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Beyond access to ICTs: Measuring capabilities in the information society

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ABSTRACT

This article discusses some development paradigms linked to the idea of an information society and explains how information and communication technologies (ICTs) are seen as a means to development. The article also looks at the concept of a 'digital divide' and the universal access to ICT policies that are meant to address the problem. It elaborates on the limitations of how current policies address issues related to how people gain access to and use ICTs. Finally, the article proposes a model for applying Sen's capability approach to analyze access to ICTs impact on development.

Keywords: *Sen's capability approach; information society; universal service; universal access;*

INTRODUCTION

The world is said to have entered the age when information is central to technology, economy, work, space, and culture. Thus, with the advent of the information age, people argue that an information society is at hand (Webster 2002). One concern regarding this development is how to make it more inclusive.

In the World Summit on the Information Society, representatives of governments and civil society organizations coming from 175 countries declared their:

> *"… common desire and commitment to build a people-centred, inclusive and development-oriented Information Society, where everyone can create, access, utilize, and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life" (WSIS 2003, p.1).*

It is understandable, therefore, that governments want to make sure that they are not left out of the opportunities associated with the information society (Lallana 2004). However, before governments proceed to developing plans and strategies for the information society, it is important to investigate the underlying development theories behind it.

This article sets out to discuss: first, some development paradigms linked to the idea of an information society; second, the concept of information and communication technologies as a means to development; third, the concept of a 'digital divide' that focuses on the lack of access to information and communication technologies (ICTs) among segments of society; fourth, policies on bridging this divide through universal access to ICTs; and finally, the limitations of how these policies address issues related to how people gain access to and use ICTs.

The second part of the article then discusses how Sen's capability approach, which addresses some of the limitations of these other paradigms, can be used to analyze universal access to ICTs and its impact on development.

Modernization, globalization, and the information society

The idea of the 'information society' can be linked to the ideas of modernization and globalization. The ideology of modernization explains how societal development must go through a series of stages, with each phase having a different technological base of production. In an information society that base would be information technology. Furthermore, in the process of increased globalization, economies of the world have become more integrated whereby information technology plays a major role in it (Odedra-Straub & Straub 1995).

As such, in both perspectives, information technologies play a part in development: with modernization, it can be seen as a potential means to close the gap among nations (Goldstein & O'Connor 2000); with globalization, it is viewed as an important component for nations to participate in the economic process (Odedra-Straub & Straub 1995, UNDP 2001).

However, these development perspectives have been questioned. The dependency paradigm, in particular, holds the view that development in one country implies underdevelopment in another, and that this is implicit in the nature of capitalism (Nulens 2000). This has also led others to question the type of 'development' governments aspire for, especially since modernization is a Western concept. Other nations then have to clarify their position with respect to these development perspectives (Volkow 1995). This also extends to the need to clarify the role of ICTs in development, since ICT-use are also value-laden, cultural and contextual (Nulens 2000, Soeftestad & Sein 2003, Pertierra 2006).

ICTs and development

Just as there are disagreements on what 'development' is and how to achieve it, there are also disagreements on whether ICTs are crucial to development.

There are those who do not see access to and use of ICTs as a luxury, but instead see them as determinants of the sustainable development of individuals, communities and nations, hence, a necessity (McNamara 2000). ICTs are viewed as crucial in the development agenda because they can be used in public administration, business, education, health, and environment, among others (WSIS 2003).

Specifically, it has been argued that ICTs assist in poverty alleviation (Duncombe 2001), and expand opportunities for economic development (Prosser 1997, World Bank 1998). Access to information provides people with the opportunity "to undertake production, engage in labour markets, and participate in reciprocal exchanges" with other people (Ellis 2000, p.31). The growing share of ICTs in world economic output is also cited as evidence of their importance (ITU 2003). The most optimistic even see ICTs as providing developing countries with an opportunity to 'leapfrog' stages of development and be at par with the level of development in the West (Nulens 2000). One evidence is a recent study that found a relationship between access to mobile phones and economic growth, with its impact more significant in developing than developed countries (Waverman, Mesch & Foss as cited in The Economist 2005b).

On the other hand, an opposing view about ICTs warns that they "will only increase existing unequalities (sic) and power relations" (Nulens 2000, p.64). Evidence of this is seen from cases showing that areas that have long benefited from excellent physical access, and have been dominant politically and economically are the ones benefiting from greater access to information technologies (Niles & Hanson 2003). The idea that development results from linking poor nations to ICTs, the Internet in particular, is considered a myth (The Economist 2005a). There are questions regarding the real effects of ICTs on national development considering the limited

evidence regarding its correlation (Heeks 1999). For instance, while ICTs have been instrumental in the development of India's information technology industry, this has not helped reduce the inequality between the rich and the poor in India's society (UNDP 2001, Warschauer 2004). Finally, for many countries, the utopian ideals of an information society that require investment in ICTs are supplanted by more pressing basic needs (Mahan & Misnikov 2004).

The view from the middle-ground considers that ICTs can play a role in a country's development if applied appropriately (Soeftestad & Sein 2003). There is anecdotal evidence that show access to the telephone, for instance, can have a dramatic effect on the quality of life of the rural poor. Historically, however, telecommunications roll-out has generally increased inequality, benefited mostly the wealthy, and had little impact on quality of life (Forestier et.al. 2002).

Whether ICTs are useful for development, therefore, is dependent on overcoming the same socio-economic barriers that contribute to underdevelopment (Kirkman 1999). Strategies for using ICTs should therefore consider their fit in the global and local context (Volkow 1995). It also implies the need for innovative public policies to make sure that technologies are not only tools for progress, but are also socially inclusive (UNDP 2001, Labelle 2005).

More field research is needed to help determine the validity of optimistic, pessimistic, or middle ground arguments. Although more and more cases are being presented, empirical evidence on the impact of interventions in this field is very limited especially in developing countries (Bedi 1999; O'Farrell, Norrish & Scott 1999). Further research is needed to determine who uses ICTs and how its benefits are distributed (Bedi 1999).

The digital divide

Of the many issues related to the impact and role of ICTs in development, the "digital divide" has gained much attention. The digital divide refers to "situations in which there is a marked gap in access to or use of ICT devices" (Campbell 2001, p.1). There is the view that the idea of a digital divide is passé or irrelevant because those who need ICTs in the more developed countries already have them, and those who do not have access do not really need them (Warschauer 2004). There are anecdotal evidences however, that access to ICTs can make a difference to people who have been deprived of it (Goldstein & O'Connor 2000, Chiung 2003). Furthermore, there is clear evidence that such a divide exists between and within countries (Campbell 2001, UNDP 2001).

Mirroring the viewpoints described in the previous section, there is optimism that this divide will be breached due to the combined effect of increase in the computing power of ICTs, the reduction in cost of transmitting information, and the convergence of different information and communication technologies (World Bank 1999). According to the International Telecommunications Union (ITU) (2003), the gap, at least as far as infrastructure is concerned, has been erased by the tremendous growth in communication network construction in the 1990s.

Yet it has also been argued that while access to ICTs has increased in all parts of the world, the pace of diffusion in the developed countries has occurred at a faster rate than in the developing world, thus increasing the divide between them (Rodriguez & Wilson 2000, Campbell 2001). In addition, the contribution of new technologies does not necessarily address the divide that exists within societies, such as the differences in the level of access between men and women (Keller 1977, Martin 1991, Richardson, Ramirez & Haq 2000), rich and poor (World Bank 1998; Gomez & Hunt 1999, Richardson 2000, O'Farrell 2001), urban and rural areas (Campbell 2001), and people with different levels of education (O'Farrell 2001, Madhusudan 2002).

In the end, the issue of whether the divide is increasing or not less important than the question of how to bridge the divide.

BRIDGING THE DIVIDE: UNIVERSAL SERVICE/ACCESS POLICIES

Providing access to basic services should be universal. In the same spirit, policies that deal with bridging the ICT divide are more commonly referred to as universal service/ universal access policies.

Universal service and universal access defined

The definitions of both universal service and universal access are based on three pillars: affordability, accessibility and quality of service (DOTC 2000, Verhoest & Cammaerts 2001).

Universal service to telecommunications is defined by OFTEL as "making affordable a defined minimum service of specified quality to all users at an affordable price" (Prosser 2000, p. 80). The European Commission, on the other hand, says that it is "a defined set of services of specified quality which is available to all users independently of their geographic location and, in the light of specific national conditions, at an affordable price" (Verhoest & Cammaerts 2001, pp. 4-5).

The focus of universal service policies focus is to promote "'universal' availability of connections by individual households to public telecommunications networks" (Intven, et al. 2000, p.1). This means measuring universal service based on the availability of ICTs in homes (i.e., the percentage of households with a telephone) (ITU 2003).

Universal access, on the other hand, refers to "a situation where every person has a reasonable means of access to a publicly available telephone…(which) may be provided through pay telephones, community telephone centres, teleboutiques, community Internet access terminals and similar means" (Intven, et al. 2001b, p.1). It is measured in terms of people (i.e., telephone lines per 100 inhabitants, percentage of people with cell phones, etc.) (ITU 2003). However, developing countries have varied definitions of access. Some define it in terms of distance, while others, with respect to time. For instance, in Burkina Faso, access is defined as a pay phone within 20 kilometres of most people. In Bangladesh, it is to have telephone access within a 10-minute walk for every villager (PANOS 2004).

In essence, both universal service and universal access are based on availability and affordability of basic telecommunication services. Their primary difference is that universal service is focused on the availability of services in all homes, whereas universal access aims to have basic telecommunication services available in all communities. This explains why developed countries tend to aspire for universal service, whereas, developing countries aim for the more modest goal of universal access considering the limitations of its market and resources (DOTC 2000, PANOS 2004).

History of universal service/access

Universal service policies can be traced from different origins in the developed world. The idea of universal service was predicated on the concept "that everyone was entitled to basic telephony at an affordable price" (Canavan 1997, p.45). In the United States, it traces its roots from the monopoly of AT&T and the ideal articulated in 1907 by Theodore Vail, the Bell System's founding father, of 'one system, one policy, universal service' (Jayakar & Sawhney 2003). It obligated the monopoly operator to provide universal service through a system of cross-subsidies to make local

telephony more 'affordable'. In simple terms, it meant that revenue from urban areas would subsidize the cost of wiring rural areas, and local calls would be subsidized by higher rates from international calls.

It turns out, however, that this was a mistaken interpretation of what the ideal meant (Garnham 1997b). What Vail really meant was "connectivity among networks rather than service for everyone" (Mueller 1993 as cited in Jayakar & Sawhney 2003). As such, AT&T was never compelled to provide geographical universality of access, and the cross-subsidies for local calls were only used as an instrument to perpetuate its monopoly by keeping its price artificially low as a barrier to entry for potential competitors (Garnham 1997b). Hence, it did not matter to AT&T where its revenues came from for as long as these were kept high (Canavan 1997).

On the other hand, in countries in 19th century Europe where economic liberalism prevailed, private entrepreneurs originally ran telegraph operations. A monopoly was eventually established due to an observed market failure. But since a private monopoly was considered intolerable, this was nationalized and operated by government (Verhoest & Cammaerts 2001).

At that time telecommunication operations were guided more by principles of public service which implied that "the State took responsibility for providing universal geographical coverage within its borders and for providing guarantee of continuity, rather than universality of supply" (Garnham 1997b, p.199-200). Nevertheless, the spread of the service was limited by the cost of the network and the improvement of the general economic conditions, and the reduction in tariffs was primarily a result of increased income per capita rather than as a deliberate result of social policy (Verhoest & Cammaerts 2001). Eventually, the concept of universal service later germinated with trends towards more liberalization.

Today, the concept of universal service is closely tied to the concepts of modernization and an 'information society'. It is based on the "premise that telecommunications services…play a fundamental role in commercial and social life that everyone should have access to a basic level of telecommunications facilities and service if they are to participate fully in modern society" (Xavier 1997, p.829).

There is no literature, however, on the history of universal access in the developing world, except for the distinction goals are more modest that in developing countries because they have less resources (PANOS 2004). In this sense, the only difference between universal access and service is that the former is a goal that may fall short of the latter depending on a country's context.

Universal access and universal service policies were also originally created to support local phone services for poor, rural, and high-cost customers (Levine 1997). However, there is a debate as to whether 'plain-old telephone service' (POTS)-based definitions of universality are still relevant, considering how ICTs today deliver other services aside from voice (Xavier 1997). This has lead to increasing pressure on policymakers to redefine the services that people are able to access through the telecommunications infrastructure, and how these will be financed (Canavan 1997, Verhoest & Cammaerts 2001, Jayakar & Sawhney 2003, PANOS 2004). It has likewise been suggested that universal access policies include the content or types of services that telecom providers should deliver to individual residents, such as education, health care and other information services (Hudson 1997).

As such, the idea of universal service or universal access to ICTs has been subject to new and varied interpretations and renewed debate. In the beginning, the main intention was to provide universal telephone service, today concerns have moved towards access to the Internet (Canavan 1997). This implies a moving target (Hudson 1997). In addition, because of different

levels of development, countries, in turn, have different notions of what ICT services are basic and what are only value-added (Greene 2003). Thus, at issue is whether access to newer ICTs is necessary, and if so, when government intervention for its universal provision is justified (Levine 1997, Garnham 1997b).

Another important change in how universal service/access is approached today is with respect to the market's structure. In the early history of the telephone, whether in the US or Europe, the provision was monopolized by either a private corporation or by a state-run entity (Garnham 1997b). Now, with a more liberalized market economy, competition has been introduced in the delivery of services in many countries, and often only by the private sector. Private sector participation is deemed crucial in developing countries because governments lack the resources needed to finance the infrastructure (Odedra-Straub & Straub 1995).

However, even though the private sector is viewed as an engine for creating the needed ICT infrastructure, there are also those who take the view that "it is not powerful enough to create and diffuse the technologies needed to eradicate poverty" (UNDP 2001, p.3). As such, fulfilling universal service obligations is still considered as a crucial state regulatory intervention "to achieve…socially desirable outcomes" not possible if the industry was left to the market alone (Garnham 1997b, p.200).

The concept of universal service/access today is a "product of contested and contented evolution, rather than an immaculate vision" (Jayakar & Sawhney 2003, p.2). How it is currently defined is a product of both its history and context. In the end, developing new approaches and policies for achieving universal service/access is important, given the development of new technologies, their convergence, and the changes in the market structure that have made past regulatory models and policies irrelevant (Greene 2003, Jayakar & Sawhney 2003).

BEYOND ACCESS

In tracing the history of universal service/access policies, it was shown how the discussion has moved from the original idea of access to a telephone (Levine 1997), to other services aside from voice (Xavier 1997), and to content (Hudson 1997). In fact, in some countries, universal service policies are integrated with social service policies, and extend to the content that is delivered via the network, such as the library or health care. As such, access may be viewed at three levels: 1) the infrastructure; 2) the service (especially with the convergence, with information and communication taken as a whole); and 3) the content (Verhoest & Cammaerts 2001). As Kirkman explains, "when we speak about access, what we really mean is access to information, knowledge, and communications opportunities, not access to one specific service or technology. [ICTs] are just tools" (2000, p.11).

This idea that ICTs "are just tools" to reach an end (Heeks 1999) makes the issue of ICT access a good area for applying Sen's Capability Approach. According to Amartya Sen (1999), the freedoms of individuals are viewed as the basic building blocks to development, as well as "the expansion of 'capabilities' of persons to lead the kinds of lives they value ---- and have reason to value" (1999, p.18). Applying the idea here raises questions on the capabilities and functionings that ICTs allow. In other words, it forces policy stakeholders to revisit the whole premise of why universal access is deemed essential.

The Capability Approach makes the issue of the divide in access and use of ICTs for development more complex than just the absence of the needed infrastructure (ITU 2003). This is why some authors caution against the technologically deterministic view of ICTs and

development (Van Audenhove 2000). In advancing the use and access to ICTs, some emphasize the need to go beyond its supply (as in the case of universal service/access policies) and focus instead on people and how they use ICTs (Norrish 1998, Soeftestad & Sein 2003). In Sen's words: "it is…important not only to take note of the fact that in the scale of utilities the deprivation may look muffled and muted, but also to favour the creation of conditions in which people have real opportunities of judging the kinds of lives they would like to lead" (Sen 1999, p.63). Hence, some authors propose that the deployment of ICTs should always be accompanied by information about its benefits and opportunities for people to learn (Mahan & Misnikov 2004).

However, for policy-makers to address the constraints in people's access, and effectively target underserved segments of society would require more exhaustive analysis. Data is needed to identify not only disparities in access, but also understand who has access, and where and how people use or do not use ICTs (ITU 2003). Moreover, people's access to ICTs is not only of one type: they exist in gradations (Warschauer 2004). Unfortunately, these kinds of data are not ordinarily monitored by national government agencies. Meanwhile, the data collected by commercial providers tend to be sharply focused and quantified, in contrast to the consumers' interests that are often diffused and hard to quantify (Mitchell 1997). As such, no systematic analysis on this has been done, save for few country exceptions (ITU 2003).

This is another area that requires further research. Doing so can offer a practical and concrete application of the Capability Approach which has often been seen as difficult to operationalize (Comim 2001, Gasper 2002). This can help clarify the concept of universal service and universal access, given the changes in market structure and technology (Hudson 1997, Verhoest & Cammaerts 2001, Jayakar & Sawhney 2003). It can then help developing countries define universal access and identify goals that are more attuned to their realities and development priorities.

The capability approach and universal access to ICTs

To understand how the capability approach can be applied to universal access requires seeing the parallelism between Sen's ideas about human development, capabilities, entitlements and functionings with universal access' place in the concept of an information society.

In this regard, this section will first discuss how Sen's ideas regarding development and entitlements also apply to critical issues regarding the information society. It will then proceed to discuss how the capability approach can be applied to the access and use of ICTs by investigating the individual differences that affect people's capabilities and freedoms. Last, it discusses how access can be seen as both an ends and a means for other functionings.

CAPABILITIES AND HUMAN DEVELOPMENT

It was discussed earlier how the concept of development and the information society share common threads. These threads are revisited here with respect to how the concept of human development has evolved and how it applies to universal access and the information society.

The term development is very value-laden. It deals with a desired good with the degree by which it is achieved equated with the degree of development. In the past, a major part of this aspired development was based on material sufficiency and human dignity for all. Basic human needs, in turn, involved adequate access to clean water, food, and shelter (Lutz 1992). Rahman (1992) refers to it as a 'consumerist view' of development because it regards human beings as purely consumers of goods and services. Nonetheless, this perpective was about the needs of the poor to survive.

It is because of this perspective that development in the past was measured in terms of aggregate economic growth. The issue, with this, however was with regard to who benefits from development as consumers, and whether growth was more important than distribution. This lead to the question of how can 'entitlements,' or the command over goods and services, be ensured for all (Rahman 1992, p.174).

It is in this respect that Sen's capability approach is different, as it goes beyond the notion of entitlements by referring to 'capabilities.' Sen says that "the expansion of human capabilities….have both direct and indirect importance in the achievement of development. The indirect role works through the contribution of capability expansion in enhancing productivity, raising economic growth….The direct importance...lies in its intrinsic value and its constitutive role in human freedom, well-being and quality of life" (1997, p.21 as cited in Flores-Crespo 2001).
Clearly, how human development is defined today is very much influenced by Amartya Sen's views cited above. According to the UNDP (2001, p.9)

> *"human development is about much more than the rise or fall of national incomes. It is about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests.… Development is thus about expanding the choices people have to lead lives that they value. And it is thus about much more than economic growth, which is only a means —if a very important one —of enlarging people's choices."*

Sengupta elaborates on this by saying that "if improvement of people's well-being is the objective of development, then economic growth….would not be an ends in itself. It can be one of the ends, and it can also be a means to some other ends, when 'well-being' is equivalent to the realization of human rights" (2000, p.568).

The same argument could be made about universal access to ICTs. Access to ICTs, just like economic growth, can expand people's choices, be an end or a means to another end, and can be linked to other human rights. For instance, access can be seen as adding to people's capability to participate in the potential benefits that the information society brings (Mann 2003). In particular, it is also a prerequisite for people to participation in 'digital democracies' (Catinat & Vedel 2001), and is also needed to protect people's rights to communicate and access information and knowledge (Hamelink 2003).

In a similar manner, the way development and the information society have been traditionally measured have certain similarities: development, as mentioned previously, is usually measured in terms of gross national products (GNP) and gross domestic products (GDP); while on the other hand, access to information and communication technologies has been traditionally measured in terms of the growth in the infrastructure through teledensities, number of Internet service providers (ISPs), number of computers per capita, etc. However, in light of the previous discussion on the human development and the capability approach, traditional measures of development and the information society should also change and be more human-centred.

For instance, economic conceptions of development have begun to acknowledge a more people-centred approach. This came as a result of evidence that showed how economic growth did not necessarily lead to poverty reduction. It lead to the idea that development had to have a human face to it, which lead, in turn, to a new set of indicators, the human development index, that provided qualitative proxies to human well-being (Green 2002).

As with the human development index, it is increasingly becoming apparent that policies must coordinate the construction of both human and technological capabilities in order to benefit from

the potential applications of new ICTs. In measuring indicators for sustainable information societies, the United Nations Commission for Science and Technology for Development (UNCSTD) for instance, includes, experience, skills and knowledge as critical components in the development of information societies aside from infrastructure (Mansell & Wehn 1998). These capabilities are needed to function effectively in today's information society. It means that society also has to move beyond techno-economic measure and understanding of ICT and development (Van Audenhove 2000), and beyond access, and focus instead on people and how they use ICTs (Norrish 1998, Soeftestad & Sein 2003). This is why some authors believe that Sen's capability approach is useful for understanding people's use of ICTs for development (Mansell 2002).

DEVELOPMENT, ENTITLEMENTS AND UNIVERSAL ACCESS

According to Sen (2001, p.183) evidence suggests that successful development can be best achieved by involving "a wide dissemination of basic economic entitlements (through education and training, through land reform, through availability of credit) [and thereby broaden] access to the opportunities offered by the market economy." In this sense, Razavi says that the analysis of entitlements is useful because it directs attention to the "processes through which individuals gain access to commodities and resources (or fail to do so)" (Razavi 1999, p.424). For instance, access can depend on a person's socio-economic position and on the rules which render claims over commodities 'legitimate. ' This means that entitlements can encompass legal rules and include socially-enforced moral rules which constrain and enable command over commodities (Ibid.).

In a like manner, a national information infrastructure is described as "an invisible, seamless, dynamic web of transmission mechanisms, information appliances, content and people…" (Jain & Mutula 2001, p.234). As such, developing these various components are seen as crucial for countries and individuals to participate more effectively in the world's economy (Alampay, et. al. 2003, Jain & Mutula 2001). Viewed in this way, it implies that access to ICTs do not necessarily lead to development unless other entitlements are provided. It requires an integrated approach to making use of ICTs in development that not only looks at the ICT infrastructure, but also the capabilities of people and creating value in ICT applications (Alampay, et. al. 2003, Mann 2003). One can then see that to benefit from the information society, there are other entitlements that are crucial for ICTs to deliver on its potential. Aside from education, training, and credit (Sen 2001), access to electricity would also be important (Jain & Mutula 2001). As Heeks (2000) explains, for data or information that are made available through ICTs to really have an impact on people's lives, social, economic and action resources are required to help them access, assess and apply the information.

INDIVIDUAL DIFFERENCES THAT UNDERMINE FREEDOMS AND CAPABILITIES

While access to a basic good is a prerequisite to use, the capability approach says that individual differences, capabilities and choice play a role on whether people make use of these goods, how they apply them, and how they are valued. Unfortunately, traditional measurement of ICT access still does not monitor the variations in the amounts and functions of use of ICT resources by different people. Since Sen (1999) argues that people have different ways of transforming the same bundle of goods into opportunities for achieving their plans in life, it is important to understand the complex nature of what restricts effective demand for them by ordinary people (Cariño 2003).

Among the factors that are often cited as having an influence on ICT use are: gender; income; level of education and skills; age; and the available infrastructure in an area (World Bank 1998,

UNDP 2001, Madhusudan 2002). What follows is an elaboration of the literature on how these variables are related to ICT use.

Gender and ICT use

Given that social and cultural contexts affect ICT's development and use, ICTs are never gender neutral. For instance, there has been a history of discrimination against women with respect to the use of the telephone and the kinds of jobs that were derived from its introduction (Martin 1991). Similarly, gender factors in people's ICT needs. For example, the need for single mothers to have a telephone at home, especially for emergencies, has been recognized since they are often more disadvantaged and housed in poorer living conditions (Keller 1977). More recent development applications have also shown how ICTs can help women. For instance, Grameen Bank's long experience with working with women in its micro-credit programme, became a springboard to using women as village phone operators (Richardson, Ramirez, & Haq 2000). ICTs, like the telephone, fax, and computer have also helped women balance two occupations, as a homemaker and as an entrepreneur (Chiung 2003). Also as an employee, it allows them to check on their children while at work.

Nevertheless, it has been seen that men and women do not start out equally when it comes to establishing their rights to social citizenship largely because of the imbalance brought about by the larger responsibilities women have at home (Lister 2000). Hence, it is expected that because of this inequality, access to communication facilities may also be affected, with men having more opportunities than women.

Income and ICT use

Considering that the poor may be the ones with greatest need, they are often the ones with least access (Gomez & Hunt 1999, O'Farrell 2001). They also tend to have slower adoption of ICTs (World Bank 1998). For instance, positive correlation has been found with respect to income levels and mobile telephone adoption (Wareham, et.al. 2004): in the United States, while it has been reported that the ICT usage of low and middle income groups have increased the most, their overall usage remained significantly lower than higher income groups (Rice & Katz 2003); in the Philippines, students in private schools have owned cell phone for a longer time compared to their public school counterparts. Since cost is not as big an issue with private school students, who also tend to be richer, they were also more frequent users of the cost-incurring features of the technology (Estuar 2003). Hence, it is expected that fewer people with low incomes than higher incomes use and access ICTs. It is also expected that the functions that poorer individuals use are influenced by cost-related considerations (e.g. more frequent use of SMS instead of voice calls).

Education, profession and ICT use

With new ICTs, jobs may be lost or created, and this raises the issue of capabilities needed to take advantage of the opportunities ICTs create (Rubery & Grimshaw 2001). In this respect, it is expected that professionals and people with white collar jobs would have more use for ICTs. For instance, studies have found that telephones help the efficiency of doctors and contribute to their having additional work opportunities (Poole 1977), while low-skilled workers were more likely to lack physical and social access to information technologies (Niles & Hanson 2003).

As for education: studies in the west show that the occupation of the head of the household and their educational attainment were strong and positive predictors respectively of mobile phone adoption (Wareham, et.al. 2004). Similar findings have been seen in the Philippines where the

use of mobile phones and computers was reported to be higher for people with higher education (San Joaquin 2005). One reason why the better educated are more likely to benefit is because literacy is sometimes made a prerequisite to using the technology. For instance, the Grameen Village Phone in Bangladesh requires that operators should be literate or at least have children who can read and write (Richardson, Ramirez, & Haq 2000). As such, it is also expected that the better educated and more literate will be using ICTs more than the less educated and illiterate.

Age and ICT use

With respect to age, it is expected that younger people would be more motivated to use information and communication technologies, especially because use of these technologies, especially the computer, has only been recently introduced in the school curricula. For instance, in America, it was found that nonusers of internet tend to be older (Rice & Katz 2003), while in the Philippines, a national survey showed people aged between 18-39 were the principal users of ICTs, especially computers (San Joaquin 2005).

Age, however, may not be significant with the use of all ICTs. Some studies in America have shown that with respect to the use of the mobile phone, age did not appear to be a significant predictor, even though with respect to the Internet, a clear age threshold existed whereby inclusion falls after the age of 55 (Wareham, et.al. 2004). This means that internet and mobile phone users are not necessarily the same group of people, with the difference attributed to the fact that mobile phones and the internet do not necessarily fulfil similar needs or utilities (Rice & Katz 2003).

Location and ICT use

With respect to location it has been shown that information divides not only exist between countries but also within them with respect to urban and rural areas (Campbell 2001). These are further exacerbated by its slower adoption in rural communities (Gomez & Hunt 1999). According to Niles & Hanson (2003), a person's social and spatial situation provides them a context through which they gain the needed skills to learn to use a technology and interpret the information. Thus, it is expected that ICTs will be more accessible in urban areas and locations closer to the centre of development will see people having greater access and use for ICTs.

BEYOND ACCESS: FREEDOM TO ACHIEVE RELEVANT FUNCTIONINGS

Gasper (2002) says that Sen's concept of functionings, capabilities and freedoms have often been 'obscurely' or interchangeably used. This can also be gleaned from Sen's own words when he says that "the evaluative focus of this 'capability approach' can be either on the realized functionings (what a person is actually able to do) or on the capability set of alternatives that she has (her real opportunities). The two give different types of information --- the former about the things a person does and the latter about the things a person is substantively free to do" (1999, p.75). Both versions can be used separately or in combination. Moreover,

> *"the assessment of capabilities has to proceed primarily on the basis of observing a person's actual functionings, to be supplemented by other information. There is a jump here (from functioning to capabilities), but it need not be a big jump, if only because the valuation of actual functionings is one way of assessing how a person values the options he has" (Sen 1999, p.131).*

The capability approach therefore implies that evaluating access alone is not enough and that "in evaluating levels of entitlements we need to take into account both the range of communication options made available… and the ability of people to actually make use of these options to achieve the relevant functionings" (Garnham 1997a, p.32). This can be a function of their education, training, skills and exposure to ICTs.

This goes back to Sengupta's (2000) earlier argument that economic growth is not only an ends but can also be a means to some other ends. Likewise, functionings are not necessarily ends, but may also be considered as capabilities that create for people other opportunities (or possible functionings).

The same argument applies to universal access to ICTs. Access to ICTs, just like economic growth, can be an ends in itself or a means to another end. Mann (2003) argues, however, that it can not be a goal unto itself if the potential benefits of the information society are to be achieved. This means it is not enough to simply determine whether people have the capability to access and use telephones, cell phones and the Internet at home, in the office, or in public places. It also requires understanding the purpose and the reasons for why people use ICTs, and the ends they are able to achieve with them. In other words, it has to be determined how universal access policies have helped people recognize new functionings, provide them with capabilities to act, and given the choice, have freely acted on them to make it real in their lives (see Figure 1).

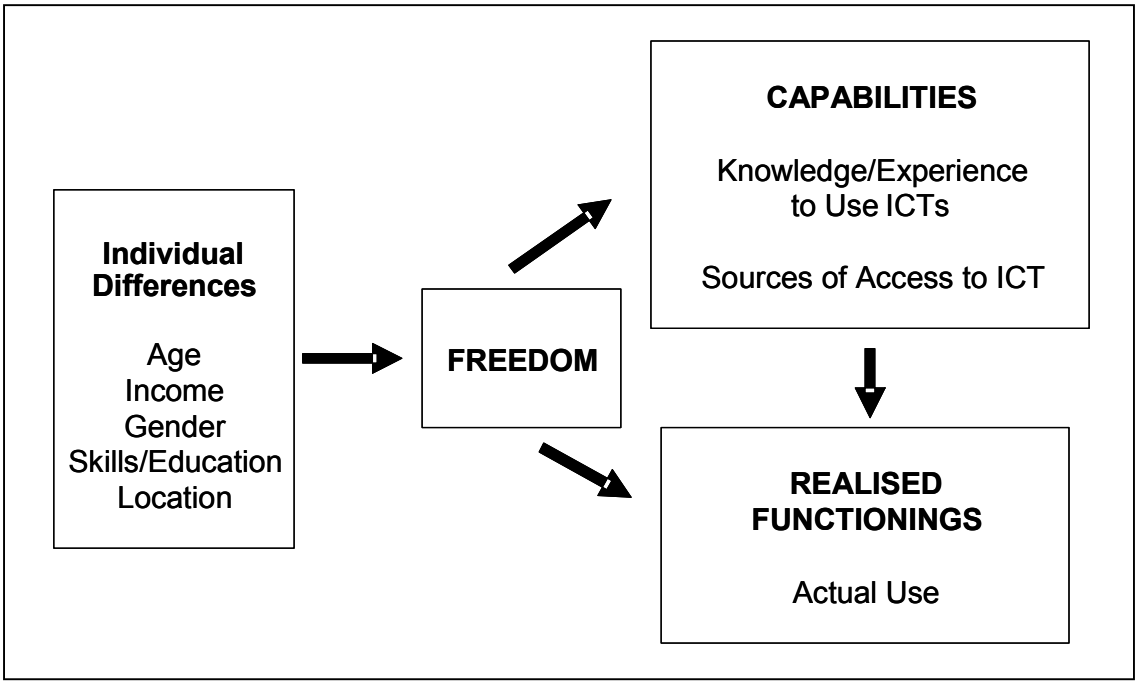

Figure 1: *The Capability Approach Applied to Access to ICTs*

Access to ICTs, for instance, can lead to other opportunities and services such as education, health, e-commerce and e-government. ICT diffusion can improve work productivity of an employee, organization or country, including positively affectiing its Human Development Index

(Jain & Matula 2001, Labelle 2005). It can expand and speed up the transmission and reception of information that households consider crucial in accessing markets and getting in touch with other people. Information that people consider important may be work-related, or it may be about family or personal, political, or economic (Mann 2003). Hence, the kind of information which individuals consider important needs to be examined, and whether they apply them in their day-to-day lives. This is connected to the concept of choice that Gasper (2003) stresses regarding the concept of people's freedoms. This means that even if an ICT is made available, people have the choice whether to use them or not, and how to use them. As such, Harris says that "the application of ICTs in the absence of a development strategy that makes their use effective will inevitably result in sub-optimal outcomes" (Harris 2004, as cited in Lallana 2004, p.ix).

This implies that access to ICTs do not guarantee development. What matters are people's actions once they are provided access. For instance, is access to the internet used to email, do business or to play games? Are ICTs being used for entertainment or for business? Again evidence regarding the successful integration of ICTs into productive endeavours has been mixed. Some countries (e.g. Brazil and Poland) show higher use of the internet for commercial use, while in others (e.g. China, Korea) it has not (Mann 2003). In addition, the ability of countries to derive benefits from ICT-use has also been found to be directly related to its level of economic development (Labelle 2005).

This is why it is important to know how people use ICT services and the barriers that prevent them from doing so in order to inform policy and adequately address the issue (Scott & McKerney 2002, ITU 2003). For instance, some research have found that differences in access and use of new media such as the Internet and mobile phones are related to socio-economic status and not because of personal preference (Rice & Katz 2003). Hence, while short-term policy goals may focus on increasing ICT availability and coverage, in the medium to long-term, there should also be policies geared towards addressing socio-economic barriers to access.

In addition, in evaluating the extent and impact of universal access to ICTs, both realized functioning and actual opportunities must be investigated. The Internet, for instance, is often described in many forums as "offering new opportunities for enabling improved access to skills acquisition and knowledge" (Mansell 2002, p. 412). Whether actual skills and knowledge is acquired given expanded access to ICTs is a different question altogether. Knowledge to use an ICT does not necessarily mean they are actually using the technology. Geographical access to the technology, also does not translate to use. Likewise, how ICTs are used may also be influenced by the policy environment it is situated in. For instance, ICTs can be used to create a surveillance society as much as it could promote active participation (Catinat & Vedel 2001). In some countries, policies towards international financial transactions affect the use of the internet for commercial purposes (Mann 2003).

In this sense, actual opportunities may or may not translate to realized functionings. It is both realized and unrealized functionings, which actually translates to demand for ICT services, and this may influence the provision by private corporations of these services to unserved and underserved communities.

To summarize, Figure 1 illustrates how Sen's capability approach can be applied to access to ICTs based on the literature on the use of ICTs for development. To elaborate on the figure, the situation people find themselves in (i.e. age, wealth, gender, education, location) affect their freedom. Their freedom, in turn, is a factor in their capability to make use of ICTs. Hence some people from the outset could not afford to use a telephone even when it is provided, or some people cannot get to a telephone because of where they are. Also, even when people are capable of using ICTs, they have the freedom to choose whether to apply it in their lives or not.

These are sometimes a function of their own perceptions of its value and utility in their home-life and work.

Only when people are truly free, capable and choose to apply ICTs in their lives will the use of ICTs be realized.

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