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Showcase of the United Nations Industrial Development Organization's (UNIDO) Business Information Centre Model for e-Inclusion & e-Accessibility in Uganda

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Abstract: This paper presents the importance of Information and Communication Technology (ICT) as a tool for sustainable economic development. Access to skills, information and technology, particularly in rural areas acts as a conduit for the growth and prosperity of Small and Medium Enterprises (SMEs), who make up the lion share of businesses in the developing world. Increased access to ICT by SMEs has an impact on productivity, innovative capacity and the ability to generate profit.

The paper showcases the United Nations Industrial Development Organisation's (UNIDO) award winning Business Information Centre (BIC) model, currently functioning in Uganda. A description of the methodology used, achievements, challenges, future perspectives and recommendations is given. Additionally, the paper touches upon UNIDO's holistic approach to addressing the issue of the lifecycle of computers in Uganda.

Keywords: Small and Medium Enterprises (SMEs), Information Communication Technology (ICT), Africa, e-Inclusion, e-Accessibility, Business Information Centres (BICs)

1. Introduction

In today's global knowledge-based economy the impact of Information Communication Technologies (ICTs) is extensive, as it has been promoting new opportunities for economic and social development. The ways in which global economic processes are conducted have been influenced by the effect of ICT in particular the creation, dissemination, accumulation and application of information and knowledge. The ability to access information is a key factor in developing competitiveness and being able to engage globally; ICT acts as a conduit in facilitating this process [1]. Unfortunately, there is an uneven distribution of this resource, which directly impacts on developing countries' capacity to fully participate in today's global information economy. This visible "digital divide" is partly due to minimal ICT access for developing countries as compared to developed countries. Figure 1 highlights the difference in access to ICT by region.

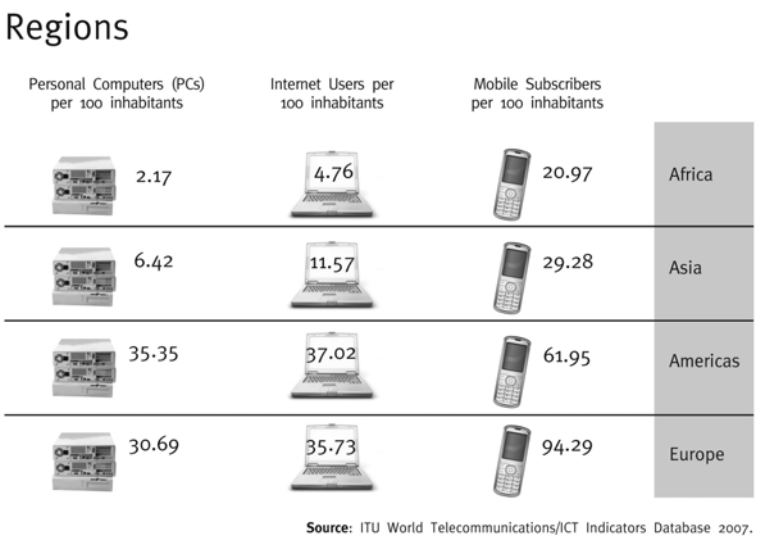

Figure 1. Number of PCs, Internet and mobile subscribers by region

Limited resources in developing countries, Africa in particular, act as a barrier to investment in expensive communication infrastructure, applications and hardware. Many countries are more concerned with basic economic priorities as housing, water and energy. Bridging the digital divide through digital inclusion may provide a possible means to make globalisation work for the poor. As stated by Bradbrook and Fisher (2004), "digital inclusion is a crosscutting issue, involving a number of social inclusion agenda, as well as ever-developing ICT". Phrased differently, "digital inclusion is social inclusion with an ICT stream" [2]. I view of this, bridging the divide is fundamentally linked to issues of empowerment, which is about using knowledge and technology to enable the poor to act. It can be said that "information has been observed as being a prerequisite for empowerment" [3] and "participation drives empowerment by encouraging people to be active in the development process" [4]. This process has to begin at the ground level by recognising the need for education, skills, employment and income generation to facilitate the alleviation of poverty, social and economic development. The importance of this fact is highlighted by the finding that "almost 60 per cent of the difference in income between Sub-Saharan African countries and the advanced industrial countries can be attributed to gaps in the stock of knowledge" [5]. Prevalence of education within rural communities in Sub-Saharan Africa is low and among female populations lower still.

As a response the United Nations Millennium Declaration (2000) has resolved to ensure that globalisation becomes a positive force for all the world's people through the promotion of gender equality and empowerment of women as an effective way to combat poverty, hunger and disease; to stimulate development that is truly sustainable; and to ensure the benefits of new technologies, in particular Information Communication Technologies (ICT), are available to all [4]. In consideration of this and of "the growing number of women in the entrepreneurship domain", it is becoming evident that "women entrepreneurs are a distinct and important ICT user group" [6]. ICT offers these individuals an opportunity to "enhance their skills therefore offers a means to generate income and elevate their status within the community" [7].

The aforementioned elucidates that "development can no longer be understood without full consideration of the widespread effects of ICTs and their applications to enterprise activities" [8]. As addressed by Gray (2006) small and medium-sized enterprises (SMEs) (defined as businesses with fifty people or less) are the driving force for industrial development in virtually all countries: they (a) occupy specialised market niches and are a

good source for innovation; (b) shape the economic globalisation process and play a leading role in creating employment, income and value added services; (c) act as a seedbed for the development and testing of entrepreneurial talent; and (d) have a huge presence due to the vast size of the sector [9]. In the developing world more than of 90 percent of the firms outside the agricultural sector are SMEs and micro-enterprises [10].

Points a, b and c raised above can be seen to be reflective of Schumpeter's (1934; 1942) ideas on entrepreneurship, that the source of innovation and technological change of a nation comes from entrepreneurs themselves. The European Commission (EC), as cited by Gray (2006), also adds to this viewpoint in that "to survive in the new competitive environment, no enterprise can afford to stand still. All have to be open to new ideas, new ways of working, new tools and equipment, and be able to absorb and benefit from them" [9]. The United Nations Industrial Development Organisation (UNIDO) is attentive to this fact, and this is reflected in one of its thematic priorities – to promote poverty alleviation through productive activities, in particular through engaging SMEs. UNIDO understands that one of the primary challenges that many developing countries face is to combine the employment potential of SMEs with increasing productivity. This requires a shift from traditional low-value price-driven to higher-value knowledge-based services. In the case of developing countries this poses a large problem, for when it comes to maintaining the knowledge base it is not a level playing field. In addition to tough constraints in time and resources, SMEs face competition for skills and access to market. If these barriers are overcome, ICT being a conduit for the flow of knowledge and skills, SMEs can enable themselves to increase their competitiveness. This point is echoed by Lock (2004) who states that "there is a clear relationship between ICT use and the growth of small businesses" [11]. With this in mind SMEs provide a good entry point into the development process. UNIDO has long realised the importance of ICT as a "leveller", having developed comparative advantage in mobilising ICT as a core tool for addressing the needs of SMEs.

2. Objectives

The main objective of the paper is to illustrate the potential impact that ICT has on sustainable poverty alleviation by showcasing UNIDO's award winning Business Information Centre (BIC) Model in Uganda. The specific objectives of the paper are:

1. To illuminate the methodology being applied by UNIDO to address the issue of e-Inclusion and e-Accessibility in Uganda;
2. To highlight UNIDO's approach to addressing the issues of accessibility and demand for affordable hardware in Uganda;
3. To describe the achievements, challenges, future perspectives and recommendations of the approach.

3. Methodology

In many developing countries relevant business information is difficult to obtain. It is often outdated, only available from isolated institutions and not tailor made for the information needs of rural entrepreneurs. Concurrently, ICT, as a means of accessing relevant information, is often unavailable and unaffordable for SMEs. For example, in Uganda Internet access and ICT usage is extremely low: there are approximately 17 Internet users per 1,000 people, and 8 out of 1,000 have a personal computer [12,10]. To tackle this issue UNIDO with the assistance of the Austrian Development Agency, set up in 2007 a network of 8 Business Information Centres (BICs) in Uganda in the districts of Kampala, Jinja, Arua, Gulu, Masindi, Soroti, Kabale and Masaka. In November 2007 this initiative won the prestigious Africa Investor Award [13].

The establishment of the BICs was based on the following structured approach: Firstly, a detailed needs assessment was conducted to identify the needs and the gap in the market for support services and to determine the portfolio of services to be offered. The locations of the BICs were selected based on five criteria: (1) critical mass of micro, small and medium-sized enterprises, (2) availability or planned telecommunication infrastructure; (3) existing SME support initiatives; (4) proximity to coffee producers/ cooperatives; and (5) the location of Uganda Investment Authority (UIA) focal points in the districts. The BICs were set up in partnership with other donor initiatives, in particular with the United Nations Development Programme's (UNDP) Districts Promotion Centres (DPCs) and UNIDO's Master Craftsman Programmes (MCPs).

The services portfolio offered by the BICs includes entrepreneurial advisory services, access to relevant business information systems, technology transfer brokering, consultancy and advisory services, reliable Internet access, technology and ITC training as well as assistance in creating linkages to local, regional and international markets. A key element in facilitating the transfer of tacit knowledge is through the utilisation of a "training the trainers" approach. At one level this has created employment through the direct activities of the centre and continues to produce skilled human capital. As stated by Foray and Perez (2000), "social capital at the local level can stimulate innovation" [14]. With access to such resources, the programme aims to promote local private sector competitiveness through an increase in productivity, innovation and job creation.

Secondly, based on the initial needs assessment a business model was developed for each centre. It contributed towards the overall sustainability of the approach by incorporating an aspect of private ownership, focusing on joint ventures between the public and private sector and srevices being provided on a fee basis.

A final factor was the use of UNIDO's results based management approach that focuses on outputs and outcomes and is impact driven. The methodology serves three main purposes: "accountability, support of management and driving learning and innovation" [15]. Transparency and consultation with the major stakeholders also forms an essential part of the delivery process.

4. Developments

4.1 Demand

Barrantes (2005) suggests that "demand is restricted by two main factors: the lack of income and the lack of information regarding the benefits associated with the consumption of the good/service" [16], phrased differently exposure and affordability are key factors in the uptake of technology. New computers in developing countries are too expensive for the general population. For example, "the price of a new PC can be as high as US$1700 in Africa, compared to the more affordable US$800 in Denmark (where the average spending power is much higher than countries in Africa) and US$450 in India. When considering a network of PCs, the differences in start-up capital needed just to purchase hardware are amplified" [17]. An alternative that has emerged is that of quality used or refurbished computers. "A used PC can cost half the price of a new one in Nigeria, in Zambia nearly a third of the price, in the Democratic Republic of Congo as little as one-sixth and in Kenya one-seventh of the price"[17]. In order to understand this phenomenon UNIDO commissioned a study by the Directorate for ICT Support (DICTS), Makerere University, Uganda, with the view to determining the marketability of quality branded refurbished computers among SMEs. The study also explored the availability of potential channel partners among SMEs for the reselling and maintenance of refurbished PCs to other individual SMEs within the locality. The sample for the study consisted of 473 SMEs from across eight districts. Of these, 418 SMEs were customers who could potentially purchase refurbished

second hand PCs, 55 were channel partners who could likely be part of a franchise to sell refurbished PCs in the various districts. Analysis of the results of the study showed that there is a high demand for quality refurbished second hand computers across Uganda.

Before embarking on addressing this gap in the market, there is the need to highlight the major obstacles illuminated by the survey. Firstly, the call for sensitisation and skills development; often there is a lack of appreciation of how SMEs are able to utilise or integrate computers into their business operations. Secondly, the price barrier and the consequent need for financial support structures. Thirdly, a shortage in the supply of necessary hardware and skills needed for trouble-shooting. All in all this presents both a challenge and an opportunity.

In an attempt to deal with the issues at hand UNIDO and Microsoft, through their partnership established in July 2006, developed a model based on a single facility involved in the repair, maintenance and assembly of computers. These PCs are then sold through the previously identified reseller partner channel that spans across the whole country. In essence this mechanism would complement the UNIDO BIC model by enabling:

- An affordable source of hardware for BICs;
- The provision of additional income from the sales of computers to SMEs;
- Increased outreach of affordable quality hardware to rural areas;
- Greater skills development through assembly and maintenance,

The specific inputs provided by Microsoft in addition to their expertise include access to its Gold Partner Refurbishment Programme that would consist of:

- Special pricing for software;
- Criteria on quality of partners including mandating of warranties for PCs;
- Marketing support and end-of-life return;
- Linkages to potential suppliers of secondary PCs.

A secondary feature of the model is its potential beneficial impact on the environment. With the increasing demand for ICT in developing countries there is also the risk of dumping and the creation of e-waste. Africa is "hungry for information but with limited capacity to manufacture it, Africa has become the world's latest destination for obsolete electronic equipment" [18]. This is an issue that is not being completely addressed within developing countries in particular Africa. Addressing e-waste with due consideration to environmental and socio-economic criteria is a complex undertaking. Some matters can be dealt with locally in close cooperation with the private sector – others will need concerted efforts and a pooling of resources on a regional level. Currently both avenues are being actively explored. The UNIDO-Microsoft approach aims to proactively and holistically address the entire life cycle of computers in Uganda.

4.2 Barriers to rural e-Inclusion

Even when there is the availability of the necessary hardware and software, a problem that is prevalent especially in rural areas is that of access to a reliable electricity supply**.** As stated by Karekezi and Kithyoma (2002), "Sub-Saharan Africa is the least electrified region of the world, with rural electrifications levels that are routinely below 5%. With the bulk of the region's poor residents in dispersed rural settlements, conventional grid electrification is considered too costly for most of rural Africa" [19]. Without a source of energy the idea of e-Accessibility and e-Inclusion is a far off target. The approach pursued by UNIDO promotes the utilization of renewable energy sources (photovoltaic, mini-hydro power stations etc.). UNIDO has accumulated significant expertise in implementing a diverse portfolio of renewable and rural energy projects and applies this knowledge to extend ICT

access to rural areas through renewable energy powered BICs, as currently piloted for example in Uganda and Mozambique.

5. Results

The implementation of the network of BICs was deployed in 2007, a methodology for evaluation and monitoring was established, and an in-depth evaluation is to be carried out in the first quarter of 2008 to assess in detail the impact of the project and to systematically distil best practices. A number of activities pertaining to skills and knowledge transfer on computer assembly, a study on the e-waste landscape and the development of sustainable business models to deal with e-waste, will continue to be carried out in 2008. The rest of this section will highlight some of the immediate positive impacts the BICs have had on the benefiting rural communities in Uganda. The success of the project has triggered the interest of the government and donors to replicate the model in other districts of Uganda. To follow, a description of three sector specific examples of achievements, namely, agriculture, manufacture and health will be highlighted.

5.1 Agriculture and agro-forestry community-based organisation

BEKOA is a local Community Based Organization (CBO) that was established in 1994 and works on teaching local farmers agronomic skills. The organization's offices are located 1.5 km from Soroti, the municipality of Eastern Uganda. BEKOA operates 8 different offices in the following districts: Soroti, Kumi, Katakwi, Amuria, Pallisa, Kumi, Bukedea and Amolator.

BEKOA's activities are mainly related to agriculture and agro-forestry. However, these activities vary depending on each district's agricultural characteristics. BEKOA has introduced a common program for all districts to ensure the sustainable development of citrus plants. The climatic and soil conditions of the soil has enabled bountiful growth of citrus orchards. Other activities within the region include fish farming.

With the help of the BIC in Soroti, BEKOA has only assisted in the setup of both corporate and staff e-mail accounts. The Internet has enabled BEKOA to freely contact its foreign-based partners at any time, thus facilitating the work on the programs currently being implemented in the region. Due to the newfound resource the centre has prompted the organization to consider designing a website to raise the awareness of its activities, as well as develop a corporate image, as a result of this BEKOA is now able to engage with external NGOs and CBOs.

Development of staff ITC skills has enabled increased efficiency and greater access to field information. In addition to establishing relationships with new partners, BEKOA has managed to explore and engage in new business opportunities. To date, the organization is in the process of securing a market for groundnuts produced by its members, thereby diversifying and increasing productivity.

5.2 Jimtex Furniture and Construction Company Ltd – Mbale Municipality

Jimtex Furniture and Construction Co Ltd started their business in 1999 and currently operate a furniture workshop in Mbale Industrial Area. The company produces office and domestic products, joinery products such as kitchen fittings, household fittings such as windows and door frames, decorative items, engages in construction services such as roofing and trades in raw timber, which is sold to wholesale traders.

Mbale-based small-scale business owners who have used the services of the Business Information Centre claim that the facility has been very useful in addressing information needs. Jimtex Furniture and Construction Co has been able to source Chinese-made multi-purpose furniture machinery that could be used to improve the quality of products. Access to the Internet has enabled a direct line of communication with the manufacturer of the

required machinery. Based on this exchange the Chinese manufacturer provided local contacts in Uganda for the supply of the specified machinery. The machine has improved the quality and finishing of the products by enabling greater sophistication in sanding and the joining of timber. The costs incurred by Jimtex Furniture and Construction Co for obtaining the initial information are very low compared to travel to Kampala to look for similar information.

Additional benefits gained from the BIC have been basic training sessions on the use of a PC. The knock on effect from this has been the further training of staff members in three establishments with the aim of installing a PC within each in order to better facilitate communication to maximise productivity and profits.

5.3 Private Medical Clinic in Jinja Municipality

Information about the BIC in Jinja and its services spread to a private clinic via word of mouth. The clinic employs four people working full time, including a medical officer, a nurse, a laboratory technician and the co-director in charge of day-to-day operations.

The clinic staff were most interested in receiving PC training, and management felt that the fees for access services of the Centre were affordable. Previously, exposure to computer technologies had been limited, most staff inclusive of management being compute illiterate. Senior management of the medical centre felt that the training they received enriched their overall business approach. PCs are now used in daily work, for example MS Word to record clinical notes as well as MS Excel to manage clinic records and information, including the inventory of drugs and medical consumables. In an effort to increase outreach of medical services staff at the centre are using Power Point presentations for voluntary work in community mobilization, as well as the use of a database to keep record of the daily attendance and treatment of the hospital's patients. This has brought about more accurate and effective treatment, especially in cases of rural patients where medical cards detailing past treatments are often lost. Staff at the centre state that "it is a common problem in Sub-Saharan Africa that people misplace or lose vital medical information which results in a delay in treatment. With access to electronic resources this is no longer an issue". Training has enabled the clinic to save enough money to acquire a personal computer, the motivation for this being to eventually computerise all the clinic's activities inclusive of financial management.

Tables 1 and 2 indicate how frequently the BICs have been accessed, the type of services requested as well as a gender and sector specific distribution of customers in all centres from February 2007 to January 2008.

Table 1. Numbers trained in ICT

Individuals trained in ICT	
Males	315
Females	226
Total trained	**541**
Repeat users	145
Affiliated with an SME	180

Table 2. Numbers accessing business information

Individuals accessing business information	
Males	80
Females	52
Sector specific breakdown	
Food processing	60
Coffee	5
Textile	20
Affiliated with an SME	47
Total	**132**

6. Conclusions

As previously stated, access to knowledge, information and technology plays a crucial role for the participation in the global knowledge based economy. And "developing countries can gain as much as developed countries from ICTs in terms of productivity" [20]. The difficulty lies in the uneven distribution of resources, reflecting existing social and economic disparities between and within countries. As illustrated by the aforementioned project, promoting e-Inclusion and e-Accessibility to level the playing field and enable sustainable economic development calls for integrated and demand-driven approaches with coordinated involvement of the public and private sector. The experience to-date gained by UNIDO can be summarized as follows:

1. Analysis of user needs may not be "clear cut" within the setting of a developing country. Often target groups and organisations have had little or no previous exposure to the proposed technology, and therefore lack even a basic understanding of what ICT can do for them. This leads to an inability to articulate their technology needs. A clear understanding of absorptive capacities is a perquisite to ensure that target beneficiaries are able to assimilate technical assistance.
2. For success and sustainability there is the need to ensure local ownership, get local buy-in, work with a local champion, and be context specific. With a locally-driven initiative there is the greater possibility of dispersal into local communities.
3. There is the requirement for sound partnerships and collaborations. The issues related to integrating ICT into development are multifaceted and complex and beyond the scope of any single actor. For an initiative to make a difference to socio-economic development in the long-term, civil society organizations, governments and the business community must cooperate, pool resources and experience, and tackle problems in a collaborative manner.
4. It is imperative to involve groups that are traditionally excluded, for example on the basis of age or gender. ICT has the ability to reward those who know how to use it with increased income and cultural and political advantages, the resulting digital divide showing up in an increasingly stark contrast. The trend is that privileged groups acquire and use technology more effectively, and due to the exponential benefits experienced, they become even more privileged. When groups are alienated for social or cultural reasons it not only hinders ICT penetration to the detriment of those excluded, but also limits the benefits of diversity in the information society more broadly.
5. An initiative must be self-sustainable in the long term either through being income generating, or by delivering on a social mission so effectively that it is worthy of continued stakeholder support.
6. An aspect of sustainability that is overlooked is that of "soft" assets such as the ability to retain human resources. An initiative needs to be asset based in that it seeks to harness locally available skills, knowledge and expertise. This will have an impact on the way in which a technical assistance is assimilated and successfully used.
7. External challenges faced must be identified and understood, based on these practical steps should then be taken to address these issues. For example, even with the availability of the necessary hardware and software, a problem that is prevalent especially in rural areas of developing countries is that of access to reliable electricity supply. Without a source of energy the idea of e-accessibility and e-inclusion is a far off target. Locally specific methodologies tailored to local needs are requirements are crucial as no general blueprint design for ICT development is possible.

Lessons can be drawn for countries launching new programmes to increase ICT's contribution to economic and social development through private sector development and

innovative productive activities. Additional and complementary efforts are needed for the successful replication of such programmes, particularly with regards to their cross-sectoral and environmental dimension.

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