From Technologists to Social Enterprise Developers: Our Journey as "ICT for Development" Practitioners in Southern Africa

View From Practice

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ABSTRACT

It is easy to find in the research literature examples of information and communication technology for development (ICT4Dev) initiatives that have failed. Rather than continue with a focus on technologies, our journey has led us towards the establishment of a network of community-based, ICT-enabled, sustainable micro services enterprises (called Infopreneurs[TM]) where "development through enterprise" is the key. The writers argue that such success requires a more socially responsible approach to business development. We have found that when the service delivery channel is enhanced by a coordinated approach to ownership and channel support, community-based businesses work well. On this journey, the challenge has been to deploy ICT in "production" mode, so that saleable products and services can be quickly delivered to the targeted community. On the basis of such learning, this article sets out a new paradigm for practitioners in this field. Here the term Infopreneurs[TM] is used to describe an ICT mediated network of "social entrepreneurs" who deliver sustainable and community level e-Business in Southern Africa. © 2008 Wiley Periodicals, Inc.

1. INTRODUCTION

1.1 Information and Communication Technologies for Development (ICT4Dev) Have Failed

Strip away all the hype about rural telecentres and e-government for the masses and telemedicine for remote regions and e-commerce for micro-enterprises and what you've got—when you apply ICTs

to the millennium development goals (MDG) agenda—are the rusting tractors for the 21st century. Most of these projects never properly work, and for those that might just get off the ground, go back 2 years later and it's all crumbled to dust. Yes, there might be exceptions but they are just that – exceptions; occasional minnows swimming against a riptide of failure. Our evidence base on this does need strengthening but a recent survey suggests at least one-third of such projects are total failures and one-half are partial failures, leaving little room for success. We are often blinded from this reality by the blizzard of e-development pilots, prototypes, plans and possibilities where "would" and "could" replace "does" and "has." (Heeks, 2005)

1.2 ICT Intensive Community Development Centers in the South African Context

In support of the Heeks' viewpoint mentioned above, there are a number of developments in the service delivery arena of developing countries in the south that are worth mentioning. One of these is the multipurpose community centre (MPCC) initiative in South Africa.

It is clear that the application of ICTs to enhance the effectiveness of MPCCs has been seen as a one of the "silver bullets" in the minds of a large section of planners as well as implementation agents and authorities to ensure enhanced effectiveness of such community-level development facilities. Unfortunately, the following comments about these initiatives are currently the rule rather than the exception:

From the burgeoning body of literature on experience with telecentre-focused MPCCs—in South Africa, as well as the rest of the continent where numerous donor-driven initiatives have been launched—it is evident that most MPCCs cost too much capital for the services they deliver, have great difficulty in covering running costs, and can only be sustained through ongoing donor grants or government subsidies. (Du Buisson, van Rensburg, & Naudé, 2003).

1.3 Challenges Regarding Ownership, Benefit, and Sustainability

With the precision tools of hindsight, it has become quite clear that the relatively simplistic views of the "enabling powers" of ICTs in the development arena has failed to deliver on the promised development goals, whether MDG or otherwise.

A classic example is Gyandoot; an initiative of computer kiosks in rural India. In 2000, amid much fanfare, this won awards from the Stockholm Challenge and the Computer Society of India. Later studies of Gyandoot in 2002 did not hit the headlines, but they found kiosks abandoned or closed; absurdly low usage rates of once every two-three days; and few signs of developmental benefits. (Heeks, 2005)

2. OBJECTIVES

This article will argue that development and implementation practitioners need a *changed mindset*: one that sees the *creation of ICT-enabled, service-orientated entrepreneurs* focused on using ICT in "production" mode (i.e., "the creation of hardware, software, and other components of the ICT infrastructure;" Heeks, 2005) as well as *content* (our addition to this list) as their main objectives.

The objectives of this article are therefore threefold. They are an effort to:

- provide an *overview of the practical position* at which we've arrived after a period of thirteen years of work in the ICT4Dev arena: "Where are we now?" and "How did we get here?";

- *share lessons learned:* "What has been learned?" and *challenges identified* during this period; and
- invite *comments* on (and participation in) this ongoing learning.

3. WHERE ARE WE NOW?

In the last 3 years, the focus of our work as ICT4Dev researchers and developers has *shifted* extensively from (a) *researching, developing, and deploying technology* "tools" and applications to (b) *establishing* an ICT-enabled, sustainable "*community of enterprises*" that delivers on the development and trade outcomes required in the South African context, i.e., a network of people we call *Infopreneurs*[TM]. This change in approach resulted from our own failures at ICT4Dev implementations, and our observation of many other failures around us.

Our changing emphasis is an effort to *address* both *the service gap* (between local-level government and under-serviced communities) and *the trade gap* (between so-called second economy, emerging enterprises, and formal, first economy enterprises (see Figure 3).

According to our model, a whole *community of practitioners* and associated contractual *relationships* can be deployed. This community eventually *produces valuable data and knowledge* concerning service delivery as well as buying and usage patterns at "the bottom of the pyramid" and therefore becomes participants in the local *knowledge industry.*

Figure 1 provides an overview of the evolution of our thinking "up" the *value addition scale*, from "box movers" to "business facilitators" of a community of enterprises that participates in the "knowledge industry."
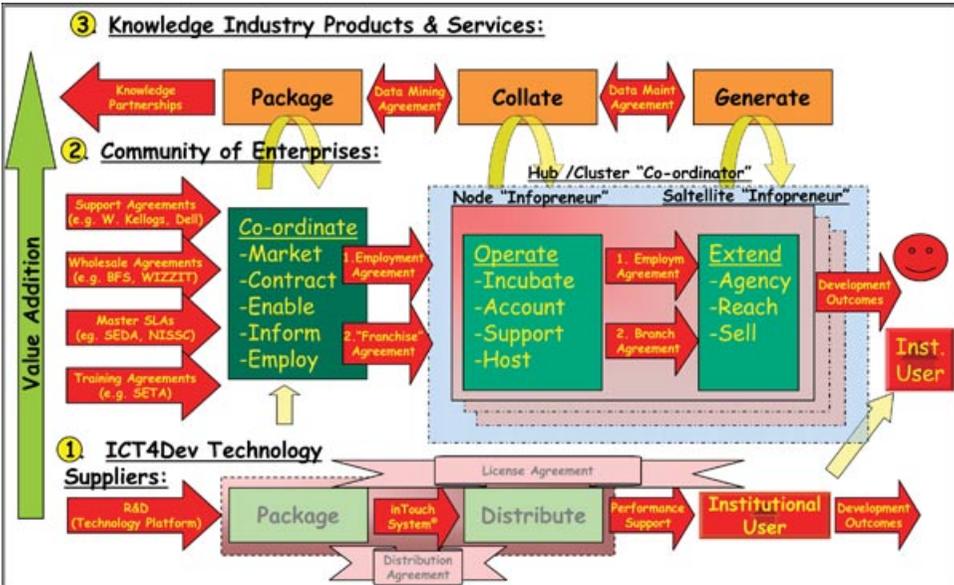

Figure 1   From "box movers" to "business developers" and beyond.

4. HOW DID WE GET HERE?

The approach, focus, and methodologies used by us during the 13 years of activity in the ICT4Dev arena are depicted on the matrix in Figure 2.

Our organizational definitions for the various types of activities (Figure 2) are as follows:

Type A Research: New knowledge creation trough strategic basic and applied research. This type of research creates new science and technology (S&T) platforms and is undertaken within the framework of potential applications (referred to as directed research).

Type B Research: New knowledge creation through experimental development (systematic research drawing from existing knowledge to substantially improve current products), problem solving, and solution development. It usually links strongly to Type A research.

Type C Research: Nonroutine knowledge application; specialist services (improving customer knowledge, decision support, and capability) and technology transfer activities.

Massification: This category of activities in most cases includes commercialization. It is an area that (unfortunately) formally falls more and more outside of the official scope of science and technology institutions but where a lot of knowledge is still lacking, especially as far as the ICT4Dev arena is concerned. There is also a challenge to do massification in a manner that provides quick and reliable "feedback" to the research and development environment. Rural Living Labs have started to provide these "umbilical cords," and we intend to utilize these (see the Conclusions section).

From the above-mentioned, it should be clear that our expertise and knowledge base has been shaped around Small, Medium, and Micro Enterprise (SMME) service delivery
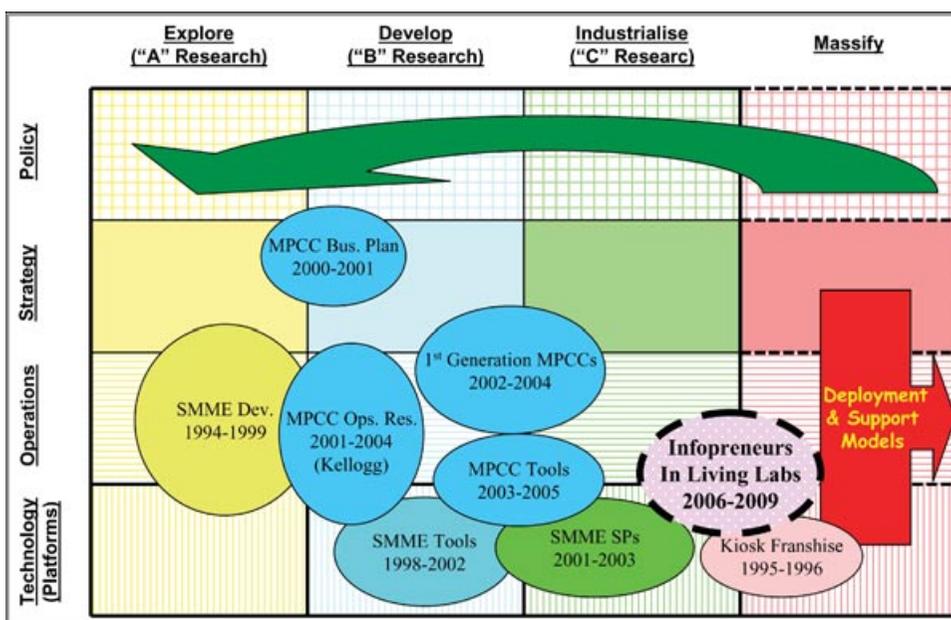

Figure 2   Research, development, implementation and massification activities over 13 years.

TABLE 1.   Groupings of Research and Development (R&D) and Related Outcomes

Experience	Dates	Type of activity	Outcomes	Discussed in paper
Obtain an understanding of SMME development practice and processes in a developing economy (SA)	1994–1998 (5 years)	A (80%) & B (20%) in the operations arena	Highlighting the importance of the mediator/ facilitator in a developing community context	5.1
Deploy a national network of public, self-help, touch-screen kiosks in a franchise model in high pedestrian traffic environments	1995–1996 (2 years)	C (40%) & Com-mercialization (60%) in operations & technology arenas	Highlight the importance of allocating resources (tools, skills) to all tasks in the "information economy"	5.2
Developing & deploying software systems in community level development facilities (SMME & multipurpose community centers)	1999–2004 (5 years)	B (60%) & C (40%) in operations & technology arenas	Highlighting implementation challenges in the technology adoption and ownership spheres	5.3
Developing robust implementation models for sustained (development) service delivery in developing economies	2004–Date (4 years)	C (60%) & Massification (40%) in operations & technology arenas.	Highlighting the importance of solid business development approaches in the ICT4Dev arena	5.4

and support operations research, developing models for MPCC operations, ICT4Dev application development, ICT4Dev application implementation, and ICT4Dev implementation "massification" initiatives (current challenge and focus). The broad *groupings* of these activities and their outcomes are provided in Table 1.

5. WHAT HAS BEEN LEARNED?

We do not claim that our learning is unique and, indeed, most of it can be confirmed by other practitioners in the same arena. We nevertheless hope that this article provides a summarized and integrated collection of the most important (sustainability) lessons learned. We hope that it might lead to a more "reality-based" discussion and approach amongt ICT4Dev practitioners in developing economies.

   Drawing on our experiences, this article will deal with the most important aspects concerning the Infopreneurs[TM] model as it has evolved to date. These aspects are as follows:

- Infopreneurs[TM] as community (development and trade) facilitators
- Infopreneurs[TM] as local content creators and maintainers

- Infopreneurs[TM] as technology and change owners and adopters
- Main ingredients of the Infopreneurs[TM] "franchise-like" model

5.1 Infopreneurs[TM] as Local Facilitators in the Development Context

Our piloting and validation have confirmed the importance of the "*local champion*", especially in the ICT4Dev arena. In our experience, this has come to mean an established and *trusted* community member with a good track record and a (confirmed) *entrepreneurial interest*, acting as the community access point (see Figure 3) for the facilitation of services and products *into—and out of*—the under-serviced community. Important aspects of the *main roles* of these "local champions" are discussed hereunder and illustrated in Figure 3.

5.1.1 Extending Reach and Bridging "Gaps". These local community service entrepreneurs act as "bridge builders" for services not available in the local context. These services frequently have a high "transaction cost" in terms of the money that needs to be spend in order to access them. They also provide the "local intelligence" that should *inform and shape the delivery* of these services. The Infopreneurs[TM] are therefore positioned to act as *local agents* for the "owners" of these services.

They are also positioned and equipped to act as bidirectional "*match-makers*" between the so-called first economy businesses and second economy participants (individuals and emerging enterprises) in the community. Slavova provides an insight into the positive contribution of these *intermediaries* in emerging economies: "The performance-enhancing
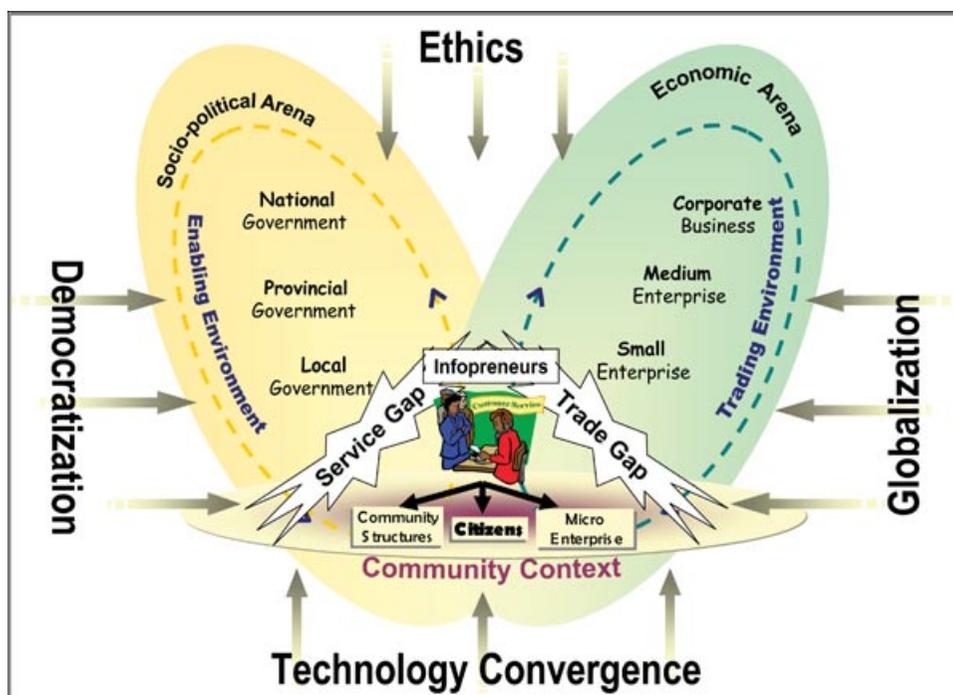

Figure 3 Local Infopreneurs[TM] as "access points" within the community context to "bridge the gaps."

functions of intermediaries include aggregating supply and/or demand, reducing asymmetries between atomic agents on one side of the market and big players on the other side, reducing operating, processing or coordination costs, providing payment and delivery services, matching buyers and sellers (Bailey & Bakos, 1997; Spulber, 1996). Formal intermediaries smooth the functioning of markets by assuring market clearing, price discovery, liquidity and immediacy. They also facilitate matching and searching, guarantee and monitor transactions" (Slavova, 2007).

5.1.2 Providing the "Development Energy".

One of the more serious challenges that we have encountered is that of "switching on the lights again" in people where long-term poverty had diminished the belief in a better and improved life. Within such "darkness," it is frequently necessary to rekindle the pursuit of an improved life through the introduction of new visions and energy from "outside." The Infopreneurs™ are equipped and supported to act as the embodiment (and carriers) of this *renewed energy and hope*—custodians of the *modern "community well"* where *"fresh water"* can be *"drawn."*

5.1.3 Providing Intimate Indigenous Knowledge.

Infopreneurs™ as "social entrepreneurs" (see detailed discussion of this under 5.4.4) are in need of an *intimate knowledge and understanding* of the social, economic, "emotional" (norms, values, and ethics) as well as technological makeup of the community in which they operate. This is needed in order to provide a *balanced expression* for both the *social responsibility* dimension of their activities and the *entrepreneurial orientation* thereof. It is also needed to facilitate an appropriate response to external influences like democratization, technology advancement, globalisation and global, ethical questions (see Figure 3).

A few initial words on the subject by Yunus (2006) will demonstrate the need for the Infopreneurs™ to be intimately acquainted with their community:

I am in favor of strengthening the freedom of the market. At the same time, I am very unhappy about the conceptual restrictions imposed on the players in the market. This originates from the assumption that entrepreneurs are one-dimensional human beings, who are dedicated to one mission in their business lives—to maximize profit. This interpretation of capitalism *insulates the entrepreneurs from all political, emotional, social, spiritual, environmental dimensions of their lives* (as well as their communal contexts)(*emphasis and insertion ours*). This was done perhaps as a reasonable simplification, but it stripped away the very essentials of human life."

5.2 The Roles and Responsibilities of Infopreneurs™ in the Information and Knowledge Industry

The community-level service entrepreneurs (briefly introduced to this point) have important functions/roles to fulfill in the creation and maintenance of data, information, and knowledge within their specific contexts. These responsibilities are discussed hereunder.

5.2.1 Preventing the "Reduction to Consumers" on the Wrong Side of the "Digital Divide".

The so-called "digital divide" usually gets defined in terms of a comparison between those who have access to (a) connectivity ("bandwidth") and (b) computing mechanisms—only two elements of the current technology "convergence" phenomenon—and those that don't have the same levels of access. In our experience there is also a

third—and often a much more damaging—element of the "divide" and that is the chasm between those who *create content* in digital format and those that get reduced to *consumers of this content* (mostly created in the West). There is therefore a very real opportunity for the creation and distribution (locally as well as wider) of community-level, indigenous, and digital content.

This content creation at community level, using ICTs in "production" mode (Heeks, 2005), makes a lot of local sense and impact if it complements the traditional oral and visual content already present in communities. Infopreneurs™ creating local video and sound and music material are an immediate "hit" within their own environments.

5.2.2 Distributed and Decentralised Content Production and Ownership.

A further challenge is that of collaborative content creation (contributing to the same knowledge base) in a distributed and decentralised fashion. One of our current initiatives is aimed at *creating a shared knowledge base* amongst the "community of entrepreneurs" (Infopreneurs™) using Web 2.0 types of mechanisms (wikis, etc.)

A further challenge is the creation and maintenance of a *national, electronic business directory and catalogue* that would contain directory as well as catalogue level information of all enterprises in the country, both formal (first economy) and emerging (second economy) in a manner that would be *affordable for all enterprises*—even the small, informal ones. These types of datasets also contribute extensively towards the local economic development (LED) activities and plans of local authorities.

5.2.3 Elevating (Indigenous) Content Creation to a Commercial Activity.

Both the local, indigenous multimedia material and the enterprise datasets that Infopreneurs™ create (and maintain) could provide opportunities for *substantial revenue streams* for these community-level service enterprises. The further advantage of the enterprise databases is the fact that there are clients for these in institutions outside of the community, e.g., local authorities and "big" business. This provides for substantial revenue streams and therefore sustainability for the Infopreneurs™ from "external, institutional" sources that reduce the need to raise this magnitude of revenues from high volumes of sales (and low margins) from the poorer citizens and micro-enterprises within the communities.

5.2.4 Provision for the Implementation of all Information Industry Tasks.

An important aspect of the successful content production activities on a commercial level is the imperative *for all tasks* within the "information industry" (creation and maintenance, distribution, brokering, and presentation) to be *clearly defined, assigned and enabled*—with appropriate skills and tools—down to the detail task levels. Figure 4 provides some indication of these tasks and their relationships. *Quality assurance* of both the processes as well as the output and end results is another aspect that needs to be clearly defined and implemented within the "production channel."

5.3 Ensuring Ownership and Adoption by Infopreneurs™

Experience to date (including those gathered through failure!) has emphasized the importance of a range of measures to initiate and ensure extensive, lasting "local ownership" by these service and information entrepreneurs.
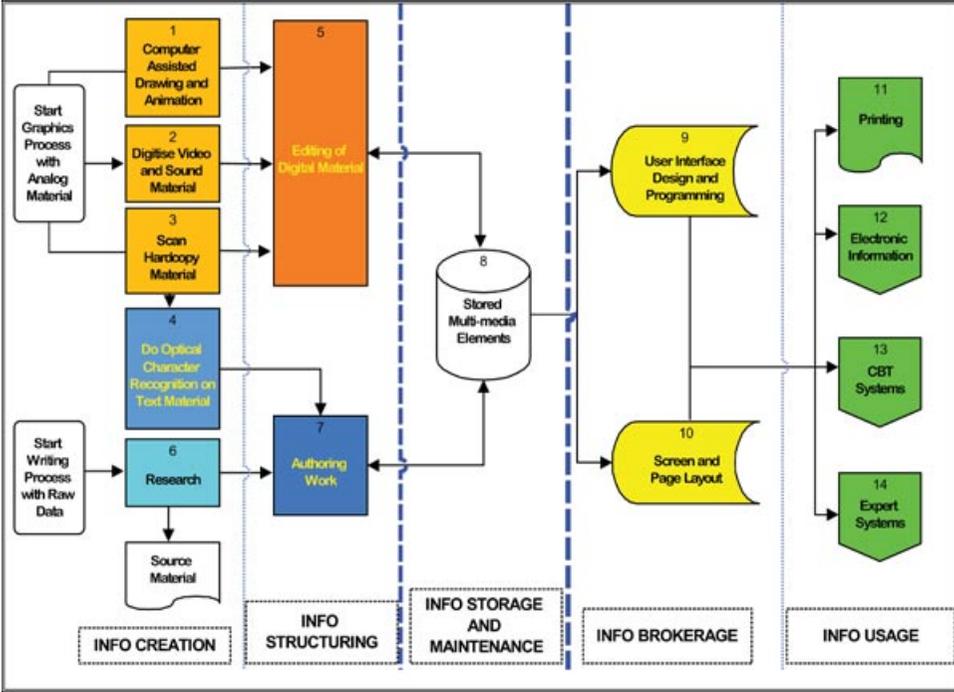
Figure 4   Information industry tasks and functions in "bridging the gap" between supply and demand.

5.3.1 Profiling the Infopreneurs™ as well as their Specific Community Context.   The importance of the *local championship* cannot be overstressed. Profiling potential Infopreneurs™ can consist of tests to determine the individual's problem solving, communication, numeracy, writing, self-management, interpersonal skills, and potential. A personality test, using reliable methods like Meyers & Brigg, can be useful.

Due to the fact that the Infopreneurs™ are not working in a vacuum, their position within—and relationship with—the community and its members are of utmost importance. We did experience some negativity towards the Infopreneurs™ that has to be managed as they start generating more substantial revenues. The idea of "social entrepreneurship" also needs to be "sold" to the community at large. Mechanisms including short-term and long-term skilling as well as ongoing mentoring are therefore often required to compensate for the *lack of soft skills* like assertiveness, conflict resolution, and negotiation skills.

As each community has their own dynamics, local Infopreneurs™ should be familiar with their community's challenges, the market (and poverty alleviation) needs, what the *real "value propositions"* for the real-world inhabitants are and also what the *associated risks* are.

5.3.2 Importance of Appropriate Training and Skilling.   It is important to take the context of rural small enterprises in consideration. The majority of aspiring entrepreneurs have had no formal business training or have never been exposed to a structured business environment. The knowledge of how to run a business is largely nonexistent. Most existing (rural) entrepreneurs operate from home and do it mostly in a reactive, subsistence mode. There are also no separate accounts for the business and the household—my money and the business' money is the same thing!
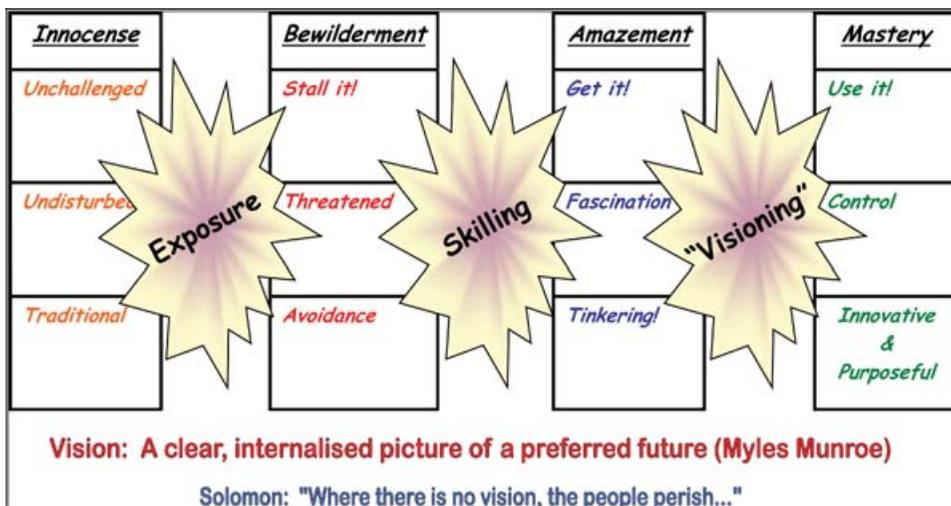
Figure 5   From "innocence" to "masters of the future".

Training and skilling programs thus have to include *all critical aspects* on how to *start-up, grow,* and *successfully run* a small business but not in an overwhelming formal business sense as this tends to *scare and confuse* these potential entrepreneurs as well as create a *mind block*. Training should encompass *all critical aspects* of business training and should take on the form of *modular training programmes* (small, digestible units for both theoretical and practical components) as it has proven to be the most effective. It should also take into account that Infopreneurs™ are *ICT intensive small enterprises* and should include *ICT training*, mostly at the application level.

5.3.3 Tangible Benefit (Revenues) for Local Intermediary Needed.   Tangible and "countable" return on investment /effort has always been one of the most powerful motivators of all times. Rendering (development) services that benefit the community *and at the same time* generating sustainable livelihoods for themselves seem to be strong motivations and rewards for proactive, entrepreneurial activities that serve to satisfy the real needs of real (rural) people.

The diagram in Figure 5 depicts some of our learning on the *adoption phases* for technology in a rural context. Monroe's (2002) view on a "*vision*" has been translated, in the case of the Infopreneurs™ , as meaning a "*social enterprise*" that delivers a *sustainable livelihood* for (predominantly) young, rural people.

5.4 Packaging a "Reduced Risk" Social Enterprise at Community Level

This large-scale deployment of Infopreneurs™ in any area requires a range of strategies and approaches to be addressed and implemented simultaneously to manage all aspects of the risks associated with such an exercise. The most important elements are discussed hereunder.

5.4.1 "Hub, Node, and Satellite" Thinking.   In order to lower the "barriers of entry," enhance support and reduce the startup failure rate and risk, we have developed a "hub, node,

TABLE 2.   Hub, Node, and Satellite Overview

Type	Main services/ role	Profiles	Facility & tools	Geographical placement
Hub Infopreneurs[TM]	Coordination & district level service level agreement (SLA) negotiation	At least 3-year post-matric (final school year) qualification	Co-located with service provider with power PC for functions like video editing as well as data projector for presentations	District (regional) municipal-ity (big town)
Node Infopreneurs[TM]	Database services and SMME development services	At least matric and 25 years of age	In own office w number of PCs for CBT and "edutainment" use	Local mu-nicipality (smaller town).
Satellite Infopreneurs[TM]	Agency & mobile "citizens services" (connectivity, training, & multi-media services)	Matric and age below 25 years	Home office w/laptop, wireless connectivity (GSM), light-weight printer and video/ still camera	Ward-level operations (±5 000 voters/ adults per ward)

and satellite" *implementation structure*. This is introduced in Table 2. It needs to be indicated that all Infopreneurs[TM] continue to act (to some extend) as "satellite Infopreneurs[TM] " (with the associated tools and services), even when deployed at "hub" and "node" level.

5.4.2 The Importance of the Regional (District Level) "Pump Station".
Our experience has emphasised the regional "digital hub" with enthusiastic and capable en-trepreneurs to "fuel the fire" further "downstream" as well as handle some of the marketing and contract negotiations on behalf of the downstream' Infopreneurs[TM] . These "regional back-office environments" are also run by Infopreneurs[TM] (with keen entrepreneurial ori-entation) and serve as resource and *energy boosters* for the small town and community based Infopreneurs[TM] who, in turn, are providing the sustainable modern *community wells* (service outlets and front desks).

5.4.3 Packaged and Validated Community-level Service Enterprises.
It should be clear at this stage that the form of the basic, evolving model is that of a franchise-like initiative. This approach is aimed at providing a *reduced risk, social enterprise package* that can be deployed in rural areas among (inter alia) youth and women entrepreneurs. Figure 6 provides an overview of this "packaged channel" approach.

5.4.4 Internationally Evolving Support for "Social Enterprise" Thinking.
Some initiatives, especially in the East, seem to support our "evolution" to date. Instances of ICT4Dev work in India, for example, have recognized the fact that the *mode in which services are delivered* is critical to its effectiveness. They have thus developed a *business model* to ensure sustainability and success of their Telecentres as a service delivery mecha-nism. These Telecentres are run by local entrepreneurs (TARAkendras) as small businesses who have a substantial stake in the success thereof (Amrita, 2005).
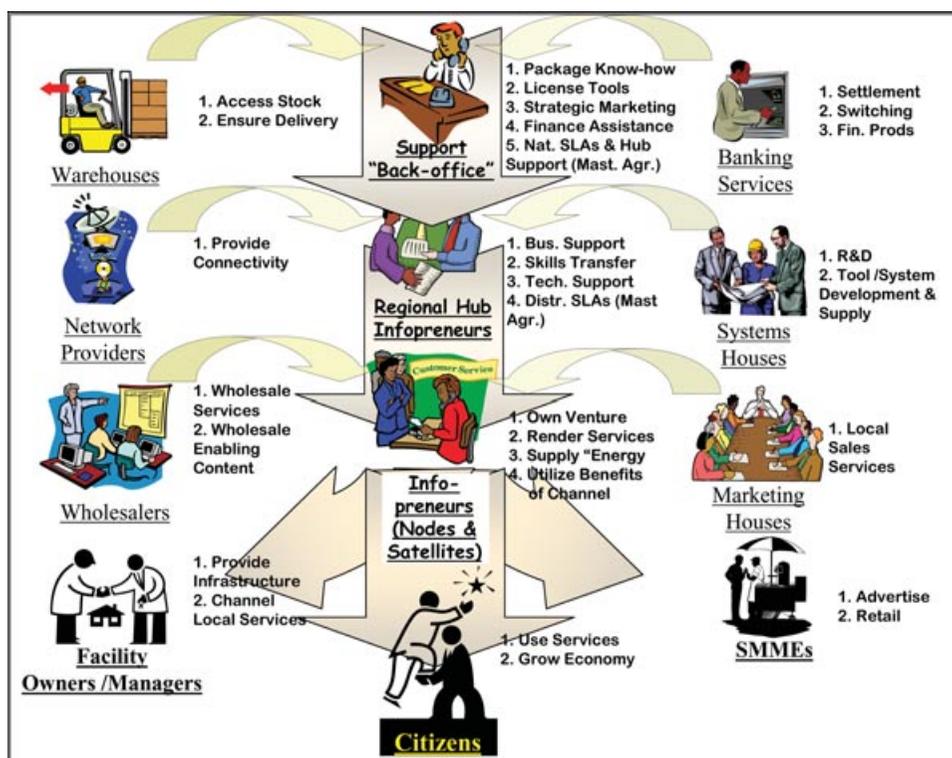
Figure 6   A packaged, franchise-like deployment model.

Yunus (2006) has the following additional, very valid contribution on the subject of social entrepreneurs, to make:

By defining 'entrepreneur' in a broader way we can change the character of capitalism radically, and solve many of the unresolved social and economic problems within the scope of the free market. Let us suppose an entrepreneur, instead of having a single source of motivation (such as, maximizing profit), now has *two sources of motivation* (*emphasis ours*), which are mutually exclusive, but equally compelling—(a) maximization of profit and (b) doing good to people and the world.

Each type of motivation will lead to a separate kind of business. Let us call the first type of business a profit-maximizing business and the second type of business as social business.

Social business will be a new kind of business introduced in the market place with the objective of making a difference in the world. Investors in the social business could get back their investment, but will not take any dividend from the company. Profit would be ploughed back into the company to expand its outreach and improve the quality of its product or service. A social business will be a nonloss, nondividend company.

6. CONCLUSIONS

The general concepts discussed in this article have been developed (in South Africa, at least) mainly over the last 3 to 4 years. Infopreneurs have been established (mainly in pilot fashion) in the Eastern Cape province of South Africa at the end of 2006. In Limpopo province, we

are in the process of *validating* the Infopreneurs[TM] deployment model in the *Sekhukhune Rural Living Lab (RLL)* as part of the EU FP6 project, *Collaboration@Rural*. We hope to implement additional, newly developed collaboration tools and services in the area before the end of 2007, followed by evaluation, revision and modification in 2008–2009.

In the space of the next 30 months, we would also like to

- formulate the most pressing needs in terms of technology development as well as business development to support the Infopreneurs[TM] deployment model;
- embark on an ongoing participatory design, specification, and validation process with the "natural daily life" inhabitants—predominantly SMMEs but also including (economic) citizens—of the rural economy of this deep rural area in Southern Africa;
- determine the nature and benefits of the long term "marriage" between systems of innovation (SOIs) and these "natural daily life" inhabitants; and
- identify and adopt the changed mindsets, especially within the SOIs, which would be required to "open up" these systems of innovation for free participation by all inhabitants of a specific economy (van Rensburg, Smit, & Veldsman, 2007).

The Sekhukhune RLL will therefore provide an opportunity to validate the work to date. It also provides an opportunity to fine-tune the *appropriate business models* for this approach to ICT4Dev. This view is summarized by Schaffers et al. (2007) in the following extract:

The various business models discussed (including the Infopreneurs[TM] model)(*our insert*) demonstrate the key characteristic of designing and shaping the various partnership designs. The paper suggests different factors determining the specific characteristics of such partnership designs and identifies the situational parameters determining adequate open and collaborative business innovation models. These in turn allow synergies and the crucial components of business model that are identified may lead to general guidelines that can be applied elsewhere.

In the light of the previous extract and the ongoing nature of our work, an open invitation is extended to all interested parties to explore ways to participate and collaborate in this exciting venture.

ACKNOWLEDGEMENTS

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