

IBM Research Report

At-a-Glance: The Demographic Imperative of Accessibility

Anne-Rivers Forcke

IBM Human Ability and Accessibility Center
9201 Arboretum Parkway
Richmond, VA 23236-5402



Research Division

Almaden - Austin - Beijing - Haifa - India - T. J. Watson - Tokyo - Zurich

At a Glance: The Demographic Imperative of Accessibility

By Anne-Rivers Forcke

IBM Human Ability and Accessibility Center

Over the course of the last thirty years, the rate at which information and communication technologies (ICTs) have “diffused” or permeated our daily lives and the rate at which we have adopted these technologies have both grown steadily. Considering the continued growth of the global population, as well as the ever-increasing use of information and communication technologies within emerging economies, the trends seem to point toward an ongoing global demand for ICT products and services. However, it is when we consider the growth in the global population and the growth in the global number of ICT users within the context of Article 9 of the Convention on the Rights of Persons with Disabilities and the recently-published *Measuring Disability Prevalence* (World Bank, March 2007), that these dramatically increasing rates of diffusion and adoption of technology help to crystallize the social, technical and commercial imperatives for the development of accessible ICT.

During the years 2001 – 2005, dramatic growth occurred in the number of information and communication technology (ICT) users worldwide. Globally, during this time, the population of fixed line and mobile phone subscribers nearly doubled, as illustrated in *Table 1*:

Telecommunications Users¹ - Population of fixed line and mobile phone subscribers (per 1,000 people in the population)	2001	2003	2005	Change 2001- 2005
Global	326	406	552	69%
Low income countries	31	49	113	265%
Middle income countries	260	387	587	126%
High income countries	1171	1260	1337	14%

Table 1

¹ World Bank Group, World Development Indicators, 2007

The global rate at which Internet users grew was similar to the global growth in fixed and mobile phone subscribers. However, there was a dramatic growth in Internet users in low income countries, as highlighted in *Table 2*:

Internet Users² - Population of Internet Users (per 1,000 people in the population)	2001	2003	2005	Change 2001-2005
Global	80	115	136	70%
Low income countries	5	16	44	780%
Middle income countries	35	73	114	226%
High income countries	378	460	523	38%

Table 2

Clearly, during these years, information and communication technologies not only diffused throughout countries of all income levels, but they were also embraced and adopted by end-users.

The Global Population and Disabilities

The “medical model of disability” – the model most widely understood and interpreted today – considers disability “a physical, mental, or psychological condition that limits a person’s activities,” linked to various medical conditions and viewed as a problem residing solely in the affected individual. Considering this model of disability, along with statistics reported in both developed and developing countries, the World Bank estimates the number of persons with disabilities (PWDs) to be between 10-12% of the global population.³

Using the World Bank’s estimates and based on a global population calculated at just over 6.7 billion people (as of September 2007), *Table 3* shows the estimated current global PWD population at just under a billion people (680-816 million people) today, with the population expected to exceed one billion (900 million – 1.1billion) as we approach the midpoint of the 21st century.⁴

² *ibid.*

³ Mont, D., *Measuring Disability Prevalence*, World Bank, March 2007

⁴ United Nations, Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2006 Revision*, September 2007

Year	2007	2010	2020	2030	2040	2050
Population⁵ (in billions)	6.7	6.8	7.6	8.3	8.9	9.4
Estimates of global PWD population (imputed as 10- 12%, in millions)	670-804	680-816	760- 912	830-984	890-1,068	940-1,128

Table 3

While our estimate of the world’s population of disabled persons seems a relatively constant percentage (10-12%), the increase in the rate of growth of the over-65 population is expected to more than double over the next 40 years, climbing from 7 to 16% or more than 1.5 billion people globally, as shown in *Table 4*:

Year	2007	2010	2020	2025	2030	2040	2050
Population⁶ (in billions)	6.7	6.8	7.6		8.3	8.9	9.4
Forecast of global population over age 65⁷ (in millions)	469			760- 830			1,504

Table 4

This aging population is significant in both its number and its implications for ICT development. As a person ages, the probability of losing some amount of functionality – whether it’s hearing, vision, mobility, dexterity, or cognitive – increases significantly, creating an immediate “second tier” of demand for accessible ICT in the form of persons over 65 with diminished sensory, motor, or cognitive capabilities.

⁵ US Census Bureau

⁶ *Ibid.*

⁷ Haub, C., *2007 World Population Data Sheet*, and United Nations Population Division

Looking, then, through the lens of the medical model of disability, and considering almost exclusively the global populations of PWDs, plus those people aged 65 years and older and likely to have or develop a medical disability, there is today an estimated market force of *more than* one billion people worldwide who require that the information and communication technology – upon which they are increasingly dependent – be accessible.

A New Approach

While the medical model is the construct for disabilities that we are historically most accustomed to using, over time the international community has largely come to recognize that the medical model is not an effective or empowering conceptual framework for promoting the full inclusion of persons with disabilities in society.⁸ As the paradigm of disabilities has shifted, it has moved away from the medical model and moved toward the social model.

Unlike the medical model of disability, the social model of disability views disability as “arising from the interaction of a person’s functional status with the⁹ physical, cultural, and policy environments.” According to the social model, disability is the outcome of the interaction of a person with his or her environment and thus is neither person- nor environment-specific.¹⁰ Within the social model, then, a disability results when a person attempts to communicate, yet does not understand or speak the national or local language. Similarly, a disability results when someone who has never before operated a phone or computer attempts to use one, with no success. In both cases, a disability has occurred, because the person was not able to interact with his or her environment.

Compared to the medical model of disability, the social model of disability inevitably encompasses more of the global population in more situations and under more

⁸ Guernsey, K. et al, *Making Inclusion Operational: Legal and Institutional Resources for World Bank Staff on the Inclusion of Disability Issues in Investment Projects*, World Bank, October 2006

⁹ The general approach for defining such prevalence follows closely the UN Washington Group on Disability Statistics. The group’s website can be found at <http://www.cdc.gov/nchs/citygroup.htm>

¹⁰ Mont, D., *Measuring Disability Prevalence*, World Bank, March 2007

circumstances. As the global population grows and ages, and as it migrates and encounters new technologies, there are evermore opportunities for societal disabilities to result and an ever-greater imperative for accessible information and communication technologies that *enable* – not impede – the interactions between people and their environments.