The New Digital Divergence

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Abstract-- **The late 20ᵗʰ Century saw the commercialization of the Internet as the great transformative technology affecting society and the economy, mostly in the developed world. The 21ˢᵗ Century is witnessing a new transformation brought on by the near ubiquitous availability of the mobile phone. The authors point out two new trends. First is the divergent growth of mobile telephony and the internet, especially in the developing world. Second is the rise of "shared use computing". Citing these and other trends, the authors raise questions about how the poor-people's technology of the mobile phone can play a central role in information and communications technologies for development.**

Index Terms— **Digital divide, Digital divergence, Mobiles, Internet**

I. THE DIGITAL DIVIDE IS DEAD?

After more than a decade of major international measures on reducing the "digital divide[1]" the discourse on the matter has gone surprisingly quiet. Perhaps it is the economic downturn which has led the post-industrial "north" to become more self-absorbed. It may just as easily be that the decade-long preoccupation with the "digital divide" has run its course like so many other issues and trends whose celebrity is short-lived.

While the metaphor of the "digital divide" may have had its roots in United States political culture, it became internationalized and widely understood, albeit differentially, through international forums. First it was the Group of 8 (G8) meetings in 2000 held in Japan. The Okinawa Charter was signed there by participating countries identifying that overcoming this relatively new development challenge was a high priority.

The Okinawa Charter was 'bullish' in its intentions, as follows:

> *Above all, this Charter represents a call to all, in both the public and private sectors to bridge the international information and knowledge divide. A solid framework of IT-related policies and action can change the way in which we interact, while promoting social and economic opportunities worldwide. An effective partnership among stakeholders, including through joint policy co-operation,*

is also key to the sound development of a truly global information society [1].

The Okinawa Charter led the G8[2] nations to adopt a special response with the establishment of the Digital Opportunities Task Force (DotForce). The DotForce held a series of forums for the next two years with updates in the subsequent G8 meetings in Italy (2001) and Canada (2002). No special accounting was done on the impacts of the DotForce but some estimated that the G8 countries (principally the US, Canada, the UK and France) invested $125 million in new specifically "digital divide" programs, most of them targeted to Africa [2].

While the G8 commitment to the "digital divide' may have been episodic, it spawned a much more elaborate and inclusive focus on the very same issues, with much broader participation in the developing world. At its every-6-year plenipotentiary meetings, held in 1998 in Minneapolis, Minnesota, the International Telecommunications Union called for the convening of a World Summit on the Information Society (WSIS). It was the heyday of the DotCom boom. Surely the digital bounty that could be seen all around the developed world needed to be shared with other, slower adopting, members of the international community.

Two World Summits on the Information Society in Geneva (2003) and Tunisia (2005) would follow. Just as the bloom was coming off the digital rose in the developed world with the DotCom bust of the early 21ˢᵗ century, the developing world was being encouraged to embrace and participate in the social and economic benefits of the digital age. Among the hard-fought text of the resolutions negotiated in Tunis over late-night meetings by diplomats involved in this quasi-United Nations process from all over the world was the following:

> **W***e recognize that access to information and sharing and creation of knowledge contributes significantly to strengthening economic, social and cultural development, thus helping all countries to reach the internationally agreed development goals and objectives, including the Millennium Development Goals. This process can be*

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[1] From Wikipedia: "*The term 'Digital Divide' initially referred to gaps in ownership of computers between groups, during which time the increase of ownership was limited to certain ethnic groups. The term came into regular usage in the mid-1990s, though the term had previously appeared in several news articles and political speeches as early as 1995. The President of the United States Bill Clinton and his Vice President Al Gore used the term in a 1996 speech in Knoxville, Tennessee. Larry Irving, a former United States head of the National Telecommunications Infrastructure Administration (NTIA) at the Department of Commerce, Assistant Secretary of Commerce and technology adviser to the Clinton Administration, noted that a series of NTIA surveys were "catalysts for the popularity, ubiquity, and redefinition" of the term, and he used the term in a series of later reports.*"

[2] We refer to the G8 as this was the point at which the membership for this group was expanding from 7 to 8 to include the scaled down, post USSR and more market-driven Russia.

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*enhanced by removing barriers to universal, ubiquitous, equitable and affordable access to information. **We underline** the importance of removing barriers to bridging the digital divide, particularly those that hinder the full achievement of the economic, social and cultural development of countries and the welfare of their people, in particular, in developing countries[3]* [3].

It seems clear that the focus upon the "digital divide" by the post-industrial and developing worlds, over less than a decade, helped to elevate the priority which governments placed on digital issues especially in the developing world[4]. It is equally clear that, despite all the announcements and nostrums for action, the impact on spending for related digital divide development priorities by developed countries in Overseas Development Assistance, in fact declined quite considerably as an Organisation for Economic Co-operation and Development (OECD) report published in 2005 indicated [4].

During the same general time-frame as the DotForce and the two (2) World Summits on the Information Society, the percentage share of aid flows relating to ICTs by OECD countries actually fell from 4.5% in 1990 to 0.6% in 2002. This decline, the report also indicates, has been partially offset by several special initiatives within OECD countries.

The OECD report further concluded:

"Development assistance for ICT infrastructure in the 1990's experienced an even stronger downward trend than aid flows in general" [4].

Along with the quieting of international conversation about the "digital divide", major development organizations such as the United Nations Development Program and the Swiss Agency for Development Cooperation actually reorganized their ICT for Development programs in the immediate aftermath of these major international forums

II. THE DIGITAL EFFECT AND THE GROWTH OF MOBILES

Whether these digital forums had any effect, it is clear that major changes have taken place in the penetration of the digital tools in people's work and lives throughout the world. Arguably the most reliable accounting of some of these changes was documented in a series of longitudinal studies which came to be known as the Digital Divide Index (DDI), the most recent of which was released at the World Summit on the Information Society in Tunis. Figure 1 represents in summary form the nature of changes that have occurred over the 10 year period 1995 to 2005.

Worryingly, some of the more traditional indicators of social development such as literacy, enrollment in school, households with televisions and land-line telephones have barely changed over this decade. This cannot be said of the digital tools of the internet and mobile telephony. Their use and penetration have accelerated very considerably.
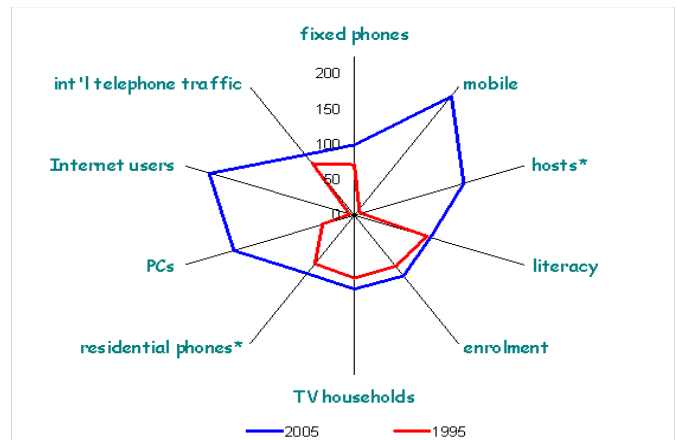

Fig. 1. Evolution of Hypothetica [5].

While the late 20th century may have seen the Internet come to dominate the development discourse, the early 21st century has very rapidly come to be dominated by a very different technology. As is reflected in Fig. 2, mobile phone subscriber rates have grown dramatically just as the 21st Century got underway. In 2008, the mobile phone came to have four billion subscribers across the world[5]. A new report by ITU estimates it to reach 4.6 billion by the end of 2009 [6]. And without question, the principal pattern of growth has been, and will continue to be in the developing world, and especially Asia.
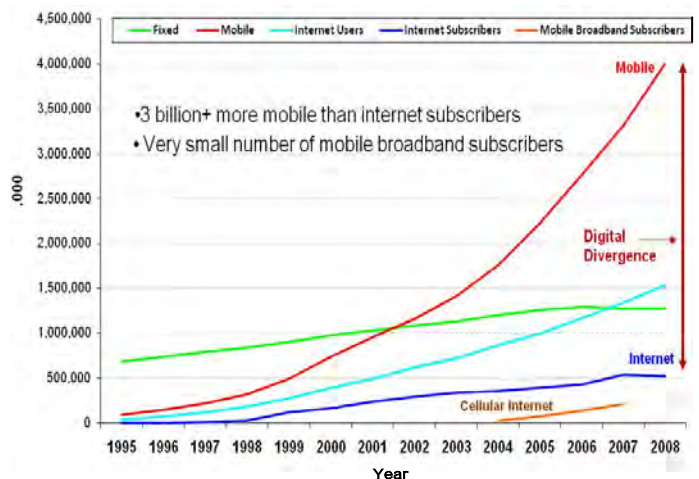

Fig. 2. Trends in ICT usage (subscribers, users), worldwide (Source: ITU Online Database: ITU ICT EYE).

Clearly, the rate of growth in subscribers to the mobile phone has grown more than almost anyone had anticipated. Driven largely by more competitive pricing and regulatory policies that favour competition, the growth of mobile access has also considerably outpaced the rate of growth of the Internet by a very great proportion.

There has been a great deal written about how the mobile phone is going to become more of an internet device. Google's Android, sometimes referred to as the G-Phone, has been

[3] Tunis Commitment (18 November 2005)
[4] See for example, Data and analysis developed by Fourati, Khaled, Research Officer, Connectivity Africa/Acacia. IDRC, 2005.

[5] Speech by ITU Secretary-General Hamadoun Touré, Geneva, September 25, 2008

developed to provide an open platform for developers to bring custom applications to the individual hand-set. Nokia's new Ovi website (www.ovi.com) is intended as a platform that provides applications that bridge both the personal computer and the mobile phone. Apple's I-Phone, RIM's Blackberry, Palm's new Pre and a host of other "smart" phones are all aiming to converge the nearly ubiquitous mobile subscriber with their own version of access to the Internet and beyond.

Despite all these efforts, as Fig. 3 indicates, the penetration rate of the internet on mobile phones has not even begun to be a minor factor.

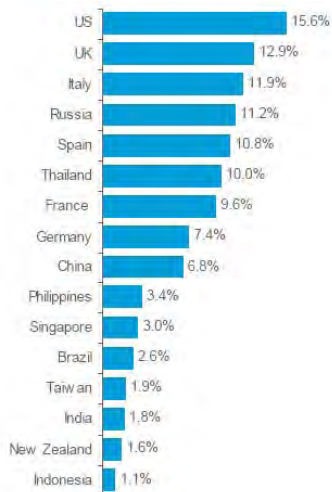Further evidence of this can be seen in Fig. 5.

Fig. 3. Mobile Internet Usage Penetration Across Sixteen Measured Countries (Q1 2008), taken from Nielsen Mobile [7].

In the developing world places where mobile phone access has grown the most, internet access on mobile phones is fractional. Even in Singapore, with no-cost wifi access freely available throughout the island city-state, mobile internet access is used by only 3.0% of mobile phone subscribers. Price and the ability to predict cost are clearly the principal reasons for this slow growth.
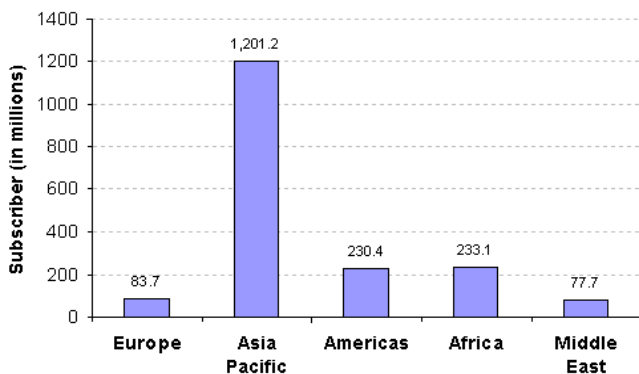

Fig. 4. Regional division of expected subscriber additions, from end-2007 to end-2012 (estimated), derived from Portio Research Ltd [8].

This growth in access to mobile telephony is principally taking place in the developing world. Asia, Africa and Latin America will be the principal drivers of mobile phone growth over the next half-decade with Asia Pacific representing more than 50% of all new growth, as shown in Fig. 4.

III. THE NEW DIGITAL DIVERGENCE

Mobile phones are now used by more then 60% of the world's population and most of Asia's developing world poor now have access. In a landmark study in 2007, De Silva and Zainudeen surveyed a stratified, random sample of bottom income quartile residents in 5 Asian countries[6] [9]. Their conclusions were that, even among the poorest, 95% of respondents had used a mobile phone in the prior 3 months and 90% of this access was with pre-paid phone cards.

Just as the developed world retreats from its fight against the digital divide, a technology arises that poor people actually use and which has considerably underdeveloped potential for affecting social and economic development outcomes. The mobile phones use in social and economic development is only now coming to be introduced.

Development organizations are now beginning to roll-out projects using the mobile phone that have little or no relationship to the Internet and TCP/IP (Transmission Control Protocol/Internet Protocol). Organizations as diverse as the MS Swaminathan Research Foundation (MSSRF) in India and the National Telehealth Centre in the Philippines are increasingly relying upon mobile telephony to introduce pro-poor productivity and service improvement enhancements in local economic development and services for the delivery of health services to the urban poor. Social investment to help them develop, learn from and diffuse the lessons from these innovations is in shorter and shorter supply.
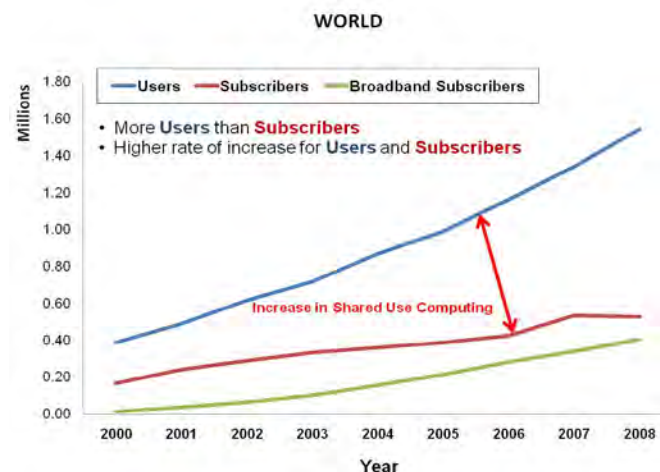

Fig. 5. World Internet Behavior, Users vs Subscribers (Source: ITU Online Database: ITU ICT EYE).

[6] The countries are Sri Lanka, Pakistan, the Philippines, India and Thailand.

Along with the penetration of mobile phones within "back of the market" communities there is another growing trend which is affecting their access to ICTs in development. As is reflected in Fig. 5, Shared Use Computing is increasing at a faster rate then either internet subscriptions or broadband access. While this data is based on varied self-report surveys done on a national level, this seems to suggest that cyber-cafes' and telecentres are playing an even more important role in how people, and presumably those who cannot afford their own technology, get access to the internet.

There are now roughly 3 billion people who have access to mobile telephony but no access to the internet. Given the current rates of growth, divergent access will increase very considerably. As their facility with the use of mobile phones increases they will seek new ways for these technologies to be used in accessing health, financial, educational and economic development services.

The new digital divergence will not last forever. The much heralded "convergence" of television, education and the Internet that was anticipated in the 1990's is only now beginning to materialize with YouTube, narrowcast streaming video and other services. We can anticipate that for the foreseeable future, the poor people's technology of mobile telephony will have to develop its own platforms and applications before the mobile phone and internet actually converge. Given the increasing rates of "shared use" computing we can imagine that this convergence will have a transitional intermediary at the local cybercafe' or telecentre.

The Internet first emerged out of a few privileged research and elite post-secondary laboratories in North America, Europe and Australia in the early 1980's. It took a concerted effort by governments to incubate and help it develop its content and applications before it could become a commercialized service almost a decade later.

Writing about that process at the time, Lester Thurow, then Dean of MIT's Sloan School of Management, underscored the need for *social investment* that would create the applications and content to later run on the commercial Internet as follows:

> *"Capitalist infrastructure can only be built behind or slightly ahead of the market...The Internet could not have been privately financed, the usage wasn't there, would take twenty years to develop...But, in the end, a social investment in infrastructure provided the means for developing an exciting set of new private industries"[10].*

Manuel Castells, the sage social historian of the Networked Society and the Internet further elaborated on this process in his book "The Internet Galaxy" [11].

> *"The Internet culture is characterized by a four layer structure: the techno-meritocratic culture, the hacker culture, the virtual communitarian culture, and the entrepreneurial culture. Together they contribute to an ideology of freedom that is widespread in the Internet world."*

The circumstances associated with the rapid growth of mobile telephony are very different. The high volume, low cost business model of the mobile revolution came before any communitarian applications could be incubated. How the mobile phone can improve health services for the poor, expand access to learning opportunities for children in the developing world or become a foundation for services and transaction at the bottom of the pyramid has yet to incubate.

As the traditional international development organizations retreat from their investments in ICTs and development, other more unlikely sources are entering the arena. The Rockefeller Foundation recently announced a new $100 million fund for investing in mobile applications of health service delivery in the developing world. Karl Brown, Rockefeller's associate director of applied technology, advised mobile health tools are particularly suited to meet the needs of developing countries. "The thing that is very compelling about the mobile phone is that it's an infrastructure that is growing very fast of its own accord, and it exists for the most part in a lot of these countries," Brown said. He added, "The mobile phone is much more suited to a lot of these environments in some cases than a computer or a laptop or an Internet connection because it doesn't use a lot of power" [12].

Even the private sector is beginning to see the relationship between social investment and pre-market development of applications in mobiles for development. The GSM industry recently announced a new GSM Development Fund. "The Development Fund leverages the industry expertise of the GSMA and its members, as well as the development expertise of international agencies and non-profit organisations to accelerate mobile services in three areas: Connectivity, Energy and mServices" [13].

If the digital revolution in the post-industrial world was about the "collapse of inconvenience"[7] then the developing world has lots of inconvenience that's about to be collapsed! Accordingly, social enterprise and local digital entrepreneurship are also entering the mobile for development space. GreenMango in Hyderabad, India is a perfect example. Those seeking services such as an electrician can use the call centre, or the website (http://www.greenmango.co.in/home), on which GreenMango vendors describe their skills in short video clips, and users, satisfied or otherwise, provide ratings and comments on the service they received. The company has registered 30,000 business owners in Hyderabad, where it has been in operation for 18 months, and 1,000 in the high-tech capital of Bangalore, where they recently set up shop [14].

The early 21st Century represents an important time and opportunity for change on many fronts. Emerging countries are becoming more important players on the world stage. The world economy is increasingly shifting to Asia. For the first time, as well, the mass of the developing world, including the poor, have access to a technology that they can afford, know how to use and that has great potential to affect their poverty outcomes.

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[7] Originally referenced by Michael Spence in personal correspondence "It's the collapse of inconvenience," says Siva Vaidhyanathan, assistant professor of culture and communication at New York University. "It turns out inconvenience was a really important part of our lives, and we didn't realize it". Cited in a early Boston Globe Magazine entitled "A Nation of Voyeurs"

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