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Research Article

Teleworking the Mobile Caribbean: Enabling Remote Work Among the Marginalized in Jamaica and Trinidad and Tobago

Abstract

The 21st century is characterized by the rapid growth of information and communication technologies (ICTs) and their assimilation into all aspects of the global political economy. The Caribbean is characterized by a heavy infusion of mobile telephony in the day-to-day lives of its people. Proficiency in the use of such ICT tools is of real value in this emerging information economy, and many governments have pursued the policy of enhancing their peoples' ICT capacities and capabilities as a means of attaining economic growth under difficult global circumstances. This article argues that more wide-scale and selective adoption of these technologies could help make the Caribbean region more competitive and enhance the lives of the poor and marginalized. One means of creatively utilizing these technologies is through telework, a concept extensively discussed in the paper as an emerging and relevant work arrangement. The implementation of telework through the use of mobile broadband is seen as an opportunity to exploit the advantages of a Caribbean workforce with virtually universal access to mobile telephony.

The paper is grounded in the experiences of Jamaica and Trinidad and Tobago with the widespread use of mobile telephony. It argues for greater policy action and more policy-relevant research into how the cellular phone can be used as a bridging technology to encourage more advanced usage of broadband applications by marginalized groups in a wide range of work-related activities.

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From the Guest Editors

Deconstructing ICT Skills and Employability

Introduction

Economic empowerment for marginalized people is one of the core interests driving ICTD practice and scholarship. Many non-governmental organizations state that improving the economic livelihood of their communities is one of their most important missions. Many training programs, from those which are donor- and public-supported to those which are privately operated, have been built with the express purpose of providing people who come into the centers with the skills they need to be hired by a local company, obtain a better-paying job, or start a microenterprise.

While numerous studies have documented the labor markets for high-end ICT skills (programmers and other IT specialists), surprisingly little research has been conducted on basic ICT skills—those skills needed to perform the common tasks associated with almost any job—especially among underserved communities in developing countries. It is for this reason that we organized this special issue, to capture and encourage research in this area.

This topic is now all the more poignantly relevant due to the current global economic crisis. Around the world, people are re-skilling and up-skilling themselves in the hopes of becoming more competitive in the labor market. In the United States, for example, the older workforce, many of whom were retired and must now return to work, cite information technology as the number one skill where they require training (AARP, 2007). This is in an environment where more than half of today's jobs require the use of a computer (Workforce Development Council of Seattle—King County, 2007). Whether it is for an underserved member of a developed or a developing country, how will such skills translate into employment opportunities? What are the most effective ways for people to learn and apply ICT skills across diverse population types and socioeconomic contexts? Are educational institutions, NGOs, and other organizations applying effective strategies? What is the role of national policy?

Employability Is Not the Same as Employment

Over the last two years, the Center for Information & Society at the University of Washington has conducted research into the above questions to understand the role of basic ICT skills[1] among the myriad of factors that affect employment prospects, the practices of NGO training programs, and the pathways people take into the labor market. In framing this issue, we posit that employability is not the same as employment. Employment is a binary concept—you can count employment rates. Employabil-

1. Defined by the Commission of the European Communities (2007): "The capabilities required for effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work, which is, in most cases, not ICT. User skills cover the utilization of common generic software tools and the use of specialized tools supporting business functions within industries in addition to the ICT industry."

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ity, on the other hand, describes "a set of factors, processes, [and training opportunities] that enable people to progress towards or get into employment, to stay in employment, to move on in the workplace, [or to find entrepreneurial opportunities]" (Government of Scotland, 2007). We believe this broad definition of employability provides a more appropriate construct to explore if, as well as the extent to which, ICT skills play a role in helping low-income groups improve their economic opportunities.

There are a variety of factors that influence the progress toward employability beyond an individual's ICT knowledge, skills, and attitudes, such as level of formal education, social networks, a region or community's economic viability, social class, caste, gender stereotypes, learning styles, and labor market dynamics, among others. A community's social and cultural fabric also plays a decisive role in attracting and retaining the most competitive workers (Sullivan, 2009; West & Garrido, 2007; Chapple, 2006; de Grip & Zwick, 2005; Houston, 2005; Fugate et al., 2004; Brown et al., 2003; Peck & Theodore, 2000; and Hillage & Pollard, 1998). Precisely because employability encompasses the combination of factors that demand contextualization, it creates a fertile ground for innovative research that explores the role of ICT skills in this process. The challenge for researchers in this field is to talk about employability by drawing from particular cases and examples, but also by extrapolating the findings to make them relevant and transferable across settings.

Basic ICT Skills and Employability—Do They Play a Role?

Our research has further identified three roles that basic ICT skills play in promoting progress toward employability:

1. **Gateway skills.** People can be excluded from consideration for employment just by virtue of not being able to demonstrate basic ICT knowledge, such as might be shown by a certificate. In these cases, no amount of effort to conduct an online job search, write a résumé, or receive assistance in other areas will make a noticeable difference. ICT skills are often a gateway that enables the possibility of employment.
2. **One among many necessary skills.** ICT skills can be a necessary element of the set of requisite skills. Communication, critical thinking, and teamwork are examples of others that are frequently cited (Conference Board, 2006). Many organizations that promote employability weave ICT skills into a larger curriculum of such foundational skills. In these cases, ICT skills may tip the balance, or they may "keep the applicant in the running," so that some other variable can come into play.
3. **Catalyst for *key* skill development.** In some settings, basic ICT skills have become so prevalent that, once the gateway function is satisfied, ICT skills are never referenced again. They are taken for granted, like reading and numeracy, particularly in settings saturated by training opportunities and exposure to technology. In these settings, domain expertise or some *other* differentiating characteristic is the key. Computer training sometimes attracts students, catalyzing the pursuit of *other* skills and services. For example, someone may enroll in a computer class because it is modern and attractive. Perhaps they may have a positive learning experience and decide to pursue advanced education at a trade school or community college. In instances like these, the computer skills did not tip the balance per se, but the computer training program catalyzed a series of events that did.

At the same time, we should caution that basic ICT skills are rarely the missing link that miraculously transforms employment prospects. Lower wage, lower skill workers typically face multiple barriers, many of which are more complex than unfamiliarity with email or word processing. ICT literacy cannot be isolated from larger social and personal contexts. Soft skills are important, as are solutions to challenges such as childcare, affordable housing, transportation, time, and appropriate attire. Homeless and immigrant populations operate under additional constraints. The hurdles are diverse and individu-

alized, and ICT must be integrated into this larger context of needs to credibly advance employability and economic opportunities for low-income groups.

Papers in This Special Issue

In November 2008, the guest editors invited submissions that address the relationship between ICT skills and employability. The four research articles and three forum pieces selected for publication present findings highlighting a diverse range of local contexts, nuances, social forces, policy directions, and other factors that contribute to employability capabilities and outcomes.

Walton, Putnam, Johnson, & Kolko examine the role of ICT skills and employment in the context of the Central Asian nation of Kazakhstan. Their findings indicate that, while ICT skills can be a predictor of employment and higher income, the levels of ICT skills required to obtain these jobs are not as high as one may expect. They argue that what are perceived as basic ICT skills in a developed nation are considered sophisticated skills in developing countries and transitional economies. This finding has implications for policy and program development aimed at improving employability, and they suggest that training efforts should focus on contextualizing the meaning of basic skills to local socioeconomic settings.

Mariscal, Botelho, & Gutierrez analyze the role of non-governmental organizations (NGOs) in providing ICT skills training to improve the employment opportunities for youth in Brazil, Colombia, and Mexico. The authors argue that NGOs play important roles as liaisons for effective adoption of ICTs among youth and for the development of some of the professional skills required to enter into the labor market. However, most NGOs in these countries are small and fragmented, and they have only limited capacity to understand the trends and demands of the labor market and form partnerships with potential employers. These limitations hamper their ability bridge the gap between ICT skills training and employment.

Tapia & Maldonado use the mandatory migration to open source software by the government in Venezuela to explore the extent to which a policy-oriented approach to universal skills can provide opportunities for ICT skills transfer to traditionally underserved populations. Although the data to measure the success of this approach is still limited, the authors argue that the strategies employed by the Venezuelan government have the potential to begin a cascade of change throughout the country.

Dunn examines the experiences of the Caribbean nations of Jamaica and Trinidad and Tobago. The author argues that extensive penetration of mobile telephony in the islands can potentially open economic opportunities for poor and marginalized communities and make the region more competitive in the global economy. He proposes to use telework as a strategy to exploit the advantages of a Caribbean workforce and the use of the mobile phone as a bridging technology to encourage more advanced usage of other ICTs by marginalized groups for a wider range of work-related activities.

Kluzer & Rissola discuss the European Union's e-Inclusion initiative, and in particular, the policies aimed at improving the standing of marginalized groups in the labor market. The authors state that the shrinking labor force in Europe demands concise and orchestrated policy actions that help improve ICT access and digital literacy among underserved populations. Using the experience of immigrants and ethnic minorities in EU countries, the authors argue that a bottom-up approach to ICT skills development would enhance the chances for integrating these minority groups into the labor market by better matching their competencies to job-task needs.

Schware discusses the role of Business Processs Outsourcing Centers (BPOs) in promoting economic development for rural communities using the "rural business kiosk project" known as *Nemmadi* in the State of Karnataka, India. He argues that the build-own-operate model that *Nemmadi* uses can help address, to some extent, sustainability problems that many telecenters face. In addition, rural business centers can promote economic activities by outsourcing services and increasing employability prospects in rural areas.

Lanvin & Králik argue that, as global competition is becoming highly knowledge-centric, the skills related to information-intensive societies (e-Skills) are becoming increasingly strategic. This trend is making more visible the growing gap in the ability of existing educational systems to produce e-skilled workers. The authors propose a multi-stakeholder approach to skills development as a key condition for narrowing the e-Skills gap. Adjustments of educational systems, promotion of career prospects for IT jobs among women, and other steps are required in order to improve access to both the labor market and to upward mobility opportunities.

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Research Article

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Abstract

The 21st century is characterized by the rapid growth of information and communication technologies (ICTs) and their assimilation into all aspects of the global political economy. The Caribbean is characterized by a heavy infusion of mobile telephony in the day-to-day lives of its people. Proficiency in the use of such ICT tools is of real value in this emerging information economy, and many governments have pursued the policy of enhancing their peoples' ICT capacities and capabilities as a means of attaining economic growth under difficult global circumstances. This article argues that more wide-scale and selective adoption of these technologies could help make the Caribbean region more competitive and enhance the lives of the poor and marginalized. One means of creatively utilizing these technologies is through telework, a concept extensively discussed in the paper as an emerging and relevant work arrangement. The implementation of telework through the use of mobile broadband is seen as an opportunity to exploit the advantages of a Caribbean workforce with virtually universal access to mobile telephony.

The paper is grounded in the experiences of Jamaica and Trinidad and Tobago with the widespread use of mobile telephony. It argues for greater policy action and more policy-relevant research into how the cellular phone can be used as a bridging technology to encourage more advanced usage of broadband applications by marginalized groups in a wide range of work-related activities.

Introduction

> *"The quickest way to get out of poverty right now is to have one mobile telephone."*
>
> —Muhammad Yunus

For the Caribbean, a region nearly saturated in access to mobile telecommunications, the existence of vibrant cultural forms and the increasing availability of the Internet have come together to create an opportunity for the region's quest to reach global markets and to competitively showcase its individual and corporate products and services.

From this vantage point, we advocate the development of telework and its related ICT capacity in Caribbean countries such as Jamaica and Trinidad and Tobago. Success in this initiative, however, is dependent upon greater policy action and more policy-relevant research into both how mobile telephony can contribute to this model, and how it can be

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used as a bridging technology to more advanced usage by marginalized groups.

The central argument of the paper is that with close to universal access to mobile voice communication in Jamaica and Trinidad and Tobago, the next logical policy emphasis should be on personal and economic development using cellular broadband technology.

Primary research findings from studies conducted in both these countries support this central thesis. The studies by Dunn (2007) and Mallalieu and Cambridge (2007) indicate that the economically marginalized are already using their mobile phones to engage in business and work-related transactions to enhance their economic survival. The studies show that the three leading forms of mobile economic engagements include:

1) A strengthening of financial support networks, social bonds and the consolidation of trust between family members and friends using the mobile phone. This largely falls within social capital theory and would appear to be an instrumental policy variable in enabling new work opportunities through networking, especially for skilled people, such as mechanics, carpenters, plumbers, etc.

2) Mobile telephony provides "address anonymity" for some of the respondents sampled from volatile communities in Jamaica. As employers tend to disfavor the so-called "wrong address," these prospective applicants find it very difficult to access employment through formal job application letters. Since the arrival of the mobile phone, and hence a lessened emphasis on addresses as a source for contacting freelance service providers, these persons are finding it much easier to secure jobs, as their cell phone numbers do not disclose their actual residential or business location.

3) Finally, some key socially disadvantaged operators of micro-enterprises have attained and maintained viability because of their use of the cell phone for marketing, for personal security, and for coordination of stock procurement. The findings also indicate that with adequate education and training, in the context of a slow but constant diffusion of ICTs in both countries, the economic and overall well being of the poor and marginalized can improve significantly.

The paper's core contribution is that the existing widespread use of mobile telephony in the Caribbean can be leveraged to create wider and more convenient occupational engagements through telework. Recently conducted research studies debunk popularly held views that low-income users of the mobile phone are primarily interested in this tool for social chatter. Instead, the research findings from the two largest countries in the Anglophone Caribbean suggest that people are beginning to make the transition from a social and conversational usage of their cell phones to more business-oriented and economically driven engagements.

Conceptual Framework

In this section of the paper, we outline some key definitions and concepts which help to guide the discussion on telework in the Caribbean. Surveying the general literature on telework is necessary, since there is a dearth of similar studies done on the Caribbean. The findings from the general literature are then used as benchmarks against which we can assess the feasibility of remote work among the marginalized in the region through bridging technologies, such as the mobile phone.

Concept of Telework

Within the last two decades, traditional notions of work have changed as the worker's physical location in relation to the "central office" has become less important in the worker's execution of particular types of tasks. This transition describes the emerging occupational practice called *telework.* Globally, increasing numbers of people are working from a variety of alternative locations that offer greater convenience, improved competitiveness, and little or no reduction in productivity.

The facilitation for the emerging telework trend has involved the rise of mobile broadband communication, including Internet-ready cellular phones and portable computers, as well as global satellite communications and secure corporate databases. Some activities previously requiring the physical presence of the employee at a central work-site can now be reallocated with even greater efficiency to home-based employees or mobile contractors who are based "on the road" or at any other remote location. But telework is not without its challenges, something to which we will return later.

Definitions of Telework

The International Labour Organization (ILO) proposed a definition of telework as far back as 1990,

which is cited by Di Martino (2004, p. 4) as "a form of work in which (a) work is performed in a location remote from central office or production facilities, thus separating the worker from personal contact with co-workers there; and (b) new technology enables this separation by facilitating communication." The European Union Framework Agreement on Telework (2002) defines it as, "a form of work or organizing and/or performing work, using information technology, in the form of an employment or contract relationship, where work, which could be performed at the employers' premises, is carried out away from those premises on a regular basis."

Milles, Carlson, Gray, and Hanneman, as cited by Atkin and Lau (2006), were the first proponents of telework, or "telecommuting," as it is described in the United States. They believed transportation savings from the substitution of communication technologies for some or all aspects of commuting could be realized, hence reducing the demand for oil. Toffler (1980), another early proponent, argued in favour of a form of "cottage industry" built on communication technologies, while Huws, Korte, and Robinson (1990) pointed to organizational restructuring and new corporate strategies as early drivers of the practice of telework. Di Martino (2001) believes the significant growth in ICTs and the digitization of some forms of work provide clear avenues for flexible work, thereby allowing countries to optimize their resource utilization and reduce their dependency on oil from fuel commuting. The underlying implication of Di Martino's argument is that not all types of jobs are suitable for telework, just those with core inputs or products that are amenable to digitization, which can be performed at any remote location, as long as there is Internet connectivity and computing facilities. Some examples of jobs amenable to digitization include architectural services, financial services, educational services, writing and editing, data processing, and music editing and production, among others.

Huws, as cited by Bibby (1996), has outlined some major categories of teleworkers and the location of their work:

1. Multi-locational teleworkers who work from different locations such as home and employer's premises;
2. Telehomeworkers who work entirely from home;
3. Freelance teleworkers who work from home, but work for different employers;
4. Mobile teleworkers who work while traveling using mobile technologies.

Telework: Trends and Issues

The need to balance professional and personal life has been cited as an important reason for the adoption of telework, especially among the elderly and those with children. Higgins et al., as cited in Johnson (1999), suggest that in eliminating commuting time to the office, telework enhances an employee's ability to "control, predict, and absorb change in work and family roles." Nilles (1996) indicates that there is some empirical evidence suggesting that teleworkers are more satisfied than non-teleworkers with their ability to schedule child-care arrangements and with the opportunity that telework offers to spend more time with family members.

It is known, however, that while, in theory, teleworking may enable more time and closer relations with family, it is a real possibility that, when working from home, teleworkers may in fact have less time for their families. This may happen as some teleworkers often work longer hours than their non-telecommuting counterparts, to the detriment of family relationships. Furthermore, the issue of whether or not telework contributes positively to work-life balance is still contested. Some researchers (e.g., Hill, Hawkins, & Miller, 1996; Johnson, 1999) maintain that the virtual office is a "cyberspace sweatshop" that blurs the boundaries between work and home life. One study (Olson & Primps, 1984, cited by Hill, Miller, Weiner, & Colihan, 1998) concluded that there may be little distinction between work and home life, and so telecommuters may exhibit characteristics of "workaholism." It has also been argued that teleworkers may work harder than those stationed at the central office because of the lack of face-to-face supervision.

While telework as a concept has been around for over two decades, it has grown in significance in the last few years. In a news release by AT&T in 2002, the telecommunications corporation reported that the real estate and job retention savings arising from telework was in excess of US$100 million annually. In its annual telework productivity survey, AT&T also reported that

1. 82% of teleworkers said that balancing work and family responsibilities was a significant advantage of telework;

2. About 70% of teleworkers are more satisfied with their current job and their personal and family lives; and
3. 56% of teleworkers who received competing job offers said that they factored telework into their decision to accept or reject the offer. (AT&T, 2002)

On the other hand, there may be downsides. One major example relates to the security of transmission of company data (Lafferty & Whitehouse, 2000; Mills, Wong-Ellison, Werner, & Clay, 2001; Schneider, 2004). The transmission of unprotected data on the Internet can make an organization vulnerable to malicious software (malware) attacks that can potentially damage its software and hardware infrastructure. Another genuine threat (not unique to telework) lies in the possible unauthorized or accidental dissemination of sensitive, mission critical information through acts such as misdirected data and industrial espionage (Baratz & McLaughlin, 2004; Schneider, 2004).

Widespread use of telework may also disrupt teamwork and organizational culture, creating negative synergies that could lead to reduced productivity (Canadian Teleworkers Association, 2005). The often "confined" lifestyle of teleworkers may lead to the loss of professional interaction and camaraderie associated with the traditional work setting. Some studies suggest that the growing use of the Internet has encouraged isolation, as workers are estranged from the work community where they can offer each other support or learn from each other (Oz, 2002, p. 235; Fairweather, 1999, p. 45). This is supported by Mills et al., who have observed that:

> . . . Some customer-service or sales activities gain exponentially from the team spirit and motivation that is generated by the leaders and managers sitting in with the teams and "leading from the front." A telework arrangement would not offer the same synergistic advantages. (Mills et al., 2001, p. 52)

For vulnerable data entry or computer-bound teleworkers, there are health concerns relating to repetitive strain injury such as carpal tunnel syndrome, but again, these concerns may not be unique to teleworkers. Working from home can convert some secure traditional employees into contract workers, operating ostensibly as self-employed persons lacking job protection and staff benefits. In some cases, it is also argued that certain company costs could actually be transferred to the teleworking employee, including the costs of infrastructure, communication, and utilities.

Despite these constraints, teleworking or telecommuting is of particular interest from the perspective of public policy and the society at large. This is due to its implications for transportation planning, fuel costs, air quality, and congestion relief. Urban traffic congestion can cause personal stress, delays, and corporate productivity losses. The practice of telework may provide a strategic means for reducing the carbon footprint of certain key sectors and energy-intensive industries. Commuting by car or bus, particularly in peak-hour congestion, is a major source of exhaust emissions and air pollution. While telework offers a solution to traffic congestion and pollution, its likely attractiveness for policy makers and governments, especially those of emerging economies, is the possibility of more rapid economic growth and sustainable development. Allowing companies to occupy less space and control the fixed overhead costs of their infrastructure would likely create more profits and provide a spillover effect for the local economies.

Researchers such as Cowell and Dunn (2006) and Di Martino (2004) have also explored the potential for telework to generate new self employment opportunities, especially in rural and inner city areas of Latin America and the Caribbean.

Telework and the Current International Environment

The technologies that power telework deployment are global in nature and origin. Digital technology and the Internet provide global options for research, marketing, publishing, archiving, and producing digital products and services. These innovations are among the leading motive forces of the process of globalization. By definition, globalization may be regarded as an intensification of the ongoing historical process of global human interaction. It derives from new means of creating and exploiting the interconnectedness and interdependence of heterogeneous peoples and communities of interest anywhere into a single global technological, economic, social, and cultural space.

The current manifestations of globalization are not unique to the present era, but are technologically and politically different. In 18th and 19th century Europe, the innovations of the magnetic

telegraphy, electricity, railways, new weapons systems, the steamships, and Morse code, among others, all converged to help reduce worldwide distances, and in practice, to facilitate European imperialism and colonial control. Geography as an obstacle to conquest and communication was tamed, although over a longer period than it took the contemporary global communication networks such as the Internet to conquer global space (Dunn, 1995; Winseck & Pike, 2007).

In the present era, globalization is intensified by digital communication, which facilitates real-time transmission of weightless bits of information across contemporary global networks. Digitalization provides an innovative method of conveying voice, data, images, and text in a seamless and compact flow of zeros and ones. As a substitute for the legacy of analogue systems, digital communication has helped to create the basis of the converged, so-called "next generation networks." It is the speed and vastly enhanced capacity for global information processing that differentiates the globalization of the present to that of previous eras. It is the Internet that has given this new wave of globalization its distinguishing features, including its transborder reach, the ability to transmit voluminous amounts of data, the ability to enhance research and development, and the capacity to facilitate more efficient distribution of goods and services.

Castells summarizes the gamut of these issues well, stating that:

> In our age, the Internet could be likened to both the electrical grid and the electric engine because of its ability to distribute the power of information throughout the entire realm of human activity. Furthermore, as new technologies of energy generation and distribution made possible the factory and the large corporation as the organizational foundations of industrial society, the Internet is the technological basis for the organizational form of the Information Age: the network. (Castells, 2002)

Neoliberalism: The Networked Society and the Market

Today, globalization is taking place within the framework of the transcendence of systems of neoliberalism. The mobility of capital in the present context underlines the reality that neoliberalism is primarily an economic doctrine. It advocates the supremacy of the free market as a tool to drive economic growth and to confer welfare in preference to government intervention in the market. It advocates the deregulation of global markets, including those of telecommunication, education, and information technology services. Libertarian economics believes in the rationality of man as an economic agent who will always pursue a course of action that will yield him the greatest utility. Secondly, this same doctrine, commonly expressed as neoclassical economics, believes in Adam Smith's "invisible hand" hypothesis, which holds that invisible forces work in perfect congruence to equilibrate demand and supply in all markets, whether they are for land, labor, capital, or natural resources.

In light of the growing networked society, capital mobility has increased principally because of its diffusible nature as a result of ICT applications. In a real sense, cyberspace, which seamlessly connects persons anywhere and anytime, has become the new battlefield for corporate rivals, as well as a new reservoir of opportunities for those who are disempowered by traditional systems in their real geographical localities.

But the new face of digital globalization also subsumes many of the inequalities and conquests of the past, resulting in a digital divide between those with constant and regular access to the information society and those without. The digital divide has been narrowly defined in terms of access to the physical resources necessary to enter that information society, namely computers and the Internet. Van Dijk (1999) refers to four kinds of barriers which restrict access. These include a lack of elementary digital experience (mental access), a lack of computers and network connections (physical access), a lack of digital skills (skills access), and a lack of significant usage opportunities (usage access).

Within the Caribbean space, e-exclusion and the digital divide are reflected in access by less than 20% of regional citizens to Internet-based computer systems and big screen broadband services. However, with close to ubiquitous access to mobile voice communication through the cellular phone, the available technology of choice among the majority of Caribbean people is being re-purposed as an instrument of personal and economic development. From this vantage point, one can better understand the imperative of developing telework and its related ICT capacity in the Caribbean countries.

For many societies, such as those in the Caribbean, without government intervention and some form of government regulation, digital dividends will never be realized. The survival of disempowered individuals and sectors of society could be endangered by being left to the consequences of the market. It is both the doctrine of competition and the power of governmental regulation that have led to the rapid and organized growth of the new telecommunications sector in both Jamaica and Trinidad and Tobago, laying the foundation for virtual saturation of mobile telephony internally, as well as strong inter-modal network delivery systems into and out of the region.

Telework and the Caribbean Context

This paper focuses on two Anglophone Caribbean countries, Jamaica and Trinidad and Tobago. While these countries have important national peculiarities, they also display many of the attributes of the majority of the English-speaking and other countries in the region. They are all small, open, vulnerable economies striving to come to terms with a post-colonial legacy of under-development. Their mostly inherited political systems accommodate frequent election of political and civic leaders and reflect, for the most part, the popular will.

There are differentiated levels of economic growth and development trends among countries in the region, but a common factor is their historical dependence on traditional agricultural products and tourism as the main sources of income. According to the Caribbean Development Bank, tourism was one of the three major contributors to growth across the region in 2006, followed by construction and services. Against the context of continued reliance on traditional sectors, two issues are drawn into sharp focus which have serious implications for the future earnings and viability of the region. These two issues, discussed in the following sections, are the liberalization of monopoly sectors and the geospatial separateness and balkanization of Caribbean territories.

Liberalization of Monopoly Sectors

The World Trade Organization's (WTO) 1995 General Agreement on Trade in Services (GATS) provided for the systematic liberalization of monopoly sectors in all member countries, as well as the removal of subsidies and tariffs on particular goods and other artificial barriers to free trade. This included the telecommunications services sector, where monopoly had reigned for more than a century.

The rapid growth of the mobile user base in Jamaica rose from about 300,000 mobile subscribers in the year 2000 to more than 2.5 million at the end of 2007 as the result of the governmental policy shift from monopoly to a competitive market and increased foreign direct investments. After more than a century of monopoly telecommunications service provision in the region by the incumbent Cable and Wireless PLC, Jamaica led the move into a competitive framework with the adoption, in 2000, of a new Telecommunications Act. Trinidad and Tobago followed in 2005.

Consumers in both Jamaica and Trinidad and Tobago welcomed the break in the Cable and Wireless monopoly as governments introduced new laws and regulations, which were backed by WTO commitments and ministerial policy directives to liberalize the markets. As a result, in Trinidad and Tobago, mobile subscribers accounted for more than 50% of all telephony subscribers in that country (Mallalieu & Cambridge, 2007), and over 70% in Jamaica by 2007.

Both Dunn (2007) and Mallalieu and Cambridge (2007), in separate country studies done for the Regional Dialogue on the Information Society (DIRSI) of mobile telephony in Jamaica and Trinidad and Tobago, indicated respectively a rapid growth of that segment over the period 2000–2006. As an example, in Trinidad and Tobago, mobile telephony experienced growth of 1,069%, compared to the growth in fixed telephony (19.9%) over the same period. In Jamaica, a rapid process of fixed to mobile substitution rendered the mobile sector the largest and faster growing segment in the regional telecom industry.

The liberalization process has brought significant returns to the telecommunications sector. In Jamaica alone, total spectrum fees collected since the beginning of the liberalization process, from April 2000 up to March 2007, are estimated at JM$4.74 billion[1] (JM$4.364 billion[2] for cellular li-

1. Approximately US$72.9 million, at US$1=JM$65
2. Approximately US$71.3 million, at US$1=JM$65

censes and JM$380 million[3] (for other mobile spectrum licenses). The total general consumption tax (GCT) collected since liberalization was estimated at JM$40 billion.[4] The total revenue realized by the Government from the sale of cellular licenses to Digicel, Oceanic Digital (Miphone), and AT&T Wireless is US$98.5 million (PIOJ ICT Task Force, 2007).

Digicel, an Irish-based firm, entered the market in 2001, and within 100 days of the start of operations, they had secured an unexpected 100,000 mobile subscribers. Unlike the incumbent Cable and Wireless, Digicel quickly provided mobile telephony services to remote and rural parts of the island and sold cellular handsets for between US$30 and US$50, which, at 2001 currency exchange rates, was more affordable for low-income earners.

Two other crucial factors allowing this rapid growth in penetration levels were that Digicel introduced the low-cost mobile handsets with prepayment plans and calling cards denominated in as little as US$ 2.20, and that Digicel introduced per second billing compared to per minute billing by incumbent Cable and Wireless. With low handset prices, the process of citizen ownership of a piece of the digital mobile revolution had now been well and truly embarked upon by even the marginalized social classes in the region.

By late 2006, the provision of a wired service by Columbus Communications, trading as Flow, added competition in the provision of landline services, including the so-called triple-play option of landline telephone, cable TV, and Internet services. These competing entities, providing more diverse offerings, have contributed to an expansion in a burgeoning new telecommunications landscape, one which offers greater access for the low-income or unemployed inner city residents and remote rural users who were previously excluded from the network by cost and technology.

This process of opening up of the Jamaican and "Trinbagonian" telecom markets had the critical effect of expanding access to telephony beyond the preserve of the rich and upper classes in both societies, to include those at the lower tiers on the economic ladder. However, as indicated earlier, large-screen, Internet-ready tools and computers have had a much slower rate of diffusion and assimilation in both countries. Mallalieu and Cambridge (2007) indicated that, at the end of December 2006, Internet subscription rates were at only 6.2% in a Trinidad and Tobago population of over 1.3 million people. Similarly, Dunn (2007), in the Jamaica country report on mobile telephony, found that just over 20% of Jamaican respondents had large-screen Internet access.

The Caribbean Discourse on Telework

In a large sense, for the marginalized of our societies, access to ICT is fast becoming the currency of the digital economy in this "digital millennium" (Dunn, 1995). While Caribbean nations remain at different levels of underdevelopment, sharing a common incidence of digital poverty, displacement, and marginalization, it is conceivable that improved access to education, as well as new forms of work, such as telework, may well be key catalysts in the region's transformation.

The idea of telework entered the Caribbean discourse quite late, although the concept had been under discussion in the industrialized North for a decade and a half prior. For the Caribbean region, initial reference to its prospects and challenges only emerged at the start of the new millennium. In an article on Jamaica published in 2000, entitled "Globalization, Tele-Working and new Trade Union Strategies," Dunn (2000) addressed the attractive prospects of telework for off-shore employment, noting that "if productivity-related problems of the region are to be successfully tackled, all participants in the social context will need to contemplate new and innovative ways to achieve and sustain employment levels within the limits of acceptable occupational standards . . ." Continuing, Dunn observed that emerging technologies were creating teleworking opportunities, not just within, but also from outside of Jamaica. "Suppliers of information intensive services can now engage in cross border trade, in the re-location of work sites, and in the concentration of certain jobs within specific cost effective social, economic, and geographical zones" (ibid.). With respect to conventional trade union practices of centralized collective bargaining, it raised the challenge of alternative methods of organizing. The 2000 paper established that the issues arising from telework for the Caribbean trade union movement and for employers included the need to restructure

3. Approximately US$5.8 million, at US$1=JM$65
4. Approximately US$61.5 million, at US$1=JM$65

work organization and management, to review conventional shift working, and to re-think employees' career development and training, as well as to prepare for future changes in employment trends (ibid.).

The meteoric rise of mobile telephony in the region would suggest that people are not technology averse and will acquire communication tools within their budget. The slow rate of computer acquisition and Internet access and usage in both countries appears to be the result of affordability factors, as many low-income families have been found to indicate interest in buying computers for their children's research and homework, if the families were able to afford it (Dunn, 2008). The policy of seeking to decrease the price of computer hardware and other access costs appears to be a necessary one if the declared expectations by the governments of e-commerce, e-government, online education, teleworking, and other economic applications are to be adopted by wide sections of the populations.

Telework and Mobile Telephony in the Caribbean: Existing Research

This paper draws on several major research projects about ICT development and applications in countries of the region. The first was a significant research project on the subject of telework in Jamaica, Barbados, and Trinidad and Tobago by Cowell and Dunn (2006), entitled "Telework: New Forms of Work and Employment Opportunities in the Caribbean." There was also a series of research studies carried out by the Regional Dialogue on the Information Society (DIRSI) entitled: "Mobile Opportunities: Poverty and Telephony Access in Latin America and the Caribbean." From this series of studies, this paper mainly draws on four major studies: the Jamaica Country Report on the National Household Survey among Low Income Mobile Users (Dunn, 2007); its counterpart country report from Trinidad and Tobago written by Mallalieu and Cambridge (2007); and finally, two qualitative research studies on mobile telephony and poverty in Jamaica.

The Telework Project

In this study, Cowell and Dunn (2006) sought to examine the prospect of telework in the Caribbean, with a focus on three countries: Jamaica, Trinidad and Tobago, and Barbados. The study explored stakeholder perceptions of the extent to which the Caribbean technology infrastructure, labor policy framework, and attitudes could support the growth of telework in the region, which might thereby create more employment opportunities. The approach to information gathering was qualitative, including in-depth interviews and focus groups. A component of secondary research was also included, providing an extensive review of diverse literature on the topic.

This study found that, despite further advances in the region's ICT industry, the practice of telework had gained little corporate or governmental attention. Cowell and Dunn suggested that several predisposing economically and socially beneficial factors remained unexplored by the main industry players with regard to the deployment of telework in Caribbean economies (ibid.). Consequently, despite emerging patterns of use at the individual level, the successful adoption of telework is dependent upon the adoption of government policies geared to grow this sector.

Mobile Opportunities

Much of the data on regional mobile telephony patterns in this paper have been garnered from the Mobile Opportunities Project executed by DIRSI in 2007–2008. Dunn (2007) and Mallalieu and Cambridge (2007) were the conductors of two of seven country studies on mobile telephony usage in Latin America and the Caribbean. The studies indicate the results of national household surveys of mobile telephony usage among low-income respondents in both countries. Both surveys were executed at around the same time, using an extensive questionnaire of more than 100 questions related to mobile telephony and other telecommunication and ICT usage patterns. There was also a qualitative study which delved further into the results that came out of Jamaica, entitled "Wha' a Gwaan: Research Report on a Qualitative Study of Mobile Telephony and Poverty in Jamaica." With the objective of gaining clearer understanding of the usage patterns, thoughts, nuances, and experiences of Jamaica's urban and rural poor, the study made use of in-depth interviews, focus groups and research diaries. The final, related study was a working paper entitled "Genderstanding Mobile Telephony: Women, Men and Their Use of Cellular Phones in Jamaica," which brought together varied qualitative perspectives on usage patterns by different social groups (Dunn & Dunn, 2007).

Telework: Emerging Patterns of Use

Teleworking the Mobile Phone

With existing cost constraints among the poor, the cell phone appears to be the best interim option toward empowering its users to be even more active participants in the global and local information economy. Low-income people, in Jamaica for example, are already using the cell phone in their quest for economic survival by keeping in touch socially with friends, family, and associates who could assist in times of special economic need. Others use the phone to combine social calls with inquiries about services and job opportunities, for marketing of ideas and products, and for informal business networking (Dunn, 2008). This is the first stage of teleworking among the marginalized.

In "Genderstanding Mobile Telephony: Women, Men and Their Use of Cellular Phones in Jamaica" Dunn and Dunn (2007, p. 10) found that "People are combining in a seamless manner an economic usage with their social communication. As one respondent Inez indicated in her interview, she uses her phone to call her friend, and what may appear to be a social call also functions as a business link. Others send or receive overseas calls related to remittances, child support, house-keeping income, and cross-border business trading. It is clear that where users are involved in self-employment or small businesses, the phone is used to garner new business and to make their services more timely and efficient, while also maintaining social contacts with friends and family."

Social capital theory provides another way to look at the feasibility of the mobile phone helping to both make the region more competitive and to make the life of poor people and marginalized groups more prosperous. This theory holds, by emphasizing the intangible value of social groups, that the nature and extent of social interaction can shape economic performance (Sinha, 2005). Mallalieu and Cambridge (2007) found that, "of all the mobile calls made in the month prior to the survey, the most frequent recipients were friends and in-country relatives, followed by work place." This provides evidence of a strong social networking application of mobile telephony. Similar findings were reported in Jamaica. It is perfectly understandable that fewer calls were made to work places, as the survey was conducted among bottom-of-the-pyramid, low-income households, who have a higher rate of unemployment than other social groups. But despite these disadvantages, work-related and economic activities were emerging as part of the universe of calls made.

This supports the argument that social networking is crucial to the survival of these marginalized people, as the vicissitudes of life at the bottom of the pyramid dictate that survival is not about what you know, but about whom you know and who knows you. As one respondent in Jamaica indicated, "it's not just who you know, but who you call, and who calls you."

Mobile Telephony and Small and Medium Enterprises

Small and medium enterprises (SMEs) are critical pillars supporting the bottom-of-the-pyramid economy and therefore are an indicated avenue for systematic and sustainable poverty reduction (Botelho & Alves, 2007). Poor people and marginalized groups often engage in micro enterprise as a form of entrepreneurship and for survival. These activities are reflected in market stalls, artisanship, building and maintenance trades, street stalls, corner shops, itinerant vending, taxi and hand-cart services, and pirated music and video sales, among other legal and illegal activities. A Jamaican taxi driver interviewed for our survey, for example, said he could not operate his independent taxi service without his mobile phone (Dunn & Dunn, 2007). While he uses it to keep in touch with his parents, his family abroad, and girlfriend, it is more central as his business tool, on which regular customers reach him for transportation. Among these and members of the lower income strata engaged in these activities, the use of the cell phone is inescapable as a micro-business tool. As income increases, the opportunity exists to build upon these enterprises, and when affordable, to transform simple usage such as voice telephony into more sophisticated usage. This pattern, however, calls for more expensive computer hardware to supplement the basic tools and create expanded personal and family opportunities for work.

Representatives of low-income marginalized groups, such as people with disabilities, have a special need for these technologies. They get connected to, and participate in, the global economy through mobile phones. A wheelchair-bound market trader still manages to secure her "load" by mobilizing her

farm produce through an old-fashioned mobile phone, a source of transportation and communication with regular clients that she has used for years (Dunn & Dunn, 2007). Another disabled person in Trinidad and Tobago operates a phone repair business from his sedentary position in Port of Spain.

Address Anonymity

While some persons are physically or mentally disabled, there are other marginal groups that suffer a social disability from their domestic or workplace addresses. In a focus group conducted as part of a qualitative investigation in patterns of phone usage, several inner city respondents reported using the cell phone to gain address anonymity in trying to seek employment or market skills and personal services. The call recipient does not have to know the home address of the caller, which could otherwise be a deterrent in both business and social contact with more upwardly mobile correspondents. Telecommuting can thus be both symbolic and virtual if the reality proves too difficult for socially disparate persons involved in such a work-related transaction.

A series of consultations[5] with industry experts to get their feedback on the feasibility of the uptake of telework in the mentioned countries elicited the following from one IT consultant from Jamaica:

> . . . some of the work I do is to set up computer labs for schools that teach children with disabilities how to use computers. At one of the organizations I work with, Caribbean Council for the Blind, the majority of workers in the organization are visually impaired, but they communicate through email with software programs that enlarge the text or generate speech from the text. They have no different level of productivity from people who have all their abilities. One of the social implications is that persons with disabilities can be brought into the workforce . . .

Similarly, Dunn (2007) has found in a working paper that the cell phone is being used extensively among the deaf and hearing impaired, and also among people with visual disabilities. All these individuals have cited the importance of the cell phone to them—particularly the texting feature, which assists with communication for social networking and for conducting business. It is in this context that emerging mobile broadband features can be leveraged to present a real opportunity for marginalized groups to be included in the mainstream of digital society. For instance, the opportunity exists for entrepreneurial applications of software such as Job Access With Speech (JAWS), to be utilized by these individuals to engage in outsourcing opportunities such as data processing and administrative work (Dunn, 2008).

The previous discussion clearly shows that there are emergent work-related patterns of use of mobile telephony in both Jamaica and Trinidad and Tobago. These patterns, however, only point to the possibility of wide-scale forms of telework, which do not yet exist. The catalyst for this transformation lies in relevant public policy-making.

Policy Applications to Support Telework

ICT capacity building can be undertaken on two related fronts: developing human capital and developing infrastructure and networks. We have already demonstrated how developing nations such as Jamaica and Trinidad and Tobago can build out their networks and infrastructure, as well as their human capital capacity in ICT, as a means toward attaining economic empowerment and the digital inclusion of marginalized peoples. The serious challenge which many developing countries now face, given the acute economic downturn in the global economy, is how to significantly increase the percentage of their workforce that is educated and computer literate, and who can earn incomes independently of threatened traditional workplaces.

Case Studies of Policy Applications: Ireland and Costa Rica

The experiences of Ireland and Costa Rica in pursing a technology lead model of economic development is relevant and useful to small-island, developing nations such as Jamaica and Trinidad and Tobago in their quest for greater ICT diffusion, as well as in planning for the long-run competitiveness of their peoples. As context, O'Riain as quoted by Green (2000) reminds us that:

> the experience of the Irish ICT cluster seems to demonstrate that skills and training are a necessary but not sufficient condition for success in

5. This was part of the exploratory study on Telework in the Caribbean (Cowell & Dunn, 2006).

> global markets. There is also a role for targeted, flexible industry policies in the context of an active partnership with unions, business, and the community. The role for the Government in this context has been characterized as the 'Flexible Developmentalist State,' which is 'defined by its ability to nurture Post-Fordist networks of production and innovation, attract international investment, and link these local and global technology and business networks together in ways which promote development. (O'Riain, 1999)

Against this background, we may briefly examine the strategy employed by Costa Rica in its ICT development, framing it as a foundation on which we can now pursue telework and other conceptual, policy, and technological applications. The Costa Rican government undertook a three-pronged approach—building capacity in health services, empowering people through education, and making extensive investments in ICT. The government systematically invested in skills and capacity building among Costa Ricans through careful investments which started from an Inter-American Development Bank (IDB) loan in 1974. Costa Rica now boasts one of the best software engineering and computer science schools in all of the Americas.

They have also managed to foster an amicable environment where public and private sector collaboration on projects is the norm. Finally, they have also continued the consistent building of their network infrastructure in telecommunications. Also owing to their political stability and investor-friendly environment, they have attracted a number of high tech companies interested in software development (Accenture, Markle Foundation, & UNDP, 2001).

Ireland has moved along a similar path as Costa Rica by investing in education and training. Green (2000) suggests that:

> the evolution of Ireland's ICT sector has been driven not only by market conditions, but by the conscious design and delivery of public policy over a number of decades in the context of EU membership and, more recently, a social partnership. This consisted of measures to attract knowledge-intensive FDI through support for indigenous companies and networks; through Enterprise Ireland's promotion of education and training at all levels in schools, universities and technical colleges; through development of a sophisticated telecommunications infrastructure; through increased funding support for research in third level institutions; and through strengthened linkages between companies and the education sector.

The combination of public and private sector investments and emphasis on education has certainly transformed Ireland's fortunes, as suggested by OECD (as cited by Green, 2000), "Past national strategies for investing in education and training have paid off in terms of faster productivity growth and higher levels of productivity at the aggregate level, and higher earnings and employability at the individual level." Given this context, one can easily understand why Ireland had the fastest growth rate of output and employment of any of the OECD countries in the period 1990–1999, during which the number of jobs increased by 42%. Also, the software industry had the largest market share of FDI (foreign direct investment) flows in Europe, accounting for 55% of the total flow.

ICT Policy Applications and the Relevance to the Wider Caribbean

Even from this limited exploration, it is clear that the experience of Ireland and Costa Rica indicate particular directions which the policy makers and leaders of Jamaica and Trinidad and Tobago may wish to consider, in order to both gain a foothold in the vast and growing global knowledge economy and to expand local engagement in telework practices. The Jamaican government has initiated this process with the development of a national ICT Strategic Plan, which delineates critical areas in which the government and industry should focus for the five-year period, 2007–2012, in order to empower as many Jamaicans as possible through access to, and usage of, ICT. In their draft submission for this national ICT Plan, Dunn and Duggan (2006) have flagged, in Figure 1, eight interlinked thematic areas which they argue deserve priority attention, should Jamaicans fully take advantage of ICT opportunities:

1. e-Inclusion: Open Access to ICT
2. Education and Training
3. Network Readiness and Infrastructure Development
4. e-Government

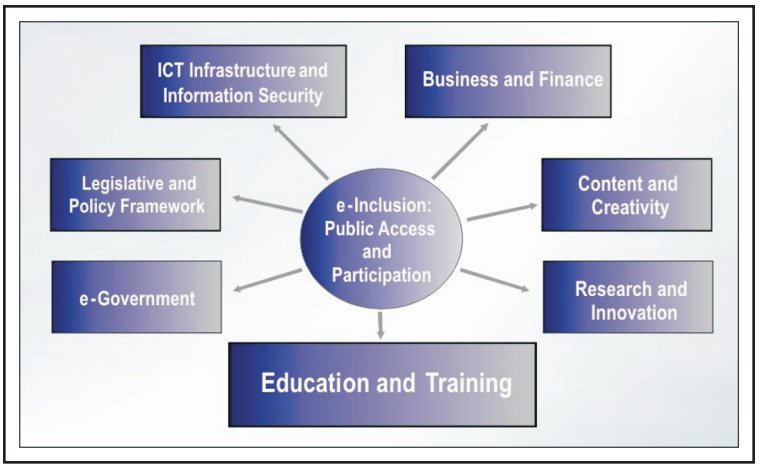

Figure 1. Strategic Roadmap to ICT Development.
Source: Dunn and Duggan (2006)

5. e-Business and ICT Industry Development
6. Research and Innovation
7. Cultural Content and Creativity
8. Legislative and Policy Framework

While these areas go well beyond more limited frameworks commonly available to comparable studies, one could further group them into two distinct dimensions: the infrastructural/technological dimension and the institutional/policy dimension. The institutional dimension involves the political, legislative, and educational processes that contextualize and maximize available technologies. They speak to the human element of ICT diffusion. The infrastructural/technological dimension involves network expansion and technical issues surrounding the diffusion of technologies.

According to Wilson (2004), "since institutions are much weaker in poorer countries, a revolution that is mainly institutional and not technical is not easily achievable." The empirical data seem to corroborate this observation, as has been seen in Ireland and Costa Rica, which first pursued the legislative and policy framework, as well as education and training, as the most important phases of their ICT development strategy. Essentially, they invested in the human dimension first, and the technical dimension second. After Ireland and Costa Rica developed their human capital, issues of network readiness and infrastructure development were then achieved through deliberate public policies that emphasized the suitability and attractiveness of the country to knowledge-intensive foreign direct investments.

While Caribbean ICT infrastructure and policy developments have unfolded differently to date, the available Caribbean research and policy recommendations suggest that the region should consider similar strategies. Countries such as Jamaica and Trinidad and Tobago, which have significant levels of unemployment and, especially in the case of Jamaica, a heavy debt burden, must also initiate their ICT strategic implementation by focusing on education, with an emphasis on information literacy and technology training. This is the model applied by Ireland and Costa Rica with so much success. Education and training will empower people to engage in more sophisticated usage of ICT, which can, in turn, expose them to better teleworking opportunities within and outside of the region.

In corroborating this approach, Dunn and Duggan (2006) suggested the following strategic objectives as an initial phase toward building the Jamaica information economy:

1. Integrate computer education into the pre-primary, primary, and secondary school curricula as a compulsory component.
2. Ensure open access and experimental learning environments at the primary, secondary, and tertiary levels of education.
3. Encourage public/private sector partnerships in ICT training and structure programs for industry-facilitated learning.
4. Develop ongoing systems to align vocational skills in ICT development to the changing needs of the public and private sectors.
5. Provide opportunities for "second chance" literacy and lifelong learning through structured programs in educational institutions.

6. Establish more regional ICT training centers to equip unemployed citizens with skills for self-employment or re-entry into the workforce.

They also call for important policy and legislative reforms:

1. Update the Copyright Act and related intellectual property laws to protect innovation and investment.
2. Establish an evaluation and compliance unit for WTO and other international competition legislation relating to ICT.
3. Create a joint Cabinet sub-committee designed to ensure ownership and involvement in ICT policy making by all other ministries, agencies, and departments of the government.
4. Enhance the pace and effectiveness of implementation of the Access to Information Act.

We could now add to this list the recognition and promotion of telework as a critical additional dimension, given the ubiquity of mobile work-related devices.

Concluding Analysis

The interplay between telework and mobile broadband can be the tool to put ICT to work in the Caribbean. As mentioned earlier, research findings from Jamaica and Trinidad and Tobago are indicating that poor people are using their mobile phones to engage in business- and work-related transactions to enhance their economic survival. We have also demonstrated that, with adequate education and training, in the context of a slow but constant diffusion of ICT in both countries, the economic and overall well-being of the poor and marginalized can improve significantly.

Cowell and Dunn (2006) have found that telework is not prevalent in the target Caribbean countries of Jamaica and Trinidad and Tobago. However, while the concept is neither prevalent nor widely practiced, the findings suggest that the opportunity is there to educate people about its potential.

The factors necessary for the diffusion of telework in Jamaica and Trinidad and Tobago among the middle and upper classes are already in place to a large extent. Both countries have a tertiary level educated group of citizens. However, among marginalized groups, the factors conducive to the deployment of telework practices are sparse; most members comprising marginal groups, such as people in dire poverty and people with disabilities, have limited access to primary or secondary education. Also, members of these disenfranchised groups have unequal access to ICT, specifically, computers and Internet technologies. However, the mobile phone can become a bridging technology for bottom-of-the-pyramid users who may transition through it to more sophisticated usages that may make more elaborate and high-level telework services possible.

The mobile phone penetration rate among low-income users stands at 95.5% in Jamaica and close to 86% in Trinidad and Tobago, which indicates a high degree of comfort and willingness by low-income people to adopt new technologies. Teleworkers could have a similar uptake under an appropriate policy and a context of employee-employer trust.

In the meantime, where telework is not possible, a policy of flexible working could be adopted to vary the start and finish times for work, to deploy job share systems, allow for multi-tasking, and develop special "on the job" information literacy training programs to prepare suitable and trusted employees for company-provided computer systems to work from home or another suitable remote location. A program of widespread wireless public access to the Internet would also help to prepare those with laptops or other advanced mobile tools to readily gain online access. Systematic school- and college-based training, as well as public education and worker orientation programs would help to counter any unwarranted resistance.

While formal telework practices are limited in Jamaica, flexible working arrangements could be a surrogate policy until there is more widespread technology access. However, initial efforts by the Jamaican government to implement flexible working arrangements were resisted by a number of sectors, including church groups and some trade unions. Some resistance is based on regard for the traditional day of religious worship, being either Sunday or Saturday. Employers, trade unions, and the Ministries of Labour and Social Security will need to find shift-scheduling arrangements that avoid such

conflicts. These institutions also need to be enlisted in the technology education process, as well as the ongoing discussion about the benefits and challenges of telework and other flexible work arrangements.

It is clear from the foregoing that the adoption of telework can bring a number of benefits to marginalized groups, including parents involved with child-rearing, the under-employed, persons with disabilities, and freelancers. It is also concluded that, while computer-based telework is far-fetched for the majority of low-income or unemployed citizens at present, a measure of telework through the use of mobile broadband is possible, and is already occurring around the region. This is being done via Internet-ready phones, voice services, texting, and other features accessible to all demographic groups, particularly the poor, many of whom already use the cell phone for income generation. More widespread opportunities among disabled people could be achieved through specialized training and special technology designs that facilitate those with physical, visual, hearing, or other forms of human disability.

The concept of telework and the scope of its potential are not clearly understood in the Caribbean region. Further research and extensive public education on the productivity potential of telework in the region are needed to better ascertain its impact on work practices, industrial relations, and people empowerment.

There needs to be greater coordination between government ministries and agencies with responsibilities for education and ICT in order to arrive at a comprehensive policy document establishing the parameters for an active telework and flexi-work environment in the countries highlighted, as well as in the wider region. The harmonization of Caribbean labor laws and practices would enable the process to proceed on a regional scale. Other key issues in labor policy also need to be resolved, including making appropriate provisions for employed teleworkers where pension issues and occupational health are concerned. ■

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