

## ICT EVALUATION: ARE WE ASKING THE RIGHT QUESTIONS?

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### ABSTRACT

The evaluation of information and communication technologies (ICT) in development activities has metamorphosed through different phases in the last 30 years. In this paper we explore the experiences of ICT evaluation in the broad business environment and draw parallels with the ICT for development (ICTD) environment. The paper motivates the need for a fundamental paradigm shift in ICTD evaluation. We argue that it is not sufficient to focus on the easily measurable tangible and quantifiable benefits of ICT. We motivate that the intangible benefits of ICT on development such as empowerment, self-esteem and social cohesion are more important from a developmental perspective. Consequently, a more detailed exploration of the theoretical and methodological implications of this shift in the ICTD field is warranted.

**Keywords:** Evaluation, ICT, development, impact, intangible

### 1. INTRODUCTION

The evaluation of the effectiveness of Information and Communication Technologies (ICT) has been evolving since the first commercial deployment of computers. There has been much debate in the field of evaluation with regards to approaches to assess the benefits and impact of ICT, which are elusive and frequently intangible. The introduction of ICT into international development activities since the late 1990s added a new layer of challenges to the already elusive subject of ICT evaluation. This paper discusses the following question: how can we assess the direct and indirect benefits of the use of information and communication technologies in the context of international and community development efforts?

The application of ICTs as a developmental tool has progressed through various phases over time. Thirty years ago the use of ICT for development (ICTD) was viewed by skeptics as a needless luxury: “How can we prioritize computers when people need water and roads?” was a typical response by critics in the late 1980s. Twenty years ago ICTs became a panacea that was euphorically believed to solve every development problem: “ICTs will bring about a new world”, is another example of a typical euphoric claim as we approached the end of the millennium. Ten years ago, however, much cynicism followed the euphoria, fueled in part by the many anecdotal stories of failure and success of ICT experiences in development that characterized much of the ICTD environment during the first few years of the new millennium. Despite widespread investment in ICT by governments and donor agencies, questions still remain as to what are the impacts, if any, of ICT in development.

Today, a handful of researchers have started to ask hard questions about the evaluation of ICT impacts, wondering whether they do exist, and whether there is a way to reliably measure them (e.g., Heeks, 2009a, and TASCHA, 2010). In recent years, nonetheless, ICT and development initiatives are being either *abandoned*, *mainstreamed* into broader sector development themes (environment, agriculture, gender, education, etc.), or “*gadgetized*”: ICTD is becoming a lab where numerous technology applications, devices and

gadgets are developed, hoping they will be adopted and used by people working in international development contexts.

In reflecting on the ICTD evaluation landscape, we suggest the ICTD evaluation field may be too narrowly focused on measuring the tangible and quantifiable *economic* benefits of ICT for development, and as a result we may have been “barking up the wrong tree”. Have we been so concerned with evaluating the tangible social and economic impacts that we have neglected other intangible impacts, which may be equally or more important for human development than the tangible and quantifiable ones? We argue that in the early days of ICTD we were focused on evaluating the outputs (counting number of computers, number of users, etc), and eventually turned our focus towards tangible outcomes related to economic growth such as business opportunities, income generation, new markets, etc. This is convergent with the modernization paradigm of development as transfer of technology for economic growth. To elaborate this idea, we explore the experiences of ICT evaluation in the business world, which has a longer history of ICT evaluation, and draw some parallels which inform how the goalposts in ICTD evaluation could be shifted. We conclude this paper by suggesting a fundamental shift in the way we think about ICTD evaluation. Finally, we point the way towards a mindset which focuses on both tangible and intangible contributions of ICT to human development.

## 2. THE PROMISES OF ICT

One of the most prominent early proponents of the benefits of ICT to human development was then Vice-President Al Gore, who professed that “...we will derive robust and sustainable economic progress, strong democracies, better solutions to global and local environmental challenges, improved health care and ultimately, a greater sense of stewardship of our small planet... [ICT] will help educate our children... it will be a metaphor for democracy itself...” (Gore, 1994).

Two decades ago statements such as this gave both the developed and developing worlds great hopes based on the potential of modern ICTs to assist an acceleration of development efforts and impacts. This sort of rhetoric was in line with the classic view of development as a ‘fast track’ to modernization, and of technology as an inevitable driver of social change (‘technological determinism’). These views of development and technology were coupled with an implicit threat to “get wired, or else”, based on the idea that “although the costs of using ICTs to build national information infrastructures which can contribute to innovative ‘knowledge societies’ are high, the costs of not doing so are likely to be much higher” (Mansell & Wehn, 1998: 7). However, just as the technology world was jolted into reality when the e-bubble burst in early 2000 (Remenyi, Grant & Pather, 2004), and the business world was shaken by the financial meltdown of 2008, the development sector has seen a slow melting of the dream of technology bringing about accelerated development, wealth, and opportunity to the majority of the world’s poor.

With the dawn of the new millennium, and notably the two-phased World Summit on Information Society (WSIS) shortly thereafter (Geneva, 2003 and Tunis, 2005) we have witnessed a proliferation of research output in ICTD, supported by research agencies, non-profit organizations, and academics. British researcher Richard Heeks (Heeks, 2009b) suggests that hundreds of millions of US dollars are invested each year in ICTD projects, and that the ICTD research area is growing significantly faster than other cognate areas. Furthermore, he posits that the ICTD outputs to date reflect: (i) a bias to action and not a bias to knowledge, (ii) a preference for what is narrowly descriptive, and (iii) a field that is not analytical enough. Others suggest that shortcomings of this research area include a lack of theory, conceptual definition, interdisciplinary approach, qualitative research, and longitudinal research (van Dijk, 2006).

After 30 years, the field of evaluation of ICTD is still maturing. In the post hype era of the millennium, there is an opportunity to refocus evaluation by moving beyond the modernization paradigm and by closer introspection of intangible benefits. To inspire this path, we will first discuss the experience of ICT evaluation in the business environment, following which we present views regarding alternatives to the modernization approach to development.

### 3. EVALUATING ICT - LESSONS FROM THE BUSINESS ENVIRONMENT<sup>1</sup>

The challenges of ICT evaluation are not entirely new. For many years, since the first deployment of computers in business, researchers and practitioners have also grappled with evaluation of its impact. Just as we currently recognize the intrinsic connection between ICT and development, in the broad business sector there has long been the idea that the implementation of ICT is indispensable to the provision of effective organizational services. As a result, the implementation and management of ICT has presented both major opportunities and challenges to businesses. Amongst these challenges, the increased complexity of ICTs combined with the uncertainty and unpredictability associated with its benefits and costs, pointed researchers to the development of sound evaluation methods that offer companies a deeper insight into the impact of their ICT investment (Irani, Love & Zairi, 2000).

The business benefits of ICT gained much attention about twenty years ago, when economist and Nobel Laureate Robert Solow characterized the computer age by saying that “we see computers everywhere except in the productivity statistics” (Solow, 1987). This anomaly became known as the productivity paradox of information technology, and there were various reasons offered to explain this paradox, such as “deficiencies in [the] measurement and methodological toolkit” and the “mismeasurement of outputs and inputs” (Brynjolfsson, 1993:66). Other researchers before Solow had explored the potential business benefits of ICT as early as forty years ago (e.g., Boyd & Carson, 1963; Gallagher, 1974; Lucas, 1973). These early studies were concerned with whether technology was being *effectively* used, and explained this effectiveness in a variety of ways ranging from relatively simple accounting measures to complex multi-dimensional balanced score-card type metrics (Bannister, Berghout, Griffiths & Remenyi, 2006); they also explored the use of surrogate measures such as user satisfaction, service quality, individual, and organizational impact (DeLone & McLean, 1992; Lomerson & Tuten, 2005; Seddon, Staples, Patnayakuni & Bowtell, 1999; Whyte, Bytheway, & Edwards, 1997). There are three phases that describe how business interest in ICT evaluation has evolved over the years. These can be mapped against three distinct eras of ICT deployment in business. Laudon and Laudon (2000:15-16) describe the evolution of these eras: “In the 1950s the effects of IS [Information Systems, or Information Technology] on organisations brought about merely technical changes, only serving to automate clerical procedures. During the 1960s and 1970s IT had an impact on managerial control, and from the 1980s onwards IS impacted upon core institutional activities such as products, markets, suppliers and customers”.

A useful categorization of the phases of IT impact on organization was provided by Zuboff (1988) who labeled these phases as Automate, Informate and Transformate: The Automate phase focused on measurement of technical aspects of IT; the Informate phase shifted towards evaluating the measurement of IT production or IT project management; the Transformate phase focused on measurement of business benefits with a shift towards a

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<sup>1</sup> We refer to the *broad private sector* business environment, as a means of reflection on the extant body of knowledge on IT evaluation. This provides a useful basis to contrast with the application and evaluation thereof of ICTs for developmental purposes in a broader societal context.

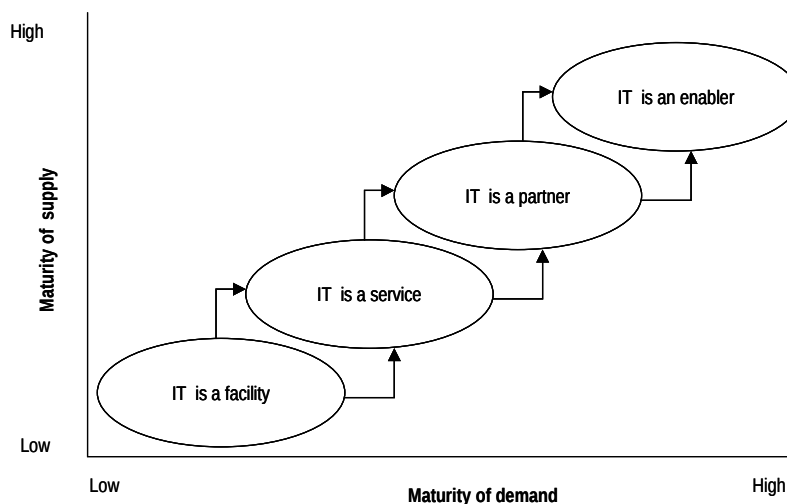
service perspective. With the Transformate phase, ICT evaluation began to focus more on the intangible aspects of business benefits, including issues such as trust, loyalty, and brand improvement in evaluation frameworks.

Before we explore the possible parallels of these models in the field of ICTD evaluation, let us examine in more detail, the *intangible* benefits of IT in the business world.

#### 4. INTANGIBLE BENEFITS OF IT IN BUSINESS

In the business world, especially from the Transformate perspective described above, there are various perceptions of the value that businesses derive from ICT. The value placed in ICT is seen to become higher as its use in the organization progresses from being just a facility to that of an enabler. Wiggers and colleagues suggested the *IT Value Perception Model* (Figure 1, below) to describe how IT value is perceived:

“The maturity of IT supply deals with the professionalism and quality of the IT function in the organisation, with maturity being measured using a quality model such as the Capability Maturity Model (CMM). Maturity of IT demand refers to the self-awareness and self-consciousness of businesses to use and demand an appropriate level of quality from their IT supportive organisations. The IT value perception describes the perception of the executive management of the added value that IT delivers to the company”. (Wiggers et.al., 2004:5)



**Figure 1: The IT Value Perception Model (Source: Wiggers et al., 2004: 4)**

Similarly, in the ICTD environment as both maturity of demand and supply increase with increasing investments in infrastructure, our evaluation foci should be tending towards dimensions and metrics related to *enablement*. Thus, the context of ICT from a development perspective must focus on ICT as an enabler, e.g., of socio-economic development. However this is exactly where the evaluation challenge becomes more complex, as ICT may *enable* a diverse set of outcomes that are difficult to link from an attribution or cause-effect perspective.

The implementation of ICTs, regardless of the setting, can result in a variety of benefits, some tangible, some intangible, and even some unexpected benefits (Kohli, Sherer, & Baron, 2003). In the business domain, a tangible benefit is one which directly affects the firm's profitability, whereas an intangible benefit is one which can be seen to have a positive effect on the firm's business, but does not necessarily influence the firm's profitability directly (Remenyi, Money, Sherwood-Smith, & Irani, 2000). A number of approaches have

been adopted to evaluate both tangible and intangible benefits of IT. Examples of IT evaluation techniques over the years have included system usage (Srinivasan, 1985; Trice & Treacy, 1986); information value (Gallagher, 1974); user satisfaction (Bailey & Pearson, 1983; Shaw et al., 2002); and service quality (Jiang et al., 2002).

Hitt and Brynjolfsson (1996) posit that the question of IT value is not a single one, but rather consists of several related but distinct issues such as *increased productivity*, i.e., is there now more output per given quantity of input? *improved business profitability*, i.e., has the business been able to use IT to gain competitive advantage and earn higher profits than it would have earned otherwise? *improved value for consumers*, i.e., what is the magnitude of benefits that have been passed on to the consumers? In terms of the latter, the issue of profits is not relevant in the ICTD domain. However *improved value* for both individuals and communities is of increasing concern, and as suggested already, the measurement constructs associated with such value is usually intangible.

| IT Benefits in Business                                             | Tangible                                                                                             | Intangible                                                                                                                                      |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Quantifiable<br>(can be measured)                                   | May be objectively measured;<br>e.g. increase in revenue;<br>reduction in costs                      | Difficult to measure objectively, e.g. obtaining information faster;<br>improved customer satisfaction                                          |
| Unquantifiable<br>(cannot be measured or more difficult to measure) | Precise impact on profitability cannot be measured,<br>e.g. better information;<br>improved security | Difficult to put a financial value to the benefit, e.g. increased customer confidence; customers or employees' perception of the firms product. |

**Figure 2: Examples of Tangible and Intangible IT benefits in a business context**  
(Adapted from: Remenyi et al., 2000: 29-30, 152-153)

From the figure above we can observe that unquantifiable, intangible benefits are those which are the most difficult to measure, assuming that some form of measurement is the goal of management and other decision makers. However, this does not imply that these areas of intangible IT benefits need to be excluded from evaluation. Likewise in the ICTD domain we are hard pressed to extend evaluation frameworks of quantifiable data that are more easily measured such as teledensity, bandwidth per capita, number of connection points, number of training certificates issued, etc. Taylor & Zhang (2007) hone in on the issue by arguing that “when a technology is regarded as the prime initiator of change in society, measuring the changing technology might seem to be enough” and that “measuring computers, cables, and connections tells us very little about the actual state of society”.

Let us now turn to the evaluation of ICT in development contexts. In doing so we draw some lessons from the business world in order to help move the field from the early euphoria, subsequent instrumental focus on primarily tangible, economic benefits of ICT on society, towards a more “mature” evaluation perspective which incorporates intangible, unquantifiable impacts of ICT in development contexts.

## 5. EVALUATION OF ICT IN DEVELOPMENT CONTEXTS

Although we have developed a substantive body of knowledge regarding the evaluation of ICTs in business contexts, we have yet to understand how the extant research outputs can be

applied in ICTD contexts. Researchers, studying business benefits of ICTs, have over the years adapted theories from other disciplines in their quest to develop models for evaluating ICT benefits. Examples of these include Communications Theory (Shannon & Weaver, 1949), Resource-Based Theory (Penrose, 1959), and Theory of Reasoned Action (Fishbein & Ajzen, 1975). However, even the business information systems researchers have been challenged. This is evident in the fragmented body of ICT effectiveness knowledge and lack of consistent trends in the application of the associated theoretical paradigms. Moreover the tools and techniques to evaluate ICTs in the business environment are not useful in the context of societal development. This therefore exacerbates the problem, as existing theories and models need to be studied carefully and adapted, if this is indeed possible, for application in the context of ICTD evaluation. Alternatively new theories for ICT evaluation needs to be developed. This of course has been recognized by the scientific community, and there have been a number of calls to the ICTD research community to respond to the challenge by providing new theories and methods e.g. van Dijk (2006); Heeks (2006); Pather & Uys (2010). Perhaps, more importantly, we require theories which will enhance a deeper understanding of the effects of ICTs on social outcomes and the level of success thereof. Perhaps then only will assessments of economic outcomes derived from ICTs be more meaningful.

A new approach to ICT evaluation in a development context would also be convergent with transformations in the notion of development itself. While early notions of development simply equated it with economic growth and transfer of technology from developed countries to underdeveloped ones, theories of development have long abandoned such simplistic and mechanistic approaches in favor of a more holistic view. Such a view includes meeting basic needs in an endogenous process that builds participatory democracy, strengthens self-reliance, promotes structural changes, and fosters empowerment and liberation (Servaes, 2008; Melkote, 2001). But the changes in approaches and theories of development do not seem to have affected the field of ICTD, which seems to be still in the development as modernization paradigm.

Today, thirty years after the ICT *productivity paradox* was highlighted, the challenges faced in evaluating impact and productivity are as relevant in the ICTD context as they were in the business environments back then. This underscores the difficulties associated with measuring ICTs regardless of the area of application and not least of which relates to the issue of impact measurement. The ‘productivity’ resulting from ICTs in respect of facilitating socio- economic development of the large numbers of impoverished and underserved communities are still to be properly understood. This is underscored by Heeks (2008:27), who in evaluating the initial ICTD era argues that insofar as evaluation is concerned the work in this field was “*held aloft by hype and uncorroborated stories, which fostered a new interest in objective impact evaluation*”.

Thus, in the ICTD environment the same questions that confronted businesses for many years still prevail, especially since the digital divide is a phenomenon linked not only to the topic of access to the Internet, but also intrinsically to the one of usage and usage benefit (Fuchs & Horak, 2008). Even though millions of dollars have been spent on ICTs by donor and government agencies around the world, we still do not have sufficient insight into appropriate methods for evaluating the effectiveness of these technologies on especially socio-economic development. Many ICTD studies and commissioned research by governments tend to focus on quantitative data in respect of penetration and rates of usage and adoption. However the true value of social development is not easy to conceptualize and hence measure. Parthasarathy & Srinivasan (2006) make a strong case that by relying on easy to measure data for well-defined indicators, econometric techniques may well suffice to measure development, but development also leads to changes that are not economic and not

all social changes lend themselves to measurement using well-defined indicators. Qureshi (2005) is also critical of macroeconomics models used by International Agencies to predict the effects of government policies relating to information technology investments and services on economic growth. She argues that while these models play a pivotal role in decision making, they often cannot explain why certain IT policies do not have the effects intended of them, or why certain investments in IT infrastructure do not bring about social and economic change. Taylor & Zhang (2007) lend support to this critique when they assert that ICTs do not create the transformations in society by themselves; they are designed and implemented by people in their social, economic, and technological contexts.

## **6. TANGIBLE IMPACTS OF ICT FOR DEVELOPMENT**

There are no dissenting voices in respect of the potential of ICTs to support social development and numerous interventions have been deployed around the world with the goal of bridging the so-called “digital divide”. Governments and various non-government and private, for-profit organizations have jointly invested significantly in this effort. Heeks (2009b), for example, in examining a “very broad notion” of ICTD estimates that as of 2007 a total of US\$840 billion has been invested in all developing and transitional economies, and approximately US\$57 billion in low-income countries (GNI <US\$935). Notwithstanding such astronomical figures of investment, well articulated evaluation frameworks, spanning both tangible and intangible impacts, are still a major stumbling block common across developed and developing countries.

A variety of factors account for this problem, including the sheer complexity of the task of measuring the impact of information on development, the lack of appropriate impact indicators, and the difficulty to collect relevant data. Ten years ago we showed that “until relevant methodologies and adequate tools are developed to effectively assess the social impact of the application of ICTs for sustainable development from the user’s perspective, efforts to demonstrate how people are empowered by knowledge will lack credibility” (Gomez, Hunt & Lamoureux, 1999). The evaluation problems were also corroborated by others, such as Batchelor et al. (2003) whom, in reporting in a study of seventeen of the World Bank’s InfoDev ICTD projects found that:

“...analysts and decision makers are still struggling to make sense of the mixed experience of information technologies in developing countries. Very often such experiences seem to amount to little more than a heterogeneous and unrelated set of anecdotes. However spectacular, successful, moving, or important some of these anecdotes may be, they remain a precarious basis for justifying major policy or investment decisions”.

Indeed there can be no doubt that we have witnessed steady, albeit slow, progress insofar as closing the digital divide from the perspective of broad access to ICT. For example, ITU statistics show that over the last 10 years, the digital divide between the developing and the developed countries has been narrowing in terms of fixed telephone lines, mobile subscribers, and Internet users. In contrast to the slow fixed line growth, phenomenal growth rates in the mobile sector particularly have been able to reduce the gap that separates the developed from the developing countries from 27 in 1994, to 4 in 2004. The fixed line gap has been reduced from 11 to 4 during the same period (ITU, 2006).

Nonetheless, more infrastructure and more access does not necessarily translate into more meaningful use of ICT, and the evidence of its contribution to social and economic development is still limited. International agencies have explored innovative ways to measure

the success of their initiatives and their impact on human development with different degrees of success. Let us briefly discuss some of the most salient experiences in this regard:

**World Bank:** The World Bank and its affiliates, the International Telecommunications Union (ITU) and the OECD, have tended to focus on statistical indicators of economic growth and human development indices. The World Bank's recent studies focus on the deployment of broadband connectivity and mobile telephony, and its contribution to businesses and government applications (World Bank, 2009 ICTD Report, Extending Reach and Increasing Impact).

The World Bank's flagship program on ICTD, InfoDev, has focused on drawing implementation lessons from its many pilot projects around the world and developed a framework for monitoring and evaluation of pilot projects on ICTD (Batchelor & Norrish, undated).

**International Donors:** Several international donors such as Canadian, Swiss, Danish and Swedish International Development agencies (CIDA, SDC, Danida and Sida, respectively) and international agencies (UNESCO in particular) have followed broadly the same direction of InfoDev and other World Bank program directions described above. Agencies such as the Canadian International Development Research Center (IDRC), on the other hand, have increasingly moved away from a focus on impact to that of outcomes in evaluating development activities (Earl, Carden & Smutylo, 2001). The shift is significant: rather than trying to assess large-scale social impacts, which happen slowly over time and are the result of what many people do, outcome mapping focuses on assessing the direct and observable changes in behavior that can be directly attributed to the activities that are implemented as part of a development program. The shift from evaluating impact to mapping outcomes comes at a cost. The detailed process to effectively conduct outcome mapping is extremely time consuming, and the resulting findings offer limited explanation of the larger, broader, or longer-term benefits social development is expected to produce.

The evaluation of ICTD activities has been caught at the crossroads of these three trends. The statistics and tangible indicators for economic growth, the lessons learned from pilot studies or scattered anecdotes of success, and the detailed documentation of outputs and outcomes do not add up to an understanding of larger social or economic impacts, which are essential to inform better policy decisions and program implementation.

## 7. A WAY FORWARD: ASSESSING INTANGIBLES IN ICTD

A fourth trend is emerging in the ICTD evaluation field. This trend is demonstrative of evaluation frameworks which focus less on direct and tangible economic, social, or political benefits and more on indirect, intangible benefits. These are more difficult to measure and point to deeper and more pervasive effects on individuals and communities.

After 20 years of euphoria, and after 10 years of seeking out tangible, quantifiable and instrumental impacts of ICT for development, we are still missing the boat. We are still unable to account for the impacts (both positive and negative) of ICT for human development. It is time therefore to start building a framework to inform new evaluation paradigms which evaluate the intangible, non-instrumental, unquantifiable impacts of ICT in development contexts.

Drawing a parallel with the business models discussed earlier, in the field of ICT for development we appear to be still in the early phases of measuring tangible, quantifiable benefits (in Zuboff's model, the Automate phase, measuring technical aspects of ICT) and Informate phase (measuring ICT production and project implementation), but with little inroads into an equivalent of the Transformate phase seen in the business world: such an approach would focus on intangible, unquantifiable benefits as well as the more easily

measured tangible, quantifiable benefits. What would the intangible benefits of ICT for development look like? In Figure 3 we offer a preliminary characterization:

| Phases of Impact Evaluation                                  | Business IT<br>(based on Zuboff, 1988)                                                     | ICT and Development                                                                                                                                                                                                            |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Early:<br><b>quantifiable, tangible outputs</b>              | Automate: measure technical aspects of IT (rate of information flow, accuracy, timeliness) | Euphoria: quantifiable outputs (number of computers, number of users, rate of bandwidth consumption; teledensity; e-literacy rate; etc)                                                                                        |
| Intermediate:<br><b>measurable, mostly tangible outcomes</b> | Informate: IT production and project implementation                                        | Instrumental: economic outcomes (income generation, business opportunities, etc)                                                                                                                                               |
| Mature:<br><b>unquantifiable, intangible impacts</b>         | Transformate: service perspective, intangible benefits (trust, loyalty, brand, etc)        | Intangibles: aspirational outcomes (empowerment, self esteem & self worth; social cohesion & social fabric); citizen empowerment (relationship with governments); Individualised motivator factors (achievement, recognition). |

**Figure 3: Phases of ICT Evaluation in Business and in Development**

There are indications of a growing awareness of the need to explore intangible and unquantifiable impacts, even among the international organizations that have promoted the early focus on tangible and measurable outputs and outcomes. For example, the World Telecommunication and ICT Development report (ITU, 2006) stated that:

“Instead, the most important economic impact of the spread and use of ICTs is indirect, by transforming the way individuals, businesses and other parts of the society work, communicate, and interact. The beneficial impact of ICTs on productivity – which can help reduce poverty – is of particular interest as ICT diffusion levels across all countries rise. One way of understanding the difficulty of measuring the impact that ICTs have, is to imagine the impact that electricity has had on the economy and society. As with ICTs, there is no denying that electricity has had important impacts on individuals, businesses and society at large but its measurement is elusive. Part of the difficulty is that both ICTs and electricity are “enabling” or “General Purpose Technologies”, which means their use and their impacts are ubiquitous yet difficult to measure because they are mainly indirect. It is not electricity or ICTs as such that make the (bulk) impact on economy and society but how they are used to transform organisation, processes and behaviours”.

The foregoing endorses our views regarding the “elusive” and “ubiquitous” nature of ICTD impact measurement, and also highlights the importance of focusing on the “enabling” and “transformational” aspects in our evaluation frameworks. McNamara (2003) extends this point in the following excerpt, emphasizing the enabling role of ICTs in one of these elusive areas impact viz. that of social capital:

There is increasing evidence that a dense and complex layer of social institutions, formal and informal groups, and networks of interaction and common interest between the individual citizen and the state is good both for the stability and responsiveness of the political system and for the economy and society as a whole. This social capital enables richer and more diverse views to surface on important societal issues, empowers groups to address common concerns and interests without necessarily relying on government intervention, and can even help the emergence of social consensus by permitting multidirectional debate and sharing of information among those with different perspectives through mechanisms that are not directly tied to the formal political and governmental structure. By facilitating new forms of many-to-many communication, collaboration, and information-sharing, both within a given country and among groups with similar interests and concerns across borders, ICTs can add to the vibrancy of civil society institutions and networks as a check on government, a source of ideas and innovations, and an outlet for the interests, concerns and desires for solidarity on the part of individuals and groups. (McNamara, 2003)

A question worthy of introspection is “*Why have these calls for attention to intangible impacts, from influential people and organizations, fallen on deaf ears?*”. Our premise is that this lack of response is simply because evaluating intangible impacts is far more challenging, and hence we have chosen not to go down the path of complexity and murkiness, and our baskets of tangible and quantifiable indicators remain as they are, incomplete as they may be. Similar evaluation problems have been faced before, e.g. evaluating benefits of water supply and electricity. One such study highlights the intangible aspect of *empowerment*. In this study it was found that given that the poor often feel marginalized and their lives can be characterized by a sense of powerlessness and instability, even the perception of benefits can assist in empowerment, which is likely to lead to proactive initiatives by the poor themselves (Songco, 2002). Another example of an intangible impact, referred to by McNamara above is that of cohesiveness. In the words of Reimer, only cohesive people can “respond collectively to achieve valued outcomes and to deal with the economic, social, political, or environmental stresses (positive or negative) that affect them” (Reimer, 2002). This therefore suggests that the tangible impacts that we have been so focused on are in fact facilitated and preceded by the intangible impacts on which we have been focused. Thus we have expended our energies on evaluating impacts which are too far down the impact timeline, and this has contributed to the fuzziness which belies the linking of ICTs with development.

We suggest therefore that examples of intangible impacts which need to be evaluated could include empowerment, self-esteem, and sense of self-worth, at the individual level, and social cohesion and strengthening of social fabric, at the collective level. Social cohesion was defined by Ritzen and colleagues as “a state of affairs in which a group of people demonstrate an aptitude for collaboration that produces a climate for change” (Ritzen et al, 2000). According to these authors, the role of social cohesion is to strengthen the trust inside and between different social groups in order to accelerate socio-economic growth with “a reasonable distribution over those groups in the population”. In the same way, Maxwell (1996) identified social cohesion with the processes of building shared values and communities of interpretation, reducing disparities in wealth and income, enabling people to have a sense that they are engaged in a common enterprise, facing shared challenges, and that they are members of the same community. These are all impacts that have been anecdotally

reported in the ICTD literature, but with little traction in the face of the dominant attention paid to tangible and quantifiable, economic impacts.

Let us take the case of a small semi-rural fishing village in the southernmost tip of Africa. None of the fisherman in this village have actually learned how to use the public access computer at the local library, a typical community based ICTD project<sup>2</sup>. However evidence from a case study (Pather & Mitrovic, 2008) indicates that the public access computers in the library provided a means of uniting the fishermen around a common cause related to fishing licenses. This in turn improved their basic livelihoods in indirect ways. If the evaluation of the centre was based on tangible measures of usage statistics, such an impact would not have been identified. In this case, a closer look at issues of *empowerment* and *cohesion* provided evidence that ICTs have indeed transformed the life of the community in ways that are far more important than what the number of users of computers would reveal.

## 8. CONCLUSION

We require new measurement strategies and a shift in focus from measuring the tangible symptoms or outputs to measuring intangible outcomes e.g., the more strategic development goals such as improved self-reliance and social cohesion. These are important building blocks of socio-economic development, and thus our ICT evaluation toolkits need to account for such indicators. Currently agencies and governments find it difficult to rationalize their expenditure and evidence. At most, much of the evaluation done to date is based on quantitative output. Some agencies, though not all, are able to provide data such as the number of people trained or rate of usage of centers. However this in itself does not inform us if any meaningful change has been brought about in people's lives. An important question that should therefore be placed on the ICTD research agenda is: *How do we extract credible evidence of the socio-economic change in people's lives, especially when this change is unquantifiable and intangible?* A further question that should also be placed on the agenda is: *what are useful techniques for evaluating such change?* The value of ICTD evaluation lies in producing data that substantiates socio-economic outcomes and impact. The research and practitioner community has to work hard to ensure that as the next era, viz. ICTD 2.0 (see Heeks, 2008) dawns upon us we should no more be held aloft by hype and uncorroborated stories.

The example of the fishing village described in the foregoing section is a typical case of an anecdote which does not convincingly provide evidence of impact due to a lack of a suitable framework which goes beyond tangible and quantifiable indicators of success of ICT for development projects. A collection of numerous anecdotes such as this does not, in itself, constitute evidence of impact. Instead, a structured approach to evaluate impact of ICT, which includes attention to intangible and unquantifiable aspects (e.g. self-worth and the strengthening of social fabric) that are *facilitated indirectly* through use, or even the presence of ICTs, will provide a more complete and holistic perspective of ICT impact.

Finally, we discussed how the euphoria and disillusionment with ICT for development may be a consequence of two issues. Firstly, it stems from its roots in a modernization paradigm which equates development with economic growth. Secondly it has to do with an evaluation approach that focuses on measuring quantifiable, tangible outputs and outcomes of the ICTD interventions. Drawing from the experience of ICT evaluation in the business environment we suggest that it is not only possible but desirable to mature into an evaluation paradigm which includes attention to intangible and unquantifiable impacts of ICT. Thus a focus on empowerment and social fabric instead on economic growth would also be

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<sup>2</sup> For an overview of the Cape Access Project see <http://www2.capeaccess.org.za/>

convergent with current theories and approaches to development, which have long abandoned the modernization paradigm. To this end, all stakeholders in the ICTD environment, including researchers, practitioners, and funders need to undergo a process of conscientization. In so doing we should aim to detach ourselves from the fixation with narrow tangible and quantitative impact metrics. A more detailed exploration of the theoretical and methodological implications of this shift in the ICT for development field is warranted.

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