Government Information Quarterly 31 (2014) 170–184

Contents lists available at ScienceDirect

Government Information Quarterly

journal homepage: www.elsevier.com/locate/govinf

Measuring ICT usage quality for information society building

Bjarne Rerup Schlichter [a,*], Lesya Danylchenko [b]

[a] Aarhus University, Business and Social Sciences, Department of Business Administration, IS Research Group, Bartholins Allé 10, 8000 Aarhus C, Denmark
[b] Ternopil National Economic University, Ukrainian Dutch Faculty, Department of Management and Marketing, Ukraine

ARTICLE INFO

Available online 25 December 2013

Keywords:
(Responsive) information society (building)
World Summit on the Information Society
Digital divide
(Actual levels of) ICT usage
e-readiness
Networked Readiness Index
ICT usage index

ABSTRACT

In 2003 the World Summit on Information Society made a call for measuring the state of Information Society (IS) building between countries. The purpose of the measuring was to assess and compare IS practices around the globe as well as share best practices. A number of measurement tools have since been developed, and a number of previously constructed tools have been employed to fulfil this goal. Even though many variations in terms of indicators have been employed, the construction of measurement tools is subject to certain limitations. One limitation is that they do not incorporate these indicators on the actual levels of Information and Communication Technology (ICT) usage off the country's stakeholders. This paper analyses the most currently used indices for measuring the state of Information Society building from the perspective of their constituent indicators. Based on the analysis, an alternative framework for IS measurement, addressing the important aspects of ICT usage quality, is developed based on data from the EU member states. By applying the framework on measuring of ICT usage quality at Romania, Cyprus and Estonia, the usefulness is tested positive, and the need to evaluate the actual levels of ICT usage for the purpose of better policy-making, while establishing an information society, is accentuated.

1. Introduction

The rapid proliferation of information and communication technologies across the globe in recent decades has fostered the rise of scientific and business interest in the problems of uneven information and communication technology (ICT) usage and information society (IS) building among and within the countries of the world. While it is widely accepted that ICT carries the potential of opening economic opportunities, promoting social and political changes in society, providing access to knowledge, creating stimulus and a field for best practice sharing in all areas of life, the actual processes of informatisation across the globe are quite asymmetrical. "Paradoxically, while the digital revolution has extended the frontiers of the global village, the vast majority of the world remains unhooked from this unfolding phenomenon" (WSIS, 2008). Even though Rodriguez and Wilson III argue that "The information revolution started in today's developed countries, so it makes sense that these countries have higher levels of technological attainment and higher use of ICT products", they further agree that, "…the magnitude of the differences is staggering" (Rodríguez & Wilson, 2000, p.40). "Whole communities and countries may be excluded on account of historical, cultural and economic forces; the gulf between technology-rich and technology-poor countries and continents may be as stark as that between local communities and individuals" (McNair, 2000).

Furthermore, proceeding on the basis that ICT does not operate in vacuum and, as any other technology advancement, is a result of wider developments, namely: scientific, innovation, social-economic, and institutional, uneven ICT diffusion across the world, reflects the disproportional global development. The lopsided pace of ICT adoption around the globe is, thus, an indication of a hardly noticeable, but very powerful process of social-economic dualisation at international and national levels. Moreover, there is a danger that unequal ICT expansion can result in reinforcing the existing social-economic inequalities: "…without internet access, which facilitates economic development and the enjoyment of a range of human rights, marginalized groups and developing States remain trapped in a disadvantaged situation, thereby perpetuating inequality both within and between States" (Rue, 2011, p. 17).

As stated by Sachs, "Today's world is divided not by ideology, but by technology" (Sachs, 2000). By internet technology, we would farther add, indeed, no other development in the ICT context have had such a breakthrough effect, as the creation of internet: "Unlike any other medium of communication, such as radio, television and printed publications based on one-way transmission of information, the internet represents a significant leap forward as an interactive medium. Indeed, with the advent of Web 2.0 services, or intermediary platforms that facilitate participatory information sharing and collaboration in the creation of content, individuals are no longer passive recipients, but also active publishers of information" (Rue, 2011, p. 6).

While recent reduction in costs of telecommunication and internet services contributed greatly to the increase of developing world connectivity rates, large differences between developed and developing

* Corresponding author. Tel.: +45 51 33 90 83.
E-mail address: brs@asb.dk (B.R. Schlichter).
URL: http://badm.au.dk/ (B.R. Schlichter).

0740-624X/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.giq.2013.09.003

countries still remain. According to a recent ITU report, average connectivity rates in developed countries are twice higher, than in the developing countries (ITU, 2012). The gap is even wider when looking at the uptake of advanced internet services, like fixed broadband. While mobile broadband penetration rates are growing in the developing countries, thus reflecting the spread of mobile internet services, fixed broadband services are still unaffordable in most developing states.

In view of this, public discourse on the topic of uneven ICT usage, initiated by scientists, policy makers and businessmen, moved to a global scale and was raised at the world's largest agenda—the United Nations. Two phases of the World Summit on the Information Society (WSIS), organised by the UN and ITU in Geneva (2003) and Tunis (2005), followed the aim of global discussion and development of ways to "ensure that everyone can benefit from the opportunities that ICTs can offer" (WSIS, 2003a).

The Summits 175 government delegates and assignees from various international organisations, ICT and media sector spokesmen, declared their "common desire and commitment to build a people-centred, inclusive and development-oriented Information Society", and acknowledged the challenge "to harness the potential of information and communication technology to promote the development goals of the Millennium Declaration" (WSIS, 2003a). The principles for the building of the IS adopted were transformed into a detailed Plan of Action (WSIS, 2003b), that set specific targets and timelines to advance the achievement of internationally-accepted goals and turn the vision of global IS into a reality.

Considerable attention during both phases of the Summit was devoted to the problem of international performance evaluation and benchmarking the progress towards an IS using comparable international statistics. The Geneva Plan of Action has clearly stated the importance of such evaluations: "appropriate indicators and benchmarking, including community connectivity indicators, should clarify the magnitude of the digital divide, in both its domestic and international dimensions, and keep it under regular assessment, and tracking global progress in the use of ICTs to achieve internationally agreed development goals, including those of the Millennium Declaration" (WSIS, 2003b). In this respect, the Tunis Agenda for the Information Society (WSIS, 2005) noted the launch of the Partnership on Measuring ICT for Development and, among others, its effort to develop a common set of core ICT indicators, which would also be used as a basis for two internationally calculated ICT indices—the ICT Opportunity Index and the Digital Opportunity Index.

The World Summit on the Information Society has generated keen interest, especially in the questions generated in its follow-up and evaluation. Besides the ICT Opportunity Index and Digital Opportunity Index, the Summit outcomes fostered the prolific development of various ICT-related measurement frameworks and tools by international organisations, scientists and policy-makers all over the world.

The significance of conducting such evaluations and comparisons cannot be underestimated. "Without some indication of how all elements of society are adapting to the installation and application of ICTs, there can be no way of understanding whether the shift towards an information society is actually taking place, or indeed, working in positive ways" (Hanafizadeh, Hanafizadeh, & Khodabakhshi, 2009). Furthermore, international assessments and comparisons are valuable tools for policy-makers, allowing the tracking of their country's progress against others, distinguishing leading states in terms of IS building and bridging the digital divide, by examining their best practice, which can be further implemented at national levels.

However, the wide variety of measurement tools and frameworks available for application, creates difficulties in selecting the "best" or "right" measure and, thus, produces a number of questions: what indicators constitute the most widely used indices and what do they actually measure? How profound and realistic are these measurements? What actual conclusions can be made from these measurements?

The purpose of this paper is to present a framework that measures the actual levels of ICT usage, and hence guides policymakers in developing national strategies of responsive IS building.

As a foundation for our paper, we will review the most currently used indices for IS measurement from the position of their constituent indicators, then discuss them in terms of providing a realistic picture of the state of IS development. The paper will continue with an overview of data and description of the methodology used to develop an alternative tool. A presentation of the findings, limitations, discussion and future research directions will follow at the end.

2. Background

This section briefly reviews the relevant literature on IS, e-readiness, digital divide, and provides definitions and the authors' vision on the relations between the concepts. The second subsection analyses the constituent indicators of the most widely used indices for IS measurement, with the purpose of identifying their major focus and limitations.

2.1. Information society, e-readiness and digital divide: definition of concepts and their interrelations

The measuring of information societies is a "grand challenge" (Menou & Taylor, 2006). Especially, when taking into account the abstractedness and generalised nature of the IS concept.

Based on the Geneva Declaration of Principles, a broad definition of the term can be developed: "… Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life" (WSIS, 2003a). The generally used generic definitions of the IS concept, e.g.: "An information society is a society in which the creation, distribution, diffusion, use, integration and manipulation of information is a significant economic, political, and cultural activity" (Wikipedia, 2011); "…a society in which information and knowledge will play critical roles in enabling the development of countries, communities and individuals" (Souter, 2010, p. 11), and "A new form of social existence in which the storage, production, flow, etc. of networked information plays the central role" (Karvalics, 2007), do not offer a clear understanding of the actual IS elements and their extreme points to be measured and compared. Thus, we must agree with Karvalics in this respect, "…it is not definitions that will reveal the genuine meaning of IS but comprehensive analyses extending to all sub-systems" (Karvalics, 2007). "The first challenge is to determine what it is that one is measuring. Is it information in society or an information society? Is it information or knowledge, or both, or ICT? Is it present state, or readiness, or potential, or outcomes?" (Menou & Taylor, 2006).

The core list of ICT indicators (Partnership_on_Measuring-ICT_for_Development, 2010) provided substance to the concept of the IS. The list includes 46 indicators in the following groups: infrastructure and access; access to and use of ICT by households and individuals; use of ICT by businesses; the ICT (producing) sector; international trade in ICT goods; ICT in education. The core list serves as a basis for tracking progress in terms of ICT usage in achieving internationally-agreed WSIS goals. Both the title of the core list, and its constituent indicators, clearly disclose the WSIS approach to IS measurement—by evaluating the levels of ICT integration in the society.

However, the level of IS development is not only characterised by the degree of technology integration, but also by the quality of national policies and regulatory practices that enable and promote the effective use of these technologies with the purpose of development, as well as the capacity of individuals, businesses and other national stakeholders to fully exploit the potential of ICT to improve the quality of life and achieve other goals (World_Economic_Forum_INSEAD, 2011). While the level of ICT adoption addresses the first part of the WSIS definition