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Telecentre Approaches in Cameroon and Kenya Illuminated Using Behavioural Archaeology

Hallberg, David; Godem, Carole; Dzimey, Walter

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LINK Centre, University of the Witwatersrand (Wits), Johannesburg

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THREE: TELECENTRE APPROACHES IN CAMEROON AND KENYA ILLUMINATED USING BEHAVIOURAL ARCHAEOLOGY

David Hallberg,
Department of Computer and Systems Sciences, Stockholm University, Sweden

Carole Godem,
AIESEC, Douala, Cameroon

Walter Dzimey,
National Health Insurance Authority, Kuntenase, Ashanti, Ghana

ABSTRACT

Throughout the last decade, telecentres have provided access to electronic communications as a supporting ICT infrastructure for community, economic, educational and social development. While the origins of telecentres can be traced to Europe's telecottage and community technology centres in the United States in the 1980s, telecentres have taken varying forms and approaches. This article illuminates approaches used by telecentre projects in Kenya and Cameroon, using behavioural archaeology. Literature stresses that behavioural archaeology refers to understanding the artefact as a tool in human activity and technology as the embodiment of human activity in the artefact.

Application of behavioural archaeology to telecentres sheds light on the nature of technology use leading to particular results or societal outcomes. Using a qualitative methodology, managers, local contractors and technicians at local telecentres were interviewed. The results show differing approaches to the purpose and design of telecentres. In Kenya, the focus is on e-government services, while in Cameroon it is on conflict solving among different societal groups. In its use of behavioural archaeology, this article adds a new perspective on the challenges of making ICT and electronic media available in resource-poor environments.

KEYWORDS:

behavioural archaeology, telecentres, Cameroon, Kenya, electronic communications, resource-poor environments

INTRODUCTION: UNDERLYING REASONS TO CONSTRUCT TELECENTRES

In many African countries, household and community access to information and communications technology (ICT) is extremely limited. Telecentres have not always been successful in bridging the digital divide (Naik, 2011; Hallberg, Kulecho, Kulecho & Okoth, 2011). Behavioural archaeology (BA) has the potential to provide insight into the appropriate design of telecentres, for effective ICT adoption and diffusion. This article reflects on a behavioural archaeology approach to understanding ICT diffusion, adoption and usage with respect to resource-poor environments. A review of two projects, one in Cameroon, the other in Kenya, examines the approaches of telecentre managers in enabling remote populations to enjoy the benefits of ICT.

The origins of telecentres can be traced to the Scandinavian telecottage approach, which emerged in the 1980s (Crellin, 1994). Analysis of telecentre approaches recorded in the literature reveal seven inter-related rationales to construct telecentres. Firstly, telecentres may be used to raise consciousness of the value of ICT for economic access thus enabling poverty reduction and enhancing quality of life (Sharma, 2005; Terry & Gomez, 2010). Secondly, telecentres may bridge the digital divide (Rogers & Shukla, 2001; Agbeja & Salawu, 2007; Ibrahim, Yasin & Dahalin, 2010) by providing resources and materials to people in environments where access to technological materials is at barest minimum.

Thirdly, the notion that telecentres may provide everyday information needs (Ellen, 2003) is concerned with the electronic information which people need to use formally, for example for business purposes, or informally for everyday life activities. In this regard, barriers to everyday information seeking include external (societal, institutional) and internal (physical, intellectual) obstacles. Accessing information electronically for those whose first language is not English, as well as those with disabilities, may be problematic. Fourthly, telecentres may enable learning and education (Larson & Murray, 2008; Ramos, Nangit, Ranga & Triñona, 2007; Gómez, Díaz & Sandoval-Almazán, 2009), meaning that they may create new learning environments for access to educational and learning materials. Telecentres can be said to provide a platform where learners can mount and explore knowledge, rather than merely consume knowledge.

Fifthly, telecentres may be used explicitly for business purposes (Abbott & Yoong, 2005), for example to market business ideas and products, either synchronously or asynchronously. Because of the flow of information that may occur when using telecentres, individuals or organisations can capitalise on such mediums to establish micro and small business networks. In sixth place, telecentres may empower people (Terry & Gomez, 2010; Crellin, 1994; Aji, Yusof, Osman, & Yusop, 2010) by providing access to knowledge, which helps users to manage life events and make decisions. Access to knowledge may give users the desire and the capacity to challenge opposing forces and participate in deepening democracy. Finally, telecentres are often constructed to provide a broad target group with ICT benefits (Jensen & Esterhuysen, 2001), thus encouraging universal access and service as regards electronic communications (Table 1 below).

TABLE 1: TARGET GROUPS FOR TELECENTRES

Individuals (local community members, tourists, truck drivers and professionals such as engineers)
Small businesses
Schools
Youth
Disabled people
Farmers
Women's group
Churches
Clinics, hospitals and healthcare workers
Police
Non-governmental and community based organisations
Trade unions
Civic organisations
Political parties
Government departments
Sports clubs

Source: Jensen & Esterhuysen, 2001

For the purposes of this article, a telecentre, referred to either as a digital village (Kenya) or a telecentre (Cameroon), is a location at which people may enjoy the benefits of ICT including access to Internet, telecommunications, fax, printing and photocopier; and/or where educational value may be derived from electronic media, as in vocational training using ICT.

FACTORS PERTAINING TO SUCCESSFUL TELECENTRES

From a study of six telecentres in India and Sri Lanka, where Gaiani, Hansson, Meegammana & Mozelius (2009) interviewed both users and owners, the authors concluded that women experienced barriers to access of information. It is difficult to reach the most vulnerable at the bottom of the pyramid with information and services, as this segment of the population does not perceive that the services are intended for them. The local community has to be involved in the design of the telecentre. Every telecentre must accommodate local languages. The following aspects with regard to the success or failure of a telecentre were singled out from their study: ownership, sustainability, languages, education, literacy and media literacy, inclusion, and vision and strategy.

BEHAVIOURAL ARCHAEOLOGY: AN ANALYTICAL POSSIBILITY

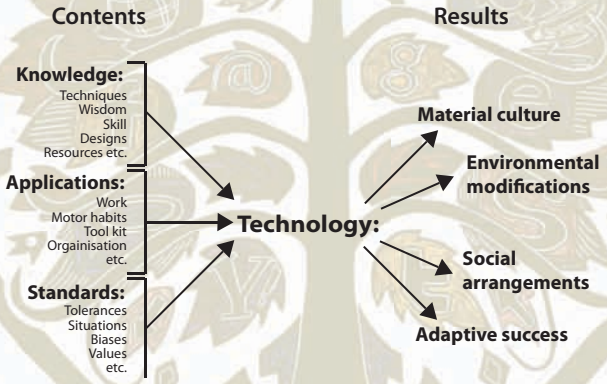
Behavioural archaeologists define human behaviour in relation to material culture (Hodder, 2001), which often implies an interest in how, why, when and where people use or make use of artefacts. This analytical approach recognises what happens when actors with particular knowledge, skills and resources – or lack thereof – change the world through the use of artefacts. The concept of behaviour, which includes humans and

artefacts, mediates ecological, social and cognitive processes. This is a holistic approach. An artefact's life story incorporates the behaviour that led to its creation, from selection of raw materials, through processing, to making available a useful product. The life story includes the bringing together of resources required for supporting manufacture of the product, including energy, human labour, time and other resources. Furthermore, the life story includes the utilisation of the artefact to produce value. These elements can be considered as components of a behavioural chain.

In addition to the concept of artefact as a concrete result of human activity, technology is a critical focus for behavioural archaeology because it sheds light on how the particular human activity led to the existence or usage of a particular artefact and resulted in a particular outcome. Archaeology and its related disciplines have been seen as useful for researching technology changes and usages (Bleed, 1997; Schiffer, 2002; Bird & O'Connell, 2006), because the nature of technology usage and value to society is revealed.

In order to understand the usage of a chosen technique when utilising technology, Bleed's perspective (1997: pp. 96-100) provides a description of technology as the embodiment of particular behaviours (content), where usage leads to particular results, (Figure 1 below)

FIGURE 1: BEHAVIOURAL PERSPECTIVE OF TECHNOLOGY: BLEED'S "CONTENTS AND RESULTS"



Source: Bleed, 1997

The application of Bleed's perspective (1997) enables the researcher to explore the behaviours embedded in technology adoption and usage, as well as where technology diffusion leads in terms of culture, changes to the environment, social arrangements and success or failure. These perspectives are what we seek to explore with respect to telecentres in resource-poor environments, through posing questions such as: Where is it envisaged that telecentres will lead in terms of benefit to communities? Which behaviours are exhibited in telecentre establishment in resource-poor environments?

Let us briefly examine the categories employed in the behavioural archaeology perspective used in this article, first with respect to content, then with respect to results.

CONTENTS

KNOWLEDGE

The knowledge element refers to the way in which the actor goes about achieving his/her purpose, how the actor manipulates his/her world. The actor needs knowledge and skills about techniques and methods that may be fruitful for each specific case of technology usage. Bleed refers to this as technological knowledge. It is also shown that there is an underlying wisdom that justifies those techniques and methods that the actor rationally chooses to employ, as the actor selects to work with tools designed in an appropriate manner. The actor may not be free to choose the tools and design, but needs to be wise in choosing the appropriate tools for the appropriate purpose.

APPLICATIONS

It is not sufficient to employ knowledge and wisdom about the best method to follow. The actor also needs to put his/her skills into practice through organising the tasks to be performed, drawing on acquired knowledge, and the design of available tools as well as exploring their practical limits. Thus the success of applications lies in their nature and in the actor's capacities.

STANDARDS

Standards are those regulations that the actor is obliged to follow when utilising technology. Such regulations are here referred to as values and principles to which the actor is culturally and morally obliged to adhere. Hence, standards are complex and for every situation there may be different standards. The actor is therefore required to use knowledge, experience and wisdom flexibly to choose and find the appropriate standards with respect to the existing cultural context.

RESULTS

MATERIAL CULTURE

Material culture and other results are the outcome of the actor utilising technology. All tangible and intangible results are an outcome of the actor's technology-oriented behaviour, meaning the input of the actor largely determines the output. Material culture refers to those results that define the value arising from technology adoption, usage and diffusion.

ENVIRONMENTAL MODIFICATIONS

The actor may bring about a change of environment when utilising technology. Even people who, directly or indirectly, experience the actor's performance will be affected by the changes introduced. The change may be in the form of access to knowledge through the technology use or changes in the socio-economic environment of the actor and his/her associates.

SOCIAL ARRANGEMENTS

Humans are social beings, hence the actor's actions will stimulate the introduction of new social arrangements that will lead to new and different relationships among people, as well as new forms of social organisation within communities and in the broader society

ADAPTIVE SUCCESS

Adaptation is necessary when a change occurs and in order for such change to generate success. In other words, a series of activities and events will need to take place, both consciously and subconsciously, in order for the desired goal to be achieved with individuals and social groups making continuous adaptations on an incremental basis.

The conceptualisation of Bleed's (1997) behavioural definition of technology informs the archaeological approach to this study, as the elements of the definition are explored and the artefacts and their usage are analysed with respect to the YNet digital village project in Kenya and the LUKMEF telecentre project in Cameroon.

"Technological activity must begin at some point, move through more or less discrete steps, and come to some kind of an end" (Bleed, 1997: p. 100).

QUALITATIVE RESEARCH METHODOLOGY

The article explores two projects in resource-poor environments in Kenya and Cameroon. It applies the frame of a behavioural perspective of technology to examine the artefacts pertaining to telecentres and the results of their use. In doing so, it draws on the results of a study of four digital villages, which form part of the Kenyan government's Digital Villages Project (DVP). The YNet Malindi project[1] , was initiated by the Kenya ICT Board (Kenya ICT Board, 2010) and is funded through the Digital Village Revolving Fund (DVRF), which advances loans to private contractors to enable them to run and establish these centres, also known as Pasha Centres.

The second telecentre project examined in this article was initiated by the NGO, Martin Luther King Memorial Foundation (LUKMEF)[2], in Cameroon. It was established as a medium to resolve social conflicts, bring peace, and increase knowledge about Cameroonian and global society.

The data collection process was designed to learn about (a) rationales for constructing these telecentres and (b) strategies employed by managers in order to make the telecentres sustainable, thus limiting the scope of the study. Empirical data was gathered between March and September 2010. Questions posed in the form of semi-structured interviews concerned content (information on planning horizons, access in local languages, competence network, available documentation and motivation for telecentres) and results (participation of women and minority groups, ownership and sustainability of telecentres, broad societal context). Programme managers for the telecentres were interviewed in Douala, Cameroon and Nairobi, Kenya, as well as by using Skype and email. Local contractors, local managers and technicians were interviewed at the telecentres in Menji, Cameroon and Malindi, Kenya. The design of questions was based on Bleed's (1997) frame, as well as on an understanding of the factors required for successful telecentres (Gaiani, Hansson, Meegammana & Mozelius, 2009). Additional questions were posed based on interviewees' responses.

1 YNet International: http://ynetinternational.wordpress.com/

2 LUKMEF: http://www.lukmefcameroon.org/

EMPIRICAL FINDINGS

At this stage of evolution of the telecentre projects, the scope of the study was limited as although it was possible to collect data on some aspects of content and initial results (Bleed, 1997), it was not possible to collect data on the results of embedded usage of ICTs. A further limitation is that the study explored only the perspective of the managers of the telecentres, not that of the users. It is noted that multiple longitudinal studies will need to be conducted to collect the requisite volume of data and depth of insight to enable a full-scale analysis of the benefits to users using behavioural archaeology. In that way the effects of a certain technological behaviour will become clearer. Nevertheless, as in all archaeology, it is important to collect even small amounts of data on rudimentary aspects of evolution, as they offer the foundation for creating a deep knowledge of the subject under study, the nature of and reasons for change, success and failure in the evolutionary path. The following data and analysis are offered as early steps in the archaeological exploration of telecentres.

INVESTIGATION A: YNET INTERNATIONAL, MALINDI, KENYA

The project is located on the coast, about 570 kilometres or 10 hours by bus from Nairobi. Malindi is considered by most Kenyans to be a rural, resource-poor area, with a population of about 120 000 people, though this is changing. The growth of Malindi is slowly turning it into a high-cost node, since it is a tourist destination. High illiteracy levels give it another face for locals, and many stick to old traditions and live under poor conditions. A local inhabitant, who has lived and worked in Nairobi, confirmed the view of Malindi as a resource-poor area:

Because of high prices and tourists being the target groups, many Kenyans cannot benefit from the services provided, such as infrastructure allocated and social amenities, which leaves them in conditions similar to the most remote areas.

PLANNING HORIZON AND COLLABORATION

The Kenyan government has recognised that there are great inequalities in the society between rural and urban communities and between women and men. In order to address this, it has invested in the Digital Villages Project (DVP), working with international stakeholders. This initiative takes place in the context of Vision 2030 (Government of Kenya, 2007), which aims, among other objectives, for a more equitable society in terms of gender. The digital villages are envisaged to have the potential to deal with these disparities to the extent that the disparities concern equal access to ICT for women and men. The long-term planning horizon presents the opportunity to respond to problems as they arise.

Limited availability of infrastructure is a constraint to rural access in Malindi. In order to combine local and global knowledge and resources to set up the digital village, the Kenyan government is collaborating with the Swedish International Development Agency (SIDA), which has contributed economic capital, and the US service company, Cisco Systems. which has contributed intellectual capital. These contributions affect the design of the project with respect to the selection of hardware and other solutions.

For example, the government's partners encourage the centres to rely on the Pasha Portals, using dedicated servers for this purpose. If any server goes down or other issues arise, it becomes a major concern for the telecentre manager:

> *I have a problem with the login system, 'coz it sometimes takes a long time to open. It sometimes tells you that the page cannot be displayed. You can get disappointed. Sometimes you will not find some information you were looking for because it's missing … Yes they have to upgrade it [the Pasha Portal]. They have to put all the information there.*

This collaborative partnership offers access to e-government, e-education, and e-health services. According to the manager:

> *They [the users] don´t have a problem with e-government services, it´s working perfectly but with e-health I talk to some health officers, some of the information they cannot access it … e-government is working, e-health has some information lacking, e-education they like it.*

FIGURE 2: YNET TELECENTRE, MALINDI, SUPPORTED BY THE DVP, KENYA



Photo collage: Kulecho & Okoth, 2010

LOCAL OWNERSHIP

In order to ensure sustainability, the Kenyan government intends to support the digital villages for a set period only. After this period, the digital villages would be managed by NGOs, private contractors or local people. In 2010, YNet International was being managed by local women. The manager of YNet International tells how she came up with the idea of running the centre:

> *IT was not my profession. I was a nurse. I studied in Mombasa but lived in Malindi. When I came back to my town Malindi, there was nothing like that. There was no cyber. I came up with an idea that I must do something in my town. I decided to leave my profession and I had to go back to school again to learn about computers, and take my time. I studied almost 14 hours a day. Now I want people to know about computers because it helped me and it can help them too.*

To spread information about the centre, managers go to local churches and advise people to use the services. The cost of Internet access has decreased, making the centre more viable:

> *No one could stay for an hour because it used to cost five (5) Kenyan Shillings [about EUR0,05] per minute, then it went down to three (3) Kenyan Shillings, then to two (2) Kenyan Shillings. Now it is one Kenyan Shilling. Now everybody can afford it and use it.*

LANGUAGE USAGE

The digital village initiatives are made complex by the existence of multiple local languages and lack of knowledge of English and Swahili among users of the centre, requiring content to be made available in a variety of languages, as expressed by a local person assisting at the YNet:

> *I am staying in coast and I have to adapt to the coastal way of life … First of all, I know the local language and I have to talk to them in their local language to understand what they are studying. Malindi is a Giriama town and I can speak Giriama fluently, even the jokes; so most of them think I am a Giriama. When they come here they speak to me in Giriama and I have to respond to them because they know I am a Giriama, but I am not, I am a Luo.*

COMPETENCE NETWORK

To ensure resources at the digital villages are maintained, managers work with technicians who are called in when needed, as the centre cannot afford to employ full time technical staff. This means that the overall responsibility for the centre is the manager's alone. Apart from the technician, who is called in, the manager relies on two young men as attendants, but if it is a complicated case, for instance if the Internet goes down, she has to call the technician:

> *Yes, it´s always available and if it goes down I call the Telkom technician to fix it.*

DOCUMENTATION AND MEASURABLE RESULTS

To document and measure the outcome of digital village usage, the manager has introduced a software application. She refers to the application as cyber software that can detect results and outcomes. For instance, when a user is logged in, the application can detect and measure printouts and what pages a visitor is using and when. It is also possible to monitor computer availability from a central computer so as to detect when something goes wrong. However, the self-assessment of the manager is also important and should be documented:

> *I don´t pride myself but I take my time to satisfy my customers. I have a really good customer care, I listen to them. I make sure that anyone who comes to YNet International must come back and must tell others that, if they have a problem with Internet, that woman [manager] there is number one and will take care of you. Now they know me for my customer care and so does my competition.*

USER GROUPS

Users of the centre, details derived from interviews and observations, included local community members, school pupils and youth, disabled people, small-scale farmers, women's groups and churchgoers. The centre uses web portals through which users can receive societal information and conduct e-government transactions. Visitors to the centre can use a pin number to submit their tax returns via the Kenya Revenue Authority (KRA) website, hence they do not have to go to the KRA offices. Citizens can also check progress in processing identity documents online.

A major concern stated by the manager is that the poorest members of the community find it difficult to reach the centre, because of its location. This is mainly because of the expansion of Malindi to make it a tourist destination:

> *If I were given the chance, I would like to open one pasha centre in their village to cut the transport cost. They have to take two transport cars to come to the centre for around KES200 only to use KES30 at the centre. It doesn´t make sense and they have to come because they have no choice.*

Although the e-health aspect of the portal is not fully operational, this is the content that would be most useful to many user groups:

> *In Malindi there are many idle people. They do drugs, the girls are involved in prostitution. I don´t have e-health to teach them how to eradicate these issues. I would like to teach them the dangers of drug use and prostitution, the outcome of going into prostitution.*

INVESTIGATION B: LUKMEF, MENJI, CAMEROON

The community telecentre project is situated in Menji, in the department of Liebalem in the South Western region, and has a population of about 43 000. The area is isolated, with rugged, unpaved roads. This is a major concern for the managers of the telecentres, as the locals find it difficult to reach the centre. However, there are facilities such as a small motel, a hospital and a prefecture school. Almost the entire population in this area lives off agriculture.

The telecentre is referred to as a multipurpose community telecentre, financed by The Enhanced Heavily Indebted Poor Countries Initiative (EHIPCI). The project is also a part of the project 100 Télécentres Communautaires Polyvalents (TCP) founded by the Ministry of Posts and Telecommunications.

PLANNING HORIZON AND COLLABORATION

According to the Director, the Board of LUKMEF has decided to focus on using ICT in rural villages to achieve the following purposes: mobile banking for the rural poor; inter-tribal dispute resolution and conflict prevention; rural food security through weather forecasting; and improving primary school performance via the integration of IT with village school networks. The concepts are being developed by different teams. The director explains that the primary school performance project initiated in 2009 is supported by the American University of Dubai,

which is training a number of primary school teachers in the use of IT as a teaching tool. Menji currently has the only community telecentre in the department of Liebalem, which comprises 50 villages. The goal is to have a telecentre in each village. Future plans are to increase the number of available devices to provide better opportunities for access; to create a village centre where international calls can be made at lower cost; and to create a local website:

> *Our vision is to have telecentres in every village, at least in south western region and north western region. The important thing is not that people will come to the telecentre to send and receive their email, but our preoccupation is how people can communicate with the world, know human rights and distance learning.*

In the long term, the organisation plans to extend telecentres to other localities and villages. In the short term, the organisation plans to increase the number of computers to 15 at Menji, then to create a call centre for people to make international calls to family. In terms of achievement, the vision is limited by lack of software and materials:

> *Now we are using a local operator for the calls by using a credit card and we don't have these cards constantly and also it's expensive. It would be better and cheaper if people could contact family via Internet but there are no headphones.*

FIGURE 3 MENJI TELECENTRE, SUPPORTED BY LUKMEF, CAMEROON



Photo collage: Carole Godem, 2010

LOCAL OWNERSHIP

The telecentres in Cameroon were initially owned by the government and after a period of activity, they were handed over to the community, NGOs or village organisations. LUKMEF is an example of an NGO that took over operation of the local telecentre. One problem it encountered was that the available suppliers of telecommunications had not extended their networks to rural areas. The first solution to this problem was the establishment of mobile telecentres. Later, communities set up their own centres, displacing the mobile telecentres. Local people manage the telecentres, either in collaboration with NGOs or in collaboration with government.

Part of the focus is on trying to connect all telecentres to form a telecentre network. The long-term goal is to link all villages with each other and to create the foundations for future global interactions. Long-term planning is seen as important in order to promote human rights, distance learning and video conferencing, through ICT access. As regards human rights, LUKMEF believes that telecentres have the potential to bring peace among the different language groups. It is believed that by exposing the users to the world outside their own community through the content provided on the Internet, they will come to better understand one another and their own human rights. It is believed that such access to knowledge has the potential to reduce conflicts of interest among different societal groups. The Director stresses that these views are still in the conceptual stage, with the project having commenced in 2009: The idea of creating such a project is necessary to the population. This is the case with the resolution of conflicts, because it can enable village leaders in conflict to resolve their conflicts without ever meeting, by teleconference.

COMPETENCE NETWORK

To achieve these ideals, LUKMEF has national and international partners. The national network of telecentres meets every three months, providing a platform for managers to discuss the difficulties encountered in their centres, and to exchange experiences and share ideas. A benefit in this kind of telecentre network is that it provides technical support to telecentres, including the one in Menji. To take care of key issues in telecentres, managers are trained at the school, Nationale Supérieure des Postes et Télécommunications de Yaoundé:

> *We want to receive training in computer management and maintenance because when a device fails we are forced to move to another town to fix it, and this is risky and very expensive considering the distance and poor roads.*

The infrastructure and level of education among the locals makes it difficult to maintain a high standard of equipment:

> *We don't have people who can make computer maintenance. If something happens with the computers we are forced to go to the town, which is difficult for us and expensive … We wish to have an engineer here to solve some problem, because it is a risk to go to town to maintain the computer because of the roads.*

The telecentre experiences the most basic hardware and software problems including mouse, keyboard and operating system failure.

LANGUAGE USAGE

Language occupies an important place in the management of the Menji telecentre. There are three spoken languages in Menji, namely French, English and Bamgwa, a local dialect.

From the outset, language was seen as being a hindrance to our development. Thus the management team consists of people originated from Menji to resolve problems related to language.

To make the centre accessible to the majority of the local population, telecentre staff translate and write documents in the local language. There are plans to extend the translation and the creation of websites in local languages of the region:

> *We help people who don't speak English and/or French by translating into and out of the local languages, creating e-mails and playing the role of intermediary for those who are non-computer literate …*

DOCUMENTATION AND MEASURABLE RESULTS

To ensure the work done by managers is fruitful, they document their progress and record information on the increasing number of clients and trainees:

> *The results, are positive, we note for example an increasing number of clients and trainees.*

The centre also receives a grant from the government via the Ministry of Posts and Telecommunications, and sometimes it receives external support. Overall, however, they cannot say much about how to measure results and impact:

> *The performance indicators that we have used until now are limited to the number of people coming to the telecentre. In terms of measuring the economic impact on the village, we cannot yet say much.*

The project uses policy documents provided by the Ministry for Post and Telecommunications, Minpostel, to identify whether they are working towards the set goals of the Ministry. The Ministry has set short- and long-term goals with regard to telecommunication, delivery times of ICTs, and usage among the people.

TARGET GROUPS

Users of the centre - data ascertained from interviews and observations - include local community members and passing professionals, small businesses, schools, disabled people, women's groups, clinics, hospitals and healthcare workers, NGOs and community-based organisations, trade unions, and government departments.

The managers undertake campaigns among the groups in the centre. One such campaign is summer training. During three months, for a price of FCFA5 000 (approximately EUR7,62), they teach different groups and especially women to use ICT. On occasion, the centre offers discounts or the usage of Internet free of charge.

There are still problems in reaching people, particularly the women in the community, as women are generally engaged in childcare and household labour, leaving little time for other activities.

The few women who come to the telecentre are teachers and students, most of them young:

> *Time after time we try to convince other women to come to the telecentre, showing them the importance of ICT in daily life, and they are interested and share this knowledge with other women.*

Organisations are considered the village elite by one manager:

> *Our plan of implementation is to consult the village elites in order to identify local needs for new information technologies and communication. Then they (will) consult the people on the eventual establishment of the centre.*

In the long run, the centre wants to expand the target groups and make the centre adequate and better equipped for the farmers. For this vision to be achieved, it must rely upon local knowledge:

> *The administrative management of (the) telecentre will be ensured by the indigenous in the long term. The villagers will also be responsible for feeding the site regularly with information such as tourism opportunities, groups and associations, agriculture and especially on culture.*

ANALYSIS: UNDERSTANDING TELECENTRE DEVELOPMENT THROUGH AN ARCHAEOLOGICAL EXPLORATION OF TECHNOLOGY, ARTEFACTS AND BEHAVIOUR

The rationale for investing in the telecentre projects is similar in both cases. One difference is that LUKMEF directed its focus towards social arrangements (bringing peace among societal groups), while YNet International placed its focus on both social arrangements (equality) and material culture (connecting villages to each other). Both centres believe that language is a barrier to equality and thus language is an important medium for building mutual understanding and learning.

In both projects, large organisations are important collaborators. These collaborations generate both intellectual and economic contributions, though these contributions are based on ideas external to the resource-poor environment. As a counterbalance, YNet's work and decisions are largely based on the manager's local knowledge. LUKMEF organises general meetings to enable managers to make common decisions and learn from each other.

Since this study only covers the views of managers, not users, Bleed's "results" are presented as "desired results". These desired results inform the telecentre design. As the telecentres illuminated in this paper develop their features, services, artefacts and technology, the nature of technology use and adaptation will become clearer, enabling further exploration using behavioural archaeology.

The cases of the Malindi and Menji telecentres provide a basis for considering how Bleed's Content and Results may be used to analyse the adaptive development of telecentres (see Table 2).

TABLE 2: A BEHAVIOURAL ARCHAEOLOGY VIEW OF TELECENTRE FORMATION, DRAWING ON BLEEDS (1997)

	YNet International, Kenya	LUKMEF Cameroon
Content		
Knowledge	Local knowledge of language, international knowledge of technology introduction, local knowledge of technology usage	Local knowledge of language, international knowledge of technology deployment and usage for a defined purpose, local knowledge of local needs in an HIPC*
Applications	Access to societal information, e-government applications such as tax transactions	Mobile banking for the rural poor; inter-tribal dispute resolution and conflict prevention; rural food security through weather forecasting; improving primary school performance
Standards	Objectives of greater rural-urban and female-male equality expressed in Vision 2030	Human rights and mutual respect
Technology	**Use of all types of ICT to achieve a desired result**	
Desired results		
Material culture	Disconnected villages in resource-poor environments become digital villages connected nationally and globally	Telecentres connect villages to each other and to global communications
Environmental modifications	Improved electronic communications infrastructure and electrification/power	Improved electronic communications infrastructure and electrification/power
Social arrangements	Socialisation includes ICT in education, small business, e-government and other social and economic sectors	Information exchange, socialisation and networking increases mutual respect and reduces conflict amongst different groups in society
Adaptive success	Would be seen to be achieved when women from different language groups can use the services on equal terms with men...	Would be seen to be achieved when people from different societal groups use the services in ways that build mutual benefit and reduce conflict

*HIPC - heavily indebted poor countries

In considering how to enable remote populations in resource-poor environments to enjoy the benefits of ICT and presenting ideas to inform the future design of telecentres, the behavioural archaeology approach appears to have merit in illuminating the path for decisionmakers if they strive to explore the relationship between content, technology and results as discussed above.

CONCLUSIONS

The projects in Kenya and Cameroon may have either a low or high impact on the society in general and on communities in particular. It is not clear whether the digital villages will bridge the digital divide between rural and urban communities, reduce inequalities between the sexes, or bring peace and understanding among language groups. Planning for the future of telecentres can focus upon:

1. Implications for adaptive success in society.

2. Implications for adaptive success for practitioners.

IMPLICATIONS FOR ADAPTIVE SUCCESS IN SOCIETY

From the two project reviews presented, it can be deduced that there are high expectations of what electronic communications and ICT can offer communities in resource-poor environments. It is expected that the access to information, knowledge sharing, social networking, and online public services made possible through electronic communications can offer the opportunity to craft changes in the social arrangements and material culture of society, thereby addressing issues such as gender equity and ethnic conflict. It is envisaged that technological collaborations can be used to share ideas, so as to enhance the quality of life of rural communities by providing access to local or indigenous knowledge, as well as provide information on advances in a wide range of technologies that may be of interest. In the resource-poor communities visited in this study, knowledge connectivity is becoming an integral part of the developmental processes of the society. Telecentres are becoming instrumental in providing network connectivity for people in otherwise isolated environments.

The projects show resource-poor communities in the early stages of adoption and adaptation with respect to ICT. In order for the telecentres projects to eventually achieve success in transforming the indigenous way of life, a process directed towards adaptive success is required. The process must be able to enable communities to retain the cultural artefacts that they value, while also experiencing social progress. Measures towards adaptive success can be designed through the application of an analytical framework such as behavioural archaeology to understand resource-poor environments and to develop in ways that enable local people and communities to create their own ICT technology-enabled environments through telecentres or adaptations of telecentres.

IMPLICATIONS FOR ADAPTIVE SUCCESS FOR PRACTITIONERS

With an eye on adaptive success, managers of telecentres can use a stylised behavioural archaeology map, such as that presented in Table 2 above, to progressively upgrade and enhance the use of telecentres in ways that draw on how people in the local environment use and learn to use ICT technological devices and services. Rather than introducing technology from the perspective of the collaborating partner, technology can be introduced from the perspective of what the user requires and how the user adapts his or her technology use to achieve equality or conflict resolution. Such an approach can strengthen national and international collaborations and promote the establishment of the proposed telecentre networks.

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