UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

REVIEW OF TELECENTER SUSTAINABILITY CRITERIA FOR THE ESTABLISHMENT OF SUSTAINABLE RURAL BUSINESS RESOURCE CENTERS FOR SMEs IN DEVELOPING COUNTRIES

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for the
Small and Medium Enterprises Branch

Vienna, December 2003

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The author thanks Matthias Fecht for his kind support.

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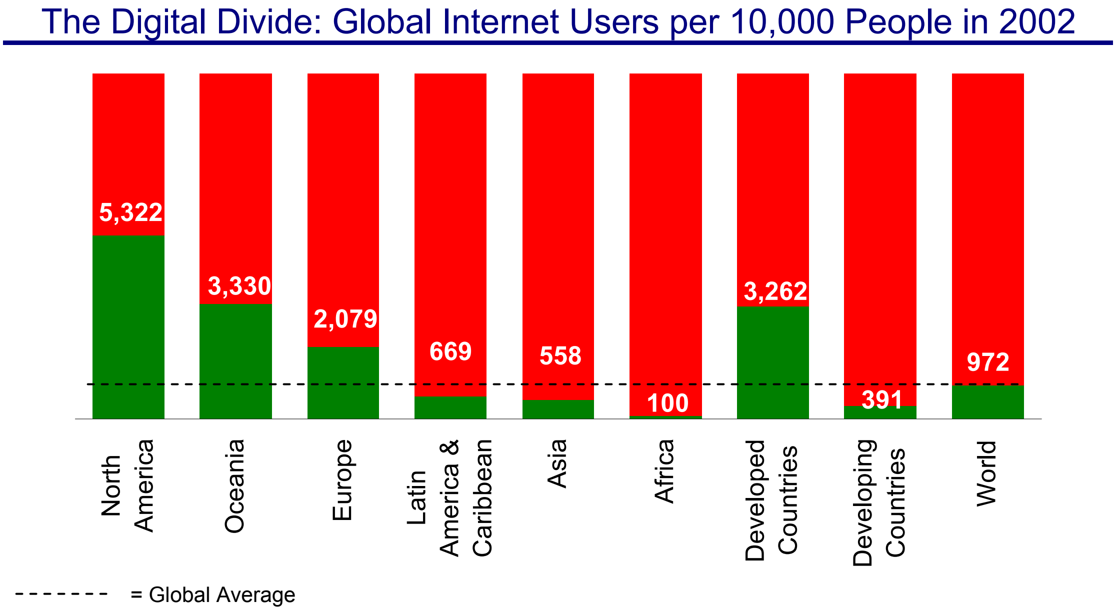
1. Introduction

1.1. *Scope of Paper*

The deployment of Information and Communication Technologies (ICTs) in developing countries has become a key strategy of the international development community to support poverty reduction strategies. In this context, telecenters are seen as a tool to bring the benefits and potential of ICTs to locations that have so far been suffering from their remoteness and lacking connectivity to the world's information society. Very often telecenters are established to target communities in their entirety, providing Internet access, e-Mail services, telephone services, educational services, but also library services or even postal services to large parts of the community. Consequently, these "Multipurpose Community Telecenters" take an approach to improve the access to ICT on a broad range, in order to narrow what is known as the "digital divide" (see Figure 1).

However, a common problem that has been experienced in the course of many telecenter projects is a lack of sustainability that prevents telecenters from successfully staying operational in the long run and becoming independent from external support and subsidies. This is mainly because a portfolio of issues makes it difficult for the center to operate profitably, such as the developmental mission of community telecenters and a weak spending power of the target customers.



Source: ITU (2003) and UNCTAD Calculations: UNCTAD E-Commerce and Development Report 2003

Figure 1; Internet Users per 10,000 People in Different Global Regions in 2002

The United Nations Industrial Development Organization (UNIDO) has taken an approach to address the issue of sustainability by adapting the telecenter concept to the needs of a customer group that has stronger finances and carries great potential to contribute to national economic development through empowerment by ICTs: Small and Medium Enterprises (SMEs). Within the UNIDO concept, SMEs are targeted as main customers and are supposed to provide the basis for self-sustainability of the telecenter. With an operational fundament created that way, the benefits of the telecenter could later spill over to the large community when the services would be extended to benefit non-SME customers.

After a first project in Sri Lanka, UNIDO has proceeded on the path described in Uganda, Africa. Through its Small Business Development module, the organization has assisted the country in setting up the *Uganda Business Information Network (UBIN)* in its capital Kampala. UBIN is an “infomediary”, a One-Stop-Shop (OSS) in the form of a physical location operated by a private company that provides Information Services, ICT Support Services and Enterprise Internet Solutions to SMEs on a commercial and demand-driven basis. For example, it helps SMEs to get access to potential markets for their products as well as information on competitive sources of raw materials and technologies. Essentially, the OSS provides services that an SME cannot accomplish itself efficiently, due to its small size and limited capacity. Through the services of the OSS, SMEs can be strengthened to increasingly exploit their potential as key contributors to wealth, employment and innovation.[1]

While the set-up of UBIN has been limited to SMEs situated in the capital city, UNIDO in a follow-up project aims at extending the services of the Kampala OSS to SME clusters in several other districts of Uganda by establishing a network of pilot Rural Business Resource Centers (RBRCs) that are supposed to enable SMEs in areas outside Kampala to make use of information and ICT support services as well. The centers are designed to follow the concept of the OSS, targeting SMEs as their main customers. It is anticipated that the Kampala OSS will function as a master backbone through service provision to the RBRC.

Yet despite the higher solvency of SMEs as described above, the issue of sustainability of the RBRCs will need to be kept in mind. In order to ensure operational and financial viability, sustainability needs to be central in the planning and day-to-day operation of the RBRCs, as it is the case for traditional community-oriented telecenters. Experience indicates that there is no one solution that can guarantee achievement of operational viability, as far as the traditional telecenters are concerned. However, papers and case studies have been written that reveal procedures and guidelines, which can help to bring telecenter sustainability closer to realization. This knowledge can be beneficial for the SME-focused RBRC establishment as well. In this relation the paper on hand is meant to support the successful rollout of the OSS concept to the remote districts.

The paper follows a two-tier approach. *Firstly*, it draws from experience and research related to sustainability of telecenters that has been collected throughout the set-up of telecenter projects of different shapes and at different locations. As the overwhelming majority of available research deals with telecenters that are not exclusively targeted towards SMEs but towards the communities at large, the examination and categorization of sustainability criteria can only happen at a non-SME specific level accordingly. The findings are integrated with further thoughts regarding telecenter conceptualization, and are systematically added together along a main plot of strategic goals of sustainability - resulting in rules and recommendations, DOs and DON'Ts, for sustainable telecenter establishment.

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[1] *UNIDO (2003)*

Secondly, it is assumed that an RBRC in a non-urban area of a developing country that targets SME customers faces similar challenges as community-oriented telecenters, despite the fact that SMEs possess better financial means than community telecenter customers. In that sense, a more solvent customer base is only considered to provide a better starting position, not a guarantee for success and viability of the RBRC. Accordingly, in the *second* tier of the document, the author relates every dimension of sustainability identified in the course of the telecenter sustainability evaluation to the specific situation of an SME-focused RBRC. This application of the research findings to the SME context will round up the document and is supposed to make it a support tool for the subsequent development of individual location-specific business plans for sustainable RBRCs.

It is hoped that the document will be of relevance to those who are interested in telecenter sustainability, be it with a focus on service provision for SMEs or not.

1.2. Definition of Telecenters

Throughout recent years, a number of different types of telecenters have been established in developing countries, ranging from small phone shops to large Multipurpose Community Telecenters. They cater for different needs, require different amounts of capital, skills and human resources, and make a varying contribution to community development.

Bigger versions of telecenters may be defined as follows:

"Strategically located facilities providing public access to ICT-based services and applications. They are typically equipped with some combination of:

- Telecommunication services such as telephony, fax, e-Mail and Internet (via dial-up or ISDN, high-speed telecommunications network);
- Office equipment such as computers, CD-ROM, printers and photocopiers;
- Multimedia hardware and software, including radio, TV and video; and
- Meeting spaces for local business or community use, training and so on."[2]

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[2] *Oestmann and Dymond (2001)*

In this document, the author will refer to “Telecenter” in a generic sense, not having a particular model in mind. This is because sustainability issues may very well be considered as general problems with an impact no single telecenter type can be collectively excluded from. Nevertheless, most of the research the paper is based on relates to larger community-oriented telecenter projects.

1.3. *Sustainability of Telecenters*

To understand the challenge of making a telecenter in a developing country sustainable, it is helpful to look at some figures relating to the performance of telecenters that were collected in the *developed world*, namely in Europe, in 1998. 50 telecenters and telecottages of the UK and Ireland provided details of their financial performance, which revealed that, although most of them had improved their performance during the previous four years, still 73 percent of them incurred losses or did only touch the break-even point[3] (see Figure 2).

Financial Situation of UK and Irish Telecenters in 1998[3]

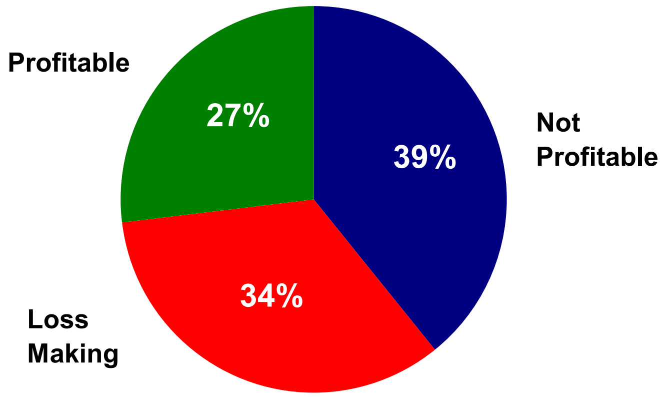

Figure 2; Financial Situation of UK and Irish Telecenters and Telecottages in 1998

Concerning telecenters in developing countries the situation is even worse. Generally, not much material regarding the performance of telecenters in developing countries exists. Generalizations are difficult to make as factors like individual location, year of development and regulatory environment are responsible for differing performance results.[4] However, a study[5] made in 2000 on telecenters in several African countries found that none of the examined Multipurpose Community Telecenters developed economic self-sustainability. According to the study, the business plans of some telecenters (such as in Mozambique) indicated that it would take them at least four years until they could become independent from external funding. In addition, although many telecenters verbally committed themselves to self-sustainability it was not expected that they would achieve that goal.

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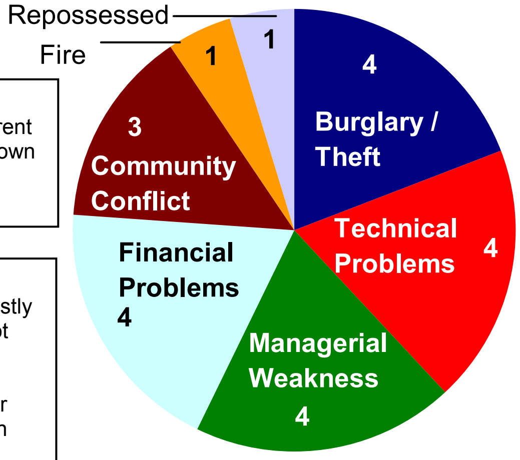
[3] *Murray and Comford (1998)*
[4] *Oestmann and Dymond (2001)*
[5] *Benjamin (2000)*

Another study performed in 2001 that reviewed all 65 telecenters of the telecenter program of the South African Statutory Board in charge with ICTs (Universal Service Agency; USA) in South Africa found that less than half of all telecenters had both operating computers and phones. Nearly a third of the centers where not operating at all. The reasons for the inoperability, such as burglary and incompetent management, are illustrated in Figure 3. The same study revealed that the more successful centers tended to "have a combination of competent managers, strong local demand, good location, the ability to innovate and develop services to meet local needs, and linkages with supportive institutions."[6]

Reasons for Inoperability of 21 Out of 65 USA Telecenters in 2001



"Catastrophic **fire** led to damage to the building and destruction of the equipment."

"A telecentre was housed in the building of a community radio station (to promote synergy). However, the radio fell into debt, their building was **repossessed**, which took the telecentre equipment too. A legal case is pending, but people are not hopeful."

"A major **burglary** had taken all, or a majority of, the equipment and there was not insurance of alternative sources of equipment, so the centre disbanded."

"Major **tensions** in the **community** between different fractions over who should own the telecentre led to the centres closing down."

"For **technical reasons**, the centre did not function. There were two main reasons – lack of power supplies for rural areas off-grid electricity where generators or other alternative supplies were not possible; and no telephone lines supplied by the phone company (and no skill to operate, or demand for, the computers)."

"These centres had an insurmountable **debt** – mostly a Telkom bill they could not pay. A debt of many thousands of rand was impossible to pay. Whether this was generated through fraud, incompetence or Telkom problems was impossible to verify."

"Unskilled or otherwise **incompetent management** had led to the collapse of the centre."

Source: Peter Benjamin, LINK Centre: Reviewing Universal Access in South Africa, in The Southern African Journal of Information and Communication – Vol. 2, No 1, 2002

Figure 3; Reasons for Inoperability of 21 Out of 65 USA Telecenters in 2001 (South Africa)

From the above we already get a first idea that telecenter sustainability is not only about financials. We learn that there are other potential impacts and dependencies that can effectively act as "show-stoppers" for the entire telecenter operations. We realize that in order to effectively address the issue of telecenter sustainability it needs to be done holistically. We have to break down the idea of sustainability into its individual dimensions. This will be done in the following Chapter.

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[6] *Benjamin (2002)*

1.4. Dimensions of Telecenter Sustainability: Strategic Goals and Driving Factors

Only if several dimensions of sustainability are considered, the sustainability of the entire telecenter can be achieved. Review of telecenter research shows that several dimensions have been defined, sometimes with different names describing one idea.

Within the scope of this paper, the author has chosen to concentrate on some central categories of sustainability, which can directly be addressed by the business plan of a telecenter or RBRC:

1. *Infrastructure Sustainability*
2. *Services and Service Relevance Sustainability*
3. *Human Resources Sustainability*
4. *Organizational Sustainability* and
5. *Financial Sustainability*

Each of these dimensions will be dealt with separately as central *strategic goals* of sustainable telecenter establishment. Within each of the dimensions, different *driving factors* will be identified that should be central elements of the telecenter planning in order to help achieve the strategic goals. While Figure 4 presents an initial layout of the concept of factors and goals, Figure 24 in Chapter 7.1 will conclude the first tier of the paper with a summary of all factors and goals.

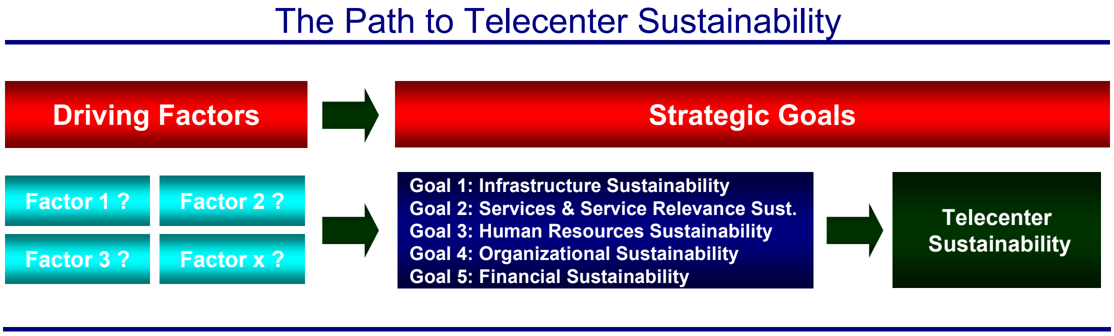
The Path to Telecenter Sustainability
Driving Factors
Strategic Goals
Factor 1 ?
Factor 2 ?
Factor 3 ?
Factor x ?
Goal 1: Infrastructure Sustainability
Goal 2: Services & Service Relevance Sust.
Goal 3: Human Resources Sustainability
Goal 4: Organizational Sustainability
Goal 5: Financial Sustainability
Telecenter Sustainability

Figure 4, The Path to Telecenter Sustainability

As this paper is seen as preparation for RBRC business planning, some other sustainability components that relate more to general societal, cultural and political issues, which are rather beyond an individual business perspective, will be excluded from discussion:

- Sustainability of Results Component
  It deals with how effectively a telecenter contributes to the social and economic development of a community.[7] Sustainability of results may even imply that a telecenter will generate the emergence of ICT capacities

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[7] *Whyte (1999)*

within the community, “handing over” its function to the community, thus making itself redundant, in the positive sense of the word.[8]

- Cultural Component (consideration of social and historical characteristics, cultural outlook, levels of education and literacy, and others).[9]

- Political Sustainability will be briefly mentioned as a requirement in the context of the liberalization of telecommunications markets (see Chapter 4.4).

1.5. Interdependency of Sustainability Dimensions

When sustainability of telecenters is being discussed, reference is frequently made to financial sustainability. Indeed, financial sustainability can be considered as an important dimension as it is a condition for achieving sustainability of other project components. It is achieved if “the revenues of the telecenter (including grants, in-kind support and cash earnings[10]) are greater than the expenditures.”[11] However, financial sustainability is an *output* of the sustainability of other components at the same time.[12]

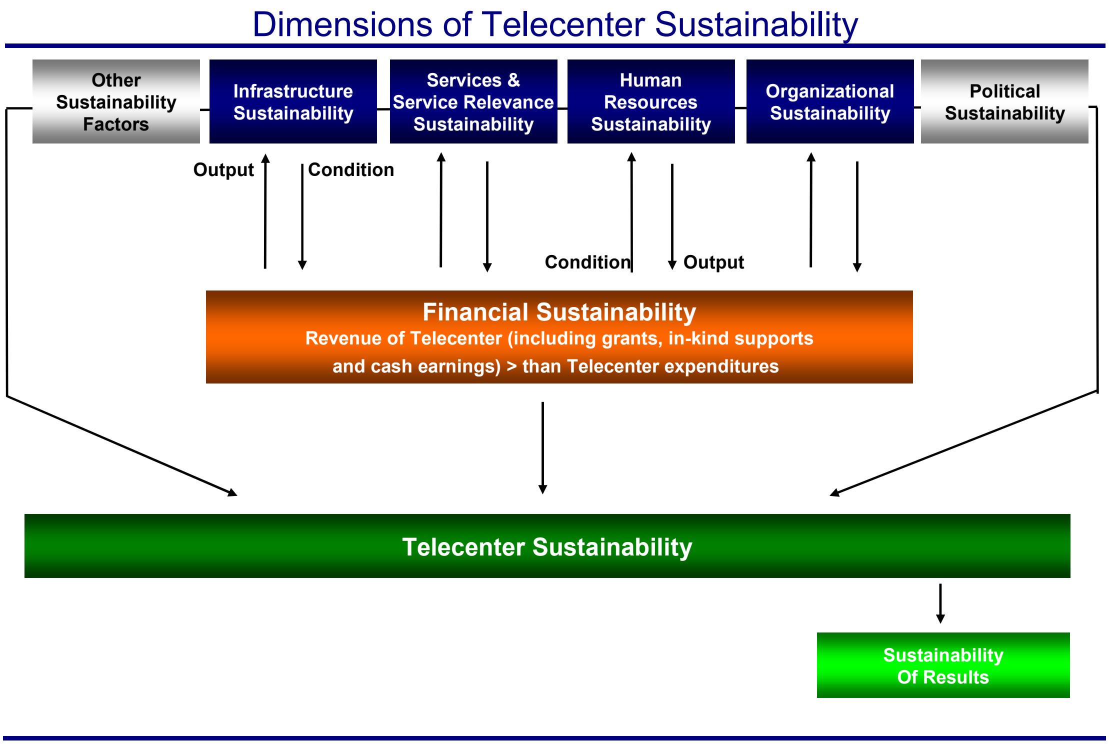
Dimensions of Telecenter Sustainability
Other Sustainability Factors
Infrastructure Sustainability
Services & Service Relevance Sustainability
Human Resources Sustainability
Organizational Sustainability
Political Sustainability
Output
Condition
Condition
Output
Financial Sustainability
Revenue of Telecenter (including grants, in-kind supports and cash earnings) > than Telecenter expenditures
Telecenter Sustainability
Sustainability Of Results

Figure 5, Dimensions of Telecenter Sustainability

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[8] *NTCA (2000)*
[9] *McConnell (2001)*
[10] *Note from the author: A telecenter may, depending on its mission, define financial sustainability such a way that it would exclude any form of external support.*
[11] *Whyte (1999)*
[12] *Mayanja (not known)*

As the achievement of one sub-dimension, like infrastructure sustainability, may be quite costly, the overall financial sustainability will always be in danger of not being met. In turn, neglecting infrastructure sustainability in order to push down overall cost will be very risky as it may severely impact the center’s service provision capability, and thus its means to make profits. This shows the dilemma that has to be dealt with in the search for sustainability of telecenters.

Yet there is no other way than, within the business planning process of a telecenter, carefully addressing each individual component of sustainability. After the following paper summary, we will start by taking a closer look at strategic goal 1, infrastructure sustainability, in Chapter 3.

2. Executive Summary

Telecenter Experience

Strategic Goal 1: Infrastructure Sustainability

"To realize sustainability of telecenter infrastructure and equipment by means of affordable, reliable and expedient components installed in a well-connected and protected facility."

Stable and functional infrastructure is a key component to enable the mission of a telecenter, which is substantial service provision. A central prerequisite for this, fast and constant telephone and Internet connectivity, is often hard to achieve due to poor public infrastructure and the isolation of rural areas, but wireless- or satellite-based technologies can assist where leased lines are not available. Technical devices prevent unstable electricity supply from causing severe service outages and damage of ICT equipment and data. Additionally, technical and non-technical strategies within a Business Continuity Planning (BCP) program can prepare telecenters for unforeseen business interruptions. A BCP program is developed along risk assessments and business impact analyses, as well as the development, maintenance, and testing of continuity plans. Equipping telecenters needs to be demand-driven, not technology-driven: It is important to carefully investigate the performance profile that is really required by the telecenter business through repeated qualified infrastructure needs assessments. Burglary and theft are frequent reasons for telecenter failure. This shows the importance of appropriate security measures, such as strong locks or alarm systems, as well as of insurance coverage. Due to factors like harsh weather conditions and inexperienced ICT users, infrastructure and equipment need good maintenance in order to benefit the telecenter as long as possible. Maintenance can be supported through basic internal staff capacity for ICT troubleshooting, strictly enforced house rules, and an inventory of key contacts for advanced back up.

Pages 14 - 23

…put in the SME Context

Satellite Connectivity for RBRCs – Power Supply through Solar Energy – Special Role of Business Continuity Concepts – Demand-Oriented Infrastructure – Increased Needs for Security and Insurance – Maintenance Support from OSS

To provide Rural Business Resource Centers (RBRCs) with good reach and reasonable bandwidth, linkage to the Internet via satellite technology (VSAT) appears most appropriate. VSAT-related experience gained during the implementation of the *Schoolnet Uganda* can be beneficial for this purpose. Renewable energy through solar technology is suggested as an ecological and durable method to create stable power supply and independence from external sources of energy. The importance of Business Continuity Planning concepts grows with the SME- and profit-orientation of an RBRC: The center can implement alternate site concepts on both the physical and the data level, and even include BCP in its product profile to be offered to SMEs as a service. Demand-orientation of infrastructure remains mandatory, also in a business-oriented center. If upward compatibility of installed infrastructure and software are considered, the center will be enabled to respond to increases in quantity or quality of demand as it occurs over time. Physical and data security as well as insurance coverage gain importance in SME-oriented RBRCs due to more sophisticated, thus more attractive, infrastructure, and higher criticality of data stored on behalf of SME customers. To enable qualified maintenance of infrastructure, staff of the central One-Stop-Shop (OSS) can provide maintenance support to RBRCs, such as technical skill development of staff through training seminars, technical help via e-Mail help desk, or central download possibilities.

Pages 23 - 31

Telecenter Experience

Strategic Goal 2: Services & Service Relevance Sustainability

“To realize sustainability of telecenter services and service relevance by means of a marketing strategy providing well designed, affordable and promoted services that respond to local needs and are offered in a supportive learning environment.”

Telecenter services will only be successful if customers consider them as relevant. While general usage trends can be observed that reveal particularly prominent telecenter services, individual relevance of a service, defined through its “usability”, depends on whether customers need, understand, afford, know, appreciate, and command it. *Need* should be identified through a local service needs assessment prior to implementation of infrastructure and equipment. Repetitive in nature, needs assessments require a thoughtful and patient approach, as the character and potential of ICT may be unknown to people surveyed. To be *understood* by customers, a service has to use understandable language and give answers to local concerns. Universities can assist in local content creation. Demand for a needed service will remain low if its *price* is too high to make those interested in it *willing or able to pay* for it. To achieve reasonable pricing, external or cross-subsidization of services may be required in early telecenter stages. Governments can support cheaper prizing of telecom services through actively promoting the privatization of telecom markets. To make people *know* the services and reduce prejudice against unknown technologies, a framework of promotional activities before and after telecenter implementation should address individual services and the value of ICTs for development in general. Educational workshops can help the customers to *appreciate* services through a combination of hands-on introduction and educational explanations of their purpose, potential, restrictions, and interfaces with traditional techniques. The importance of ICT training observed in Western countries should be done justice to through training services of different complexity levels, which, together with everyday user assistance, will *increase customer skills* and help them to overcome *manageability constraints.*

Pages 31 - 42

…put in the SME Context

Categorization of SMEs – Segmented Needs Assessment – RBRC Service Categories & Ideas – Local Context through Local Sector-Oriented Profiles – Segmented Pricing and Promotional Strategies – Training Centers of Competence – e-Security & e-Trust

Making services relevant for SMEs requires an understanding of the nature of the SMEs as customers. In that relation, choosing a segmented needs assessment approach by organizing SMEs into four categories of ICT readiness will prevent that a potential customer group is neglected. Possible RBRC service categories include Information Services, ICT Support & Training Services, and Enterprise Internet Solutions, to be extended by ideas like a virtual portal to match entrepreneurs, investors, SME employers, and human resources. Local relevance of products an RBRC receives from the central OSS can be assured by the application of Local Sector-Oriented Profiles, which will filter information, services, and marketing tools provided against regional sector-specific criteria. Pricing and promotional strategies should reflect differing ICT readiness stages of SMEs as well: Advanced SMEs may pay decent prices for customized business information solutions of high quality which will be marketed to them via individualized promotional and advertising efforts. Compared to this, lower-level SMEs will be charged lower prices for basic services, which need to be promoted to them in a more educational manner, explaining benefits without the technical abstractness of a product feature driven promotion that is typically used in ICT-related advertising. In order to enable the provision of user training for the full spectrum of services, each RBRC can become a Training Center of Competence in one subject area, distributing its specialized knowledge through train-the-trainer seminars, provision of training material, and helpdesk support for non-specialized trainers. E-Security and e-Trust services can help SMEs to confidently move from a rural marketplace into a virtual marketspace, trusting their remote business partners and relying on confidentiality, integrity, and non-repudiation of electronic documents.

Pages 42 - 62

Telecenter Experience

Strategic Goal 3: Human Resources Sustainability

“To realize sustainability of human resources by means of highly motivated, qualified, continuously trained, reasonably paid, and visionary staff and management.”

Competent staff is vital for telecenter success, as it is responsible for service creation and provision, customer confidence, telecenter development, and income generation. While low salaries paid in rural areas often cause scarcity of high profile qualifications, soft skills, like flexibility, teamwork, and good community skills, play their own important role. However, a certain salary level and (non-financial) incentive schemes should be maintained to limit frequent fluctuation of employees and loss of the corporate experience associated with them. Employing volunteers is another possibility to cope with shortage of financial means. Telecenter staff and managers need on-going training in key skills and techniques, such as equipment and applications operation, customer service orientation, financial planning, etc. Staff training materials have been developed and are available on-line. Literature review reveals that a competent manager, a “local champion” who is visionary and able to make ICT concepts understandable for the community, is one of the most important ingredients for telecenter sustainability. Additionally, women have been described as better telecenter managers, due to their social and communicative skills as well as their eagerness to learn and inquire about new trends.

Pages 63 - 66

…put in the SME Context

Implications of Sector-Specific Qualification – Volunteering in an RBRC – RBRC Staff Training – Double-Headed Management Structure

It is recommended to recruit RBRC staff from candidates possessing the same set of qualifications that has been suggested for a regular telecenter. Additionally, it will be an advantage if the qualifications of RBRC staff link into the special nature of the locally dominating SME sector. Sector-specific knowledge will, among other things, provide employees with a better understanding of SME needs, higher capabilities of converting sector-relevant raw data or information into sector-oriented information packages, and higher acceptance received from the SME customers. Volunteers working outside of regular contracts can be considered for activities that do not directly interfere with sensitive SME customer information, such as advertising support, content development, etc. The need for qualified technical and non-technical staff and management training that includes sector-specific knowledge will likely grow in positive correlation with product complexity and customer skill level, which are expected to develop in an RBRC over time. The OSS can support the RBRCs through centrally produced staff training courses and material. A double-headed management team is suggested as management structure for the RBRC, consisting of a manager for services and marketing (SME sector and content-oriented function) and a manager for technology and support (technology and infrastructure-oriented function).

Pages 67 - 71

Telecenter Experience

Strategic Goal 4: Organizational Sustainability

"To realize organizational sustainability by means of a suitable ownership and leadership pattern, the promotion of effective telecenter and human networking, and strategic business planning and documentation."

Privately owned telecenters have been found to be more profitable and successful than those in public ownership, due to factors like greater entrepreneurial spirit of private proprietors. However, as too much profit orientation may outdo the developmental mission of the telecenters, the establishment of public-private sector partnerships has been suggested that combine private investment and management with a supportive yet regulatory function of public actors. Like every alliance, a "partnership for development" has to result in "win-win-situations" for all participants. Telecenters should organize themselves in networks in order to, among other things, share resources and experience and combine forces to influence public policy debate. Each telecenter should consider active networking as an important part of its business strategy, intelligently employing its technical network-based tools for this purpose. A sound and continuously updated business plan should build the framework for all aspects and strategic goals of sustainability, from service and infrastructure needs assessments to service profiles, staffing, and marketing concept. Additionally, the knowledge, experiences, techniques, customer contacts, configurations and ideas that arise in a telecenter over time need to be preserved through documentation.

Pages 72 - 77

…put in the SME Context

Required Characteristics of an RBRC Ownership and Leadership Pattern – Pattern Evaluation and Recommendation for RBRCs – Networking of the OSS and its RBRCs – Business Planning and Documentation Requirements

Through the implementation of the RBRCs by UNIDO, the frequently used pattern of center implementation by a socially oriented body will be followed. Substantial private and appropriate public sector involvement should constitute a public-private sector partnership for RBRC ownership and leadership. A pattern of ownership and leadership is recommended that introduces the RBRC as a new profit center of an existing private SME support institution, created as a separate legal entity with a majority of private shareholders, and limited public shareholding as regulatory mechanism. Plenty of networking opportunities exist between the OSS, subordinated RBRCs, and third parties, including networked information and service provision, exchange of ideas and product concepts, expansion of countrywide virtual products, business process delegation and data mirroring as part of a Business Continuity Planning strategy, etc. Important elements of initial and continuous RBRC business planning will be intense analyses of regional SME industries and the definition of the SME target market. RBRC documentation activities can contain the creation of best practices handbooks, as well as preservation of marketing research results, SME customer profiles, and other information – partly stored in electronic formats.

Pages 77 - 87

Telecenter Experience

Strategic Goal 5: Financial Sustainability

"To realize sustainability of telecenter finances by means of a location with sufficient demand structure, financial controlling and discipline, attraction of financial support, but most of all an holistic telecenter concept that considers every of the previously outlined sustainability dimensions."

Financial sustainability is a key factor for telecenter sustainability, as it is a *condition* for achieving sustainability of other project components and the survival of the telecenter. However, it is an *output* of all other sustainability dimensions at the same time, which are thus turned into the most important long term driving factors for financial sustainability. Moreover, financial sustainability is based on a given minimum purchasing power and sufficient density of potential telecenter customers. In addition to budgeting, bookkeeping, and strict financial discipline, telecenters should establish financial controlling mechanisms keeping them informed of the status of planned vs. actual expenditures, earnings, and cash flows. Wherever possible, telecenters should also invest time and effort in actively trying to attract financial support with clever marketing, relationship building, and lobbying activities.

Pages 88 - 90

...put in the SME Context

SME Density and Ability to Pay – Financial Controlling – Interpretation of Controlling Information for Action

In addition to sustainability of: services and service relevance, infrastructure, human resources, and organizational framework, sufficient density of SMEs and their ability to pay is a key prerequisite for financial sustainability of RBRCs. The consideration of rural areas hosting clusters of SMEs will be most promising as RBRC location. Locations will qualify themselves through a good combination of average income level per SME and SME density per square kilometer. Comparison of budget numbers with actual bookkeeping within the process of financial controlling will enable management to actively steer RBRC operations and respond to unforeseen developments. The challenge will be to draw the right conclusions from the controlling information available in order to correct what needs to be corrected. In that sense, divergence of planned vs. actual values may be rooted in wrong decisions made, environmental impacts, technical reasons, staff performance, false actual values, or unrealistic plan values.

Pages 90 - 94

3. Strategic Goal 1: Infrastructure Sustainability

To realize sustainability of telecenter infrastructure and equipment by means of affordable, reliable and expedient components installed in a well-connected and protected facility.

A telecenter is a service center. Services are its product and the key to success or failure. Only good services will create customer confidence and revenue. Thus, maintenance of quality and availability of the services need to be of top priority. A stable and functional infrastructure is one major component required to achieve this.

Driving factors to achieve infrastructure sustainability are:

- Connectivity
- Stability and Business Continuity
- Demand-Oriented Infrastructure
- Center Security and Insurance
- Infrastructure Maintenance and Supply

3.1. Connectivity

Enabling remote areas in developing countries to benefit from the information that is available within global information networks like the Internet first and foremost requires a link that permits access to the information in a sufficient manner. Minimum requirements of connection availability, speed and stability have to be fulfilled. However, as the telecommunications infrastructure outside of urban regions is often very basic, proper and affordable connectivity is sometimes difficult to achieve by telecenters.

If no local access point to an Internet Service Provider is available, connections are sometimes made via long-distance telephone lines with high connection charges and insufficient bandwidth and stability. While a long-distance telephone line may still be appropriate for bulk-sending e-Mails that have been written off-line, Internet access, fax connections, or other services requiring extended telephone access will get very expensive this way. It has been observed that the high costs and lack of quality associated with this arrangement have prevented rural telecenters from becoming profitable.[13]

While it is associated with higher cost, a sufficient number of users may justify the installation of a permanent Internet link using wireless technology or a leased line. If remote areas do not have dedicated lines available, cellular phones, VHF/HF radio or low-earth orbit satellite technology may be a solution to enabling connectivity.[14] Proenza claims that although there are prospective projects involving low-earth orbit satellite technology, they have yet to materialize. Besides introducing examples of so called “last-mile” solutions, he suggests VSAT technology (“Very Small Aperture Terminal”) as a cheap alternative that is more and more being used in Latin America and the Caribbean. Still, due to the high cost of the VSAT hub (US$400,000 – 1,000,000) that distributes the signal to individual telecenter parabolic antennas (which themselves are indeed affordable, at ca. US$2,500 incl. accompanying equipment), a VSAT solution with its own hub ground-station will only be economically viable if several remote locations share the cost of signal distribution.[15] Shakeel et al name a cheaper VSAT alternative offered in South America, where a low-cost reseller of unused satellite bandwidth (Tachyon) offers connection to its network. For this solution, no extra hub is required, as the company routes data traffic directly from the telecenter to the satellite. Costs consist of US$5,800 for satellite antenna and installation, plus US$18,000 for annual usage.[16] Tachyon’s data coverage area currently includes Europe, North America, some countries in the Middle East, and some South American and North African countries. Asia and the majority of African countries, however, are not yet covered.[17]

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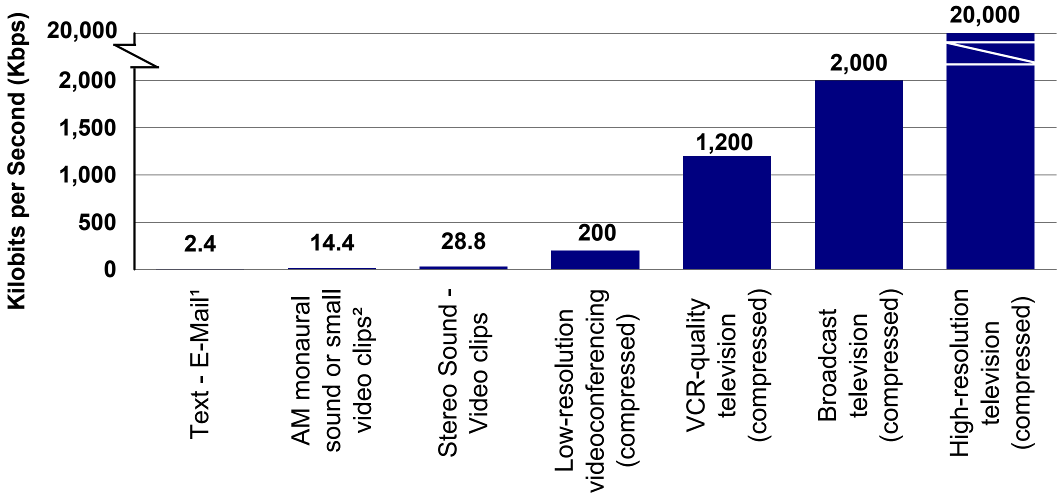
[13] *Proenza et al (2001)*

[14] *Jensen and Walker (2001)*

Bandwidth Requirements of Telecenter Applications



[1] transmitted at a rate of 3 pages per minute (10 pages if compressed)
[2] 20% of the screen at a rate of 3 or 4 frames per second

Source: Proenza et al (2001): Telecenters for Socioeconomic and Rural Development in Latin America and the Caribbean, FAO / ITU / IADB, Washington D.C.

Figure 6, Bandwidth Requirements of Telecenter Applications

VSAT offers broadband transmission of data. However, where such cutting-edge technology is not available, bandwidth becomes another important issue of connectivity. Slow speed of Internet based services caused by insufficient bandwidth can be very discouraging to the user. Furthermore, advanced techniques like video conferencing are not feasible without a certain degree of connection speed, beyond the level simple telephone lines (about 56Kbps) or GSM mobile telephone connections (9.6Kbps) can provide. A telecenter in Mamelodi, South Africa, uses a Wireless Community Network called "Community Information Delivery System" (CIDS). The system provides a bandwidth of 2Mbps that is used with shared access by schools, businesses, training centers etc.[18]

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[15] *Proenza et al (2001)*
[16] *Shakeel et al (2001)*
[17] *Tachyon, Inc., www.tachyon.net*

Figure 6 gives an overview of the range of bandwidth requirements of different telecenter applications.

3.2. Stability and Business Continuity

3.2.1. Stability

As initially mentioned, services are the central element of a telecenter. Permanent availability and reliability of telecenter services are key qualities that contribute to customer satisfaction. However, public infrastructure in developing countries, especially in rural areas, is often still insufficient and unstable. If telecenter services are affected by external instability or the infrastructure is malfunctioning in itself, service quality is immediately in danger.

The operator of a telecenter needs to be aware that the continuity of its business can be negatively affected by different snags. For instance, personal computers need to be operated in an air-conditioned facility. In case of failure of the air-conditioning system within a hot environment, PCs and other equipment will have to be powered down in order to prevent overheating. Thus, they will no longer be available to offer services.

Similarly, stability of services can be severely impacted by external failures. In regions with weak telecommunications infrastructure, unstable telephone lines that can cause interruption of both voice and data transmission services are a major issue. A lack of stability in electricity supply can seriously affect operations as well. Sudden power outages caused by lightening strikes, floods, etc. will not only interrupt electronic services but can seriously damage equipment when hard disks in computers or servers crash, destroying the data stored on the disks and in caches.

Besides devices that help to deal with power outages (UPS = Uninterrupted Power Supply), the following components may be required to guarantee operational stability:[19]

- Voltage stabilizers
- Surge suppressors
- Shock protection
- Grounding

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[18] *Fuchs (1997)*
[19] *Proenza et al (2001)*

- Air-conditioning to provide appropriate humidity, temperature and indoor ventilation for the operation of hardware

Experience made with unstable power supply has been reported from Nakaseke telecenter in Uganda where power cuts lasted as long as 78 hours. The center has a backup system but it does not cater for devices with high energy consumption, such as photocopier and printers.[20] When deciding for a range of infrastructure components ensuring stability, the cost should be measured against the potential benefit on an individual basis. If a center thinks that copying is not part of its key services, the Nakaseke solution as described above may be considered as sufficient. Similarly, the question whether a back-up server or back-up data streamers (e.g. Redundant Array of Inexpensive Disks systems) are worth their investments should be answered on individual basis. As always, the right balance of risk vs. investment has to be found.

3.2.2. Business Continuity Planning

Generally, the negative potential of business interruptions should in no way be underestimated.[21] More and more companies in the developed world realize that business interruptions can cause a major threat to their whole business. Thus, so called “Business Continuity Planning” programs (BCP) are being implemented. While the cost of ICT downtime and business interruption for large corporations of developed countries can be several millions of dollars per hour, telecenters in developing countries can lose at least a good reputation and an arduously established customer base, which will be difficult to regain. Especially in remote locations with fragile public infrastructure, telecenter operations that are prepared for and guarded against business interruptions can gain significant reputational advantage over competitors, promoting reliance as a major component of their business proposal.

In any case, telecenter personnel should understand that Business Continuity Planning is not only about infrastructure or electricity. It rather extends to the continuation of all kinds of business processes that are performed by humans. Even if limited budgets do not allow for advanced back-up solutions, there are many basic things that can be done to prepare for disruption of business.

A more advanced Business Continuity Planning approach would include what is listed below. Obviously, the feasibility of the planning depends on the capacity of the respective telecenter. However, even a small number of elements implemented from the list can be of significant benefit to the stability of telecenter services.

Risk Assessment and Business Impact Analysis:

- Identify potential threats that could cause disruption of business.
- Identify how the threats would affect individual services.

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[20] *Benjamin (2000)*

[21] *The author has worked for the Global Business Continuity Planning unit of a multinational financial institution.*

- Categorize the impact of disrupted services on revenue streams and reputation.
- Prioritize services that should be guarded against disruption of business.

Business Continuity Planning:

- Identify the resources needed for restoring services.
- Create and document contingency procedures and actions, such as
    - Procedures that accelerate the notification of vital staff members in case of disruption of business (call-out cascades with mobile phone numbers / home numbers of staff).
    - Recovery teams, which are responsible for handling business interruptions.
    - Team positions within the recovery teams that define roles and responsibilities of people internal and external to the telecenter operations in case of disruption of business (e.g. "person responsible for customer care", "person responsible to replace hard disks and restore lost data on hard disks", "person responsible to co-ordinate recovery efforts", etc.).
    - Recovery actions, allocated to different team positions, which should be performed in case of different scenarios. Formulated in a manner that is easily understandable even in hectic situations, they should outline procedures related to IT and telecom recovery, special actions to be taken during generator activity, switching of equipment from a crashed phone line to an alternate line (e.g. wireless), etc.

      Very simple yet effective solutions can also include: stock of manual office supplies, such as pens and paper, in order to allow the customers to quickly switch from e-Mail services to faxing of manually written pages, in case the Local Area Network or Internet connection break down; If the local business environment and customs allow: co-operation agreements with (competing) telecenters to use each other's facilities as alternate sites in a co-ordinated effort, in case that only one of both is affected by a disruption of business (the telecenter affected may want to establish a quick and convenient shuttle service bringing its customers to the alternate site).
- The documented procedures should be stored in folders both in the telecenter and at the homes of staff in charge with recovery actions.

Plan Testing and Maintenance:

- Perform structured walk-throughs on a regular basis: verbally review the planned contingency actions together with the staff members in order to identify their effectiveness and deficiencies (update the plans accordingly).

- Perform recovery exercises, i.e. simulate power outages on weekends. Test the recovery strategies for sufficiency and feasibility.
- Update the plan content according to changed procedures, technologies, or service profiles. Review the plans on a regular basis.

After all, telecenter BCP can be very much enhanced by common sense and clear thinking of management and staff, including preparedness for the “unthinkable” (and certainly the undesired) in their business strategy.

3.3. Demand-Oriented Infrastructure

Infrastructure consists of all the ICT equipment required to enable the service profile of the telecenter. This may include Personal Computers with monitors, servers, printers and scanners, fax machines, video conferencing equipment, etc.

The goal of a telecenter infrastructure outfitting should be to maximize the capabilities of the deployed hardware while at the same time minimizing its implementation cost and maintenance requirements. A telecenter is supposed to provide quality services, not to provide sophisticated infrastructure. ICT infrastructure with its high performance features sold in developed countries is very often pushed into the markets rather than pulled by customer demand. As money is shorter in developing countries it will be important to carefully investigate the performance profile that is really required by the telecenter business. If expensive features of equipment are not required to realize the service profile desired by the customers, it makes no sense to invest money in them. Equipping telecenters needs to be demand-driven, not technology-driven.

On the other hand, saving money at the wrong end might impact the quality of the services, which will push down consumer confidence. Also, the rapid technological advancement of digital technologies needs to be considered, implying that software and equipment become outdated very quickly.[22]

Not only telecenter services but also the equipment itself should be catered to the needs of the customers. If the customers do not accept a certain type of media it will be difficult to teach them different. Actual needs have also seen being ignored in cases when the equipment was bought by means of centralized or bulk purchasing. This may occur if a telecenter is planned by a central organization. Although this type of purchasing may imply potential savings and less administrational work, it carries the risk that equipment will be installed not according to the local needs but according to purchasing patterns: Telecenters that were established by the Universal Service Agency (USA) in South Africa were found to be equipped with a consistent equipment profile, and no or little effort had been made to cater the deployed equipment to the local needs – to some extent because of the USA’s central office’s requirements to perform centralized purchasing. The same study revealed that some telecenters had more telephone lines installed than were actually used. Due to the high fixed cost, telecenters ran into financial trouble and were put in danger of being “killed by over-capitalization”.[23]

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[22] *Stoll (2003)*

The above shows necessity of a qualified infrastructure needs assessment that enables the catering of the infrastructure to customers’ needs (Which media are they willing / able / prepared / keen to use? Which level of connectivity will they require?) and those defined by local circumstances and environment (What level of air-conditioning is required by outside temperature or humidity? Which investment in connectivity is required due to deficiencies in the local economic development environment?). Due to rapid technological advances, infrastructure needs assessments should be considered as ongoing processes rather than one-time activities.

3.4. Technology Components

Depending on the services the telecenter decides to provide and the budget that is available, a variety of components can be considered for installation. Accordingly, there is no standard technology profile that fits to every telecenter. Rather, the profile should be catered along the service needs that are identified in the course of a service needs assessment (see Chapter 4.2) and along the infrastructure and media preferences of the customers.

Figure 7 is based on suggestions made by Mike Jensen and David Walker in “Telecenter Technology”.[24] It gives a rough overview of components a telecenter could include in its configuration but is not limited to. It also briefly illustrates some aspects that go along with the individual components.

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[23] *Benjamin (2002)*

[24] *Jensen and Walker (2001)*

Suggested Components of Telecenter Technology

4. Applications

C o p y r i g h t

Common Applications

- Desktop Publishing
- Spreadsheet Software
- Internet-/Web Applications
- Trend: LINUX operating system

Computer Use Management Syst.

Pre- and Post-Payment Accounting of Online time.

Chargeable Smart Cards can be used.

Internet / Web Applications

World Wide Web access, E-Mail, File Uploads via FTP, streaming audio / video, videoconferencing, online chat, newsgroups, etc.

Call Accounting System

Pre- and Post-Payment Accounting of Telecom use.

Digital read outs of accumulated call charges.

Educational and Training Software

Not to replace face-to-face training! Also delivered via the Web.

5. Audio / Video

Videoconferencing

Saves travel cost, but high investment and connection cost (ISDN). Internet Videoconferencing on the uprise!

Radio Systems

Portable low-cost FM transmitting stations: Local broad-casting! Streaming Audio via Internet.

Digital Camera

For many purposes, such as ID photo-graphs, documentation of events, etc. Upload of pictures!

Video Cass. Recorder

Broadcasts, video training and education, recording of videocon-ferences, etc.

Projection Equipment

Overhead projector/ screen for trainings. Caution: Has often NOT been USED after purchase!

3. Hardware and Local Area Network

Computers

User PCs and Administrative PCs.

Minimum requirements include: Pentium 350MHz, 32 MB RAM, 4 GB Hard Drive, 14inch monitor, sound card / sound blaster, network card, microphone, UPS, surge protector…
Older or recycled machines might be used.

Printers

1 Printer to every 8 – 10 PCs, linked via the LAN. Types depending on service profile. Desktop publishing services require commercial quality levels.

Integrated models (fax/printer/scanner/ photocopier).

Scanner

Flatbed scanners as most efficient type to scan books, publications, photographs, maps, etc.
Integrated scanners (fax/printer /scanner/photocopier).

Local Area Network

e.g. linkage of hardware via 100BaseT 16-port Ethernet hub (can be extended further). Wireless LANs become popular, but are still expensive. Max. 70km range!

CD burner / writer

To record, store, distribute events, archival material, etc.

To create back-ups of databases, music, video files.

2. Telecom

Telephones

Regular telephones. Cell phones.

Hands-free and speaker phones for audio-conferencing (expensive!)

Long-distance cordless phones (e.g. 2.4 GHz), with max range of 5 km for mgmt. and staff.

Fax

Stand-alone “Group 3” fax with dedicated line recommended.

Integrated models (fax/printer/scanner/ photocopier).

Free fax services may be available via Internet.

Modems

Min. 14.4Kbps for graphic images. Text can be received with lower speed. Provision of higher speed (e.g. with 56.6Kbps modem) dependent on local telephone network quality.

1. Connectivity

Telephone Line

Usually:
- 1 Line for Voice
- 1 Line for Fax
- 1 Line for Internet

Minimum: 1 shared line

Wireless / Satellite (Permanent Link)

To replace phone line:

- Leased Line
- Wireless Line

- Cell Phones
- VHF/HF Radio
- Low-Earth Orbit (LEO) Satellite

6. Other

Photocopier

Digital printers (RISO) copy cheaper, with less maintenance, operate in hot and dusty conditions. Integrated models (fax/printer/scanner/ photocopier) for low volumes!

Paper Shredder

Destroys confidential documents of clients or the telecenter operations.

Binding Machine

Can have income generating potential, if there is demand for creating booklets/reports!

Different binding systems to choose from.

Laminator

Covers documents with a thin film of plastic. Preserves them from humidity and dirt.

Based on: Jensen, Mike and Walker, David (2001): Telecentre Technology, in “Telecentres – Case studies and key issues”, The Commonwealth of Learning, Vancouver.

Figure 7; Suggested Components of Telecenter Technology

3.5. Center Security and Insurance

As illustrated in Figure 3, the South African study identified burglary and theft as the most frequent reasons for telecenter failures (nearly 20% of cases), equally significant than managerial weakness or technical problems.[25] We learn from this that telecenters, especially in less densely populated areas, need to pay attention to how to secure their property. Jensen and Walker suggest a series of actions to be considered in order to secure telecenter equipment and cash:

- Constant vigilance
- Marking the equipment with special identification marks
- Create an inventory of serial numbers in order to be able to identify stolen items
- Securing equipment to desks and benches
- Install strong locks, window bars and alarm systems
- If the telecenter is free-standing, it may be required to have security fencing or even to employ guards during day and night time[26]

Additionally, insurance of property should be considered, although this may be very costly. Depending on the type of property insurance, it would cover for burglary, losses caused by fire, lightning, explosions, smoke, vandalism and mischief, and collapses of the sinkhole. Other options would include damage through water, freezing, falling objects, as well as glass breakage. If the situation permits, the existing property insurance of the owner could be extended to the staff and property of the telecenter acting as tenant. Liability insurance will cover lawsuits and claims coming from harm to persons that occurred on location of the business, and would also cover claims arising from contracts with others, to include the landlord.[27]

Security can be extended from physical to data security. Depending on the quantity and quality of data hosted at the telecenter, it will have to guard it against unauthorized access from inside or outside the facility as well as against loss caused by damage of equipment (fire, water, etc.; see also Chapter 3.2 on Business Continuity Planning).

Again, investment decisions have to be made carefully: Whyte points out that experience from telecenters in different parts of the world reveals costs caused by physical and data security to be most commonly higher than expected.[28]

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[25] *Benjamin (2002)*

[26] *Jensen and Walker (2001)*

[27] *Jensen and Esterhuysen (2001)*

[28] *Whyte (1999)*

3.6. Infrastructure Maintenance and Supply

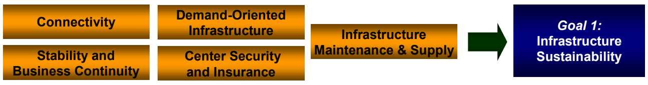
Infrastructure and equipment need careful and proper maintenance in order to benefit the telecenter as long as possible. This is especially applicable in the harsh conditions that exist in many developing countries (heat, humidity, dust). Furthermore, customers that are often inexperienced in the use of information and communication technology imply aggravated conditions for hardware in general.[29] While users may lack experience, it is even more important that the telecenter staff develops sufficient technical capacity to enable the maintenance of stable services. Mayanja recommends the development of at least a basic capacity for troubleshooting and risk reduction. By doing so, the staff will not need an external expert for every small problem, such as small hardware or software errors.[30]

Telecenter management should pay tribute to the fact that many of its customers are inexperienced in handling ICT equipment by establishing rules that help to maintain it in a good state. For instance, the windows should be closed at all times in order to prevent dust from entering the rooms. Also, customers should be allowed to enter the rooms of the telecenter only with shoes that are free from sand or dust, as both can harm technical equipment. Drinking and eating should not be allowed in the telecenter for the same reasons.

Technical problems of more serious character can be addressed with an inventory of key contacts for advanced back up. However, especially in rural areas, computer equipment maintenance is rare and expensive, and the related personnel are hard to find.[31] Whyte lists the cost of updating and maintaining equipment (especially computers) as another major item that is frequently underestimated in telecenter projects.[32]

In order to quickly respond to technical problems, the telecenter should be allowed to order supplies itself, not via centralized purchasing of e.g. a development agency acting as the owner. This will accelerate the process of restoring the affected functions back to normal.

3.7. Strategic Goal 1 in the SME Context


Connectivity
Demand-Oriented Infrastructure
Stability and Business Continuity
Center Security and Insurance
Infrastructure Maintenance & Supply
Goal 1: Infrastructure Sustainability

The following Chapters deal with additional aspects that need to be considered when the identified driving factors for infrastructure sustainability are applied to the operation of an RBRC that specifically targets SMEs.

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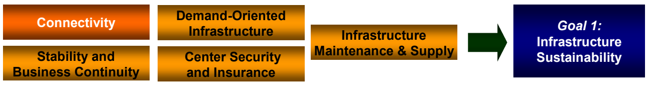
[29] *Oestmann and Dymond (2001)*
[30] *Mayanja (nk)*
[31] *Proenza et al (2001)*
[32] *Whyte (1999)*

3.7.1. Connectivity


Connectivity
Demand-Oriented Infrastructure
Stability and Business Continuity
Center Security and Insurance
Infrastructure Maintenance & Supply
Goal 1: Infrastructure Sustainability

For a rural RBRC, good connectivity is vital as many of its typical services cannot go without it: Information services of various kinds, website hosting and maintenance, e-Business solutions, let alone video conferencing. Both speed and stability are important. Due to high connection charges combined with small bandwidth, use of long distance telephone lines to enable Internet access is unlikely to be a good solution.

Another option for realizing Internet access of RBRCs in Uganda is the lease of fiber optic lines which can be utilized for voice and data transmission. They are available from the two national operators MTN Uganda Ltd. and Uganda Telecom Ltd. (UTL) only.[33] Yet depending on the locations to be selected for the rural RBRCs, the availability of leased line connections in remote areas with complex topography is uncertain.

To overcome this problem, satellite operated VSAT technology is an option which is suggested here to provide RBRCs with good reach and reasonable bandwidth. Local satellite antennas on site of the RBRC have to be linked to hub ground-stations, as described in Chapter 3.1. In Uganda, the ground-stations are connected to the foreign Internet via so called *International Data Gateways*. Eight gateway licenses that had been granted in Uganda already before the 5-year exclusivity period for the national telecom operators began were in place in 2001.[34] Examples of gateway operators are SpaceNet International (http://www.spacenet.co.ug/), Infocom Ltd. (http://www.imul.com/) and Afsat Communications Uganda Ltd. (http://www.afsatug.com/vsat.php). The latter serves 85 private businesses and NGOs in Uganda as VSAT provider and supplied the technology for the *Schoolnet Uganda*,[35] Africa's first national wireless satellite-based schools connectivity project.[36] So far, Schoolnet Uganda has been having problems with utilizing VSAT technology already installed, caused by the exclusivity of license agreement mentioned above.[37] However, as the 15 schools integrated into the project are located in rural locations all over Uganda, experiences made so far in the course of the project should be evaluated further if VSAT is considered as technology to connect rural RBRCs to the Internet.

While VSAT could be the technical solution for providing Internet connectivity, voice telephony services powered by VSAT is not yet available in Uganda.[38] This may change in future as examples of other African countries demonstrate feasibility. To give only one example: South African Telkom SA had a VSAT provider set up a rural satellite telephony network that has been serving nearly 3,000 communities with telephone and Internet access.[39]

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[33] *In Uganda, many telecommunication related services are available exclusively from MTN and UTL. This duopoly exclusivity has been fixed for a period of five years, ending in July 2005 (Source: Uganda Communications Commission, http://www.ucc.co.ug/licensing/about.html)*

[34] *Wasukira and Naigambi (2002)*

[35] *Econ One Research, Inc., and ESG International (2002)*

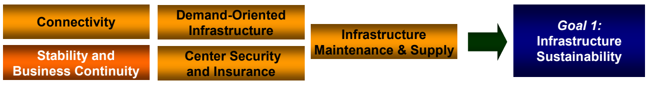
[36] *See http://www.world-links.org/english/html/uganda.htm and http://www.schoolnet.sc.ug for more information*

[37] *Center for Development Research (ZEF Bonn) (2002)*

[38] *Econ One Research, Inc., and ESG International (2002)*

Whatever solution will be selected to connect the respective Ugandan RBRCs to the Internet, with other information sources, and among each other: its sufficiency is assumed to be a major prerequisite for sustainable maintenance of SME customers' demand and for sustainability of the center as a whole.

3.7.2. Stability and Business Continuity


Connectivity
Demand-Oriented Infrastructure
Stability and Business Continuity
Center Security and Insurance
Infrastructure Maintenance & Supply
Goal 1:
Infrastructure Sustainability

From the perspective of an RBRC, SMEs as professional customers have better means to spend money on ICTs than non-professional customers would have, at the same time they carry a greater risk as they have more money to lose. Consequently, stability of services offered in an RBRC is even more important for the establishment of sustainable customer trust. While the quality of external infrastructure, such as electricity supply, is beyond the control of the RBRC, everything should be done to internally guard the center with power generators and other security mechanisms, as previously described. Multiple telecom and Internet solutions, such as landlines *and* mobile lines or satellite enabled Internet, which can be switched between, are contingency measures to prepare for telecom service interruptions.

3.7.2.1. Renewable Energy for Rural Power Supply

A means to gain independence from unreliable electricity grids is the use of renewable energy technologies, such as Solar Photovoltaics (PV). The higher investment cost of such a system can be offset by the low maintenance cost and its long lifetime. One success story on the application of solar energy for ICT provision comes from the village of San Rámon in Honduras. Solar power supplied a classroom equipped with 11 computers, TV, video and tape recorder, digital cameras, scanners, printers, etc. On top of that, solar energy was sufficient to serve six additional classrooms and a community center, each with outlets for TVs and computers, a health clinic with heating and cooling system, streetlights, etc. The power supply that has been provided through PV is said to have significantly raised the quality of life in the small village, which had been too isolated to be hooked up to the electricity distribution network.[40]

If the electricity supplied through renewable energy technology is limited in volume, it is recommended to deploy equipment with reduced power consumption. When in a telecenter desktop computers, monitors and laser printers were replaced by laptop computers and inkjet printers, power consumption was found to be reduced by 70 percent. The higher investment in equipment was easily compensated by the energy savings.[41]

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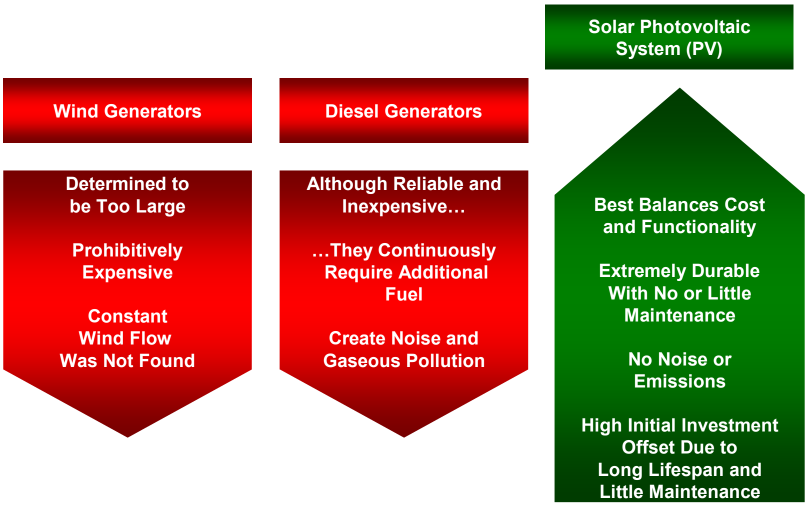
[39] *http://www.gilat.com/Solutions_CaseStudies_TelkomSA.asp*
[40] *Verdisco and Melara de Fanconi (2001)*
[41] *Shakeel et al (2001)*

Figure 8 lays out the arguments that led to the decision for Solar Photovoltaics to supply a telecenter in rural Costa Rica.

Decision for Solar Photovoltaic Electricity Supply in Costa Rica Project


Solar Photovoltaic System (PV)
Wind Generators
Diesel Generators
Hydro Turbines
Determined to be Too Large
Prohibitively Expensive
Constant Wind Flow Was Not Found
Although Reliable and Inexpensive…
…They Continuously Require Additional Fuel
Create Noise and Gaseous Pollution
Best Balances Cost and Functionality
Extremely Durable With No or Little Maintenance
No Noise or Emissions
High Initial Investment Offset Due to Long Lifespan and Little Maintenance
Limited by Topography and Rainfall of Location
Not Appropriate in Many Areas

Based on: Shakeel, Hani; Best, Michael; Miller, Bruno; Weber, Sam (2001): Comparing Urban and Rural Telecenters Costs, MIT Media Laboratory E-Development Group, Massachusetts Institute of Technology, Cambridge, MA

Figure 8; Decision for Solar Photovoltaic Electricity Supply in Costa Rica Project

3.7.2.2. Business Continuity Planning For and From the RBRC

Chapter 3.2.2 has stressed the general importance of Business Continuity Planning and outlined some key components. The importance of a BCP program increases with the SME orientation of the RBRC. With rising level of ICT usage and dependence, the limit of tolerance on behalf of the customers regarding RBRC service disruptions can be expected to fall. As a business center offering high level services, eventually becoming part of national or even international value chains, the RBRC carries responsibility to put plans in place that take in account the risks and harsh conditions that often exist in rural areas of developing countries. For example, if the RBRC is involved in data storage on behalf of SME customers, it has to understand that the value of data can be much bigger than initial investment for data streamers required for creating back-up copies in a location that is secure against theft or destruction (fire, etc.).

On the other hand side, the center can effectively use a substantial BCP concept for its advertising and as an attractive incentive for SMEs to put their trust in the reliability of its service concept.

The network character of multiple RBRCs and an OSS within a developing country already implies a good starting position for a BCP. Plans can be made to delegate urgent activities to another RBRC that is not affected by, for example, a severe power or telecom outage, caused by a regional flood or a storm. Activities worth delegating could imply urgent negotiations with international counterparts by telephone or video conference within a process of contract negotiations or agreeing on business deals. BCP starts where the “Alternate Site” RBRC needs to be informed and prepare itself for its potential role as backup actor in a scenario of business interruption. It implies the necessity of at least one functioning mobile phone and relevant contact numbers, so that the affected RBRC is simply in the position to inform the alternate site of the incident and the actions that it needs to have continued or completed on its behalf.

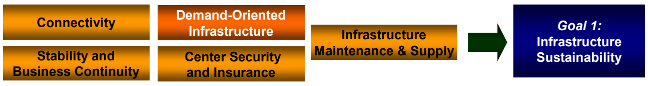
If connectivity and network configuration allows, the alternate site concept could be expanded to the data level. In this scenario, data hosted by an RBRC (e.g. customers’ websites, databases serving as order books, etc.) would be mirrored onto a central server of the OSS on a nightly basis. In case of server breakdown on location of the RBRC, visitors of the SMEs’ websites would be re-routed to the OSS server in the capital city without even noticing it. Moreover, OSS staff could review important records of the order book database, communicate selected contents to RBRC staff via mobile phone, or even fax selected pages to the RBRC via a functioning landline.

The aforementioned options are only some ideas that can be realized within a BCP for an RBRC. Risk assessments, business impact analyses, recovery teams, plan testing and maintenance, to repeat only some elements, should all become part of the RBRC’s Business Continuity strategy. Only resources like time, money, and staff, set the limit to the sophistication and comprehensiveness of a Business Continuity Planning program. Yet the most important ingredient is creativity and fantasy to be put in plans and set against the trouble that can come with unexpected business interruptions.

Once an RBRC develops and becomes proficient in its own BCP concept, it may even think of including Business Continuity Planning in its service range *offered to SMEs*. It does not need an expert in textile manufacturing to create a continuity plan for a textile factory. Rather, the planner needs to be a clear thinker, able to think himself into situations and work processes. He would sit down with management and workers of the factory, in order to explain the BCP idea, learn about the procedures, requirements, and vulnerabilities of the operations, and subsequently develop his recommendations and strategies to be applied to the specific situation of the company.

In many developed countries, the only companies that are forced by law to have a certain level of Business Continuity and Disaster Recovery Plans in place are financial institutions and insurance companies, as severe business interruptions in the financial sector can even put entire national economies at risk. One could argue that it is excessive to suggest similar strategies for SMEs of developing countries. But it is the discontinuity of many businesses in different sectors, caused by the harsh ecological conditions and the poor infrastructural situation many of the developing countries are facing, which has a share in preventing them and their businesses to climb up the ladder of economic wealth. *These* companies are the ones which *really* deserve to own effective plans against disasters and for the continuity of their business.

3.7.3. Demand-Oriented Infrastructure


Connectivity
Demand-Oriented Infrastructure
Stability and Business Continuity
Center Security and Insurance
Infrastructure Maintenance & Supply
Goal 1: Infrastructure Sustainability

Demand-orientation of infrastructure is mandatory, also in a business-oriented RBRC. An infrastructure needs assessment is essential. The following two exemplary statements could occur in preparation of the outfitting of an RBRC. They underline the necessity of a careful approach:

1. “We do not target school children. SMEs are professional businesses; they need to have state-of-the-art ICT machinery at their command.”

⇒ Yes, they are professionals and need ICTs not for fun but to do business and earn money. But that is why they have to be able to *benefit* from the equipment available, integrate it with their skills and align it with their level of ICT proficiency, instead of being overwhelmed by technology which is beyond their individual horizon. They can and will only pay for a service because they feel that it helps them, not because it runs on expensive equipment which the center urgently needs to be refinanced. They cannot afford to pay only for superb technology to bring excitement.

⇒ However, if the center purchases equipment and software according to a well planned long-term strategy, it will make sure that the chosen components allow for an upward compatibility, so that more sophisticated elements can be added to the existing hardware in sync with rising demand.

2. “We have been realizing some demand for cutting-edge services, such as high-speed video conferencing. As we like to satisfy this demand, which has been formulated by our most advanced SME customers, and as we like our name to stand for a high-level product spectrum, we have to install such a system.”

⇒ *Quality* of demand is one argument, *quantity* is another. A later Chapter will explain the different stages of ICT readiness SMEs can be found in (see 4.8.1 Categorization of Enterprises). If a very small percentage of SMEs asks for a high-level service that requires the center to invest in expensive infrastructure or maintenance cost, the investment needs to be carefully calculated against its expected return in order to prevent “killing by over-capitalization”.

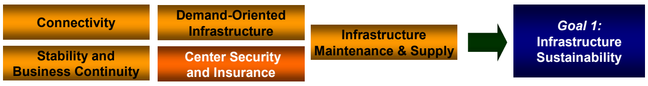
3. “We are following the concept of the One-Stop-Shop in our capital city. They have made experience with servicing SMEs. Other RBRCs are operating in the Woodlands and at the West Coast. We can learn from the experience of all of them and design our infrastructure profile according to theirs.”

⇒ Yes, they can learn from each other. The networking structure of the OSS-RBRC concept can be very beneficial for exchanging service, infrastructure, and configuration ideas. The SME-specific learning curve can be collectively maintained and developed.

⇒ No, the RBRC should not design its infrastructure profile according to other centers without questioning it. The urban environment of the OSS very likely implies different ICT requirements and provides more sophisticated possibilities (cheaper and better connectivity, easier maintenance, etc.). Its infrastructure setup may fit here, but not in a rural environment hundreds of miles away. RBRC West Coast caters for a different sector than RBRC Woodlands. Thus, they may require very different configurations as well. Critical evaluation of all recommendations is strongly suggested.

As it will be recommended in a later Chapter for the service needs assessment, the assessment of infrastructure needs similarly should follow a segmented strategy, considering the heterogeneity of SMEs according to their varying levels of ICT readiness and requirements (see Chapter 4.8.2 Service Needs Assessment: Segmented Approach).

3.7.4. Center Security and Insurance


Connectivity
Stability and Business Continuity
Demand-Oriented Infrastructure
Center Security and Insurance
Infrastructure Maintenance & Supply
Goal 1: Infrastructure Sustainability

Obviously, the issue of physical and data security, as introduced in Chapter 3.5, does not lose relevance with the involvement of SME customers.

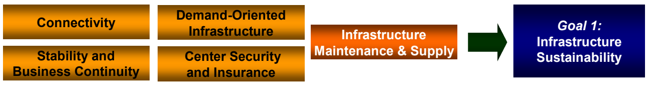
Quite the reverse is the case, because…

- Burglars may be attracted by potentially more expensive and more diversified equipment
- The focus on business customers may lower the inhibition level of locally originating burglaries, which could be higher if the center was to more comprehensibly benefit a community as a whole (as it is more apparent with a community-oriented telecenter of traditional kind)
- SME customers may require the possibility of *immediate* building and system access outside of regular business hours, which would require the installation of an access control system (e.g. swipe cards or PIN system)
- *Data* stored on behalf of SME customers, such as e-Procurement information or hosted webpages, is likely to be of higher criticality, requiring rigorous protection against…
    - Loss by means of hardware failure or disasters (fire, etc.): internal or remote data recovery concepts.
    - Loss, manipulation, or theft by means of external or internal attacks: strong internal network security via user accounts and

passwords *and* strong external security via firewalls and data encryption (see also Chapter 4.8.9 on e-Security).

Additionally, the necessity of insurances is expected to rise with a business model targeting SMEs. Through growing data volume and profit relevance of data and information administered by the RBRC on behalf of its business customers, the consequences of incidents caused by the center (such as culpably negligent loss of customer data) can be more serious, making comprehensive insurance coverage more important. Furthermore, more expensive infrastructure insured in a rural area of a developing country, with potentially greater risk of extreme weather events, will imply considerable amounts of property insurance premiums charged. It is important to understand that premiums charged for property insurance will be negatively correlated with the money invested in physical security to be established inside and outside of the RBRC.

3.7.5. Infrastructure Maintenance and Supply


Connectivity
Demand-Oriented Infrastructure
Stability and Business Continuity
Center Security and Insurance
Infrastructure Maintenance & Supply
Goal 1: Infrastructure Sustainability

Assuming services and the underlying equipment in an SME-oriented RBRC to be partly quiet complex, infrastructure maintenance is a task to be taken very seriously. The higher the complexity and regional exclusiveness of the deployed equipment, the more likely the RBRC will have to rely on own specialized staff for equipment maintenance. In this regard, “basic troubleshooting capacity” maintained in-house, as suggested for telecenter projects, might turn out not to be sufficient for an RBRC.

Technical skill development of internal staff can be facilitated, however, through support centrally provided by the OSS. Training sessions can be held on location of the OSS. Centrally given advice can also help the technical staff to stay on top of technical development and apply new software or hardware updates according to best practices. The OSS may establish e-Mail newsletters or password protected special sections on its corporate webpage for this purpose, to include download possibility of software, drivers, user manuals, etc. Depending on the level of proficiency present among the central OSS’ technical specialists, the network may even consider the establishment of an online help desk maintained at the OSS (for example based on a Lotus Notes database), which administers and responds to support requests submitted by RBRC technical staff (including a “trouble ticket” system for the tracking of the request status).

The above are only some possibilities to improve the maintenance capacity of RBRC staff. If hardware and software are perfectly serviced, they will have an extended lifetime, not be prone to business interruptions and reduce occasions of customer discontent.

House rules for protecting the infrastructure (closed windows, clean shoes, etc.) are expected to be followed more consequently by business customers, as compared to community telecenter customers representing all ages and demographic layers. While eating and drinking will not be allowed in technically equipped rooms, the facility should contain a recreation room allowing for consumption of food and also serving as resting room for customers participating in all kinds of training seminars.

Autonomous in its capacity to order equipment, the RBRC should get the possibility to benefit from special conditions of bulk purchases processed by the OSS. Yet purchasing authority should always reside with RBRC management who is in the best position to assess and oversee the equipment situation and need. If e-Procurement solutions form part of the OSS / RBRC service profile, the obvious thing to do would be to utilize this technology for internal supply chain management as well.

4. Strategic Goal 2: Services and Service Relevance Sustainability

To realize sustainability of telecenter services and service relevance by means of a marketing strategy providing well designed, affordable and promoted services that respond to local needs and are offered in a supportive learning environment.

As previously described a carefully tailored and maintained infrastructure is key prerequisite for enabling the telecenter to provide services, as the services are a function of the infrastructure. However, infrastructure will not create beneficial services by itself. In order to be successful, services need to be intelligently modeled to fit the customers' needs. While the technological thrill of services that are new to the target audience may create an initial interest, only those services will prevail that offer value going beyond first technological excitement. IBM splendidly incorporated this idea in an advertising slogan in 2001: “Bad ideas don't get better on-line”.

But *which* are the services that are suitable for a telecenter?

There has been a wide discussion on which services to introduce. A large variety of suggested services exists, from simple services such as making phone calls or sending faxes to complex ones, like e-Business solutions or management training courses. General trends can be observed that reveal services especially prominent among telecenter users in developing countries: the primary demand identified in a study on eight telecenters in South Africa is based on basic telecom and office equipment.[42] This comprises phone calls and faxes, photocopying, printing, and typing services and bookkeeping for micro-businesses.

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[42] *Roman (2000)*

As the need for services heavily depends on the local circumstances and selected target customers, there is no universal service profile to be suggested in this paper. Rather, the author has chosen to introduce service suggestions that are catered to Small and Medium Enterprises (SMEs) in the Sub-chapter 4.8.3, which deals with services in an SME context.

The current Chapter provides a more conceptual perspective on the driving factors required to bring services and service relevance sustainability closer to realization.

These factors are:

- Service Needs Assessment
- Local Context and Local Language
- Reasonable Pricing
- Promotional Activities
- Educational Workshops
- User Training and Assistance

4.1. Marketing Approaches to Increased Service Relevance

The relevance that services possess in the perception of the telecenter's target customers will decide upon their success.[43] High quality services that meet needs within a specific environment, e.g. the developed world, may be considered irrelevant in the context of local needs in a developing country. In this case the services will not be able to exploit their usual potential.

The previously mentioned study of the USA telecenters found out that the more successful centers did not only provide equipment but managed to learn which services were required and to make the center respond to these needs accordingly.[44]

In order to assure service relevance when designing the service profile, certain aspects need to be considered. Most of all, a local service needs assessment *prior* to the initial implementation of infrastructure and equipment is vital for the creation of demand-driven services and cannot be replaced by any kind of generic approach. Additionally, as demand and technology are constantly changing, needs assessment should be considered as a continuous process. Both current and potential customers should be surveyed to discover deficiencies in service relevance and to explore needs whose satisfaction would very well be relevant to the target customers.

If we define "relevance" not limited to relevance of the service content but as relevance through *usability* of the service as a whole, we can identify a number of factors of which each should be addressed within the telecenter's marketing strategy in order to make the service relevant from the standpoint of the individual customer:

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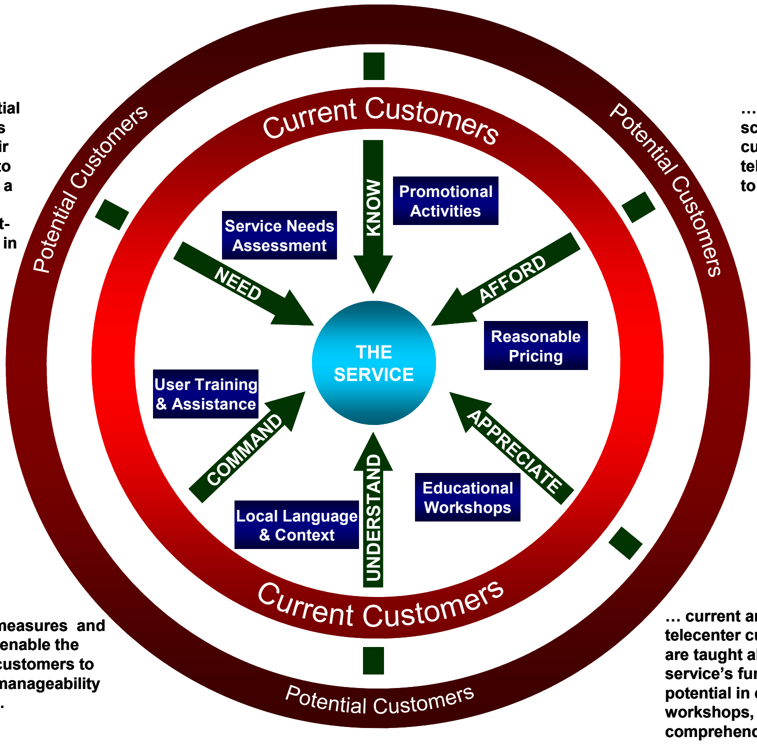
[43] *Mayanja (nk)*

[44] *Benjamin (2002)*

Targeting Service Relevance: A Service Gains Relevance, if…


Potential Customers
Potential Customers
Potential Customers
Current Customers
Current Customers
KNOW
Promotional Activities
Service Needs Assessment
NEED
AFFORD
Reasonable Pricing
THE SERVICE
User Training & Assistance
COMMAND
APPRECIATE
Educational Workshops
Local Language & Context
UNDERSTAND

…current and potential telecenter customers are informed of its existence in the course of promotional activities.

…current and potential telecenter customers are surveyed for their local service needs to enable the design of a useful service or the discovery and adjust-ment of deficiencies in the usefulness of an existing service.

…reasonable pricing schemes enable current and potential telecenter customers to make use of it.

…training measures and assistance enable the telecenter customers to overcome manageability constraints.

… current and potential telecenter customers are taught about the service's function and potential in educational workshops, in order to comprehend the benefit it can provide.

… it is provided in a language that is (easily) understood by and has a local context that is relevant to current and potential telecenter customers.

Figure 9; Targeting Service Relevance

A service gains relevance if…

- current and potential telecenter customers are surveyed for their local service needs to enable the design of a useful service or the discovery and adjustment of deficiencies in the usefulness of an existing service (need the service); and/or
- it is provided in a language that is (easily) understood by and has a local context that is relevant to current and potential telecenter customers (be able to understand the service); and/or
- reasonable pricing schemes enable current and potential telecenter customers to make use of it (be able to afford the service); and/or
- current and potential telecenter customers are informed of its existence in the course of promotional activities (know the service); and/or
- current and potential telecenter customers are taught about its function and potential in educational workshops, in order to comprehend the benefit it can provide (appreciate the benefits of the service); and/or

- training measures and assistance enable the telecenter customers to overcome manageability constraints (be able to command the service).

The following Chapters will explore these marketing aspects a little more in detail.

4.2. NEED the Service: Service Needs Assessment

Only a needed service can be a successful service. Thus, prior to the service design of a telecenter, a thorough service needs assessment should identify the needs for communication, information, and training-related services that are present among the target customers.

Depending on the local situation, a needs assessment can include different approaches, such as interviews, surveys, and focus group sessions. Clearly, the research process needs to be interactive and cannot be imposed onto the prospective customers. They should recognize the research as an important step towards an improvement of their situation and realize that the results will be directly reflected in what the telecenter would have to offer.

Carrying out the needs assessment requires a thoughtful and patient approach, as the nature and potential of ICT and the related services may be very new and unknown to the prospective telecenter customers. They may need to be informed about services themselves and their potential in order to decide for themselves whether they can be beneficial. As they might be not yet familiar with ICTs and may feel threatened by the unknown that ICTs represent for them, the needs assessment is a good chance to show them that the project will be about satisfying demand, and not imposing technology. If technology enters a community as a “servant”, not a “master”, it is likely that people will be more receptive.

Mardle urges to *respect* the achievements of poor countries’ communities when trying to find “solutions” to their problems. He claims that people in these countries have survived under harsh conditions, often due to their strength of character, intelligence, and persistence: “Poor people are just poor, they are not stupid”, he states.[45]

Experience tells that it is not easy to find appropriate personnel to carry out an interactive, sensitive, and authentic needs assessment. People in charge with the assessment have to have both access to and acceptance by the local community as well as a certain technical understanding. Engineers from South African cities that designed and developed Information Systems for rural communities often produced poor results since they did not understand the needs of the community, which in turn did not have confidence or experience in the technology.[46] Based on this, Shakeel concludes that the more a community developed an internal capacity to do needs assessments, the lower the risk of ongoing misunderstandings or misinterpretation would be.[46]

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[45] *Mardle (2003)*

[46] *Shakeel (2000)*

Colle and Roman suggest[47] that, while there is no universal research agenda for telecenter needs analysis and evaluation, there is a number of preparatory questions we should ask ourselves before we start designing a model (see Figure 10).

Preparing a Needs Assessment: Questions to be Addressed

HOW	WHO	WHY
What research tools do we use? There are multiple qualitative and quantitative research methods, and not all of them are difficult to master, or expensive to carry out.	**Who is in charge of the research?** **Who are the stakeholders in the project?** **Who decides what methods are going to be used and who will carry out the research?** **Who has a stake in the research results?** - Communities? - Universities? - Local and national governments? - Project staff?	**What are the objectives of research?** - Project design? - Community empowerment? - Academic and scientific knowledge dissemination? - Awareness building? - Fund raising? - Project sustainability? - Policy making?

Figure 10; Preparing a Needs Assessment: Questions to be Addressed

After telecenter and service implementation, the telecenter should deploy monitoring procedures which should help the staff to keep on observing the demand for offered services and the altering needs of the current and potential users. If demand changes the services need to be adjusted accordingly in order to keep them up-to-date and competitive, thus maintaining their sustainability. Telecenters have to “keep reinventing themselves so as to remain at the center of the community”.[48] Telecenter staff should also closely monitor technology development in order to introduce new technology and solutions to the telecenter according to demand and as they see fits.

Market research, to include regional demographics, can help to extend the perspective on service and technology needs beyond the sphere of the telecenter itself.

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[47] *Colle and Roman (2001)*

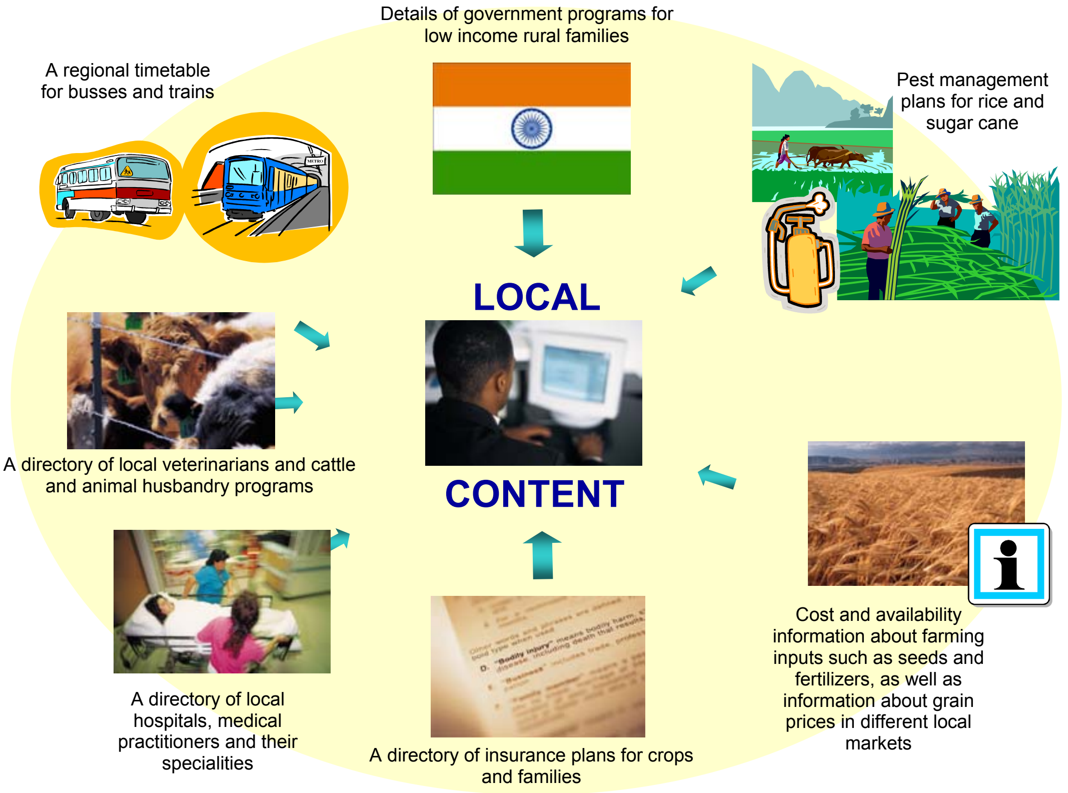
[48] *Mayanja (nk)*

4.3. UNDERSTAND the Service: Local Context and Local Language

If infrastructure permits, customers of a telecenter can have access to an enormous amount of data and information available via the Internet. Yet finding information that is relevant in a local context may be very difficult, as a lot of the information provided in that way is of generic content and does not provide answers to "local" concerns, may they be related to local markets, local sectors or other topics of local character. An example of lacking understanding of the local context was a project to import American educational software to Chile. The project failed because the software was not capable of being used by several children sharing one PC.[49]

Moreover, the information may be useless if it cannot be understood because it is only presented in a language or in dialects local customers are not familiar with.

Example for Local Content Creation: India


Details of government programs for low income rural families
A regional timetable for busses and trains
Pest management plans for rice and sugar cane
LOCAL
CONTENT
A directory of local veterinarians and cattle and animal husbandry programs
A directory of local hospitals, medical practitioners and their specialities
A directory of insurance plans for crops and families
Cost and availability information about farming inputs such as seeds and fertilizers, as well as information about grain prices in different local markets

Based on: Oestmann, Sonja and Dymond, Andrew C. Intelecon Research & Consultancy Ltd. (2001): Telecentres – Experiences, Lessons and Trends, in "Telecentres – Case studies and key issues", The Commonwealth of Learning, Vancouver.

Figure 11; Example for Local Content Creation: India

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[49] *Shakeel (2000)*

All this calls for local content development to be actively promoted by the telecenter. Some telecenter initiatives did this by searching for content development partners such as local farmers' organizations, educational institutions and NGOs.[50] Figure 11 shows the types of local content that were created by volunteers in a database for four "infoshops" in Pondicherry, India, covering a rural area of around 20,000 people.

Colle and Roman call for involvement of universities as partners in the production and packaging of research-based factual information, for instance by turning their research and knowledge into education, information, and training packages suitable for community use. They could also play a role in research on the information needs of communities.[51] As information technology allows transmission of information without impact of physical distance, the local content could be produced remotely and not necessarily at the location of the community or the telecenter itself.

Another issue not covered in this paper to more detail, relating to the capability of "understanding" a telecenter service, lies in the level of literacy of the potential customers. Literacy is an important prerequisite for the use of many telecenter services and cannot be taught by the telecenter itself. It is on behalf of educational institutions to cater for increasing the overall literacy to sufficient levels.

4.4. AFFORD the Service: Reasonable Pricing

When we have identified service and information needs of our potential customers, we know what services they would be interested in. However, offering *needed* services will not automatically imply that *demand* for the service will be generated. Demand will remain low if the prices of the offered services are too high to make those interested in them willing or able to pay for them.

Literature on telecenters with a developmental mission generally suggests that especially in the initial phase of the telecenter, external subsidization of prices is almost inevitable for achieving reasonable pricing. This is a lesson that has also been learnt in successful telecenter projects of the developed world, where services converted to revenue generating only after they had been launched on a subsidized basis.[52]

In addition to external subsidization, a telecenter can include cross-subsidization in its business plan. This concept implies that services generating profits will compensate the losses that are produced by services less profitable (which at the same time might have very high developmental value!).

At the latest when external subsidies are removed, the telecenter has to care for "reasonable" prizing also from its own standpoint, as it must be interested in its own survival. The prices have to at least reflect the actual service production cost in order to prevent the center from running into debt.

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[50] *Oestmann and Dymond (2001)*

[51] *Colle and Roman (2002)*

[52] *Shakeel (2000)*

It remains a big challenge to achieve affordable pricing in rural areas of developing countries, where the per capita income is generally lower than in urban regions. While governments of developing countries do not have means to easily raise the income level, it is even more important that they contribute to a sustainable political enabling environment for telecenters with affordable prices for telecommunication services. Especially advanced forms of communication services, such as distance learning, telemedicine, or e-Commerce, suffer from expensive Internet provision charged on per-usage basis.

To exploit the potential of services requiring permanent on-line status, it is vital that the market offers flat rates that are independent from usage time. As it has been observed in developed countries, only increased competition within telecom markets that are more and more privatized will force providers to offer flat rates. Governments of developing countries should enable this development by actively promoting privatization of the telecom market, recognizing that the implied potential for sustainable development is a higher good than short-term profits that state owned telecom firms provides to them.[53]

4.5. KNOW the Service: Promotional Activities

A needed, understandable and locally relevant service has a good chance to be a revenue model for the telecenter. Yet the service needs to be marketed to current and potential customers, so they get aware of its existence.

4.5.1. Preparatory Promotion

Promotional activities should already commence way before the first of the telecenter services is operational, even before the establishment of the telecenter. They should not only focus on the service level but on the marketing of the value of ICTs for development in general. As described in a previous Chapter, rural communities may be scared by new technologies that they have never seen before, and which are so very different from traditional techniques they have known before. It is an important yet difficult task to communicate the idea that ICTs can be beneficial in various ways. This task cannot only be handled by the telecenter initiatives themselves. Colle and Roman call for governments and private sector initiatives targeting popular participation in the Information Society to plan strong campaigns that promote the benefits of information.[54] Good experience has also been made with the wide distribution of leaflets, brochures, posters and other information materials in both local and English language that promoted the Nakaseke telecenter project in Uganda before it was even started. The campaign helped to create a “local” image of the information and communication technology.[55]

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[53] *Kirkman (1999)*
[54] *Colle and Roman (2002)*
[55] *Benjamin (2000)*

Nakaseke project staff also used “word of mouth” marketing. A core group of ICT users in Nakaseke was created, mainly to fulfill two reasons: firstly, the members of the group should interest others in the use of ICT. Secondly, they were supposed to act as information brokers for people who were not able to access the services themselves.[56] However, promoting ICTs requires a cautious and sensitive approach. It can be assumed that those who have difficulties mastering the new technologies will very likely be elderly members of the community, who often traditionally have been carrying the role of information brokers themselves. They may perceive the new technology as a competitive source of information, undermining their own function and authority within the community. Thus, extra effort has to be invested to respect elders’ concerns and opinions.[57]

It is also recommended to use key community members and educators to promote the idea, benefits and services of the telecenter to young and old members of the community.

The fact that community members do develop interest in ICT related telecenter services was observed in a report which found that telecenter customers who used e-Commerce services had initially begun using the facility for social or general reasons before they realized the opportunities the Internet could provide to them.[58]

4.5.2. Ongoing Promotion

Once the telecenter is operational a constantly updated marketing plan should set guidelines on how and where to promote the telecenter and its services. Figure 12 provides a framework showing different content and media to be considered for an effective promotional strategy.

Telecenter management may also use promotional incentives to stimulate demand.

These can include, inter alia:

- Rebate schemes for frequent users
    - Get discounts on online minutes through pre-payment of time packages
    - Get a bonus service session or training after purchase of a defined number of services
- “Happy Hour” rebates during off-peak times in order to keep the equipment busy
- Customer’s birthday discount
- Student discounts

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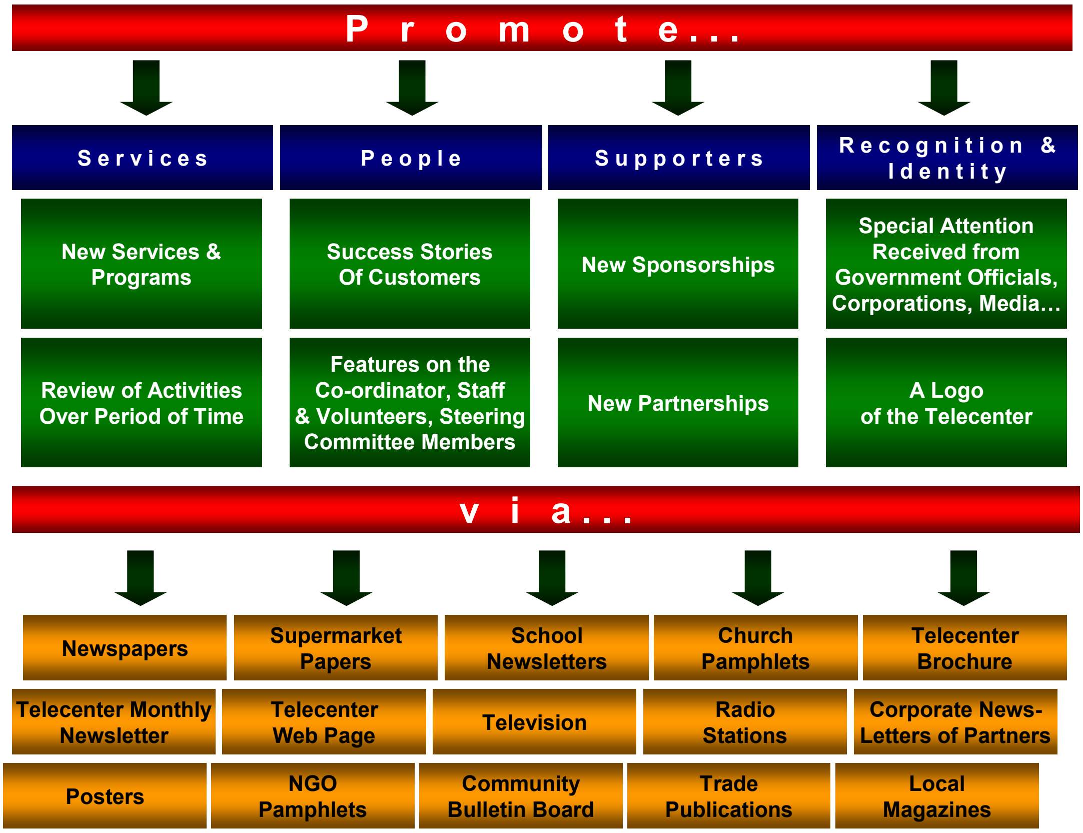
[56] *Mayanja (2001)*
[57] *O’Farrell et al (1999)*
[58] *McConnell (2001)*

- Voucher Schemes: Promote new services by means of subsidized vouchers (internal or external subsidy)

As common marketing technique suggests, also the concept of a telecenter cannot be equally targeted towards every single member of a community. It is useful to define priority services and include this philosophy in the marketing strategy of the center. Fuchs suggests to have an “anchor use” of the telecenter, which will give the management a market focus and position of strength,[59] Mayanja calls for the “prime service” to be the most popular and relevant one.[60]

Telecenter Promotional Framework


Promote...
Services
People
Supporters
Recognition & Identity
New Services & Programs
Success Stories Of Customers
New Sponsorships
Special Attention Received from Government Officials, Corporations, Media…
Review of Activities Over Period of Time
Features on the Co-ordinator, Staff & Volunteers, Steering Committee Members
New Partnerships
A Logo of the Telecenter
via...
Newspapers
Supermarket Papers
School Newsletters
Church Pamphlets
Telecenter Brochure
Telecenter Monthly Newsletter
Telecenter Web Page
Television
Radio Stations
Corporate News-Letters of Partners
Posters
NGO Pamphlets
Community Bulletin Board
Trade Publications
Local Magazines

Based on: Jensen, Mike and Esterhuysen, Anriette (2001): The Community Telecentre Cookbook for Africa, United Nations Educational Scientific and Cultural Organization, Paris.

Figure 12; Telecenter Promotional Framework

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[59] *Fuchs (1998)*
[60] *Mayanja (nk)*

4.6. APPRECIATE the Service: Educational Workshops

Promoting a telecenter and its services and programs with the means described in the previous Chapter is an important step towards knowledge and acceptance of the services by current and potential customers. However, as ICTs will very often introduce concepts, potential, and procedures that have been unknown to large parts of developing countries' population, it requires more than a poster or leaflet to make them really appreciate the ICT related services. The more complex a service is or seems to be, the more important is it to guide customers into its use in order to remove inner barriers and make them *experience* and really *understand* and *appreciate* what the service can do.

The telecenter can design workshops customers can attend for free or a minimal fee. The workshops will combine a hands-on introduction to the use of specific services with educational explanations of their purpose, potential, restrictions, and the interfaces and parallels they have with traditional activities that the customers are familiar with.

An educational workshop will belong to the marketing activities, not the training activities of the telecenter, although the regular telecenter trainers will be required to perform them. They should be comprehensive enough to convey a "feel" and understanding of the service, yet not consume inappropriately much time and resources.

Educational workshops might want to try to answer questions of the following nature:

- WHAT IS the Internet?
- Why is information important?
- How could I benefit from information obtained via the Internet?
- Why not continue to live without ICTs?

The demand and complexity of workshops obviously depends on the service profile that is being offered in the telecenter, ranging from basic questions like the above to more complex topics, such as education about information solutions for small businesses, market data research, or management training programs relating to business strategy, marketing, etc.

4.7. COMMAND the Service: User Training and Assistance

The importance of training staff and customers for the telecenter to become sustainable is undisputed. McConnell lists not less than eight authors that have made this point in their publications.[61] The importance of ICT training is highly recognized in Western countries, where for instance the IT industry of the United States of America spends 50% - 68% of its total project costs on training.[62] These high percentages as well as the fact that US trainees are likely to already have a previous knowledge better than that of ICT users of developing countries indicate that the importance of promoting telecenter training must not be underestimated. Besides training of telecenter management and staff (see Chapter 5.2), training of telecenter users is the other important training activity.

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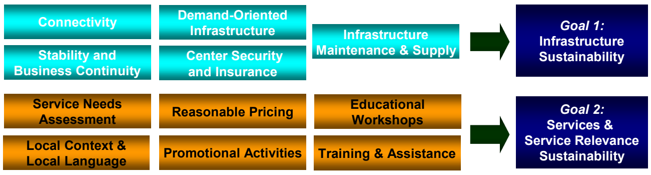
[61] *McConnell (2001)*
[62] *Whyte (1999)*

As mentioned before, the range of user training services offered in the telecenter should follow the needs identified in the course of service needs assessments. Training can start on a fairly basic level, such as how to log on to the Internet or how to apply for and use an e-Mail account, and be extended to include training on text-, graphic-, spreadsheet-, and other applications. The list of possible modules continues with non-ICT related management training covering topics of all kinds, such as bookkeeping and financial controlling, business strategy, marketing and promotional management, and e-Business, to name only some. Training courses providing a certificate will be especially valuable and attractive to customers.

One approach for training services is to cater particularly to young people, as they are generally more open to and skilled in the use of new technologies. Furthermore, the youth is known to adapt more quickly and have the longest productive horizon still to come. Thus, investing in training of young people will result in high return on investment in the long run.[63] In order to promote gender equity, training programs should also take special attention of women's training needs in order to increase their socio-economic status by means of ICTs.[64] Though, it needs to be considered that both explicitly targeting women and young people may again problematically affect traditional structures of gender hierarchy and respect for seniority.

Once a customer is trained and starts to use a service, the telecenter needs to be prepared to respond to queries and problems the user may encounter while using a service. Assistance is important to maintain customer confidence and show the customer that problems that occur with software or hardware can indeed be solved.

4.8. Strategic Goal 2 in the SME Context


Connectivity
Demand-Oriented Infrastructure
Stability and Business Continuity
Center Security and Insurance
Infrastructure Maintenance & Supply
Goal 1: Infrastructure Sustainability
Service Needs Assessment
Reasonable Pricing
Educational Workshops
Local Context & Local Language
Promotional Activities
Training & Assistance
Goal 2: Services & Service Relevance Sustainability

Unlike a telecenter targeted at large parts of a community, an RBRC will provide services that are particularly supposed to cater to the needs of Small and Medium Enterprises. However, the *relevance* of the provided services - the extent to which SMEs need, know, afford, appreciate, understand, and command the services - will again decide upon their success. Accordingly, the RBRC marketing approach should follow the same framework as previously laid out.

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[63] *Proenza et al (2001)*

[64] *International Bank for Reconstruction and Development / The World Bank (2000)*

The following Chapters deal with additional aspects that need to be considered when the identified driving factors for services and service relevance sustainability are applied to the operation of an RBRC that specifically targets SMEs.[65]

4.8.1. Categorization of Enterprises

Making the services relevant for SMEs requires an understanding of the nature of the SMEs as customers. It will be helpful to start on the assumption that SMEs can, according to their degree of ICT usage, be grouped into categories. In their research, Duncombe and Heeks identified four categories of SMEs, each having a different status of ICT availability and usage (see Figure 13).

SME Categories: Status of Category Members

SME Category	Status
Non-ICT Users	• Do not use ICTs or telephones • Owners appreciate personalized information channels and sources • Yet social network (providing information) is constrained in size and quality • Insularity
Non-IT Users	• Do use telephone/fax • Do not use computers • Lack of finance and lack of management/workforce skills
Non-networked ICT Users	• “First-Footer” computer users • Do use telephone/fax • Do use stand-alone computers (low-level usage) • Lack of management and information skills
Networked/ Intensive ICT Users	• Found mainly in technical services, IT services and tourism sub-sectors • Make significant use of networked computers

Source: Duncombe, Richard and Heeks, Richard (2001): Information and Communication Technologies and Small Enterprises in Africa – Lessons from Botswana, Summary Final Report, Institute for Development Policy and Management, University of Manchester.

Figure 13; SME Categories: Status

The RBRC marketing approach needs to respond to the differences that exist between the SMEs of the individual categories, especially as far as the approaches to product profile (incl. training), promotional activities, and pricing are concerned. The following Chapters will maintain reference to the categories identified.

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[65] *Due to the prime importance of services for an RBRC, this section exceeds those which deal with the other strategic goals in the SME context in volume and level of detail.*

4.8.2. Service Needs Assessment: Segmented Approach

Service Needs Assessment
Reasonable Pricing
Educational Workshops
Local Context & Local Language
Promotional Activities
Training & Assistance
Goal 2:
Services & Service Relevance Sustainability

Needs of customers, in this case SMEs, can only be reliably identified by means of a service needs assessment. When preparing and performing such assessment, SMEs belonging to different categories, as identified above, are expected to have different needs of ICT services and support. Research performed in Botswana revealed the following overall needs to be associated with the different SME categories (see Figure 14).

SME Categories: Assumed Needs of Category Members

SME Category	Assumed Needs
Non-ICT Users	• Localized information needs • To build informal information networks • To develop community telecommunications and radio/TV/newspaper based channels • Skills development (e.g. communication) • To use ICT intermediaries only as a secondary priority
Non-IT Users	• To use ICT intermediaries • To improve capacities for information capture, processing and dissemination • Mediated access to communication via e-Mail and WWW (receipt and dissemination of information)
Non-networked ICT Users	• To build basic management and information capacities • To help make more/better use of the computers they have: Specific ICT support (as in printing or publishing sector) • Expand use of ICTs for compatibility with customers/suppliers • Adopt ICTs to keep up with modernization • Understand need of ICT sustainability (continued supply of finance, skills, knowledge, spares, consumables)
Networked/ Intensive ICT Users	• To adopt a more integrated and strategic approach to ICTs that applies the technology to key business goals • Employee skills to effectively manage systems • Understand marketing and promotion concepts • Best practices about development and management of computerized information systems

Source: Duncombe, Richard and Heeks, Richard (2001): Information and Communication Technologies and Small Enterprises in Africa – Lessons from Botswana, Summary Final Report, Institute for Development Policy and Management, University of Manchester.

Figure 14; SME Categories: Assumed Needs

Provided the RBRC plans to offer a portfolio of services covering a wide range of SME service needs, the selection of companies to be surveyed in an assessment should result in a representation of each of the identified categories. Accordingly, a pre-selection of SMEs should be made, and the structure of the assessment surveys needs to factor in the differing starting situations of the companies surveyed. Such assessment that investigates companies' needs across the full spectrum of company categories will provide higher reliability and will make sure that no potential customer group is neglected.

In order to find gaps in regional or national information provision, the SME needs assessment should also analyze the ICT supply situation by identifying sources for ICT services that are already available. For this reason, stakeholders of the SME sector other than the customers should be included in the process, such as public and private information sources, R & D institutions, training institutions, or consultancy providers. In addition, SMEs should be surveyed for ICT equipment they already possess as this may decrease the demand for mediated access.[66]

Just as customers of traditional telecenters, SMEs may not be aware of service solutions to some of their problems. Thus, their receptivity for these services can only be identified if they understand their potential. This can be explained to them in “product concept tests”, followed by questions about their interest in buying the services, and what price they would be willing to pay for them. Services that are considered for implementation can be offered in the center on a testing basis in order to measure actual demand and adjust the offer based on the findings.[66]

Familiarity with the local SME sector and the predominant local industrial sectors (such as textiles, food processing, farming, etc.) will be required for personnel performing the needs assessments. While it will be helpful to deploy staff from the central OSS that is already familiar with the nature of the services that can be offered in an RBRC, they should co-operate with local individuals who are trusted by the local SME community. These individuals should have the ability to translate and apply SMEs’ business constraints and service needs to the potential that ICTs offer, at the same time respecting potential retentiveness towards the idea of dealing with new and unknown services – which might be common among Non-ICT and Non-IT Users. If existent, regional SME associations can be involved in the process.

A continuous assessment process will enable the RBRC to prioritize the offered services along the SME categories according to the real demand as it shifts over time. The center can deploy its technological capacity for this, by implementing online questionnaires that can be filled out by customers, providing valuable feedback on their use of services, suggestions for improvement, criticism, or formulation of needs to be addressed by the center. Customers that provide feedback can be rewarded with service vouchers, e.g. free online time.

When conceptualizing an RBRC needs assessment and gap analysis, the following illustration may be helpful. Based on his research, Heeks grouped the external information needs of SMEs into three main areas, identifying their overall demand and supply situation, and things needed to address the existing gap. His main finding was that more focus should be put on the provision of output market related information. The categories and their assessment are laid out in Figure 15.

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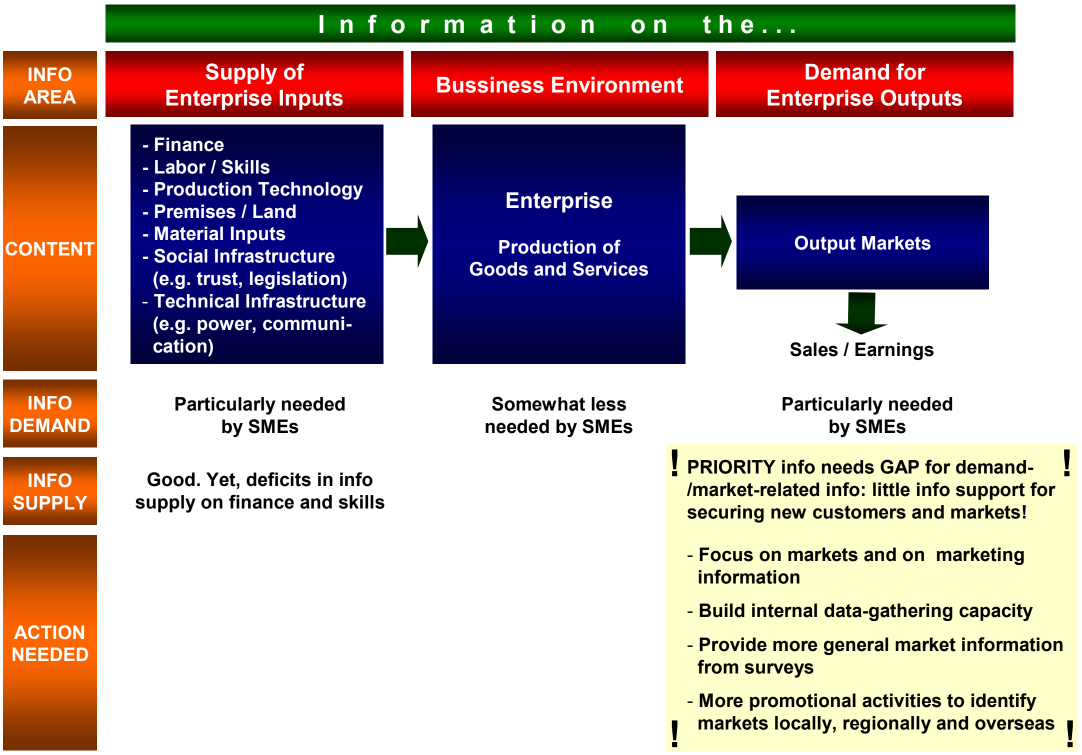
[66] *Chua et al (1999)*

Information Needs of SMEs: Main Areas



	Information on the...		
INFO AREA	Supply of Enterprise Inputs	Bussiness Environment	Demand for Enterprise Outputs
CONTENT	- Finance - Labor / Skills - Production Technology - Premises / Land - Material Inputs - Social Infrastructure (e.g. trust, legislation) - Technical Infrastructure (e.g. power, communi-cation)	Enterprise Production of Goods and Services	Output Markets Sales / Earnings
INFO DEMAND	Particularly needed by SMEs	Somewhat less needed by SMEs	Particularly needed by SMEs
INFO SUPPLY	Good. Yet, deficits in info supply on finance and skills		! PRIORITY info needs GAP for demand-/market-related info: little info support for securing new customers and markets! !
ACTION NEEDED			- Focus on markets and on marketing information - Build internal data-gathering capacity - Provide more general market information from surveys - More promotional activities to identify markets locally, regionally and overseas ! !

Based on: Duncombe, Richard and Heeks, Richard (2001): Information and Communication Technologies and Small Enterprises in Africa – Lessons from Botswana, Summary Final Report, Institute for Development Policy and Management, University of Manchester.

Figure 15; Information Needs of SMEs: Main Areas

4.8.3. Services of an RBRC

Based on the outcome of a segmented service needs assessment, the RBRC will be able to design individual service profiles for the members of all SME categories identified above. Clearly, SMEs belonging to the more advanced categories (Networked/intensive ICT Users and Non-networked ICT Users) will provide the RBRC with the most lucrative revenue potential, e.g. through the purchase of advanced training services and business information solutions. Yet following a farsighted approach, the needs of Non-ICT and Non-IT Users should be addressed as well, as they might develop their capacity and demand for stronger ICT usage, thus be turned into customers creating stronger revenue. Including Non-ICT and Non-IT Users as target customers would highlight the developmental task that the RBRC should fulfill, despite its mission of profitability.

However, resource-based decision has to be made whether or not the center can afford to include SMEs that are only interested in very basic services. A study performed on a nonprofit supplier of ICTs in the Philippines recommended that the center should drop transaction facilitation services, such as phone, fax, and photocopying, in order to specialize in higher value-adding business development services.[67]

4.8.3.1. Categories of Services

When developing its strategy for Business Information Networking (e.g. UBIN in Uganda), UNIDO has named three categories of services to be offered to SMEs in the One-Stop-Shops (see Figure 16).

One-Stop-Shop SME Service Categories

Information Services	ICT Support & Training Services	Enterprise Internet Solutions (EIS)
Profile Reports	Corporate Capacity Building	Web Site Development & Maintenance
Industry Reports	Student Training	Web Site Hosting
Technology Offers	Other services	e-Business Solutions and Portals
Technology Transfer Brokering		Intranet and Extranet Development
Consultancy and Advisory Services		e-Procurement activities
		e-Security
		e-Trust

Source: UNIDO

Figure 16, One-Stop-Shop SME Service Categories

This categorization can also be used as a starting point for the needs assessments performed in the course of the RBRC establishment, as it is planned to network between services provided in the urban (OSS) and in rural regions (RBRC) (see also Chapter 6.4.2 on Organizational Sustainability and Networking of the RBRCs). However, whether all services offered to SMEs in urban areas are relevant to rural SMEs, or whether additional services have to be added, can only be decided based on the assessments' outcome.

4.8.3.2. Information Services

As suggested for telecenters in the related Chapter, also the RBRC should define a "prime service" that will be anchor of its marketing strategy. Following the UNIDO concept of the urban One-Stop-Shop in Kampala/Uganda, the prime service category that may prove to be of greatest importance for the RBRC customers too are "Information Services". Information Services are integrated information solutions, which are fed by national and international information sources. With these services, value is added to raw data that is made available, assessed, processed and transformed into information in order to facilitate SMEs' capabilities of decision-making. Thus, the information services are to address a variety of inquiries in an efficient and cost-effective manner. In addition, regular publications are published, such as profile reports for exporters, reports on technology offers, or industry reports covering domestic and international statistics, trends, or market opportunities.[68]

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[67] *Chua et al (1999)*

[68] *UNIDO (2003)*

Farmers are one example of potential customers for information solutions: In many developing countries, agricultural extension systems lack sufficient funding and have had mixed effects. Research found that much of the available extension information was outdated, irrelevant, or did not meet the farmers' needs – indicating the need of a locally trusted intermediary to transform and disseminate information.[69]

4.8.3.3. Enterprise Internet Solutions

The service category of "Enterprise Internet Solutions" carries potential for rural SMEs to connect to remote locations inside or outside of the country. SMEs can use the Internet for trade promotion by exposing their products to potential customers through globally accessible websites or e-Business portals. The RBRC can provide development, hosting, and maintenance of websites and e-Business solutions, to include e-Procurement. At the same time, the center can embed the e-Business solutions in a secure environment in order to make them trustworthy for the SME customers (see also Chapter 4.8.9 TRUST the Service: e-Security and e-Trust). Development of Intranets or Extranets for SMEs is another service that may be demanded.[70]

SME interest for webpage development and hosting was found in the aforementioned study of the Laguna SME Service Center in the Philippines: in the course of considering an introduction of these services, five percent of the surveyed businesses expressed definite interest in having a webpage as advertising tool for new markets. 38 percent were definitely or probably interested and revealed a price sensitivity allowing for a pricing clearly above the industry standard prices. Hence, the research showed that web development and hosting services did not only have a market but could be offered on a profitable basis. From these findings, Chua et al in their study derived a role for the Laguna center to extend its business into Internet based information brokering.[71]

For details on the third category of OSS services, ICT Support & Training Services, please see Chapter 4.8.8 User Training and Assistance.

4.8.3.4. Further Service Ideas

In addition to the cited services, some other ideas that might reveal potential in a service needs assessment are:

- Virtual Portal to Match Entrepreneurs, Investors, SME Employers, and Human Resources
    - The RBRC is supposed to be a core unit of a network, having the potential to link together information sources, SMEs, and other parties and organizations, both on a virtual and on a physical level. The RBRC may want to use this position to establish a…

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[69] *O'Farrell et al (1999)*
[70] *UNIDO (2003)*
[71] *Chua et al (1999)*

  - …virtual matching portal that stores information of different business stakeholders interested in finding relevant counterparts:
  - *SMEs* looking for funds to expand their current business, or *entrepreneurs* in need for finances to realize their business idea, can search for investors.
  - *Investors* can search for profit opportunities by supporting entrepreneurs or SMEs, be it with financial or other resources, such as raw materials, knowledge, experience, or business connections with third parties.
  - *SMEs* or *entrepreneurs* looking for qualified staff can advertise job postings or search the staff database for management or staff fulfilling the requirements needed for their business ventures.
  - *People* looking for employment with SMEs or want to support entrepreneurs can post their curriculi vitae, including special qualifications, at the same time searching the database for job offers matching their criteria.
  - The information stored in a database will be mirrored between different RBRCs and the OSS, which will create a national portal.
  - The RBRCs will act as independent broker and assist with their expertise by verifying, classifying, and matching offers and requests across all dimensions.
  - Provision will only be charged upon successful mediation / placement.[72]

- Regional Virtual Marketplace
  - The RBRC to establish a regional virtual marketplace, which will be product driven, not supplier driven: the Internet based portal will provide information on products (and services) offered by regional SMEs.
  - Thus, the database can be searched for products of different product categories, sectors, locations, norms and standards, and the related contact and purchase information.
  - Membership of SMEs in the virtual marketplace may be based on qualification criteria, such as product quality, vendor reliability, etc. Hence, it can amount to a quality seal, adding to the reputation of the featured SMEs.
  - The quality seal could be used by the respective SMEs for their marketing campaigns (packaging, advertising), and would add

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[72] *The described model is inspired by an Internet based investors platform that has been successfully established in Western Europe (BrainsToVentures AG, St. Gallen, Switzerland, www.b-to-v.com)*

value to their image and to the image of the RBRC and its virtual marketplace at the same time.

  - The physical RBRC will be an anchor point for both the technical realization and the promotion of the virtual marketplace to regional SMEs.
  - Each RBRC can host one regional marketplace, and the databases may be merged together to be administered as a national virtual marketplace by the central One-Stop-Shop.
  - Target of the marketplace will be regional and national wholesalers and retailers, as well as importers of other countries.
  - The portal will be financed through provision charged to the participating SMEs as percentage of revenue made through the marketplace.
  - In addition, part of the cost could be charged to the customers (online provision of product related contact and purchase information to user only upon prior registration; payment to follow in case that transaction will be realized).

- Marketing Assistance
  - To be delivered through trade fairs and the facilitation of subcontracting agreements between large companies and SMEs.
  - SMEs to promote and sell their products during the trade fairs, which are organized by the RBRC.
  - RBRC to support business matching facilitated through its networking with other centers and organizations.
  - RBRC to sponsor seminars on subcontracting.
  - Additionally: Marketing consultancy offered by the RBRC.
  - Revenue to be gained through registration fees for trade fairs, eventually through commission on the basis of trade fair sales of its clients, through a fee for facilitating subcontracting agreements, and through marketing consultancy and business matching. Initial cross subsidization of marketing assistance service to build customer base.
  - This kind of service has proven to be potentially very profitable.[73]

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[73] *Chua et al (1999)*

- Business Registration
    - Business registration for SMEs may be required by law and enforced by local governments. The RBRC may be authorized by the respective body to process business name applications for new and renewal applicants.
    - Staff can assist in filling out forms, increasing the proportion of correctly submitted applications.
    - Applications will be forwarded to the respective authority for approval and registration.
    - The center earns processing fees and service charges.
    - Due to strong demand caused by eventual law enforcement, this service has proven to be potentially very profitable.[74]

- Further services that may be relevant include: video conferencing, rental of RBRC space for meetings, bookkeeping, typing services, graphics design and desktop publishing (to include design and production of promotional posters or leaflets, business cards, etc.), and postal services (including arrangements to facilitate exporting business).

4.8.4. Local Context and Local Language

Service Needs Assessment
Reasonable Pricing
Educational Workshops
Local Context & Local Language
Promotional Activities
Training & Assistance
Goal 2:
Services & Service Relevance Sustainability

4.8.4.1. Support from OSS through Local Sector-Oriented Profiles

From the SME perspective, the “local context” is influenced by the configuration of the local economy through SMEs, which often constitute a dominating local or regional sector, such as fishery, rubber, textiles and clothing, etc. ICTs are meant to bring the world closer to rural SMEs, yet they have to matter to and be understandable for businesses as they exist locally. Thus, in order to safe time and money, the RBRC needs to cater its service profile to the local sectoral portfolio of SMEs, as it becomes apparent at the time of the service needs assessment at the latest.

However, consideration of the local context is particularly in danger once a location that is outside of the local hemisphere provides input. In the case of RBRCs this can happen when information and services are created and passed on to them by the central national OSS to become part of their product portfolio. Consequently, the central OSS has to have a mechanism in place to prevent itself from disregarding the sector-specific local context that is present on location of its subordinated RBRCs, and to help it in meeting the “local flavor” of each individual RBRC product spectrum. This can happen by means of individually developed “Local Sector-Oriented Profiles” (LSPs). An LSP will be a logistic guideline at the disposal of OSS staff to be applied each time that information, services, marketing tools, etc. are to be deployed to remote RBRCs. These profiles are to be in line with the results of previously performed service needs assessments and customer analyses, and are meant to filter out contents even before they are passed on to the RBRC, that would otherwise be largely irrelevant to the respective RBRC customers. By performing this pre-selection, experienced OSS staff can help their colleagues at the RBRCs not to get overwhelmed by the huge amounts of information that would flow down or be available from the OSS if not filtered against regional sector-specific criteria. In that sense, OSS staff can use their expertise through the application of an LSP to act as an interface between the information and services that are centrally *available* and those that are *required* in a local context.

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[74] *Chua et al (1999)*

OSS to Consider Local Contexts:
“Local Sector-Oriented Profiles” for Information Transmission to RBRCs

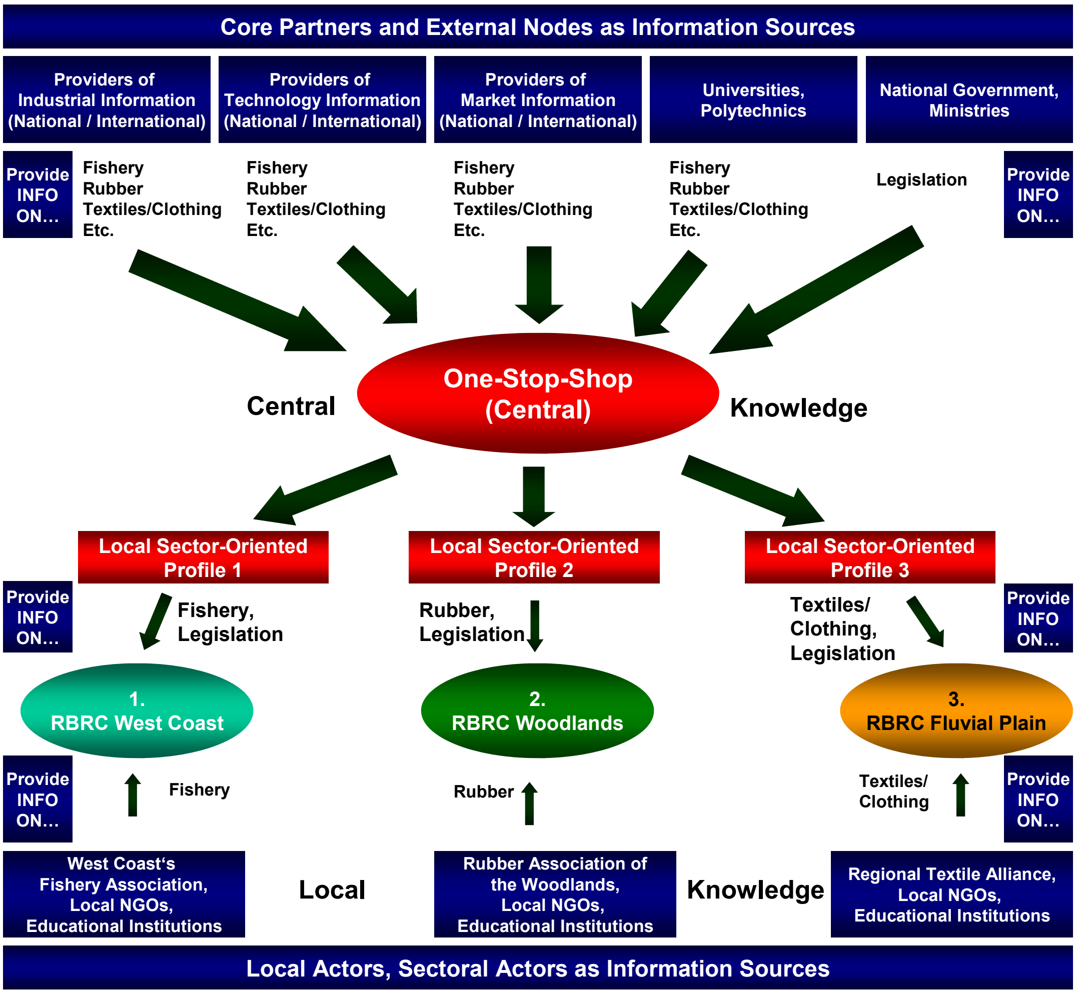
Core Partners and External Nodes as Information Sources
Providers of Industrial Information (National / International)
Providers of Technology Information (National / International)
Providers of Market Information (National / International)
Universities, Polytechnics
National Government, Ministries
Provide INFO ON…
Fishery
Rubber
Textiles/Clothing
Etc.
Fishery
Rubber
Textiles/Clothing
Etc.
Fishery
Rubber
Textiles/Clothing
Etc.
Fishery
Rubber
Textiles/Clothing
Etc.
Legislation
Provide INFO ON…
Central
One-Stop-Shop (Central)
Knowledge
Local Sector-Oriented Profile 1
Local Sector-Oriented Profile 2
Local Sector-Oriented Profile 3
Provide INFO ON…
Fishery, Legislation
Rubber, Legislation
Textiles/ Clothing, Legislation
Provide INFO ON…
1. RBRC West Coast
2. RBRC Woodlands
3. RBRC Fluvial Plain
Provide INFO ON…
Fishery
Rubber
Textiles/ Clothing
Provide INFO ON…
West Coast‘s Fishery Association, Local NGOs, Educational Institutions
Local
Rubber Association of the Woodlands, Local NGOs, Educational Institutions
Knowledge
Regional Textile Alliance, Local NGOs, Educational Institutions
Local Actors, Sectoral Actors as Information Sources

Figure 17, OSS to Consider Local Context: “Local Sector-Oriented Profiles” for Information Provision to RBRCs

LSPs for each RBRC maintained on the level of the OSS will help the OSS management to improve the applicability of services, such as advisory or training services, that are brought to RBRC locations through OSS staff. Furthermore, a reduced selection of information channeled through to an RBRC will increase the means of the OSS, or the RBRC respectively, to translate the actually forwarded contents into local languages or dialects.

4.8.4.2. Application of Local Sector-Oriented Profiles

Filtering information or services should not restrict but support the RBRC in doing its work. An LSP needs to be carefully developed and applied in co-operation with the local RBRCs. If an RBRC feels that its LSP should be extended or adjusted it should be able to request this from the OSS without complicated administrative procedures.

To apply LSPs to the various types of tools and products that are created by the OSS and can be forwarded to an RBRC, different procedures can be followed, depending on prerequisites, like type of tool or product, as well as technical or network infrastructures.

LSPs can be applied…

- *…to filter information provided:*
    - If database access is physically granted by the OSS to RBRCs through network connection (e.g. SQL-Server based): limit access to selected databases/database tables by means of user profiles on the database security level. User profiles to be administered on behalf of the OSS network administrator or external information providers acting as database hosts.
    - If information is distributed by the OSS to RBRCs via electronic mail (e.g. e-Mail information newsletters): limit distribution of selected information by means of distribution lists based on the LSPs.
    - If information is made accessible online by the OSS to RBRCs via Intranet or Internet pages: steer/facilitate the access of information by laying it out grouped along the information requirements defined in different LSPs.
- *…to filter services provided:* services originating from the OSS, such as training services, only to be provided on location of the RBRC if the respective LSP indicates need for them.
- *…to filter marketing tools/ -programs provided:* Before their deployment, marketing tools, such as promotional leaflets or posters, promotional gifts, or information campaigns, produced on site of the OSS should be examined for local relevance and compatibility, based on LSPs.

LSPs should be regularly reviewed and updated and stay in sync with the results of ongoing needs assessment reviews performed by the RBRCs. Both OSS staff and management have to maintain high awareness of individual LSPs as they change over time, in order to stay in touch with local requirements. Constant awareness will also help them to appropriately consider local demand when contracting new information sources or developing new product concepts. All this requires good communication procedures established between the RBRCs and the parent OSS.

4.8.4.3. Local Content Development and Translations

In addition to relevant content centrally provided, RBRCs need to consult local actors, such as local business associations, NGOs, or educational institutions, to contribute relevant information on a local level. They may also be won for translating content from international or national into local languages or dialects. Local governments need to provide information on local legislation, possible support programs, or other official matters that affect SMEs. When requesting this information provision from the local governments or ministries, the RBRC can take the opportunity to simultaneously raise their awareness for the need and potential of SME support and regional support infrastructure development.

From the technical perspective both local content development and translation activities could be performed remotely before being supplied to the RBRC online.

4.8.5. Pricing

Service Needs Assessment
Reasonable Pricing
Educational Workshops
Local Context & Local Language
Promotional Activities
Training & Assistance
Goal 2: Services & Service Relevance Sustainability

SMEs have stronger finances than typical customers of a Multipurpose Community Telecenter. This makes affordability of services a lower barrier to SMEs. Yet an RBRC service will only be attractive to them if they perceive the value gained for their business as higher than the cost of the service.

When setting the pricing policy, different pricing objectives should be considered for SMEs from different categories. With cutting-edge services, such as customized business information solutions or e-Commerce provision, primarily targeted at the more advanced SMEs, the RBRC can aim for local leadership in product quality. With its value added ICT solutions carefully tailored to business needs identified, the center should try to raise the quality of the high profile services above what competitors offer. With appropriate promotion of this quality, the leadership position may allow for charging a price higher than that of competitors.

A method to identify prices that are accepted by SMEs is to perform a price sensitivity test by calculating the “revenue maximizing price”. SMEs will be asked to on a scale of prices ranging from low to high indicate the maximum price they would be willing to pay for a specific service. From the different percentages voting for particular maximum prices and the corresponding values, it will be possible to derive the price at which the service would earn maximum revenue. It must be noted that the result will not indicate whether the price identified is sufficient to cover the costs of the center so as to enable the service.[75]

Revenues gained from the top service segment can in turn be invested in cross-subsidization of basic services, such as communication via e-Mail or telephone, and WWW usage. This will enable a second pricing strategy targeted at the larger number of SMEs that possess weaker finances, likely Non-ICT and Non-IT Users. In addition to cross-subsidies, external subsidies should be used for partial cost recovery of these basic services that would otherwise not be affordable for many SMEs. With this strategy, implying rates below those of competing businesses, the center can aim at the penetration of the local basic ICT market, creating customer loyalty among those SMEs that still have little economic means, but through the usage of basic and affordable ICTs may be empowered to become revenue-generating customers at a later point in time.

Financial controlling mechanisms, however, need to be established in order to protect the center from setting pricing policies that are incompatible with the actual service production prices and amount of available subsidization, thus would be "unreasonable" from its own point of view (see Chapter 7.4.2 on Financial Controlling of the RBRC). Reasonable pricing can also only be achieved if the center is established in an area that offers a sufficient density of SME customers with appropriate demand in general (see Chapter 7.4.1 on SME Density and Ability to Pay).

4.8.6. Promotional Activities

Service Needs Assessment
Reasonable Pricing
Educational Workshops
Local Context & Local Language
Promotional Activities
Training & Assistance
Goal 2: Services & Service Relevance Sustainability

The key recommendations that have been given in a previous Chapter for promotional activities of telecenters are equally applicable to an RBRC (preparatory and ongoing promotion, see Chapter 4.5, with Figure 12; Telecenter Promotional Framework: services, people, supporters, and recognition & identity as four cornerstones of ongoing promotion).

4.8.6.1. Advertising to Different SME Target Groups

On top of that, when the RBRC takes action to promote its products, the differences among its SME target customers, based on the level of ICT usage and familiarity, again play a role. *Non-ICT Users* and *Non-IT Users*, who likely constitute a large portion of rural SMEs, will have to be addressed with pragmatic advertising taking an educational approach. Basic *benefits* related to the use of ICTs will have to be explained here. This has to happen *without the technical abstractness of a product feature driven promotion* that is often typical for ICT related product slogans. At the same time, a bridge to concepts and issues that have already been familiar to this target group should be built.

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[75] *Chua et al (1999)*

NOT:

- “Our network provides the data you need to have”;
- “Surf the Internet at high speed”;
- “We create your web presence”.

RATHER:

- “Communication Technology can bring good news to your customers just as safe as your own hands would do”;
- “Come to learn how Technology can help you like a devoted assistant”;
- “Information Technology safes you time to spend with your family”
- “Your customer will love your printed invoice”; etc.

This kind of advertising can also be combined with inviting SMEs to Educational Workshops (see Chapter 4.8.7), where the concept of educating on the benefits of ICTs will be continued.

On the other end of the SME spectrum, advertising targeting *Non-networked ICT Users* and *Networked/Intensive ICT Users*, who are assumed to be smaller in numbers and have a greater basic knowledge of ICTs, can take a more advanced approach. Now, it can be about explaining the fundamental difference of stand-alone vs. networked PCs, the full potential of e-Commerce services, etc. Due to good prospects of higher per-SME profit ranges gained from this target group, RBRC staff can make more individual efforts, e.g. to visit selected SMEs, presenting to them the range of its services, and submitting their business card. Membership or trial membership schemes offering special discounts can be introduced as incentives on this occasion.

4.8.6.2. Advertising Synergies

Once an SME is an established customer of the RBRC, the latter may provide the SME with promotional posters for it to post in its shop. Such posters displayed in the SME store saying, for example, “We are connected to the world - through RBRC West Coast” can fulfill a two-way advertising task:

1.) Advertising for the SME. The SME demonstrates to its customers that it works with up-to-date ICT solutions for the benefit of its customers.

2.) Advertising for the RBRC. To attract business partners or customers of the SME as new RBRC customers.

Prerequisite for mutual advertising steps as described above is that the RBRC in fact aims for a quality-driven business strategy, as already pointed out in the previous Chapter on pricing, making its name a “good name”. In that sense, promotional strategies will only be successful if the quality and reliability of the underlying products prove their messages right.

Another part of promotional activities will be the inclusion of SME business associations, labor unions, NGOs, and other organizations and representatives acting as interfaces with local and regional SMEs. Publications and events of these organizations can be used to bring awareness of the RBRC and its products closer to the SME clientele.

4.8.7. Educational Workshops

Service Needs Assessment
Reasonable Pricing
Educational Workshops
Local Context & Local Language
Promotional Activities
Training & Assistance
Goal 2:
Services & Service Relevance Sustainability

With Educational Workshops for SMEs, the RBRC can try to positively influence the attitude that SMEs have towards ICTs and the benefit it could bring to them. They will support SMEs to move from traditional and informal ways of business relevant communication and information collection/dissemination to the acceptance of advanced ICTs. As previously mentioned, these workshops would be offered free of charge or for a minimal fee, and combine a hands-on introduction to the use of specific services with educational explanations of their purpose, potential, restrictions, and the interfaces and parallels they have with traditional activities that the customers are familiar with.

Elements of Educational Workshops can be:

Get to know a service - A video beamer can be used to introduce basic or advanced services to the audience: how do webpages look like and how can information be found on them; how can e-Mails be sent and received; how does a profile report on an export country look like, what does it contain, and what is it good for; what does marketing strategy contain, why is it important, and what can be learned about it in a training seminar;

Try out a service - Guided hands-on introduction to a computer or other ICT hardware can create curiosity and reduce fear of the unknown.

Case Studies - The potential of offered services can be communicated to rural SME representatives by means of the presentation of case studies that have been collected in One-Stop-Shops, the urban equivalents of the RBRCs. Learning about how success has been achieved through the employment of ICTs will make them more confident and help to reduce prejudice. It will also provide an understanding of how ICTs have successfully been applied to sector-specific business procedures that so far have been performed in traditional ways.

Keynote Speakers - Publicly recognized individuals, such as university professors, politicians, successful entrepreneurs, or ICT specialists can be invited as keynote speakers of workshops in order to present their view on the importance of ICTs in general, or individual services such as web presence, e-Commerce, etc.

Collection of Feedback – Educational Workshops belong to the marketing activities of the center, so they can also be used to feed back and improve its marketing approach: participating SME representatives, which may be both current and potential customers, should fill out feedback forms after the sessions, answering questions on how useful, interesting, complex, etc. they perceive both the workshop and the services that have been introduced. This can form part of the ongoing service needs assessment procedures.

4.8.8. User Training and Assistance

Service Needs Assessment
Reasonable Pricing
Educational Workshops
Local Context & Local Language
Promotional Activities
Training & Assistance
Goal 2:
Services & Service Relevance Sustainability

While Educational Workshops are supposed to positively influence perception, reduce inner barriers and close awareness gaps of potential and current RBRC customers, user training and user assistance has to tackle actual manageability constraints of services and tools, and support the development of general skills that help SMEs doing business. In this relation and according to the previously outlined categorization of SMEs, we can assume training needs that differ between Non-IT Users, Non-networked ICT Users and Networked/Intensive ICT Users. Figure 14 on page 44 already contained some assumed training needs of the different category members, which would require individual and location-specific assessments in order to be put in more concrete terms.

SME Development:
Considerations on ICT Training Requirements and Impact

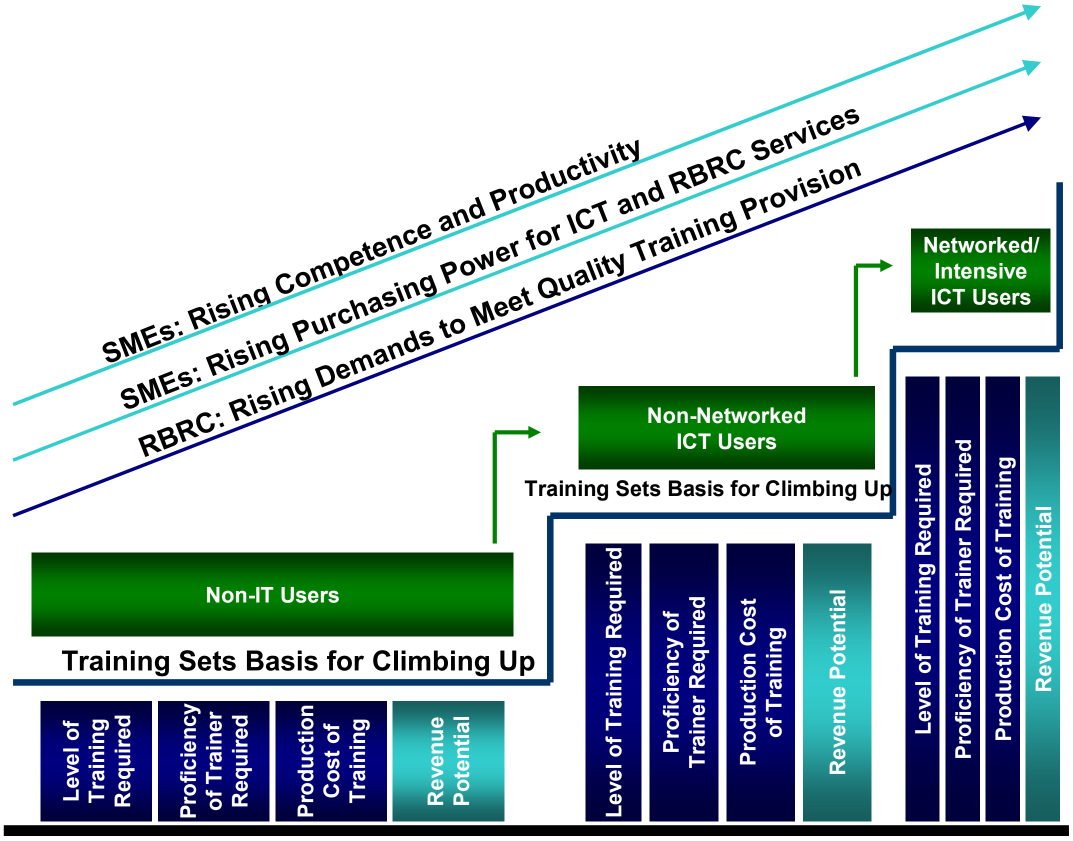

SMEs: Rising Competence and Productivity
SMEs: Rising Purchasing Power for ICT and RBRC Services
RBRC: Rising Demands to Meet Quality Training Provision
Networked/ Intensive ICT Users
Non-Networked ICT Users
Training Sets Basis for Climbing Up
Non-IT Users
Training Sets Basis for Climbing Up
Level of Training Required
Proficiency of Trainer Required
Production Cost of Training
Revenue Potential
Level of Training Required
Proficiency of Trainer Required
Production Cost of Training
Revenue Potential
Level of Training Required
Proficiency of Trainer Required
Production Cost of Training
Revenue Potential

Figure 18, SME Development: Considerations on ICT Training Requirements and Impact

RBRC management should be aware that offering user training for SMEs *from different categories* is not only a means to address varying needs, but is also vital in the interest of long term SME development and the RBRC's own business strategy. Assisting SMEs to make best use of ICTs at their individual level of ICT readiness will improve their prospects of promotion to higher levels. This can be concluded as only well-trained users will be able to exploit the full potential of ICTs for the benefit of their company and invest resulting profits in a further development of its ICT structure and –strategy. Such advancement of SMEs in their ICT use will not only imply SME development through strengthened competence and productivity, but will increase the revenue potential of the RBRC through stronger demand for advanced ICT services.

At the same time, rising demand for high level training services increases the pressure on the RBRC to meet the higher quality standards that go in line with these services. The RBRC could follow several strategies to prepare for this, as described in the following two sub-Chapters.

4.8.8.1. Training Centers of Competence for High-Level Training Development

In today's fast changing technical and business environment, the provision of user training in very advanced applications or high-level management courses makes high demands on the competence of trainers and the quality of training curriculae. While it is likely that only a small percentage of the RBRC customers need and afford these top training services, it would be a heavy burden for the limited number of RBRC staff to stay informed about and keep being prepared to provide the full spectrum of them at all times. To address this problem, it will be worthwhile to establish a network of *training centers of competence* out of the OSS and the associated RBRCs within a country. In this system, each RBRC would be assigned one subject area of high-level training, e.g. "e-Security", "Intranet Development", etc., to have its staff become expert in. It would be the responsibility of the respective RBRCs to maintain their expert status by observing and staying on top of technological developments and extending specialized staff skills that relate to their field of responsibility.

Trainers of one center of competence would not necessarily be the only individuals capable of providing courses related to their specialty. This would be difficult, as traveling to other RBRCs for specialized training provision will not always be easy, given the poor quality of many rural traffic networks. Rather, they can take over a "train-the-trainer" function in their special field, traveling to the other RBRCs once in a while to provide local trainers with refresher courses and keep them up-to-date about changes and new developments of the special topic concerned. Furthermore, the respective training specialists could serve as the helpdesk support contact for the non-specialized trainers and be responsible for the development of training material related to their subject area. On top of all, the OSS could take over the function of co-ordinating the distribution of topics between all RBRC training centers of competence. The OSS could also function as a powerful center of competence itself, in view of its special position within the OSS-RBRC network.

4.8.8.2. Alliances

The RBRC can actively try to establish alliances with other organizations that may assist in the provision of trainers, the design of training material, or training content. This could be, among others, educational institutions of the tertiary level. For example, economics or business faculties of universities could provide relevant research findings to the RBRC, so that they can directly flow into training seminars and benefit the SME community. Knowledge provided can relate to micro- and macro economic trends, national or international research e.g. on human resources management or tax law, international import restrictions, international norms and standards, etc. The asset the RBRC can bring into such kind of alliance in return could be special conditions for the purchase of RBRC services that are granted to students of the allied universities (if the geographic distance between university and RBRC allows for it). This move would help students to get access to tools and services they require. At the same time it would bring student customers and SME customers together in one facility, supporting the establishment of new employer-employee relationships.

If no institution is available in reasonable proximity of the RBRC, the latter may benefit from alliances established between the OSS and universities of the capital city.

4.8.8.3. Assistance

User assistance is an important activity to maintain customer confidence. This is valid no matter if the customers are SME representatives in an RBRC or private users in a community telecenter. If a customer calls for assistance, RBRC staff needs to respond fast and in a competent manner. It has always to remember that ICTs are generally a relatively new phenomenon to rural population. Building trust and confidence in ICTs among the customers is a difficult endeavor, however, losing it can be very easy: if the staff conveys the impression that a problem (of technical nature, of understanding, of manageability…) cannot be solved easily simply because the employee does not want, is not prepared, or does not have time to help, the customer's confidence in the respective service or tool in particular and in ICTs in general can rapidly drop. If staff does not sufficiently assist, it will not understand the nature of the problems that occur. Thus, it will neither be able to learn where it needs to extend its technical assistance skills, nor will it be able to derive weak spots in the RBRC's training courses, in the RBRC's hardware or software setup, or whatever else is causing the necessity of user assistance. Management has to prevent all that by defining friendly, competent and immediate assistance as one of the top staff values the RBRC promotes.

4.8.9. TRUST the Service: e-Security and e-Trust

SMEs as customers of an RBRC are expected to have a higher demand for advanced Internet solutions, as it is the case for the average customer of, say, a Multipurpose Community Telecenter. Technically, they can use the Internet to create exporting channels, use e-Commerce services, perform online procurement, to name only some activities. Yet in order to make these services relevant to the SMEs, another variable of services relevance has to be added to the six that have previously been discussed: they have to TRUST the service!

Especially in developing countries, where so far business has largely been performed on a very local and personal basis with a clear focus on direct human relationships, motivating people to move from a rural marketplace into a virtual marketspace is a challenging task. As trust has always been a major ingredient of traditional business relationships, a lack of trust in relationships established over networks can seriously turn down the willingness to consult the services listed above – a phenomenon that is also present in developed countries. Development of trust, in this case “e-Trust”, is important to overcome this obstacle.

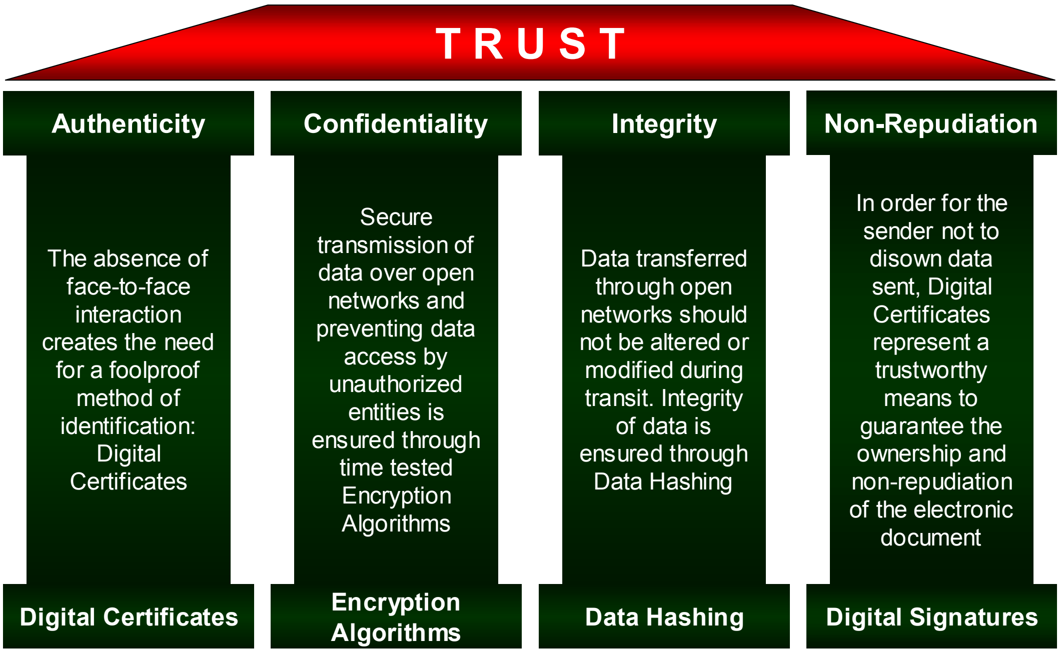
4.8.9.1. Human Dimension of e-Trust

Trusting business relationships maintained via the Internet has both a human and a technical dimension. The former implies that business relationships established by utilizing the Internet, eventually export relationships bridging big geographic distances, make it difficult for rural businesses to physically meet their counterparts on a regular basis. To overcome a deficit in trust in the parties and counterparts involved in e-Business, the RBRC can adopt the role of a trusted third party that will assist in establishing remote business relationships. It can, as a service, mediate between SME customers and remote parties in order to make both feel confident about each other before entering business deals facilitated by Information Technology. At the same time it can use its networking capabilities to do background checks upon potential remote business partners (business performance, liquidity, etc.). As management and staff of the RBRC will represent known faces to the rural SME customers, it will be easier for the latter to develop trust in both the e-Business procedures and the remote business candidates once “approved” by the center.

4.8.9.2. Technical Dimension of e-Trust: e-Security

Mediation of the RBRC to establish Internet supported business relationships can already be an important step towards increasing the trust of SME customers in Internet based business services, still, the lacking transparency of the technical procedures involved will remain a serious problem for rural customers that so far have not been using comparable techniques. When providing e-Business solutions, the RBRC should therefore consider the implementation and use of technology enhancing the e-Security of the tools and procedures utilized. Without a secure environment, SME customers will have substantiated reason to not perceive e-Business activities as trustworthy.

E-Security in the described way can be created through the establishment of a *Public Key Infrastructure (PKI)*. Using so called public and private keys, a PKI framework can provide secure identification of users involved, secure transmission of data preventing unauthorized access or alteration, and guarantee of maintained ownership of electronic documents (see Figure 19).



Public Key Infrastructure (PKI): Enabling the Four Pillars of Trust

TRUST

Authenticity	Confidentiality	Integrity	Non-Repudiation
The absence of face-to-face interaction creates the need for a foolproof method of identification: Digital Certificates	Secure transmission of data over open networks and preventing data access by unauthorized entities is ensured through time tested Encryption Algorithms	Data transferred through open networks should not be altered or modified during transit. Integrity of data is ensured through Data Hashing	In order for the sender not to disown data sent, Digital Certificates represent a trustworthy means to guarantee the ownership and non-repudiation of the electronic document
Digital Certificates	Encryption Algorithms	Data Hashing	Digital Signatures

Based on: Odyssey Technologies, http://www.odysseytec.com

Figure 19, Public Key Infrastructure (PKI): Enabling the Four Pillars of Trust

The keys (digital certificates) that are used in a PKI take over the function of digital passports and are only issued by trusted “Certification Authorities”, such as WISeKey or VeriSign. Certificates are only delivered through a face-to-face identification process, which assures that they authenticate only the owner that is really registered with them. The certificates can be used with different applications, for instance to encrypt and decrypt e-Mails, so that they can only be read by the intended recipients.[76]

E-Security is a vital prerequisite but not sufficient by itself for establishing e-Trust. Even if the e-Security of a PKI implemented by an RBRC can be trusted, e-Trust will only exist once the customers really do perceive the services as trustworthy. This shows that it will be on behalf of the center staff and its promotional activities to raise awareness for the measures taken, to convey the reliability that goes along with the marketspace secured that way, and to make business solutions based on the Internet relevant to current and potential SME customers.

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[76] *WISeKey SA, www.ecommercepki.com*

5. Strategic Goal 3: Human Resources Sustainability

To realize sustainability of human resources by means of highly motivated, qualified, continuously trained, reasonably paid, and visionary staff and management.

Telecenter staff enables the services and brings them to the customers, is responsible for customer confidence, telecenter development and income generation. Thus, the sustainability of human resources is vital for the success of the center.

Driving factors for human resources sustainability are:

- Qualification, Payment, and Incentives
- Training of Telecenter Staff and Management
- Capable Management (“Local Champions”)
- Openness to Female Management

5.1. Qualification, Payment and Incentives

As a result of low salaries paid especially in rural areas, telecenter staff with very high profile qualification is difficult to be found particularly on the countryside.[77] However, Mayanja thinks that Diplomas are not the major criteria for hiring staff. Besides knowledge and skills in the use of ICT, marketing and creation of tailor made programs, he stresses the importance of soft skills, such as interest to learn new skills, flexibility, and teamwork.[78] Fuchs’ finding from his telecenter case studies is that “telecenter people have good community skills, like to work with others, (and) are aggressive about bringing the mission of the telecenter to all segments of the community…”[77] Telecenter management particularly requires a set of skills, which will be dealt with in Chapters 5.3 and 5.4. If there is room for improvement of a hired employee’s skills, training seminars for staff can compensate for that (see Chapter 5.2).

Still, it is important that in order to prevent heavy fluctuation within the staff structure those employees the telecenter can “afford” are paid an appropriate salary. Otherwise, frequent leaves of employees caused by low salaries will imply the risk that the asset of experience gathered in the course of the telecenter establishment and day-to-day business will leave with them. If, in addition to this, the telecenter does not maintain proper documentation of services, knowledge, or configurations (see also Chapter 6.3 on Business Planning and Documentation), it will imply that important information and skills will not be passed on to successors, putting the telecenter as a whole at risk of failing to “learn” from its experience.

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[77] *Fuchs (1998)*

[78] *Mayanja (nk)*

Another way of dealing with the obstacle of small funds is to engage volunteers from the community that work for the telecenter without payment. The previously mentioned study about eight telecenters in South Africa identified two volunteers in the Tembisa telecenter in a township close to Johannesburg being responsible for performing the training seminars. The same study found volunteers to be employed in Mamelodi Telecenter, Mankweng Telecenter, Botlokwa Youth Telecenter, and Siyabonga Multipurpose Telecenter. In the latter telecenter, all paid staff had to be laid off and it was finally run exclusively by volunteers who received only compensation for travel expenditure.[79] Although volunteers obviously play a central role in realizing many telecenter projects,[80] we have to be conscious that their voluntary status can lead to problems in retaining and motivating them, which in turn may diminish the overall sustainability of telecenter human resources. However, if no finances are available to reward volunteers, telecenters may find other incentives, such as training (skill building), free use of services and equipment, or college credits in the local university.[81]

After all, we have to be aware that availability of volunteers can only be assumed. Thus, volunteering should not be the rule but rather the exception within the telecenter strategy, if we anticipate sustainability of human resources sustainability.

5.2. Training of Telecenter Staff and Management

Qualified telecenter staff and managers are vital for its success. While a certain skill level is prerequisite for taking up a telecenter position, acquisition and maintenance of knowledge and skills necessary for doing all aspects of the job in appropriate manner require additional training. Murray and Murray point out that “high-quality ongoing training is crucial to ensure that the providers are familiar with these technical resources, aware of their strengths and weaknesses, and capable of using them to maximum advantage”.[82]

Jensen and Esterhuysen suggest that staff should be made familiar with the mission and goals of the telecenter as well as with procedures and best practices. Except being trained in key skills and techniques (“customer service orientation, financial management, equipment and applications operation and support, and how to train others effectively”), staff should also be introduced to simple things that keep the center going, such as replacing printer cartridges or changing a bulb in an overhead projector.[83]

Managers need to be trained in financial planning, book keeping and controlling, marketing technique, staff management, ICT skills and computer literacy, to name only some areas. Learning presentation skills (to include the use of programs such as PowerPoint) will help the manager to perform promotional activities to potential customers or stakeholders.

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[79] *Roman (2000)*
[80] *Oestmann and Dymond (2001)*
[81] *Colle and Roman (2002)*
[82] *Murray and Murray (2001)*
[83] *Jensen and Esterhuysen (2001)*

Telecenter staff training materials have been written that build on experiences made and knowledge collected. In “Modules for Training Telecentre Staffs”,[84] Colle and Roman have published useful training units that can be deployed to form the content of telecenter training seminars. The World Bank combined experience of several partner organizations (such as IDRC, UNESCO) into comprehensive staff training agendas and supporting resources for school-based telecenters which are available online.[85]

In addition to initial training, maintaining the skill level of staff and managers is another important task. In the Ugandan Multipurpose Community Telecenter of Nakaseke, the staff was provided with short refresher courses on a regular basis. In order to keep abreast with technological development, this especially addressed the ICT trainers.[86]

5.3. The Manager as “Local Champion”

While competent telecenter staff as such is an essential factor, the role of the manager is of utmost importance. Literature review reveals the common perception that a competent manager is one of the most important ingredients of a telecenter for making it sustainable. On the other hand, incompetent management has been observed as a major reason for telecenter failure.[87] Colle and Roman consider it vital to have a “Local Champion”, an innovator who is able to “mobilize others to accept the vision of an ICT telecenter program”.[88] He or she should be visionary and have the potential to make ICT concepts understandable for the community. If this manager is a local person, it is more likely that he will be better accepted by the community and more credible when introducing the telecenter concept to it. This will help him to convince people that they should “try out” what the telecenter offers. Acceptance by the community, thus, is a major factor: “Computer and other skills can be taught – drive and respect cannot.”[89]

The importance of a “local champion” for the success of telecenter projects seems to be a universal phenomenon: case studies of projects in Ireland, Australia, Sweden and Canada[90] reveal the impact of central personalities with major and long term involvement on foundation and operation of the telecenter. In Canada, the availability of a suitable “local champion” did even decide about which region to give priority in establishing a telecenter project. Proenza et al summarize the lessons learnt from the analysis of different telecenter experiments as follows: “Behind every successful telecenter - whatever its type – there is invariably a person - sometimes more than one - who is enthusiastic and personally committed to the success of the venture, acts with considerable independence and is intimately familiar with the locality and community in which the center operates, and is able to articulate the community’s needs and satisfy its demand for services.”[91]

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[84] *Colle, Royal D. and Roman, Raul: Modules for Training Telecentre Staffs – An Interim Report with Sample Modules, Cornell University, Ithaca, NY, June 1st, 2001. The units cover titles such as “The Role of Telecentres in Our Communities”, “The Role of The Telecentre Manager”, “Marketing Your Telecentre” and “Making Computers Work for You”. http://www.itu.int/ITU-D/univ_access/telecentres/documents/ModTrainingTelecStaff.pdf.*

[85] *School-based telecenters workshop training materials: http://www.worldbank.org/worldlinks/telecentres/workshop/trainingmaterials.htm*

[86] *Mayanja (2001)*

[87] *Benjamin (2002)*

[88] *Colle and Roman (2002)*

[89] *Benjamin (2002)*

[90] *Fuchs (1997)*

5.4. Openness to Female Management

“The right man for this job is a woman”[92] Richard Fuchs claims, pointing out that women are likely to be the better telecenter managers. While many European telecenters selected technically trained and certified management according to qualifications such as computer science, physics, and mathematics, other centers in Canada gave higher priority to skills relating to community development, communication, and organization - skills that are more commonly found with women. Additionally, women seem to be less hesitant than men in openly admitting if they need assistance (e.g. technical), which puts them in a stronger position as far as informal learning is concerned. Finally, it can be expected that it will be easier to compensate deficits in technical skills of a female manager as compared to reducing the lack of social and communicative skills that may go along with a male manager.[92] Other sources describe women as better telecenter managers due to their “inherent predisposition … to learn, inquire about new trends, and patience, all of which are required in high levels for successful community telecenters.”[93]

All this are arguments against a general preference for male candidates applying for telecenter management positions, occurring under the assumption that technical expertise was the most important factor to be considered. If capacity allows, a management team could be considered comprised of a male and a female member. Management responsibilities could then be distributed between them according to the arguments and observations that have been described above. We will pick up on this idea in one of the forthcoming Chapters (on management in the RBRC context, 5.5.3.).

As mentioned in an earlier context, it needs to be borne in mind that traditional paternalistic structures within communities can complicate the involvement of women in management positions.

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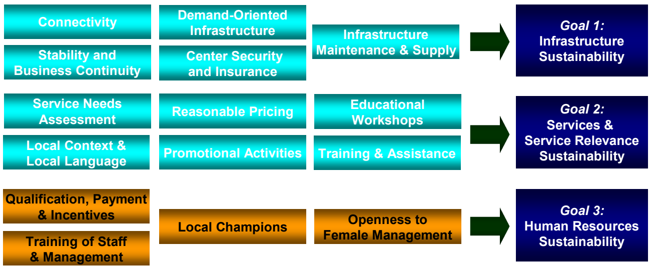
[91] *Proenza et al (2001)*

[92] *Fuchs (1997)*

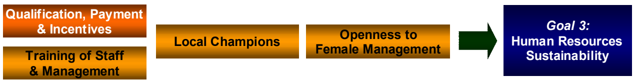
[93] *Mayanja (nk)*

5.5. Strategic Goal 3 in the SME Context


Connectivity
Demand-Oriented Infrastructure
Infrastructure Maintenance & Supply
Stability and Business Continuity
Center Security and Insurance
Goal 1: Infrastructure Sustainability
Service Needs Assessment
Reasonable Pricing
Educational Workshops
Local Context & Local Language
Promotional Activities
Training & Assistance
Goal 2: Services & Service Relevance Sustainability
Qualification, Payment & Incentives
Training of Staff & Management
Local Champions
Openness to Female Management
Goal 3: Human Resources Sustainability

The following Chapters deal with additional aspects that need to be considered when the identified driving factors for human resources sustainability are applied to the operation of an RBRC that specifically targets SMEs.

5.5.1. Qualification, Payment, and Incentives


Qualification, Payment & Incentives
Training of Staff & Management
Local Champions
Openness to Female Management
Goal 3: Human Resources Sustainability

Qualified, appropriately paid and motivated staff obviously is of equal importance in an SME-focused RBRC. Yet the narrower range of target customers (SMEs) suggests some further considerations.

Generally it is recommended to recruit RBRC staff from candidates possessing the same set of qualifications that has been suggested for a regular telecenter, such as ICT, marketing, and teamwork skills. On top of that, the nature of SMEs as primary customers extends the required staff profile to a certain extent. When each of the RBRCs is placed into a rural cluster of established SMEs, it will likely find a locally dominating sector, like rubber or textile industry. The information and service needs of this leading sector will necessarily be the major concern of the RBRC. Consequently, it will be an advantage if the qualification of RBRC staff links into the special nature of the associated sector. This will be the case if an employee…

- Holds or is in the process of acquiring a university degree or another professional certificate relating to the sector; or/and
- Has gathered practical work experience in a profession belonging to the sector; or/and
- Has gathered working experience as a teacher, instructor, or advisor in a profession belonging to the sector; or/and
- Has been raised in a family that has (traditionally) been active in the sector, potentially in the form of its own SME.

A mix of telecenter- and sector-specific skills available that way will provide the employee with…

- Better sensitivity for potential needs of SME customers which will facilitate the development of new product ideas and product concepts

- Better skills in designing, executing and evaluating needs assessments and product concept tests
- Higher capabilities of converting sector-relevant raw data or information into sector-oriented information packages (e.g. industry reports)
- Better means of realizing need for adjustment of the Local Sector-Oriented Profile (LSP) that defines the interface between the OSS and the RBRC for information and service forwarding (see Chapters 4.8.4.1 and 4.8.4.2 on LSPs)
- The ability to give advice to SME customers; e.g. on which services fit best to their individual situation, how ICT solutions can be applied to sector-specific working procedures and problems that have so far been performed or handled in traditional ways, etc.
- Better means to really comprehend and respond to SME customers' concerns and complaints in situations where the products of the RBRC do not properly address their needs or give other reason for dissatisfaction (competent customer care)
- Higher chances that he/she will be respected by the SME customers as a competent partner who really knows their subject ("he is one of us"). This may be even more important as the more traditionally oriented of the SME representatives, who tend to be skeptical against ICTs in general, could otherwise be encouraged in their refusal of ICTs if the "ICT person does not know anything except ICTs".

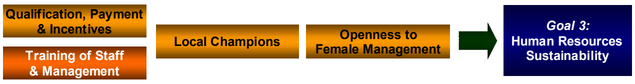
Although it is likely that not the entire staff can have the required ICT skills *and* be recruited from the relevant sector, the center management should integrate a certain level of specialized sector competence among its staff. Business associations, labor unions or educational institutions can be consulted for providing recommendations on sector-linked candidates to the RBRC.

The types of services that have been introduced as elements of an RBRC's anticipated product portfolio make great demands on the involved staff, as far as qualification, commitment, reliability, and discretion are concerned. Facing complex, tailor made, and continuously adjusted services and contents, the center will also rely heavily on constancy of staff structure. Through its business customers, the RBRC should be in a relatively better position than a community-oriented telecenter to pay salaries that correspond with these demands more appropriately. However, the more commercial orientation of an RBRC does not erase the importance of a fundamental philosophy of the employed staff that is rather idealistic and driven by awareness of the developmental mission and potential of the center.

The question whether to employ volunteers can certainly not be universally answered. Paid employees will be bound by contract to observe confidentiality regarding customer information of any kind also after their contract of employment will have expired. Volunteering outside of regular contracts of employment that impose strict duties (and rights) on both employees and employers could be problematic if the volunteers are put in contact with sensitive customer information or data. The reliability and trustworthiness of volunteers shall not be doubted here. However, center management should try to get a feel for whether the *trust* SME customers put into ICTs and the RBRC, as their direct partner making ICTs happen for them, could be negatively impacted if volunteers are put in charge with contents SMEs are particularly hesitant to reveal to outsiders (see also Chapter 4.8.9.1 on the Human Dimension of e-Trust and the RBRC's role as "trusted third party"). Yet for activities that do not directly interfere with sensitive or highly critical customer information, such as advertising support, content development, etc., volunteers are surely a very helpful means of support to be considered by the center.

In terms of both volunteers and regular employees, the equipment, services, and training courses within the center profile should allow for many ways to reward and motivate them through free usage. Staff can also be motivated through participation when they introduce their own new service ideas to product concept testing and take part in converting them into newly developed services. Thus, management should always be open to new ideas and encourage staff to come up with suggestions and speak their mind regarding product weaknesses and improvement opportunities.

5.5.2. Training of RBRC Staff and Management

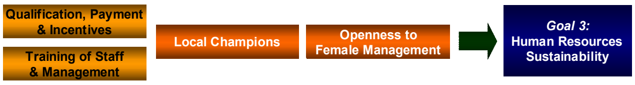

Qualification, Payment & Incentives
Training of Staff & Management
Local Champions
Openness to Female Management
Goal 3:
Human Resources Sustainability

Only some brief remarks here, since no significant changes in the application of staff and management training in the case of an SME-focused center are to be mentioned, in addition to what has been outlined in Chapter 5.2. Certainly, the need for high-level training (technical and non-technical) grows in positive correlation with product complexity and customer skill level, which are expected to develop in an RBRC over time. Also, *sector-specific knowledge* needs to be part of training curriculae enabling staff to apply ICT solutions to real world problems of local businesses. The center can take advantage of those staff members that have a sector-specific background to act in the role of staff trainers. Of course, management has to assure that it acquires and maintains appropriate knowledge of the sector itself, too, as it is responsible for key decisions depending on the sector's altering needs, structure, and situation. The importance of sector-specific knowledge of the manager(s) will be dealt with in the following Chapter as well.

The networked structure of the OSS-RBRC constellation may allow for video conferencing as media for staff and management training, especially in terms of non-ICT related training. Another option can be training sessions per video cassette, eventually on CD-ROM, e.g. on marketing, customer orientation, conflict resolution, etc., that are centrally produced on location of the OSS and deployed to the RBRC sites.

If the capacity of the involved trainers allow for it, staff training can be integrated in the daily business of the center via group sessions that only consume the working time of a few employees at a time. By scheduling the training that way, the person co-ordinating the training can make sure that the center is always sufficiently staffed, while all employees receive the required new trainings or training updates piece by piece.

5.5.3. Management of the RBRC


Qualification, Payment & Incentives
Training of Staff & Management
Local Champions
Openness to Female Management
Goal 3: Human Resources Sustainability

Previous Chapters have highlighted the importance of…

- A competent manager fulfilling the role of a “local champion”, who is innovative, visionary, and accepted and understood by the local community
- The manager’s familiarity with the local situation and needs and how to satisfy them
- Good management skills relating to community development, communication, and organization (which are frequently found with female managers)
- Special knowledge of staff in general and of the manager in particular relating to the economic sector predominantly present in the region served by the RBRC

A management structure of an RBRC should address all the above aspects in order to optimize management’s effectiveness and ability to act. The model which is suggested to fulfill this demand is a double-headed management team, set up according to the following structure:

a.) Manager for Services and Marketing

This person will have very strong communication and organization skills and be also very familiar with the situation, processes, and needs of the locally dominant economic sector populated by SMEs. ICT skills will be required, but be only of secondary importance. The role will be rather SME sector and services content oriented. Areas of responsibility will relate to content-, communication- and strategy-driven, non-technical activities, including all aspects of marketing or fields like customer relations and content acquisition. Female candidates may be, but not necessarily have to be, particularly suitable for this position.

b.) Manager for Technology and Support

Information and Communication Technology Skills will be top quality of this person, followed by experience relating to facility management. Local SME sector-specific skills will be advantageous, but not of primary importance. This role will be rather technology and infrastructure oriented. Areas supervised by this manager will be technically-driven, extending to topics such as service realization, physical center security and e-Security or ICT training. Male candidates may be, but not necessarily have to be, particularly suitable for this position.

A detailed overview of the proposed management team structure and its areas of responsibility is given in Figure 20.

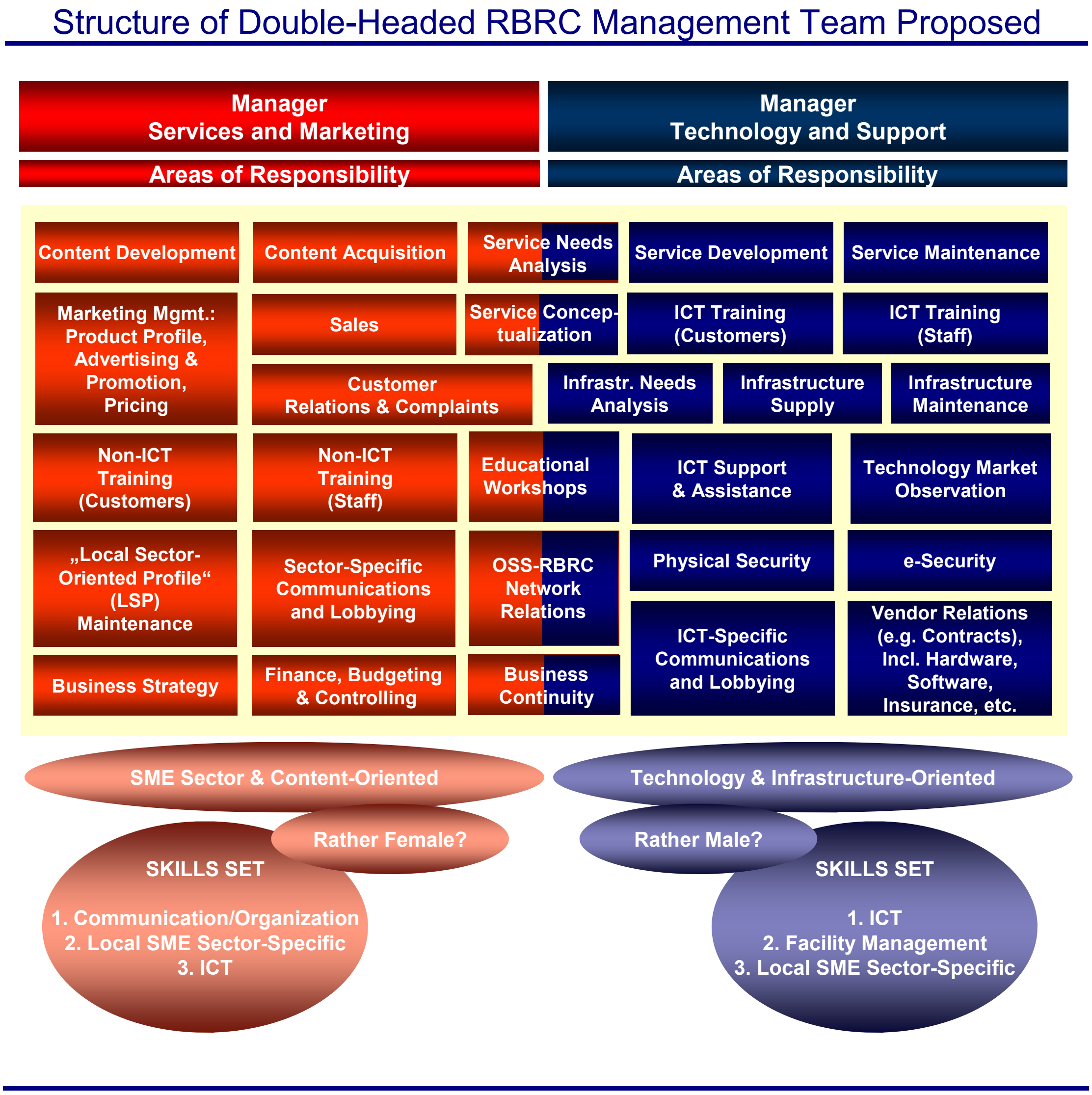

Structure of Double-Headed RBRC Management Team Proposed
Manager
Services and Marketing
Manager
Technology and Support
Areas of Responsibility
Areas of Responsibility
Content Development
Content Acquisition
Service Needs Analysis
Service Development
Service Maintenance
Marketing Mgmt.: Product Profile, Advertising & Promotion, Pricing
Sales
Service Concep-tualization
ICT Training (Customers)
ICT Training (Staff)
Customer Relations & Complaints
Infrastr. Needs Analysis
Infrastructure Supply
Infrastructure Maintenance
Non-ICT Training (Customers)
Non-ICT Training (Staff)
Educational Workshops
ICT Support & Assistance
Technology Market Observation
„Local Sector-Oriented Profile“ (LSP) Maintenance
Sector-Specific Communications and Lobbying
OSS-RBRC Network Relations
Physical Security
e-Security
ICT-Specific Communications and Lobbying
Vendor Relations (e.g. Contracts), Incl. Hardware, Software, Insurance, etc.
Business Strategy
Finance, Budgeting & Controlling
Business Continuity
SME Sector & Content-Oriented
Technology & Infrastructure-Oriented
Rather Female?
Rather Male?
SKILLS SET
1. Communication/Organization
2. Local SME Sector-Specific
3. ICT
SKILLS SET
1. ICT
2. Facility Management
3. Local SME Sector-Specific

Figure 20; Structure of Double-Headed RBRC Management Team Proposed

Obviously, this model can only be realized if the capacity of the RBRC allows for a management consisting of two people. Also, the extent to which the respective managers either delegate the assigned activities to subordinates or assist in executing them depends on the number and capacity of staff. Depending on the individual center, more than the five areas listed in the Figure may be required to be handled under shared responsibility.

6. Strategic Goal 4: Organizational Sustainability

To realize organizational sustainability by means of a suitable ownership and leadership pattern, the promotion of effective telecenter and human networking, and strategic business planning and documentation.

The author has chosen the term "Organizational Sustainability" to describe the need for certain aspects to be considered in order to support the performance and future prospects of the telecenter.

These aspects include

- The organization of the telecenter into a suitable implementation, ownership and leadership pattern
- The organization of the telecenter and its staff within a network of telecenters and people
- The organization and recording of the telecenter's strategies and procedures in business plans and documentation

6.1. Implementation, Ownership and Leadership

6.1.1. Supply-side vs. Demand-side Driven Telecenters

A comparative study[94] of telecenters in different global locations showed that most of them followed a similar pattern of implementation and leadership: the implementation happened through development agencies whereas the centers were operated by local NGOs. The problem that was identified by the authors of this study is that when the operations of the telecenter are run by an NGO that is primarily committed to development, profit aspects are likely to only have secondary importance. As a consequence of that, ownership and management by NGOs or other socially oriented bodies imply a higher risk that prices do not reflect the actual cost of services, market analysis and business planning are neglected, competition cannot effectively be faced, and staff and managers are not properly paid or trained in advanced operations.[94] In this kind of telecenters that have a *supply-side approach*, initiative and risk are taken out of the hand of the telecenter's operator, which reduces his motivation to create a competitive business. In addition, the decision-making power of local residents is very low in a supply-side driven telecenter, which will make them suspicious or disinterested, and reduce their demand.[95]

To overcome these issues, recommendation is being made to involve the private sector in the ownership and leadership of telecenters in order to make them more competitive and enhance sustainability. It has been observed that centers where the operators have a stake in them benefit from their greater entrepreneurial and risk taking spirit. In his study on South African telecenters, Benjamin concluded that sustainability indicators where noticeably higher for privately-owned compared to publicly-owned telecenters[96] (see Figure 21).

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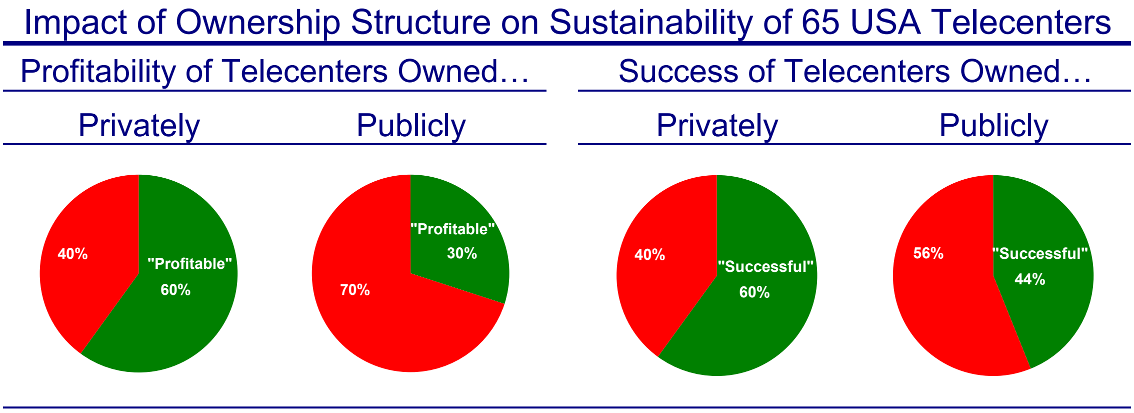
[94] *Oestmann and Dymond (2001)*
[95] *NTCA (2000)*



Out of 65 telecenters interviewed, 50 were publicly owned and 15 were privately owned.

Definition of "Profitable": "Whether the telecenter produces a monthly profit. This is bare operating project (income – immediate expenses). It does not consider reserves (e.g. for maintenance), depreciation, and almost all centers do not pay tax."

Definition of "Successful": "Whether the telecenter managers and/or the USA fieldworkers feel the centre has been successful. In most cases the managers' and fieldworkers' views coincided (where in two cases even after discussion they could not agree, the telecenter manager's view was recorded)."

Source: Peter Benjamin, LINK Centre: Reviewing Universal Access in South Africa, in The Southern African Journal of Information and Communication – Vol 2, No 1, 2002

Figure 21; Impact of Ownership Structure on Sustainability of 65 USA Telecenters in 2001 (South Africa)

Telecenters with private ownership will by nature choose a more *demand-driven approach*. They will start with small-scale operations, adding new services to their profile only if demand and revenue made allow for expansion.[97] Service relevance, as described in Chapter 4, is more likely to be on top of the manager's list of a demand-driven telecenter.

However, putting too much emphasis on private ownership may also have the undesired effect that the idea of profit maximization will outdo the developmental mission of the telecenter, as those services that can effectively contribute to communal development may not be primary income generators. Equal access to information and communication technology may suffer if the public sector withdraws as regulator.[98]

6.1.2. Establishing Public - Private Sector Partnerships

To resolve the conflict resulting from pure private or public telecenter ownership, Mayanja suggests a *partnership* model between the private and the public sector (with the public sector taking the lead). While the private sector would be responsible for providing the investment, the public sector and government would be required to create an enabling environment. This would include infrastructure development and public subsidies intended to reduce operational cost and encourage the private sector to invest and to have the center produce more development value.[99]

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[96] *Benjamin (2002)*
[97] *NTCA (2000)*
[98] *Mayanja (nk)*

Besides Mayanja some other authors highlight the importance of partnerships between public and private sector for rural ICT initiatives,[100] an idea that is also supported by the United Nations Millennium Development Goal (MDG) No. 8. This goal calls for the "development of a global partnership for development", in order to "in cooperation with the private sector, make available the benefits of new technologies - especially information and communications technologies".[101] Possibilities for such co-operation extend to all stages of a telecenter project: Multi-sector partnerships are claimed to be important not only when it comes to creating sustainable results but already in the implementation phase of a telecenter.[102]

There are various constellations as to how to distribute the responsibilities relating to implementation, ownership, and leadership of a telecenter between the members of a public and private sector partnership. In any case, it is important to plan and execute a "partnership for development" as careful as, for instance, a strategic alliance between two private sector corporations that are exclusively profit-oriented. The partnership will only be successful if synergies are created that result in "win-win-situations" for all participants. It cannot be expected from private sector parties to contribute to a telecenter project partnership without receiving a certain degree of return on investment – be it the establishment of a "social reputation" in the national or international public opinion. At the same time, private sector partners have to be aware that representatives of the public sector, like international support organizations or governments, feel committed to the mission of sustainable development and will only contract with companies that respect this priority. Thus, people in charge with finding the right partners to be invited for co-operation need to have a great deal of patience, communication skills, and the right feel for evaluating commitment, enthusiasm and goals' compatibility.

6.2. Networking of Telecenters

Partnership building does also play a role among telecenters themselves. "No telecenter can be an island" Stoll writes, claiming that sustainability of telecenters is unachievable if they do not network among each other.[103] He calls telecenters to organize in national, regional and international networks, identifying three reasons (see Figure 22).

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[99] *International Bank for Reconstruction and Development / The World Bank (2000)*

[100] *Listed in: International Bank for Reconstruction and Development / The World Bank (2000)*

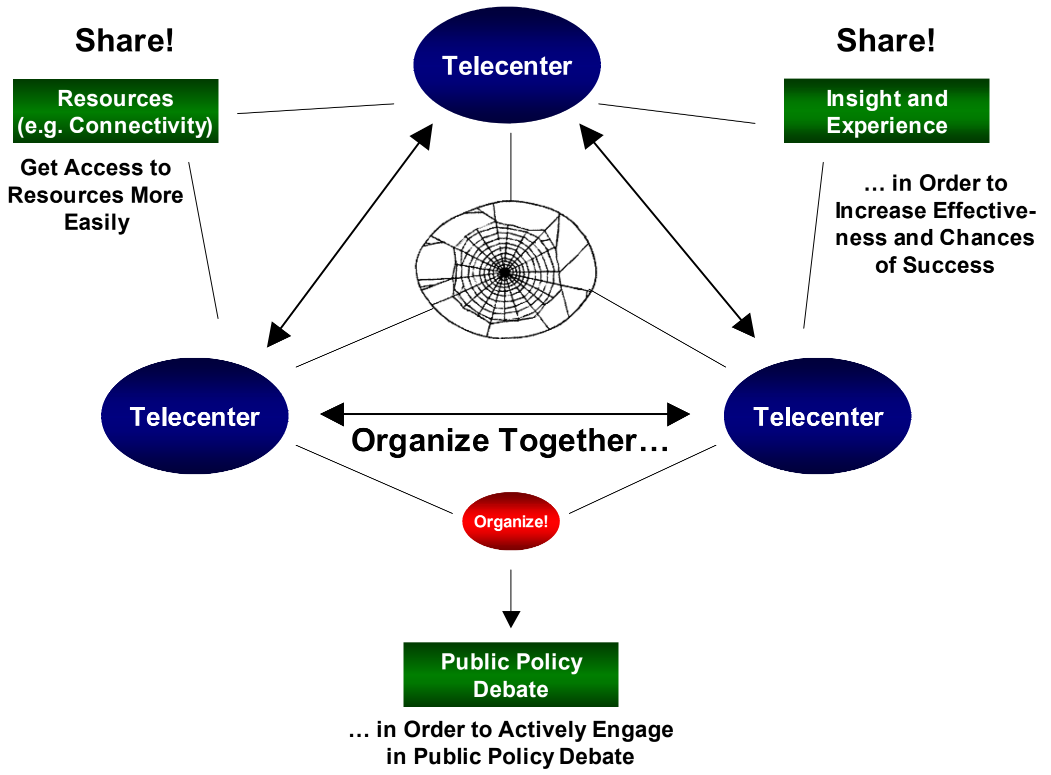
[101] *UN Millennium Development Goal No. 8, http://www.un.org/millenniumgoals/*

[102] *International Bank for Reconstruction and Development / The World Bank (2000)*

[103] *Stoll (2003)*

The significant importance of the human factor for telecenter projects has been highlighted in the previous Chapters of this paper. The importance of human *networking* can be derived from this. Fuchs reports the benefits staff from different Western telecenters gained from spending time with each other in order to exchange technical, operational and moral support. However, he claims that telecenter staff in developing countries will have to be supported by international initiatives that help to establish organizational "networking" links.[104]

Three Reasons for Networking Between Telecenters


Share!
Resources (e.g. Connectivity)
Get Access to Resources More Easily
Telecenter
Share!
Insight and Experience
... in Order to Increase Effective-ness and Chances of Success
Telecenter
Organize Together…
Telecenter
Organize!
Public Policy Debate
... in Order to Actively Engage in Public Policy Debate

Based on: Stoll, Klaus (2003): Telecentres Sustainability: What Does it Mean? Development Gateway.

Figure 22; Three Reasons for Networking between Telecenters

The findings of the previously cited study about South African telecenters support the networking philosophy. The study concludes that the better of the surveyed telecenters exchanged their experiences, ideas and solutions. It votes for a comprehensive networking approach (electronic, paper-based and face-to-face) and gives a committee of Northern Province telecenters as an example, which functioned as a platform for sharing of experience and as lobbying force towards the Universal Service Agency and a Telecommunication company.[105]

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[104] *Fuchs (1998)*
[105] *Benjamin (2002)*

Proenza et al suggest the creation of national or regional “Virtual Networks” (like the US based “Community Technology Center’s Network, CTCNet) to facilitate the interaction and mutual support of telecenters.[106] Stoll reports on a network that already links about 1,350 telecenters in Latin America and the Caribbean (Somos@Telecentros) and argues that the idea of networking should be extended to include links between the social, private and governmental sectors in order to make their individual efforts of solving the digital divide more effective.[107]

An agenda for a national association of telecenters that was put together in an ICT workshop as proposition to the Government of India in 2001 contained the following:

1. Coordinate content supply with developers and suppliers
2. Negotiate with resource suppliers
3. Arrange public relations advocacy and awareness campaigns for ICT and telecenters
4. Provide liaison with government departments and NGOs
5. Train telecenter personnel and organizational users of telecenter facilities
6. Promote and arrange telecenter research
7. Provide liaison/negotiating with other communication enterprises (for example, cable television operators, equipment suppliers)
8. Provide leadership and enforcement of minimum standards of service and professional codes of conduct[108]

On the level of the individual telecenter, management should include active networking as an important part of the business strategy. As the telecenter’s service activity as such includes providing tools that are based on network technology and facilitate networking activities (the World Wide Web, Newsgroups, etc.), the telecenter should take the opportunity to intelligently employ these tools for its own purpose of networking as well.

6.3. Business Planning and Documentation

In the telecenter sector where both customers’ needs and technology will change over time, strategic thinking of telecenters is vital to enable both continued customer orientation and optimal deployment and use of technology.[109] The importance of business planning became obvious when many international experts considered training for telecenter managers relating to business planning as one of the most important training activities for achieving telecenter sustainability.[108]

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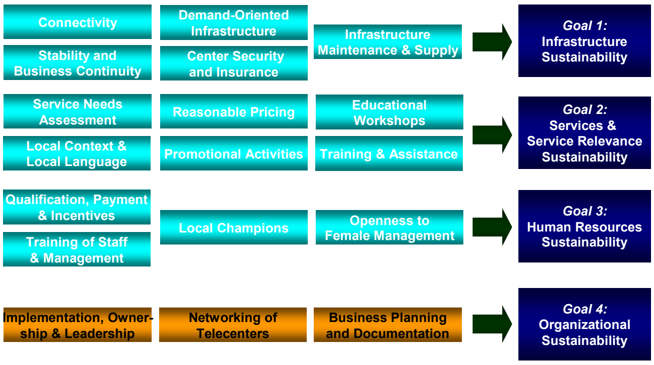
[106] Proenza et al (2001)
[107] Stoll (2003,b)
[108] Colle and Roman (2002)
[109] Fuchs (1998)

A sound business plan should build the framework for all aspects and strategic goals that have been discussed in this paper, from the findings of service and infrastructure needs assessments to service profiles, staffing, and marketing concept. In that sense, a telecenter should by no means be treated differently than any other business start-up. In addition, management should be aware that the business plan is not a one-time project but is to be continuously updated and adjusted to new developments. The variety of factors potentially affecting telecenter sustainability as described in here provides an idea of how manifold the need for adjustment of the business plan can be. An awareness of the dimensions of sustainability, not only by management but also by regular staff, and the linkage and adjustment of the telecenter's processes and issues to the dimensions accordingly, will provide a good basis for active monitoring of business and maintenance of a value adding business plan.

Another important activity is documentation. While on the search for successes and sustainability the telecenter is constantly trying to climb up the learning curve, the knowledge, experiences, techniques, customer contacts, configurations and ideas that arise over time need to be preserved through documentation. This will, among other things, enable the telecenter to convert the learned into effective staff training programs that help the center to cope with staff fluctuation. In addition, documentation of telecenter functions and services can be converted into promotional material or be used to facilitate acquisition of funds or political support.

Once again, the telecenter can use its technological means and knowledge to implement and perform the procedure of documentation in a convenient and efficient manner.

6.4. *Strategic Goal 4 in the SME Context*


Connectivity
Demand-Oriented Infrastructure
Infrastructure Maintenance & Supply
Stability and Business Continuity
Center Security and Insurance
Goal 1: Infrastructure Sustainability
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Local Context & Local Language
Promotional Activities
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Goal 2: Services & Service Relevance Sustainability
Qualification, Payment & Incentives
Local Champions
Openness to Female Management
Training of Staff & Management
Goal 3: Human Resources Sustainability
Implementation, Ownership & Leadership
Networking of Telecenters
Business Planning and Documentation
Goal 4: Organizational Sustainability

The following Chapters deal with additional aspects that need to be considered when the identified driving factors for organizational sustainability are applied to the operation of an RBRC that specifically targets SMEs.

6.4.1. Implementation, Ownership and Leadership

Implementation, Ownership & Leadership
Networking of Telecenters
Business Planning and Documentation
Goal 4: Organizational Sustainability

The SME Support Centers described in this paper are implemented under the guidance of the United Nations Industrial Development Organization, which as a specialized agency of the United Nations System is committed to sustainable industrial development support in developing countries. Through the implementation by UNIDO, the frequently used pattern of center implementation by a socially oriented body is followed. By owning the individual business planning processes, UNIDO will assure that SME development objectives are adequately considered when the RBRCs are implemented.

But which strategy should be followed when it comes to ownership and leadership pattern?

6.4.1.1. Required Characteristics of an RBRC Ownership and Leadership Pattern

Chapter 6.1 has provided recommendations on telecenter ownership and leadership patterns. Applying them to an RBRC, we can derive the following arguments:

- *Substantial private sector involvement* to make RBRC more competitive. Private ownership of the RBRC promises better results of profitability and success. Combined with decision power through private management, it is expected that private ownership of the RBRC will result in a more demand-driven approach, prioritizing strict verification of infrastructure and services need as well as service relevance, and avoiding over-capitalization. Having a stake in the RBRC property, private management will be keen to carefully consider important mechanisms of risk reduction, such as RBRC security and insurance. Ownership of equipment will motivate the operator to appreciate the importance of infrastructure maintenance. The prospect of profit will encourage him to actively face competition and improve the RBRC concept as much as possible.

- *Appropriate public sector involvement* to guarantee maintenance of SME focus and developmental mission. A certain level of supply-side driven ingredients assured through public sector involvement will be needed to guarantee a good balance of short-term vs. long-term profit goals, e.g. balance of connectivity expenditure vs. local content creation or educational workshops. In other words, apparent and profitable demand for Internet access, based on curiosity of customers, should not cover up hidden demand for training and educational services, which SMEs might have to be made aware of first (e.g. in educational workshops). Public sector representatives can contribute financial incentives, or decision making through acquiring a limited portion of shares, to correct exaggerating profit orientation. To achieve this combination, the RBRC should be built on a…

- *Public – private sector partnership* of ownership and leadership. The following chapter introduces models which might prove to be suitable to achieve the effects described.

6.4.1.2. UNIDO Patterns of Ownership and Leadership

When planning the OSS implementation, UNIDO has developed three different models of ownership and leadership.[110]

1. *RBRC as Profit Center of Existing Public or Private Host*
    - Selection of an existing organization
    - From the public or private sector, but involved with SME activities
    - To implement and host the RBRC as profit center within own operations
    - Constitution of advisory committee to ensure that interests of other actors in the sector are met. Committee to consist of representatives of other stakeholders.
    - Prerequisite: Host organization has to contribute resources!

2. *Existing Host Operating RBRC under Public Ownership and Private Sector Leadership*
    - Funding being provided from Government or other public sector sources
    - Private sector management
    - i.e. a Government-owned and private contractor-operated structure

3. *RBRC as New Entity with Shared Ownership*
    - Establishment of an entirely new entity
    - Shareholders from public and private sector
    - Majority of shares held by the private sector
    - Shareholders represented in the Board of Directors
    - Investment of public shareholders (e.g. development banks, SME associations, governmental institutions) aiming at: support of SME operations
    - Investment of private shareholders (e.g. Internet Service Providers, IT and e-Business/Internet companies, IT-training institutions) aiming at: commercial profit

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[110] *UNIDO (2003)*

6.4.1.3. UNIDO Patterns: Evaluation and Recommendation

After evaluating the above models for suitability based on the suggested characteristics of ownership and leadership patterns as outlined in Chapter 6.4.1.1, the author comes to the following recommendation for the RBRC implementation:

- 2nd model not recommended
- Combination of 1st and 3rd model recommended

This recommendation is based on the following arguments:

2nd model: Existing Host Operating RBRC under Public Ownership and Private Sector Leadership

Public ownership of an RBRC added to an existing host organization may be beneficial for the RBRC for financial reasons, since operational losses could be compensated with the public owner's funds. The important role of development aspects would be secured. Private management of the center would contribute free enterprise expertise.

However, publicly secured financing through public ownership is expected to turn down motivation and efficiency orientation of the private operator, resulting in low RBRC sustainability through reduced quality and competitiveness of services. Moreover, political discontinuity could endanger the financing of the center, e.g. by a local government as single owner.

This model is not recommended for RBRC implementation.

Combination of 1st model (RBRC as Profit Center of Existing Public or Private Host) and 3rd model (RBRC as New Entity with Shared Ownership)

In a concept combining features of the 1st and 3rd model, an existing organization of the *private sector* involved with SME activities would be selected to *physically* implement and host the RBRC within its own operations. This host organization would contribute resources, such as parts of its facilities, staff and expertise.

From the *legal* point of view, the RBRC would be founded as a new entity, with shareholders from private and public sector. The majority of shares would be held by private sector members with the host organization owning a significant part and other private stakeholders, such as Internet Service Providers. The minority of shares would be held by public sector actors, e.g. development banks. The majority of private shareholders would ensure the commercial attitude and support the competitiveness of the center. However, the Articles of Association or the stock structure, of the new company could be created in a way that would imply special voting rights on part of public investors vs. higher dividends on part of private investors (preference shares). This would make sure that the minority of public shareholders in the Board of Directors would keep sufficient weight to influence the business strategy towards assuring the mission of SME development and restricting mere profit orientation. The central OSS, as an important operational backbone to the RBRC, could become a shareholder as well, securing its influence on the business strategy.

Physically placing the RBRC into an *existing* organization of *private* nature involved with SME activities would imply the advantage of specialized SME knowledge. In addition, required seed money, like initial infrastructure cost, would be lower and promotional expenditure could be saved since the new RBRC brand could benefit from existing awareness of the host's brand.

This model would create a public – private sector partnership and combine a regulatory mechanism with a strong commercial attitude. It is thus recommended for the RBRC implementation.

6.4.2. Networking of the OSS and its RBRCs

Implementation, Ownership & Leadership
Networking of Telecenters
Business Planning and Documentation
Goal 4: Organizational Sustainability

Not to be an island - this is one of the reasons why the One-Stop-Shop in the capital city of a country like Uganda aims at extending its impact through Rural Business Resource Centers. Equally, the maxim of the RBRCs themselves should be to maintain the networking idea through active interaction with the OSS and other RBRCs accordingly. Throughout previous Chapters, networking opportunities have already been mentioned in various contexts, and are presented in this Chapter in a summarized form.

- **Information and Service Provision**
  Information and services created, collected, or maintained by the OSS can be forwarded to RBRCs, depending on their respective Local Sector-Oriented Profiles. This information and services may be subject to amendments depending on local contexts on location of the recipient RBRCs.

- **Exchange of Ideas (Human Networking) and Product Concepts**
  OSS staff and staff of all RBRCs can share ideas, experiences, questions, concepts (product-, ICT-, marketing-, etc.) and best practices through face-to-face or phone-/video conference meetings, electronically (e.g. Internet news groups, e-Mails) or paper-based. This can be extended to active networking and research co-operation with other business resource centers and other related organizations specialized on SME support inside and outside of the country.

- **Countrywide Products**
  Some services achieve their specific value primarily through the networked structure of RBRCs/OSS which turns them into products with countrywide expansion and impact. Examples are previously described service models such as the *Virtual Portal to Match Human Resources, Entrepreneurs, SME Employers, and Investors* and the *Regional Virtual Marketplace* (see Chapter 4.8.3.4 for details).

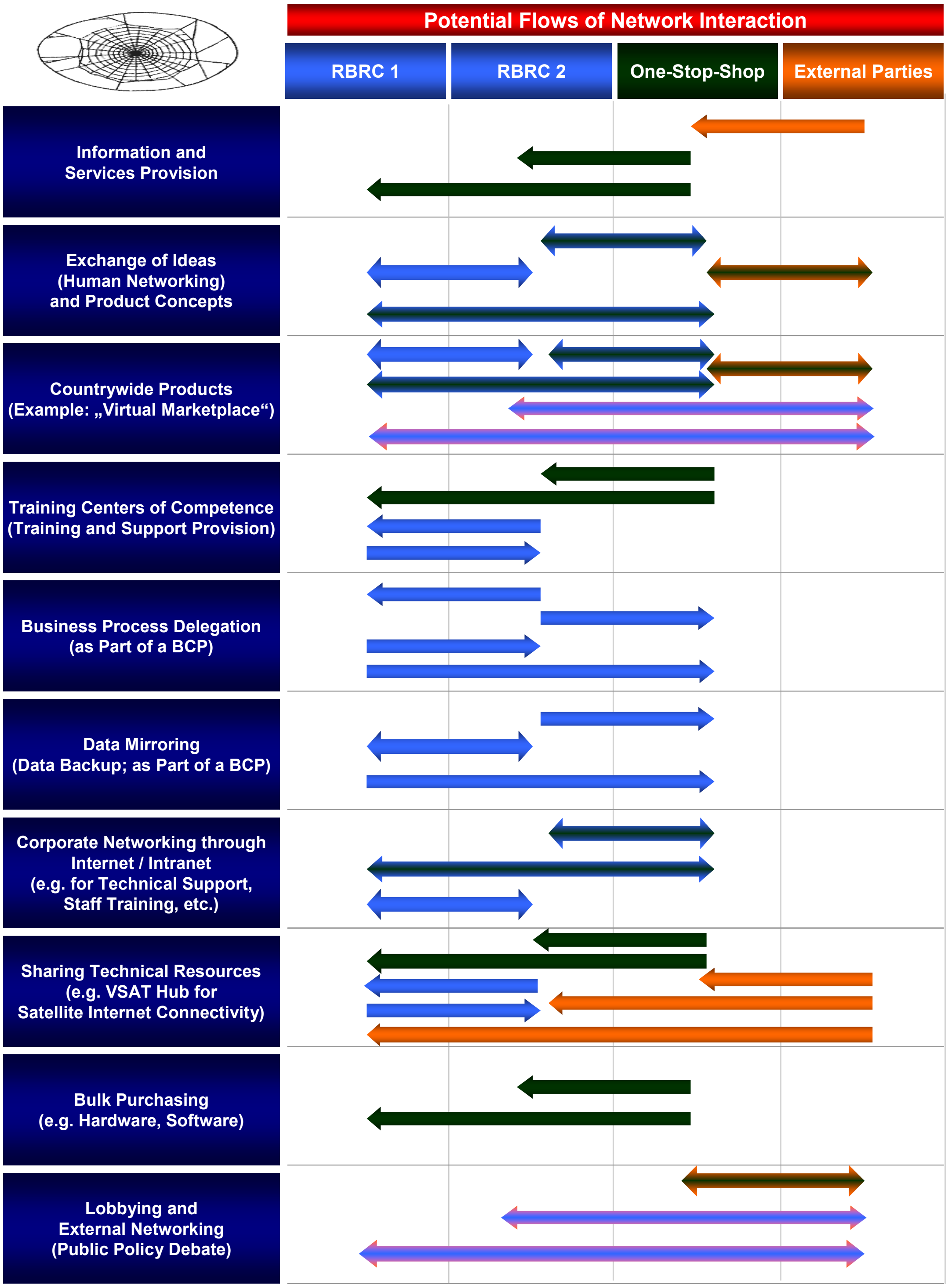
- **Training Centers of Competence (Training and Support Provision)**
  A staff specialization concept co-ordinating the creation of training centers of competence can enable OSS staff and RBRC staff to provide (other) RBRC locations with training services (*trainer-to-customer:* trainer of RBRC 1 trains customers of RBRC 2; or *train-the-trainer:* trainer of RBRC 1 trains trainer of RBRC 2) or helpdesk services (trainer of RBRC 1 assists trainer of RBRC 2 per phone, e-Mail, etc., in solving problems that occur regarding specific services at RBRC 2). Establishment of an online help desk maintained at the OSS (for example based on a Lotus Notes database), which administers and responds to support requests submitted by RBRC technical staff, may be considered.

- **Business Process Delegation (as Part of a BCP)**
  Business Continuity Plans can be made to delegate urgent business processes from one RBRC to another RBRC or the OSS that is not affected by, for example, a severe power or telecom outage, caused by a regional flood or a storm. Activities worth delegating could include urgent negotiations with international counterparts by telephone or video conference within a process of contract negotiations or finalizing of business deals.

- **Data Mirroring (Data Backup; as Part of a BCP)**
  Data stored on RBRC servers can be transferred to other RBRC or OSS servers on a regular basis for the creation of backup copies that are available for restoration in case of hardware failure. Data mirroring between RBRCs/OSS can also be supportive if a backup server takes over the function of a failed server (e.g. re-routing of webpage visitors to the backup server).

- **Corporate Networking through Internet/Intranet (e.g. for Technical Support, Staff Training, etc.)**
  Remotely given advice can help technical staff of the RBRCs to stay on top of technical development and apply new software or hardware updates according to best practices. The OSS may establish e-Mail newsletters or password protected special sections on its corporate webpage for this purpose, to include download possibility of software, drivers, user manuals, etc. Video conferencing systems can be used for staff training of remote RBRCs.

RBRC – OSS Networking Potential


Potential Flows of Network Interaction
RBRC 1
RBRC 2
One-Stop-Shop
External Parties
Information and Services Provision
Exchange of Ideas (Human Networking) and Product Concepts
Countrywide Products (Example: „Virtual Marketplace“)
Training Centers of Competence (Training and Support Provision)
Business Process Delegation (as Part of a BCP)
Data Mirroring (Data Backup; as Part of a BCP)
Corporate Networking through Internet / Intranet (e.g. for Technical Support, Staff Training, etc.)
Sharing Technical Resources (e.g. VSAT Hub for Satellite Internet Connectivity)
Bulk Purchasing (e.g. Hardware, Software)
Lobbying and External Networking (Public Policy Debate)

Note: Outlined interaction flows are optional examples. Further relationships may be useful or required.

Figure 23; RBRC – OSS Networking Potential

- **Sharing Technical Resources**
  Connectivity may be shared by means of a VSAT Hub, operated by the OSS or an RBRC, which provides other RBRCs with Internet connectivity via satellite.

- **Bulk Purchasing**
  Commonly needed equipment, software, etc. can be ordered through bulk purchasing in order to benefit from quantity discounts. Nevertheless, care must be taken not to create redundancies through bulk purchasing that does not address actual local requirements.

- **Lobbying and External Networking (Public Policy Debate)**
  This includes the creation of links between the RBRC/OSS network and the social (e.g. NGOs), private (e.g. equipment suppliers, telecom companies) and governmental (e.g. ministry of telecommunications, ministry of trade and commerce) sectors in order to make their individual efforts of solving the digital divide more effective (e.g. working towards liberalization of telecom markets, creating national awareness campaigns for ICTs and SMEs, etc.).

Figure 23 graphically summarizes the networking relationships outlined above and gives recommendations as to which flows of network interaction could be established.

6.4.3. Business Planning and Documentation

Implementation, Ownership & Leadership
Networking of Telecenters
Business Planning and Documentation
Goal 4: Organizational Sustainability

6.4.3.1. Business Planning

A telecenter needs a plan, so does the RBRC. It needs to be developed along local circumstances, which will be easier for experts with a linkage to the local situation. Yet as the RBRCs are based on the original concept of the OSS, elements of the OSS' business planning will play a crucial role. On top of that, regionally sourced advice from stakeholders of the SME sector will be helpful as well.

Outlining the full framework of the business plan would go beyond the scope of this chapter. Useful content includes, but is not limited to…

- Definition of RBRC and its business scope (vision, mission and objectives), legal status, area of reach, etc.

- Analyses of the regional SME industry/sector, to include size of market, expected market trends, etc.

- Competitor's analysis through review of the regional/national business support services industry, to include expected competition, current distribution of market shares, etc.

- Definition of the target market under consideration of different stages of SME ICT readiness.

- Marketing plan, to include all aspects relating to service profile, pricing strategy, and promotional strategy, as well as plans and expectations relating to sales of services.

- Management and staff structure, to include profiles of qualification, distribution of responsibilities, reporting lines, payment schemes, requirement for external support, etc.

- Operational strategy, to include selection of physical location, facility, infrastructure, equipment and software (incl. supply), required insurances, establishment of financial controlling and Business Continuity Planning mechanisms, etc.

- Financial strategy, to include income and cash-flow projections, personnel costs, financing strategy (incl. donations), break-even analysis, etc.

- Planned stages of implementation.

The document on hand and all driving factors and strategic goals of sustainability contained are intended to be considered and linked into the business plan as comprehensively as possible.

Following to the actual implementation of the RBRC, when the business plan is further maintained and adjusted to market and business developments, interfaces created between the processes of financial controlling, evaluation of customer feedback, or exchange of ideas through OSS-RBRC networking on one side, and business plan maintenance on the other side, will facilitate the latter to large extents.

6.4.3.2. Documentation

Documentation within the RBRC helps to create sustainability of the corporate memory. Among other things, it preserves awareness of business processes and availability of grown assets, such as a library of the customer base acquired over time, and increases the center’s independence from individual employees and protection from disadvantages caused by staff fluctuation. In general, documentation is an important prerequisite for maintaining the center’s ability to act.

The need for documentation impacts many aspects of the center’s work. The following listing gives an overview of some of the documentation requirements, purposes, and procedures, as they may exist in the RBRC.

1.) Services

Marketing Research Results

All information coming from service needs assessments, product concept tests, price sensitivity tests, customer feedback etc., that relate to the design or modification of services require preservation. In addition to books and folders that store filled-out paper forms, a services database[111] can be set up to integrate this services-related information and knowledge. It can be consulted on various occasions, e.g. by service developers when designing new services, or by management when preparing a presentation to potential donors or other stakeholders. Customer feedback on training, services, or educational workshops can technically be collected via online questionnaires to directly feed into the services database. Suggestions for improvement or service ideas provided by customers via a questionnaire can flow back into newly developed service needs analyses.

2.) Business Processes

Best Practices Handbooks

Over time, center personnel will experience both successes and failures, do some things right and others wrong. Success and failure will enable a learning process aiming at the increase of success rate. To facilitate this learning process best practices handbooks can be created to document the experience and allow new employees to optimize their way of working more quickly. Best practices handbooks can relate to needs assessment strategy, service development, customer relations, hardware maintenance, and other fields. They should be easily available and be constantly updated. Their content will also form part of staff training seminars.

Business Continuity Plans

Business Continuity procedures will be documented to be available in instances of unforeseen business interruptions. They will be documented in paper-based plans, as plans stored online are more prone to unavailability in case of power outages or building inaccessibility. To maintain availability of BCP documentation once the center itself is affected, copies should be kept at the homes of recovery personnel. Plans may be differentiated into small emergency response plans that outline the immediate actions to be taken after an incident, and larger Business Continuity Plans that list recovery procedures more in detail.

Except for preparing the center for business interruptions, the existence of continuity plans can also be mentioned within the marketing strategy to promote preparedness and reliability.

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[111] *Depending on the capacity of the center, a "database" in the sense mentioned here and further down, may be based on MS Excel Worksheets or on more advanced solutions.*

3.) SME Customers

An SME Customer Database can host…

- Customer-specific contact information: customer details are stored, such as address, management details, and third parties (e.g. important vendors of SME customers, important customers of SME customers).

- Individual requirements and service pattern: service and information requirements (to include level of ICT readiness), individual hardware requirements, individual "desires" or complaints collected in feedback forms. What kind of data is stored on behalf of SME customers?

- Account administration: Which IT user accounts are granted to the SMEs? Which building security access accounts are granted to the SMEs? Are there differences in access rights among staff of one SME (e.g. management vs. employees)?

The information stored in a customer database can serve for customer relations matters, helping to cater customer care, product offers, etc. to the individual situation of the SMEs. Properly administered account information will enhance physical and data security and accelerate administrational processes of account handling.

4.) Human Resources

An HR Database can host…

- Working and vacation schedule of RBRC staff
- Staff contact information
- An inventory of external key contacts for technical support
- An inventory of contacts from other RBRCs and the OSS (to include specialists of other training centers of competence).

5.) Promotional Management and Research

Documentation of press releases and other publications on the RBRC as well as documentation of research relating to SME ICT support can feed into promotional activities targeting current and potential customers, donors, industry organizations, or political decision-makers.

6.) Financial Management

Matters relating to finance and accounting, such as bookkeeping, management accounting (financial controlling), loan contracts, etc.

7. Strategic Goal 5: Financial Sustainability

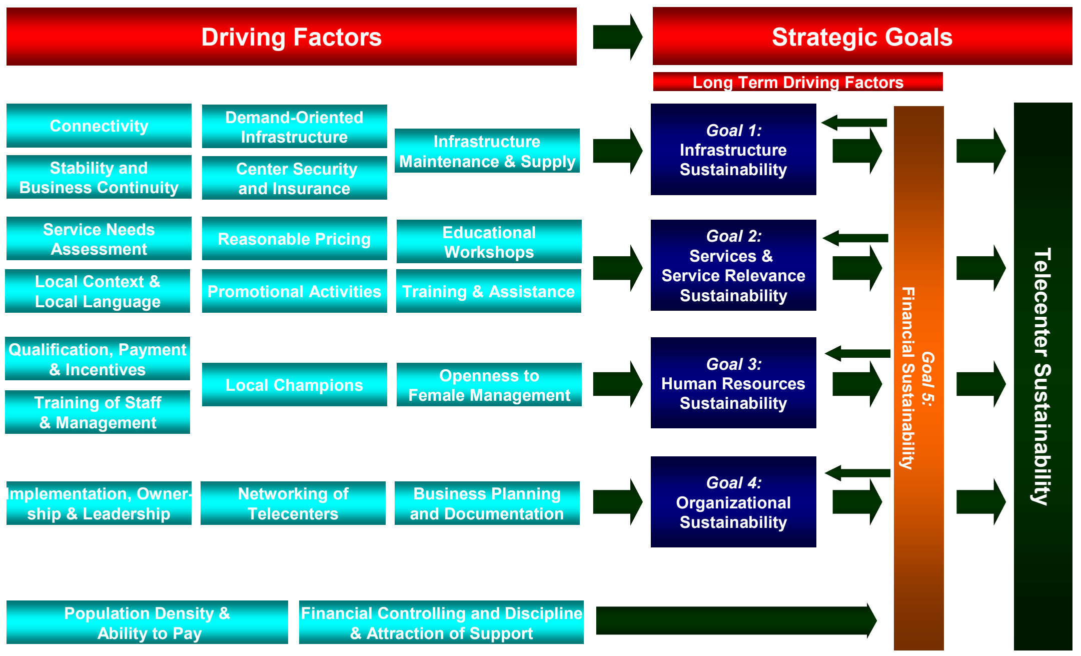
To realize sustainability of telecenter finances by means of a location with sufficient demand structure, financial controlling and discipline, attraction of financial support, but most of all an holistic telecenter concept that considers every of the previously outlined sustainability dimensions.

7.1. Sustainability Dimensions as Long Term Driving Factors for Realizing Financial Sustainability

As initially mentioned, financial sustainability is a key factor for telecenter sustainability, as it is a *condition* for achieving sustainability of other project components and the survival of the telecenter.

On the other hand, the previous Chapters outlining the strategic goals of *sustainability of infrastructure*, *services and service relevance*, *human resources*, and *organizational framework*, have confirmed that the performance, and thus financial sustainability, of the telecenter is an *output* of these sustainability dimensions at the same time.

Telecenter Sustainability: Strategic Goals and Driving Factors


Driving Factors
Strategic Goals
Long Term Driving Factors
Connectivity
Stability and Business Continuity
Demand-Oriented Infrastructure
Center Security and Insurance
Infrastructure Maintenance & Supply
Goal 1: Infrastructure Sustainability
Service Needs Assessment
Local Context & Local Language
Reasonable Pricing
Promotional Activities
Educational Workshops
Training & Assistance
Goal 2: Services & Service Relevance Sustainability
Qualification, Payment & Incentives
Training of Staff & Management
Local Champions
Openness to Female Management
Goal 3: Human Resources Sustainability
Implementation, Ownership & Leadership
Networking of Telecenters
Business Planning and Documentation
Goal 4: Organizational Sustainability
Population Density & Ability to Pay
Financial Controlling and Discipline & Attraction of Support
Goal 5: Financial Sustainability
Telecenter Sustainability

Note: some other components of sustainability that relate more to general societal, cultural and political issues, are not covered in this Figure (see also Chapter 1.4)

Figure 24, Telecenter Sustainability: Strategic Goals and Driving Factors

Consequently, the aforementioned strategic goals 1 - 4 are as such identified as *long term driving factors* for achieving goal 5, financial sustainability, and vice versa. Figure 24 provides a summarizing overview of the relationship of driving factors and strategic goals, as identified in the course of the paper.

While the identified impact of the driving factors 1 – 4 is crucial for financial sustainability, some other topics which directly relate to sustaining telecenter finances will be outlined next.

7.2. Population Density and People's Ability to Pay

McConnell mentions an "economic component" of telecenter sustainability, which relates to income levels and people's ability to pay.[112] Obviously, telecenters can only sell their services in the presence of a given minimum purchasing power and sufficient density of their potential customers. As it is outside the means of a telecenter to immediately impact income levels, the decision for the location to host a telecenter needs to be based on a lower limit defining a minimum density of people with enough purchasing power to create sustainable demand. If the catchment area around a potential telecenter location does not provide sufficient demand, the location cannot be considered.

7.3. Financial Controlling and Discipline, and Attraction of Financial Support

In addition to budgeting and bookkeeping, telecenters should establish financial controlling mechanisms keeping them informed of the status of planned vs. actual expenditures, earnings and cash flows. These management accounting procedures will act as a warning mechanism to help management realize unprofitable services and amounting debts at an early point in time. Business procedures and strategies can then be corrected accordingly.

Benjamin raises concern over the fact that depreciation of telecenter equipment is generally ignored and the replacement cost are not considered in the budgets.[113] This is even more alarming as both inexperienced users and the rough conditions that are frequently found in developing countries accelerate the process of equipment depreciation.[114]

Debts should not only be recognized, they should be prevented as much as possible by means of strict financial discipline. For instance, if telecommunication services are purchased by the telecenter on basis of prepayment, it will prevent that telecom costs run out of the telecenter's control.[113]

Being disciplined does not mean not to accept financial help. Whyte defines that financial sustainability is achieved if "the revenues of the telecenter

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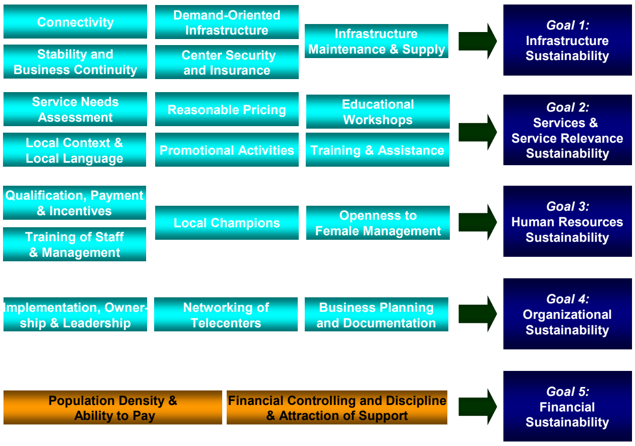
[112] *McConnell (2001)*

[113] *Benjamin (2002)*

[114] *Oestmann and Dymond (2001)*

(including grants, in-kind support and cash earnings) are greater than the expenditures."[115] Indeed, a telecenter may, depending on its mission, define financial sustainability such a way that it would *exclude* any form of external subsidy. However, if there are any chances of getting external support, in the form of subsidies, donations, grants, in-kind support, or whatsoever, the telecenter should invest time and effort in actively trying to attract these[116] with clever marketing, relationship building, and lobbying activities.

7.4. Strategic Goal 5 in the SME Context


Connectivity
Demand-Oriented Infrastructure
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Goal 3: Human Resources Sustainability
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Goal 4: Organizational Sustainability
Population Density & Ability to Pay
Financial Controlling and Discipline & Attraction of Support
Goal 5: Financial Sustainability

As it applies to telecenters, financial sustainability of RBRCs can be considered as both *condition for* and *output of* the other strategic goals of sustainability that have been put in an RBRC context in the chapters 3.7 (Infrastructure), 4.8 (Services), 5.5 (Human Resources), and 6.4 (Organizational Framework).

This implies again that making these dimensions sustainable will turn them into the most important contributors to achieving this fifth of the strategic goals covered in this paper.

The paper closes with the RBRC perspective on some additional aspects relating to financial sustainability as well.

7.4.1. SME Density and Ability to Pay

Population Density & Ability to Pay
Financial Controlling and Discipline & Attraction of Support
Goal 5: Financial Sustainability

For the establishment of sustainable RBRCs, the consideration of rural areas hosting clusters of SMEs will be most promising, due to a concentrated amount of potential customers. When calculating the target customer volume, only the area that is in acceptable travel distance to the center can be factored in as catchment area. Comparable to telecenters targeting the broad population, the average income of the SMEs in question needs to meet a minimum quantity in order to allow the RBRC to operate at a profit.

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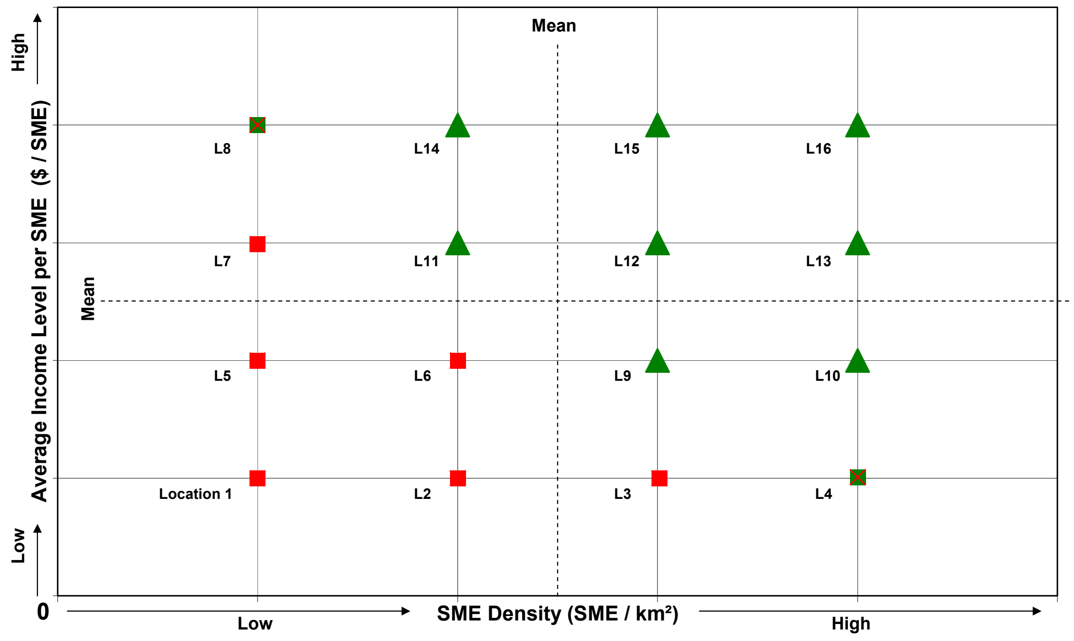
[115] *Whyte (1999)*
[116] *Mayanja (nk)*

Figure 25 illustrates the fictitious selection process of an RBRC location fulfilling minimum requirements of SME density and purchasing power. The locations qualify themselves through a combination of average income level per SME and SME density per square kilometer. In this model only the *Locations L9 – L16* fulfill the minimum demand requirements for the establishment of an RBRC, as they host enough SMEs with acceptable spending power.

RBRC Location: Critical Mass of SMEs and SME Income Level



In this model only the Locations L9 – L16 fulfill the minimum demand requirements for the establishment of an RBRC.

Note: mean values are to be seen as average of the total surveyed rural areas without considering presumably higher values of a country's urban areas.

Figure 25, RBRC Location: Critical Mass of SMEs and SME Income Level

Location 1 offers a very low income level, distributed between a small number of SMEs, both attributes that prevent its suitability for RBRC implementation.

Although Location 8 has a very high per-SME income level that is far above average, the few represented SMEs are not enough to cover the fixed costs of the center *and* create sufficient economies of scale. Moreover, the SMEs can afford a substantial part of their ICT solutions on their own premises which again reduces the already weak demand for RBRC services. Finally, the low representation of SMEs itself does not justify the establishment of a center from the perspective of the RBRC's developmental mission.

The above-average spending power of Locations 11 and 14 compensate for their below-average SME density, making them a possible choice. The same applies to Locations 9 and 10, which provide the center with a potentially high capacity utilization sold at appropriate prices.

Although Location 4 has a very high SME density that would theoretically provide enough need for services, the limited size and capacity of the RBRC prevents this high density of SMEs to compensate for their very low average income level and spending power. In other words, the center lacks capacity to manage the amount of service units that would have to be sold to make services profitable at their very low per-unit price.

Locations like 12, 13, 15, and 16 are obviously in the best condition to contribute to financial sustainability of the RBRC.

7.4.2. Financial Controlling of the RBRC

Population Density & Ability to Pay
Financial Controlling and Discipline & Attraction of Support
Goal 5: Financial Sustainability

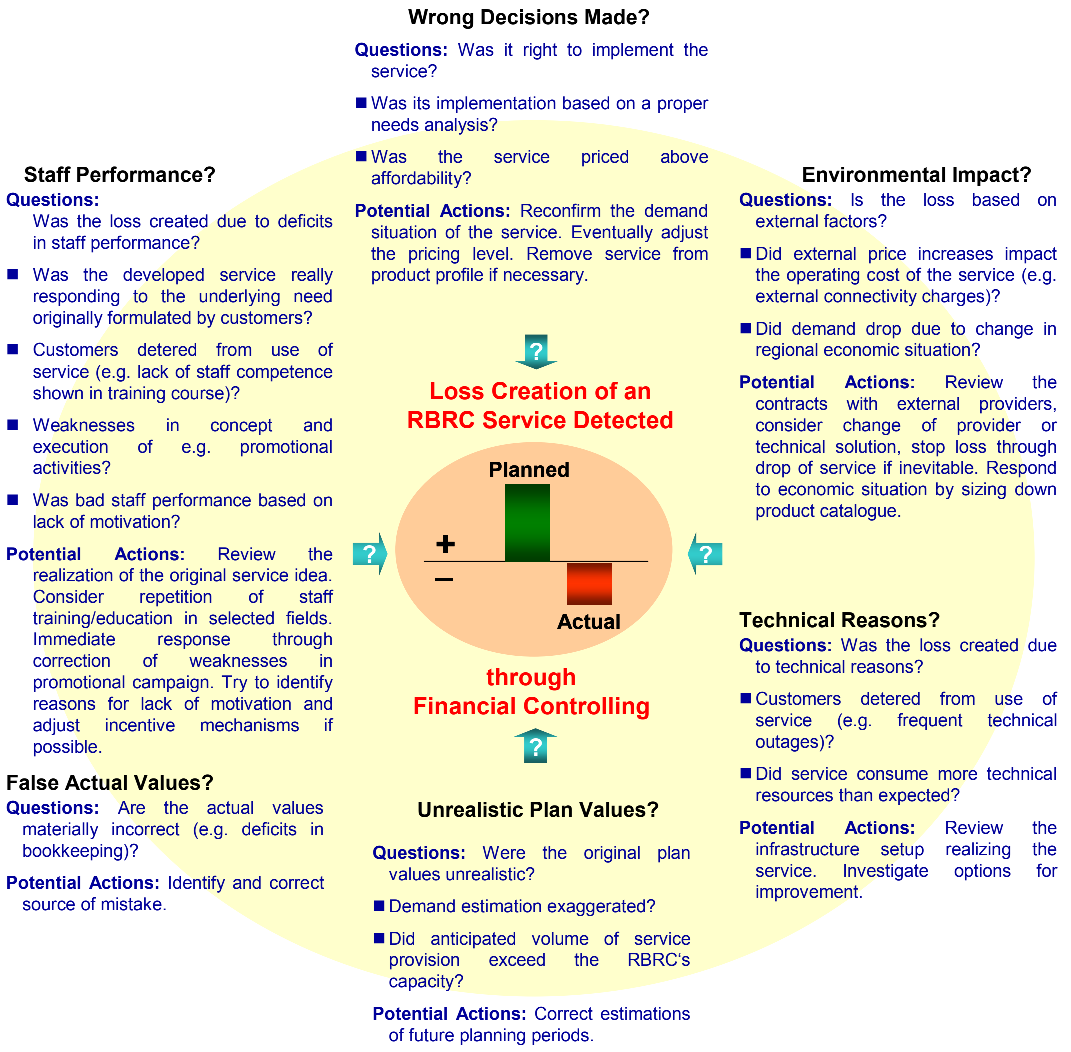
On top of a developed business plan and the business strategy contained, the RBRC budget is another element of a framework guiding the operational center on its way of doing business. Anticipated amounts of operating revenue and expenses, infrastructure investments etc., are combined to illustrate the financial requirements and expectations to the best extent possible. While it may be under the overall control of one manager, the development of substantial budget figures certainly requires back-and-forth evaluation under the involvement of the entire management team and other key members of staff. This will increase chances that assumptions on profits and losses are in line with realistic judgments and that the distributed money is carefully allocated without important business requirements being ignored.

Upon completion and approval of budget, the plan values can enter a continuous process of comparison with actual bookkeeping. This financial controlling process will enable management to actively steer RBRC operations and respond to unforeseen developments.

Discovering divergence between plan and reality is one thing, identifying the underlying reasons another. The difficult part for the involved manager will be to draw the right conclusions from the controlling information available. Only if the controlling information is correctly analyzed, it will enable the manager to learn and convert the learned into action in order to correct what needs to be corrected, thus improving the prospects of the center.

Figure 26 illustrates different causes that might be responsible for non-achievement of planned financial results. It also gives an overview of actions that could be taken to correct the situation accordingly.

RBRC Financial Controlling: Interpretation of Findings for Action



Wrong Decisions Made?

Questions: Was it right to implement the service?

- Was its implementation based on a proper needs analysis?
- Was the service priced above affordability?

Potential Actions: Reconfirm the demand situation of the service. Eventually adjust the pricing level. Remove service from product profile if necessary.

Staff Performance?

Questions:

Was the loss created due to deficits in staff performance?

- Was the developed service really responding to the underlying need originally formulated by customers?
- Customers detered from use of service (e.g. lack of staff competence shown in training course)?
- Weaknesses in concept and execution of e.g. promotional activities?
- Was bad staff performance based on lack of motivation?

Potential Actions: Review the realization of the original service idea. Consider repetition of staff training/education in selected fields. Immediate response through correction of weaknesses in promotional campaign. Try to identify reasons for lack of motivation and adjust incentive mechanisms if possible.

False Actual Values?

Questions: Are the actual values materially incorrect (e.g. deficits in bookkeeping)?

Potential Actions: Identify and correct source of mistake.

Loss Creation of an RBRC Service Detected

through Financial Controlling

Environmental Impact?

Questions: Is the loss based on external factors?

- Did external price increases impact the operating cost of the service (e.g. external connectivity charges)?
- Did demand drop due to change in regional economic situation?

Potential Actions: Review the contracts with external providers, consider change of provider or technical solution, stop loss through drop of service if inevitable. Respond to economic situation by sizing down product catalogue.

Technical Reasons?

Questions: Was the loss created due to technical reasons?

- Customers detered from use of service (e.g. frequent technical outages)?
- Did service consume more technical resources than expected?

Potential Actions: Review the infrastructure setup realizing the service. Investigate options for improvement.

Unrealistic Plan Values?

Questions: Were the original plan values unrealistic?

- Demand estimation exaggerated?
- Did anticipated volume of service provision exceed the RBRC's capacity?

Potential Actions: Correct estimations of future planning periods.

Figure 26, RBRC Financial Controlling: Interpretation of Findings for Action

Of course, finding the reason of unplanned losses is not easy, simply because the loss might be caused by a combination of the factors outlined in the illustration.

Another pitfall making controlling and the related response a complex undertaking is that actions taken to correct one mistake will potentially impact another variable, which may result in another plan value not being met. For instance, if the loss related to the service in Figure 26 resulted from customer dissatisfaction caused by unstable technical equipment, the action to be taken may be to replace or upgrade the technology concerned. This will imply unplanned expenditure for hardware, which in turn can result in the infrastructure investment plan values being exceeded.

Yet a functioning controlling regime is the only way for RBRC management to maintain good overview of different aspects of the center. It is an important steering wheel that allows management not only to anticipate but to react to business developments coming down the road, and to keep the center under good control on its way towards financial and overall sustainability.

8. Abbreviations

Bps	Bits per second
BCP	Business Continuity Planning
CIDS	Community Information Delivery System
CTCNet	Community Technology Center's Network
GSM	Global Standard for Mobile Communications
ICT	Information and Communication Technology
LSP	Local Sector-Oriented Profile
NGO	Non-Governmental Organization
OSS	One-Stop-Shop
PV	Solar Photovoltaics (PV)
RBRC	Rural Business Resource Center
SME	Small and Medium Enterprise
UBIN	Uganda Business Information Network
USA	Universal Service Agency
VHF/HF	Very High Frequency/High Frequency
VSAT	Very Small Aperture Terminal
WWW	World Wide Web

9. References

Benjamin, Peter (2000): Report on Telecentres in Africa as part of the Telecentres 2000 Research Project, DRA-development, Johannesburg.
http://www.communitysa.org.za/africaict/report_intro.htm

Benjamin, Peter (2002): Reviewing Universal Access in South Africa, in *The Southern African Jornal of Information and Communication* – Vol 2, No 1, 2002, LINK Centre, P&DM, Witwatersrand University, Johannesburg.
http://link.wits.ac.za/journal/j0201-pb.htm

Center for Development Research (ZEF Bonn) (2002): Information and Communication Technologies for Development – Country Report Uganda, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn
http://www.countryanalyticwork.net/Caw/CAWDoclib.nsf/0/7976C33ECD63B31985256CF5006B7C1E/$file/uganda.pdf

Chua, Ronald T., with Contributions by Miehlbradt, Alexandra Overy (1999): The Laguna Small and Medium Enterprise Service Center: A Case Study of a Nonprofit Supplier of Information and Communications Services in the Philippines, Development Alternatives, Inc., Bethesda, MD, USA.
http://www.mip.org/pdfs/mbp/laguna-sme.pdf

Colle, Royal D. and Roman, Raul (2001): Challenges in the telecenter movement, Cornell University, Ithaca, NY, prepared for the ICA-IAMCR Conference on the Digital Divide, University of Texas, Austin, November 15-17, 2001.
http://communication.utexas.edu/college/digital_divide_symposium/papers/colle.pdf

Colle, Royal D. and Roman, Raul (2002): The Telecenter Environment in 2002, Cornell University, Ithaca, NY.
http://ip.cals.cornell.edu/commdev/documents/jdc-colle.doc

Duncombe, Richard and Heeks, Richard (2001): Information and Communication Technologies and Small Enterprises in Africa – Lessons from Botswana, Summary Final Report, Institute for Development Policy and Management, University of Manchester,
http://www.man.ac.uk/idpm/ictsme.htm

Econ One Research, Inc., and ESG International (2002): Uganda Telecommunications - A Case Study in the Private Provision of Rural Infrastructure, Los Angeles, CA
http://rru.worldbank.org/Documents/Uganda%20Report%20(Final)%20(7-30-02).pdf

Fuchs, Richard (1997): If you Have a Lemon, Make Lemonade: A Guide to the Start-up of the African Multipurpose Community Telecentre Pilot Projects, Acacia Initiative, IDRC.
http://www.idrc.ca/acacia/outputs/lemonade/lemon.html

Fuchs, Richard (1998): Little Engines That Did – Case Histories from the Global Telecentre Movement, Acacia Initiative, IDRC.
http://www.futureworks.ca/engine/

International Bank for Reconstruction and Development / The World Bank (2000): Rural Access to Information and Communication Technologies: The Challenge for Africa; prepared for the African Connection Secretariat, with support from the Department for International Development of the United Kingdom (DFID), the Information for Development Program infoDev, and the World Bank, prepared by TeleCommons Development Group, Guelph Ontario.
http://www.unbotswana.org.bw/undp/docs/bhdr2002/rural%20access%20to%20ICT%20the%20challenge%20of%20Africa.pdf

Jensen, Mike and Esterhuysen, Anriette (2001): The Community Telecentre Cookbook for Africa, United Nations Educational Scientific and Cultural Organization, Paris.
http://unesdoc.unesco.org/images/0012/001230/123004e.pdf

Jensen, Mike and Walker, David (2001): Telecentre Technology, in “Telecentres – Case studies and key issues”, The Commonwealth of Learning, Vancouver. http://www.col.org/telecentres/Chapter%2019.pdf

Kirkman, Geoffrey (1999): It’s More Than Just Being Connected – A Discussion of Some Issues of Information Technology and International Development, Information Technologies Group, Center for International Development, Harvard University
http://www.cid.harvard.edu/ciditg/resources/beingconnected.pdf

Mardle, Earl (2003): The Jhai Telecenter Model: Founded on Human Relationships, Supported by Communication and Assisted by Technology, Development Gateway.
http://www.developmentgateway.org/node/133831/sdm/docview?docid=446462

Mayanja, Meddie (not known): The African Community Telecentres: In Search of Sustainability, ICT for Education Program, World Bank Institute.
http://www.developmentgateway.org/download/165918/In_search_of_sust_telecenters_DG.doc

Mayanja, Meddie (2001): The Nakaseke Multipurpose Community Telecentre in Uganda, Uganda National Commission for UNESCO, in “Telecentres – Case studies and key issues”, The Commonwealth of Learning, Vancouver.
http://www.col.org/telecentres/chapter%2010.pdf

McConnell, Scott (2001): Telecentres Around the World: Issues to be Considered and Lessons Learned, ICT Development Group, Richmond, Canada. http://www.it4dev.net/Other_papers/Telecentres.pdf

Murray, Bill and Comford, Dominic (1998): Universal Access – Telecottage & Telecentre Survey 1998, Small World Connections, International Telecommunication Union (ITU).
http://www.itu.int/ITU-D/univ_access/seminar/buda/papers/bm/TCA-98-SURVEY.html

Murray, Bill and Murray, Cathy (2001): Training Telecentre Managers, Staff and Users, in “Telecentres – Case studies and key issues”, The Commonwealth of Learning, Vancouver.
http://www.col.org/telecentres/Chapter%2018.pdf

NTCA; Norton, Marlee R.; Tetelman, Dr. Michael S.; Brosnan, Christiane; Kendro, Maria A.; Bacon, Brian S.; Lohmeyer, Patrick; Fuchs, Richard; McBride, Kristi (2000): Initial Lessons Learned About Private Sector Participation in Telecentre Development, National Telephone Cooperative Association, Arlington, Virginia.
http://ntca.netstrategies.com/content_documents/telecentredev.pdf

Oestmann, Sonja and Dymond, Andrew C. Intelecon Research & Consultancy Ltd. (2001): Telecentres – Experiences, Lessons and Trends, in "Telecentres – Case studies and key issues", The Commonwealth of Learning, Vancouver. http://www.col.org/telecentres/Chapter%2001.pdf

O'Farrell, Clare; Norrish, Dr. Patricia; Scott, Andrew (1999): Information and Communication Technologies (ICTs) for Sustainable Livelihoods, Preliminary Study, aerd / intermediate technology (it).
http://www.rdg.ac.uk/AcaDepts/ea/AERDD/ICTBriefDoc.pdf

Proenza, Francisco; Bastidas-Buch, Roberto; Montero, Guillermo (2001): Telecenters for Socioeconomic and Rural Development in Latin America and the Caribbean, FAO / ITU / IADB, Washington D.C.
http://www.iadb.org/sds/itdev/telecenters/index.htm

Roman, Raul (2000): Towards a Training Framework for Telecentre Managers, M.A. thesis, Cornell University, Ithaca, NY
http://www.devmedia.org/documents/SouthAfricaReport.doc

Shakeel, Hani (2000): Barriers to Telecenter Implementations in Sub-Saharan Africa, Technology and Policy Program, Massachusetts Institute of Technology, Cambridge, MA
http://www.ksg.harvard.edu/iip/stp305/Shakeel.PDF

Shakeel, Hani; Best, Michael; Miller, Bruno; Weber, Sam (2001): Comparing Urban and Rural Telecenters Costs, MIT Media Laboratory E-Development Group, Massachusetts Institute of Technology, Cambridge, MA
http://www.is.cityu.edu.hk/research/ejisdc/vol4/v4r2.pdf

Stoll, Klaus (2003): Telecentres Sustainability: What Does it Mean?, Development Gateway.
http://www.developmentgateway.org/node/133831/sdm/docview?docid=442773

Stoll, Klaus (2003,b): Somos@Telecentros: The Story So Far and Lessons Learned, Development Gateway.
http://www.developmentgateway.org/node/133831/sdm/docview?docid=442785

UNCTAD (2003): E-Commerce and Development Report 2003, United Nations Conference on Trade and Development, New York and Geneva. http://r0.unctad.org/ecommerce/ecommerce_en/edr03_en.htm

UNIDO (2003): Capacity Building for Business Information Networking, United Nations Industrial Development Organization, Small and Medium Enterprises Branch, Vienna. http://www.unido.org/file-storage/download?file%5fid=13229

Verdisco, Aimee, and Melara de Fanconi, Analyda (2001): Honduras: Solar Energy Bridges the Digital Divide, Inter-American Development Bank / Honduran Council for Science and Technology, in "TechKnowLogia", International Journal of Technologies for the Advancement of Knowledge and Learning, May/June, Knowledge Enterprise, Inc., Oakton, Virginia. http://www.onsatnet.com/html/news_archives/techatwork.pdf

Wasukira, Elisha, and Naigambi, Wilber (2002): Report on the Usage of ICT in Local Governments in Uganda, International Institute for Communication and Development (iicd), United Nations Online Network in Public Administration and Finance (UNPAN), New York http://unpan1.un.org/intradoc/groups/public/documents/cafrad/unpan006316.pdf

Whyte, Anne (1999): Understanding the Role of Community Telecentres in Development – A Proposed Approach to Evaluation, http://www.idrc.ca/telecentre/evaluation/AR/30_Und.pdf

Other Websites Referenced:

Brains-to-Ventures AG, www.b-to-v.com
Gilat Satellite Networks Ltd., www.gilat.com
Odyssey Technologies Ltd., www.odysseytec.com/
Schoolnet Uganda, http://www.schoolnet.sc.ug/
Tachyon, Inc., www.tachyon.net
Uganda Communications Commission, http://www.ucc.co.ug
UN Millennium Development Goals, http://www.un.org/millenniumgoals/
WISeKey SA, www.wisekey.com; www.ecommercepki.com
World Links for Development (WorLD), www.world-links.org