment, as is the case with coordinated terrorism. Perpetrators of the September 11 attacks in the United States are believed to have orchestrated their actions through the Internet (Karim, 2003), which allows people to increase their social networks beyond the limits of physical proximity and beyond the limits of social conventions (Turkle, 1996).

Many new applications developed online are furthering communication processes and expanding people's networks of relationships. Websites such as MySpace and Facebook are allowing people to locate and rebuild relations with friends and share information with a wide

network of online relationships. As GPS technology is combined to mobile phones, as is the case with Loopt's application for Apple's iPhone, the digital relationship is transformed into an awareness of the physical location of friends and family. This may be the first generation of such uses of ICTs but it is pointing to the possibilities and developments of the future. These applications, coupled to portable devices, are expanding once again the nature and possibilities of technologically mediated relationships.

Wilding (2006) states that ICTs are permitting the maintenance of relationships at a distance but they quickly become insufficient when more direct contact is required, as in the case of caring for an ailing family member or ageing parents. Her informants also demonstrate how email can be used to circumvent traditional channels and hierarchies of communication and decision making, effectively displacing the seat of authority within a family and involving people who traditionally would not have been informed of decision making processes. Benítez (2006) highlights the generation gap that is furthered by children's use of the Internet and quick acquisition of skills and access to information unavailable to older siblings. These new skills and quick access to information can dramatically affect power relations within groups and alter traditional social hierarchies that were once based on kinship and age (Mansour Tall, 2004). The ability to maintain such close communication can also incur unnecessary strain on relations, especially those of spouses. ICTs can be used to monitor the behaviour and location of loved-ones faced by the fear of infidelity (Horst, 2006). Furthermore, Wilding (2006) reminds us that those family members who are most likely to require assistance and support are those who are least likely to be able to use these new forms of communication: the elderly and the sick. As a matter of fact, half of her informants state that their families do not make use of ICTs, and interestingly, some of her informants dislike the fact that ICTs make it easier to reach them, as some migrate to create distance between themselves and others. Differences in the distribution of skills and knowledge mean that migrants will continue to rely on a wide range of services in order to communicate with friends and family abroad. Research conducted in the Château-Rouge area in France, a neighbourhood known to be home to a large migrant community, has revealed the limits of computer use and therefore email due to language proficiency and illiteracy. In this area, businesses established telephone centres as viable services targeting migrants as opposed to Internet cafés (Ros et al, 2006). Despite low capabilities in this migrant community, ICTs are

still employed. The question is, which ICT is best suited for which migrant, Internet or mobile phone?

9 Diaspora Communities and the News

Contrary to the historical flow of media from agencies in developed countries, which promoted a certain hegemonic world view in the press, ICTs, such as satellite television, have opened channels of information that originate from developing countries (Karim, 2003). Senegal's WorldSpace system is a great example of a developing country's effort to generate content geared for its diaspora and migrant community. Launched in 2006, the service was designed firstly to broadcast abroad and only later was made available within Senegal (Ros et al, 2006). Accessibility to news originating from one's country of origin can be very important in maintaining a sense of connection and involvement with events back home (Benítez, 2006). Satellite channels also offer migrant experiences in developed countries to be distributed in developing countries, such as Telemundo in the United States where the images and viewpoints often defer from other major American networks. In the case of Telemundo, the audience, largely immigrant based, determines the content and angle of the media reporting (Karim, 2003). The same effect can be found in alternate mediums. It is often expressed that ICTs such as the Internet has the potential of bypassing the traditional interests of media enterprises (Clark, 2003), which have been demonstrated to be highly influenced by dominant sources of economic and political power and which have predefined audiences and market objectives (Shoemaker and Reese, 1996). Referring to an interview with a director of *Radio América*, an online radio station that caters to the Latino community in the United States but regularly receives emails from migrant listeners in all corners of the world, Benítez (2006) demonstrates that online audiences are much broader than with traditional broadcast mediums and can service the entire globe. Editors of small local newspapers in Timor-Leste confirmed this view when they explained that the audience of their news websites, which mirror the content of the daily press in Dili, are the diaspora. Publishing online news in Tetum, these editors keep in mind this small yet important audience spread throughout the world.⁸ Furthermore, contrary to traditional media such as television or the press, the Internet is much less regulated and hierarchical. Online, through sites

⁸ Statements collected by the author in 2006 during field research in Timor-Leste. As an example, please see: <http://www.suaratimorlorosae.com>.

such as Indymedia.org, users have the unique opportunity to be content producers as well as consumers of news. The obstacle of the digital divide remains in so far as it is access that determines who will create content (Bernal, 2006), but nevertheless the potential of access and creation exists.

How migrants are conceived in their host countries can be heavily influenced by the media. Through their images and their choices of words, media have the potential of impressing on the public, a dichotomy of values and beliefs (Wood and King, 2001). The media can serve as a political tool that can have strong negative consequences on the experiences of migrants. A newspaper stance and portrayal of a story can have a direct impact on the public's opinion of migration, as has been argued in the UK in relation to the rights of migrants to social security and their use of tax dollars sent back home in the form of remittances (ibid). To the contrary of this view, yet also a misconception and a form of misinformation, media in developing countries has been argued by several authors to potentially act as a lure for migration. For instance, it is argued that "media spread biased images of wealth and western luxury", which are especially appealing to youth but are by no means guaranteed to all who make their way to high-income countries (Schapendonk and Moppes, 2007:2).

Kunreuther (2006) demonstrates how migrants can in some instances become the voice of opposition within politically monopolized contexts. Her research on the influence of the diaspora during the Nepali government's attempt to silence opposition to the monarchy in 2005 shows that despite the physical control and takeover of mediums like radio and the local press, voices of opposition can filter through decentralised channels like the Internet. Radio shows in Nepal commonly featured members of the diaspora on the airwaves, broadcasting telephone calls and messages to family and friends. Migrating was heavily promoted by the government of Nepal as a good means to increase national revenues through remittances yet at the time of repression, it was this very distance that allowed dissent and the expression of opposition to the monarchy (ibid). ICTs such as the Internet are tools that are capable of bringing issues to the surface of public opinion and debate, despite attempts at silencing or censoring them (Hill and Hughes, 1998, Wilhelm, 2000, de Donk et al, 2004). Instead of relying on media, users are becoming *the* media (Wall, 2003). As people increasingly look online for sources of information and entertainment, an encounter with alternative news, a solidarity network's site, a forum geared to

a specific political debate or a social project, is increasingly probable (Rodgers, 2003). As it is in the case of Iranian and Turkish-Kurdish communities in Europe, Van Den Bos and Nell (2006) write, "Diaspora websites that are extensions of print media are directly or indirectly connected to political movements in exile." This in turn is affecting the content of traditional news outlets who cannot afford to ignore these competing sources of information, which are being consulted by growing numbers of people seeking up-to-date detailed and most importantly alternative information (Bennett, 2004).

The case of Eritrea points in the other direction. Here it is the government itself that is promoting the creation and participation of online communities in order to bridge the citizenry that is within the borders of the country with the diaspora that exists outside. The government is actively involving the diaspora in order to increase the human capital of its state. This could be argued to be an example of a strategy to turn brain drain into brain gain. As Bernal (2004) realized, and contrary to many state policies, the concept of citizen in Eritrea is not bound to geography but rather to origins, meaning that one is considered Eritrean irrespective of citizenship or place of birth, as long as one is the descendant of an Eritrean national. The diaspora is therefore actively involved in matters of the state. At the time of independence, it is estimated that about one third of the population was living abroad and most did not return (Bernal, 2006). Through online networks, the diaspora was mobilized and became crucial in funding the war against Ethiopia, creating a new constitution, rebuilding the history of their land, constructing new understandings of Eritrean identity and community, and serving as watchdog to the foreign press and the Eritrean government (ibid). As de Hass (2006) states, diasporas are active stakeholders in the development of their countries, what is therefore needed of governments and development practitioners is for them to mobilize themselves and communicate with diaspora communities and networks in order to promote their involvement and build synergies between all actors.

It is important to consider also the relative safety that is experienced online by users who are located in undemocratic contexts, or where state violence, repression, and censorship are elements of the political climate, as compared to public display of opinions. In these settings of political repression, the Internet has proven itself to be a much safer environment in which to exchange information and ideas. Studying the postings within Usenet groups or chat-rooms, Hill

and Hughes (1998) have discovered that political opinions form the most substantial part of communication exchanges within online forums for those groups that are specific to states that are repressive and undemocratic. Email is another component of the Internet that facilitates political exchanges of ideas and information as discovered by the administration of Amnesty International. They celebrate the distributive capacities of email and its relative security of reception and use allowing them to receive and send up-to-date information concerning pending crises and alerts, bypassing authoritarian control of surface mail services, which can be intercepted and confiscated (Lebert, 2003). The Internet facilitates dissent and activism by facilitating, coordinating, disseminating, and mobilizing efforts throughout the world (ibid). There exists a strong camp in academia that suggests that international peace may be more readily attainable with the advent of the Information Age due to access to wider sources of information and freedom of expression (Allison, 2002). Access will of course be fundamental to this process. Issues of the digital divide can be especially pronounced in transnational mobilization as members in developed countries have more readily available access to ICTs and more financial resources to allocate to technology. An example of indigenous struggles in Mexico demonstrates the problems that can arise in this type of situation. In this instance, members of the coalition Oaxacan Indigenous Binational Front located in the United States were as a result of the digital divide at the forefront of the movement simply because their Mexican counterparts were either less skilled at using computers or lacked access to ICTs. Indigenous members of the coalition therefore had less voice than their peers north of the border. This inevitably caused tensions within the group and further divided members along geographical and economic lines (Levitt, 2008).

Although civil society advocates applaud aspects of ICTs that promote participation and mobilization, some governments are not as keen. In fact, several governments actively try to limit the positive impacts that ICTs may bring to their country through policies that either censor the content of communication or outright bar access to technologies that give an insight to the outside world. For example, television and Internet were for reasons of cultural preservation banned in Bhutan until 1999 (Phuntsho, 2001). Guatemala, Malaysia, Singapore, and Thailand have all heavily controlled access to satellite television for the same type of reasons (Warf, 2000). Singapore has also attempted to control content accessible by Internet users by forcing

content providers to register with authorities. Their licences were bound to the condition that they actively censor information that has strong political leanings (ibid). China on the other hand, seeing the incredible development and economic impact that ICTs can have has solely sought to control content that is accessible to users within the country yet promotes the development of infrastructure and diffusion of access. What has been the trend in China is the banning of access to several international news sources which publish stories that are critical of the government and its policies. This is done by barring access to these sites directly at the source of the country's Internet connectivity (Harwit and Clark, 2001). Their strategy also includes the active censorship and persecution of Chinese citizens who use the Internet to express counter-governmental views and opinions. Service providers are in this country forced to self-censor their content and monitor the behaviour of their users. Failure to do so has lead to the revoking of licences and heavy penalties, even imprisonment (ibid). The recent cases of activists and journalists Shi Tao, Li Zhi, and Jiang Lijun demonstrate the power that the Chinese government is able to exert over content providers. In these cases, it was Yahoo!, an international corporation conducting business in China, who was obliged to divulge the identity of the users who had been actively posting "subversive" information online. The company therefore assisted the authorities in supplying information vital to the imprisonment of these individuals for matters that are considered freedom of expression in the company's own country of origin (RSF, 2006). This has lead to a highly public debate on the corporate social responsibility of American companies abroad yet the problem in China remains.

10 Changing the Context of Migration around the World

There is very little evidence that ICTs promote migration on a large scale or that they influence people's decision to migrate but there are many case studies that show how ICTs can be used to influence people's opinion and experience of migration. A phone call from a relative who has successfully reached Europe or a media report showing the good life abroad often fuel the desire to migrate (Schapendonk and Moppes, 2007). With every new communication technology invented, what we are seeing is an increase in the range of options migrants have to communicate with their families and friends abroad and an increase in the frequency of those interactions. This has been demonstrated to help migrants deal with shocks by making it easier to

request assistance from relatives and friends that are abroad. This author feels strongly that ICTs are in a sense becoming technological social safety nets and resources that can be tapped in times of need. This may be especially true for migrants as services offered through ICTs, such as mobile money transfers, become ever more common across the world.

ICTs are impacting the lives and even the culture of migrants in significant ways and that they are facilitating large quantities of communication between friends and relatives divided by geographical distances (Ros et al, 2006). ICTs can be personal or communal and are used to maintain contacts with friends and family members abroad. Some research also shows that ICTs are bringing down the costs associated with migration. The field of IT itself may be a gateway for migration for many high-skilled workers, but ICTs are not enabling the creation of cultures, identities, or families where none existed (Wilding, 2006). ICTs are assisting migrants to maintain their cultural identities, albeit in changing forms. ICTs create a sense of connection and serve as connection. Therefore, seeing the movement of people as a force of Westernization does not do justice to the cross-cultural impacts and hybridization effects that contact and channels of communication have on cultures around the world.

The study of diaspora and ICTs does show "new forms of integration or social exclusion between migrants and their relation to social and political networks in their home country" (Benítez, 2006: 185). Through digital media, groups of people, both diaspora and minorities, can in fact take control of the images and information that represents them (Ros et al, 2006). ICTs have also enabled the emergence of long distance 'real-time decision-making' and are changing social relations of power through shifting social roles as determined by access to technology and information (Mansour Tall, 2004). As the example of Eritrea demonstrates, this is a viable alternative in the context of citizens living abroad and may become an important component of e-governance. ICTs in this example are an important tool for the national community, making the Internet the "quintessential diasporic medium, ideally suited to allowing migrants in diverse locations to connect, share information and analyses, and coordinate their activities" (Bernal, 2006: 175). But, as the online community continues to grow and is increasingly important to migrants, the digital divide becomes ever more prominent for those who are not part of these networks since technologies such as the Internet may be their only channel of communication in

which to share their experiences as migrants with a network or community that will understand and support them (Mitra, 2001).

An important consideration for governments is therefore the need to support and enable these exchanges while creating "an environment conducive to economic development, with political stability and sound economic policies", so that the diaspora will value investing at home as is the case in India and Korea (UNDP, 2001:93), and as we have seen in China. Research demonstrates the benefits that can be stimulated when governments nurture communication with the diaspora and facilitate their return and capabilities for investment at home. A significant component of this aspect is the maintenance or establishment of trust between governments and their citizens living abroad (Saxenian, 2006). As the wealth of literature concerning the digital divide attests, ICTs have a positive impact on development in those settings that meet the basic requirements of: "clean and consistent power, a robust, accessible and affordable connectivity network, technical literacy, skilled users and support systems, functional markets, and supportive regulatory and policy framework" (Kramer et al, 2007: 8). Governments can also support the use of ICTs by targeting disadvantaged groups and creating points of access coupled to literacy and ICT training. Authorities in Hong Kong were very successful in collaborating with NGOs and establishing a wide range of initiatives and projects that addressed the digital divide in their territory to significantly increase ICT use (Fung, 2006). The government of California in the United States also pursued this strategy and established a network of immigrant run community technology centres which are structured to answer the needs and concerns of individual migrant communities. By combining computer and Internet skills to cultural and community services, these centres are allowing immigrants to learn in a safe and practical environment that takes into account their linguistic skills and particular cultural needs (Fairlie et al, 2006).

Therefore, the future of ICTs and their impact on migrants may not be the development of increasingly sophisticated and new technologies. It may simply be the continued penetration of existing technologies into communities around the world in ever more remote and distant regions, so far unreached by the relay towers and satellites that make digital communication possible (Panagakos and Horst, 2006). This conclusion is supported by the fact that the ten telecommunications markets to have shown the highest rate of growth between 2000 and 2005

are exclusively in developing countries⁹ (TeleGeography, 2006). This of course requires a multi-stakeholder approach that involves not only the government and civil society but also the private sector, which is the main investor in ICTs around the world (Castells, 2000). In 2004, 50% of the world's countries were still bound by monopolies on Internet connectivity. This figure represents both state run and private enterprises. This tends to translate into higher than necessary costs of ICT use, especially in developing countries where markets are smaller and more expensive to service (ITU, 2006). The opening-up of telecommunications markets to competition will continue to have positive impacts on the costs of access and use of ICTs (Sierra, 2005). Research from the Pacific, Africa, and Latin America all demonstrate that competition in the telecommunications industry is vital to reducing costs and increasing the spread of Internet and mobile communications (Commonwealth of Australia, 2008, GTB, 2007, TMG, 2008, and Wallsten, 2001). Government policies that regulate and promote investment in the telecommunications sector consequently translate in most contexts as facilitators of growth in ICT diffusion and more specifically Internet use (Guillén and Suárez, 2005).

Looking at migration data coupled to telecommunications flows, conclusions presented in this paper are further reinforced. Research for the World Bank calculates that amongst the ten most significant migration corridors around the world we find those of Turkey-Germany and India-United Arab Emirates (Ratha, 2008). What is interesting to note, and may not be completely due to migration but is nevertheless revealing, is the fact that Turkey's largest flow of telecommunications data (measured in the quantity of telephone calls in minutes) is to Germany and both India's and the United Arab Emirates largest data flows are between each other (TeleGeography, 2006). When we look at the spread of mobile communications, it took the world 15 years to reach 25% of the global population, of which the vast majority were in developed countries. It took another 4 years to reach 50% and it is believed that the vast majority of the next 25% will be found in developing countries between now and 2011. 60%, or roughly 600 million of the new users, will be in rural areas (West, 2008). As it is increasingly advocated in business schools and the private sector, the base of the pyramid is the future of technological market growth (Kramer et al, 2007). This is a fundamental area where governments can assist ICT users in developing countries, and therefore also benefit migrants and their families.

⁹ These countries are: Bolivia, Ecuador, El Salvador, India, Kuwait, Nigeria, Pakistan, Senegal, United Arab Emirates, and Venezuela (TeleGeography, 2006).

Investment coupled with the right policies on ICT infrastructure and service delivery will not only be beneficial to the future of ICT use and its role in development, it is the key to its success and an important element of migration.

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