

Telecentre Replication Initiative in Borneo Malaysia: The CoERI Experience

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Abstract

There are many bridging-the-digital-divide initiatives implemented by various government agencies and non-governmental organisations throughout the world. Hence, numerous studies have been conducted to identify the critical success factors in providing remote and rural communities equitable access to Information and Communication Technologies (ICTs). Malaysia has its fair share of successes and failures in such initiatives. One such initiative, the eBario Project, which provided ICTs to the rural and remote community in Bario, East Malaysia, has been in operation over the last decade. The project was undertaken by the Centre of Excellence for Rural Informatics (CoERI), Universiti Malaysia Sarawak (UNIMAS) with active participation of the local community in Bario. Critical success factors of the eBario Project include the close cooperation between the project initiator and the local community, strong support from the local champions, focus on actual needs and socio-economic goals of the community, and deployment of appropriate technologies to the remote community. Given its relative success, the eBario project has been replicated to four other rural and remote sites in Borneo Malaysia. This paper highlights some of the lessons learnt during our replication process, hence providing a guide to policy makers, project implementers and researchers who intend to deploy telecentre projects at a larger scale.

Introduction

It is generally acknowledged that the provision of ICTs to remote communities can help in alleviating poverty or improving the socio-economic status of the communities. Among the many benefits of providing ICTs include giving access to unlimited knowledge (e.g. e-learning), providing health related services (e.g. telediagnosis), offering many businesses opportunities (e.g. e-commerce), presenting employment opportunities and providing government services (e.g. e-Government websites) (UNESCAP, 2007). Typically the access to ICTs is provided through community e-centres, community ICT access points or telecentres. All these initiatives are quite similar to cybercafé except that the telecentre is run by the community for the community while the cybercafé is run by private individual(s) for public consumption. In this paper, the term telecentre is used to refer to an access point whereby the community is able access ICTs and the Internet.

With the importance of the telecentre as a means to provide ICTs access to rural communities, UNESCAP (2008) argued that the Asia Pacific Region needed over half a million telecentres in order to serve its expanding population. Unfortunately, the scaling up of telecentres poses many challenges. These include the financial constraint in building the telecentres, the difficulties in rallying the support of the community, the mammoth task to ensure its sustainability, the challenge to offer e-services which suit the needs of the community and the ultimate goal of bringing meaningful change to the community. Despite these challenges, it is still possible to scale-up telecentres if a workable replication model is being utilised.

Hence, this paper is proposing a replication model, developed by the Centre of Excellence for Rural Informatics (CoERI), Universiti Malaysia Sarawak (UNIMAS) as a possible framework to scale up telecentres. The CoERI replication model is a viable guide to scale up telecentres since CoERI has

successfully replicated its telecentre project in four other sites in Borneo Malaysia. This model, however, is far from perfect. Since CoERI has only replicated four sites, the model would need further modifications if the scaling up involves a greater number. Still, the CoERI replication model offers a useful framework for policy makers, project implementers and researchers who are interested in scaling up telecentre projects in their respective countries.

Telecentre Replications

The replication of successful telecentre projects has been undertaken in many countries utilising different strategies and approaches. It is imperative to look at these projects before taking a glimpse at the CoERI replication model. From this brief overview, we could gauge the challenges faced by telecentre replication initiatives worldwide, thus providing us with a better understanding of the replication agenda. The projects discussed here are Drishtree (India), Medan Infodesa (Malaysia), Gaseleka (South Africa) and KADO (Pakistan).

1.1 Drishtree – India

An Indian-based ICT enterprise, Drishtree has developed an entrepreneurial network of ICT Centers or Kiosks that provide access to information and services that are related to education, health, employment, government services, insurance, and e-commerce in the rural areas. Drishtree has a total of 3,200 Kiosks that connected more than 1.5 million villagers (as of August 2007) to Panchayats (local government). On average, there is one Kiosk for every five to six villages in India (Drishtee Foundation, 2006). Kiosks are franchised to local entrepreneurs who are charged with a franchise fee. The franchisee then has to operate the franchise by renting a suitable location. The computers used in the Drishtree kiosks have to be purchased by the entrepreneur himself/herself.

Started in 2000 in Dhar (Madhya Pradesh), Drishtree's first project was a web-based software, known as the Gyandoot (Messenger or Informant) which was basically an e-government initiative deployed in a small village in India. The e-government initiative was aimed at delivering government services to the rural poor. One of the strengths of this replication initiative is its utilization of a popular business model (franchise) which enables it to be self-sustainable. In addition, there is a strong rapport between Drishtree and the state and district governments, allowing the ICT initiative to further flourish. This success had enabled Drishtree to earn international recognition through the Stockholm Challenge Award, a prestigious award accorded to ground breaking ICT initiative (White, 2010). Despite its success, the major constraint faced by Drishtree is the technological aspect of the Kiosks which have poor telecom services and unreliable power supply.

1.2 Medan Infodesa – Malaysia

The Medan Infodesa is a Malaysian government initiative, spearheaded by the Ministry of Rural and Regional Development. It aims to bridge the digital divide between urban and rural communities through the promotion of direct interaction and extensive use of ICTs. To achieve this goal, the government allocated a total of USD5.5 million under the Eighth Malaysia Plan (2001-2005) (UNESCO, 2002). Until the first quarter of 2010, the Malaysian Government has established 217 Medan Infodesa in East and West Malaysia (Tajudin, 2010). Despite the huge roll-out, many of the telecentres are facing uncertain future. They could not sustain themselves financially due to the lackluster response of the local communities towards the telecentres (Razak & Malek, 2008). As a result, the telecentres could not raise sufficient income in order to sustain its operation costs.

1.3 Gaseleka – South Africa

The Gaseleka telecentre is located in South Africa's poorest province, the Northern Province – a remote area located about 80 kilometres from the nearest town, Ellisras. There are 34 villages surrounding Gaseleka with a population of about 85,000. Gaseleka is the first telecentre to be established by the South African Universal Service Agency (SAUSA) in 1998 (Benjamin, 2001b). The centre is well networked throughout the area. It offers access to services like phone, computer, fax, printing, scanning and photocopying. The local chiefs lend their support to the project and maintain close links with the local government. By the end of 2000, a total of 65 telecentres had been established – 11 mini-telecentres and 54 full telecentres. These telecentres were located in all of the nine provinces of South Africa, the great majority in the rural areas (Benjamin, 2001a). The Gaseleka project receives strong support from the local communities because of their dependence on the services provided by the telecentre. Unfortunately, due to variety of technical, managerial, competitive and financial reasons, over half of the established telecentres including Gaseleka are not functioning well (Benjamin, 2001b).

1.4 KADO – Pakistan

Karakoram Area Development Organization (KADO) is a community initiative with a mission to enhance local capacities for sustainable and equitable development. It started in 1996 by promoting handicraft projects to help disadvantaged people but soon diversified into other development projects including ICTs. Most KADO's ICT initiatives can be found in Hunza valley and the broader Karakoram region. In order to take advantage of the ICTs revolution, KADO effectively and creatively use the technology for local development. By the end of 2000, KADO had initiated various ICT projects including websites development for the promotion of local business, computer literacy programs, ICT training and Internet services in the Northern Areas of Pakistan. Since the initiative started by the local community, it could sustain itself without requiring any assistance from the government or other organizations (CHRS, 2010). Still, the future of KADO projects looks uncertain due to the stiff competition from commercial ICT providers.

eBario: The Basis of CoERI Replication Initiative

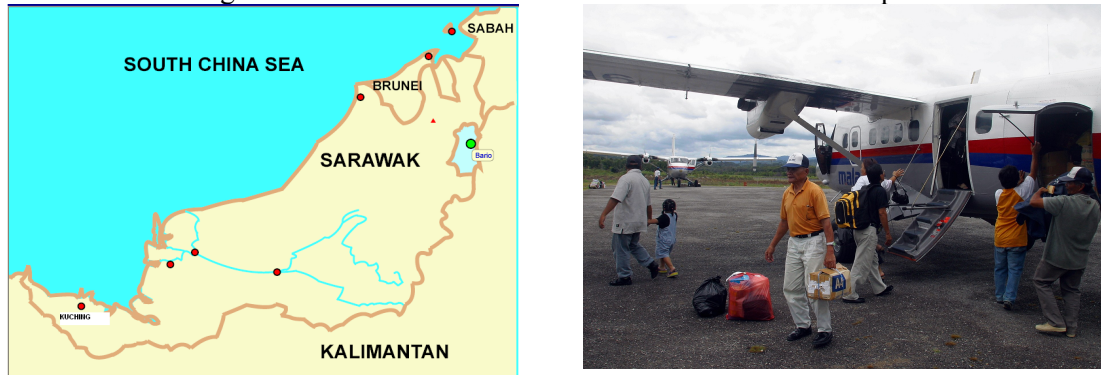
Evidently, there is a global movement that aims at replicating telecentres in the rural areas so as to promote socio-economic development among the poor and marginalized community. In Malaysia, a group of researchers from UNIMAS (the same group later founded CoERI) embarked on the same venture, equipped with a strong belief in the power of ICTs in bringing profound change in the people. They started their endeavour by setting up a telecentre in one of the most isolated area in Borneo Malaysia, i.e. Bario. This project subsequently became the basis of CoERI replication initiative.

1.5 eBario

In 1999, UNIMAS initiated a pilot project that aimed to bridge the digital divide in Malaysia. Known as eBario, the pilot project deployed ICTs in the remote area of Bario in order to stimulate socio-economic development there. Bario is located on the island of Borneo, close to the Malaysia-Indonesia border (see Figure 1). The only practical way to reach Bario is by taking a 19-seater Twin Otter plane which takes about an hour (see Figure 1). At the start of the project, there were no roads leading to Bario, thus a journey by land took up between 3 to 4 days of river cruise and 2 to 4 weeks of jungle trekking. However, since 2010, there is a logging road that connects Bario to the nearest city, Miri. Still, the journey takes between 16 to 18 hours over rough terrains which are generally inaccessible during the wet monsoon period. There are 12 longhouses in Bario, with a population of 1,000. The majority of the population in Bario is Kelabits, a small ethnic group in Sarawak. They are generally farmers who grow the famous

Bario rice. The decision to pick Bario was obvious. It is an isolated area that lacks basic infrastructures (no 24-hour electricity supply and no telecommunication service). The extreme condition in Bario simply justified the need to bring about socio-economic development in this remote area through the introduction of ICTs which acted as an agent of change.

Figure 1: The location of Bario and its main mode of transportation



1.6 The eBario Model

On the onset of the eBario project, the researchers involved were fully aware of the need to shift from looking at technology per se, to examining the people's needs. They realized that to ensure the success of the project, they need to put equal importance on understanding the technology as well as the context within which the technology will be deployed. As noted by Garcia & Gorenflo (1999), there is a need to put emphasis on the context in which the technology will be introduced, and who will use the technology, and not just on the technology itself. In the words of Anderson et al. (1999), the enthusiasm for ICTs and their potential should not make us forget that the focus should be on the people, organisation and processes, as opposed to the technologies themselves. Based on this consideration, the research team decided to employ Participatory Action Research (PAR) as an approach to deploy the telecentre project in Bario. This approach would allow the researchers to learn about the community, while at the same time the community could learn about ICTs from the researchers. But most importantly, this approach provides an opportunity for the community to participate actively in the project, thus improving the telecentre's chance of sustainability.

In PAR, the community members played an equal and active role throughout the project, i.e. from the planning, right through the implementation of the project. To institutionalise the community's participation, a steering and management committee which comprised the Paramount Chief, the village headman, heads of the longhouses and representatives of the youth, women, and religious groups was established. All major decisions pertaining to the project were made by the steering committee while the management committee was responsible for administering the telecentre. From the close collaboration between the research team and the community, the former was able to identify the latter's needs which were then used to custom-made the services that the telecentre would provide. Subsequently, in 2001, sixteen computers with Internet access (via the Very Small Aperture Terminal (VSAT) - see Figure 2) were made available in the secondary school in Bario. Several teachers were given ICT training in order to familiarise themselves with the new technology. Then, they taught the school children how to operate the computers and surf the Internet. A year later, another ten computers with an Internet access was made available to the rest of the community through the setting up of a community telecentre. The same training-of-the-trainer method was used to provide ICT training to the rest of the community. With the access to ICTs, there was an increase in the level of computer literacy among the students, teachers and the rest of the community members. The telecentre was handed over to the community in 2006.

Basically, what this means is that the community has to operate the telecentre on their own. Its revenue is generated mainly from charging the users, scanning of documents and printing, as well as the organising of events such as the Slow Food Festival and the eBario Knowledge Fair.

Figure 2: VSAT



The main users of the telecentre are the lodge operators who use emails to communicate with their customers while some members of the village committee use word-processors to type the minutes of meetings or official letters. The senior citizens also do not want to be left out. They use emails to communicate with their loved ones who are living outside Bario through the help of a telecentre administrator who access their emails on their behalf. The telecentre charges both locals and visitors for the use of the computers. The money collected thus far average between RM600 (USD171) and RM1,000 (USD286) a month. Given that the telecentre is still partly run by volunteers (technical staff are now on the telecentre's payroll), and uses solar power to run the computers, this collection is considered the first steps towards achieving a sustainable model for the telecentre.

eBario enables the Kelabits to communicate with the outside world using the telephone and the Internet. This is by far the most important impact of the telecentre to the community in Bario. Apart from that, the telecentre plays an important role in promoting the growth of tourism in Bario which is evident from the increased number of flights (from 1 to 2 flights daily) and lodges (in 1998, there were only two lodges but today there are 14 lodges). The growth of tourism translates to more revenue and employment opportunities for the community.

The sustainability of the telecentre has mainly been attributed to the lodge operators who have been actively using the telecentre. Given the remoteness of Bario, the Internet is vital to the lodge operators in terms of promoting their lodges, and communicating with their clients. The telecentre is also the focus of international events such as the Slow Food Festival and the eBario Knowledge Fair (a developmental conference held in Bario). Critical success factors for the eBario project include the involvement of the community, the active involvement of local champions, the focus on actual needs and socio-economic goals of the community, and the use of appropriate technologies to bring connectivity to the rural community.

1.7 Challenges Faced

Given the remoteness of Bario, everything that was needed to set up the telecentre had to be flown in, thus increasing the cost of the project. Charting a plane for one-trip cost about RM 4,600 (USD 1,200) for a load of 1,200 kg. All equipment (such as computers, solar panels, generator) as well as building materials necessary for the construction of the telecentre had to be flown in. Thus, a major portion of the expenditure was for transportation costs. As passenger aircrafts are prohibited to transport fuel, the cargo-carrying Sky Van was used. Unfortunately, the Sky Van was always unavailable due to its high demand.

Thus, there have been occasions where the diesel used to power the telecentre was hard to come by. And when the diesel was available, the price of the commodity hinders the community from buying it. In 2000, the price of one gallon of diesel in Bario was about RM12 (USD 3.42) – whereas it only cost RM3.21 (USD0.97) in the city. In 2005, the price of one gallon of diesel rose up to RM32 (USD9.14). Thus, running a generator for about 4 hours (which uses up a gallon of fuel) would be cost prohibitive. This prompted UNIMAS to replace the power supply at the telecentre from the diesel generator to solar.

Another challenge faced by the research team was the poor communication infrastructure in Bario. While the computer price has declined significantly, the cost of telecommunication has not. Also, at that time, providing Internet access to remote communities was largely unheard of. Starting from scratch, the research team explored ways to provide this connectivity, leading to the use of VSAT.

An equally challenging task faced by the research team was the arduous attempt to establish rapport and trust with the community. Prior to the eBario project, the community had gone through bad experience with other organisations that failed to deliver their development promises. Such experience made the community quite skeptical towards the telecentre project. The dialogue with the community leaders and planning of the whole project took approximately two years, from the initiation till the actual introduction of ICTs into the community. A more detailed account of the challenges can be obtained from Songan, Khairuddin, Yeo, & Gnaniah (2006).

1.8 eBario 2.0

After almost a decade, eBario is at a crossroad. Many of its equipment have become obsolete, the number of users had declined, the needs of the people in Bario have changed and a new communication service has penetrated the community. Hence, there is a need to revive eBario. The eBario Management Committee and UNIMAS are now in the midst of looking at a new business model to sustain the telecentre. Based on the discussions with the community, a number of applications are being developed. The community is largely made up of people advanced in age, who have many family members living outside Bario. One of the applications is to allow them to communicate with their family using cheaper solutions such as VoIP. A challenge here is to provide Internet connectivity, as presently the Internet is available at the telecentre. A solution to provide access to all the 12 villages around Bario (some as far as four hours walk) is the next step, and with it, possibly telehealth solutions will be offered soon.

1.9 National and International Recognition

With the profound impact of eBario on the local community, it received numerous international and national accolades. These include the Gold Medal, International Innovations Awards, Commonwealth Association of Public Administration (CAPAM), in which eBario emerged the winner from 112 submissions from Commonwealth countries. It also won the eAsia Award from the Asia Pacific Council for Trade Facilitation and Electronic Business, Taipei, as well as the national *Anugerah Perdana Teknologi Maklumat* (IT Premier Award), presented by the Prime Minister of Malaysia. This was preceded by Bario being named as one of the Top Seven Intelligent Communities 2001 by World Teleport Association.

Lessons Learnt from eBario

The eBario project presents some many valuable lessons that helped UNIMAS researchers to further understand the issues and challenges faced in deploying ICTs projects in the rural area. Some of the lessons learnt from the eBario project are:

- Technology cannot function successfully without the community's aspiration and readiness to improve their well-being.
- Community participation is critical. This can be achieved by establishing a steering committee made up of the community leaders and the project team. The cooperation provided by the community acts as a catalyst to the success of the project.
- Local champions are the key component in the success of the telecentre. These local champions are passionate about improving the livelihood of their community. They act as a motivator and "vision carrier" of the project. With their influence, local champions can mobilize local resources towards realising the project.
- Smart partnerships with various organisations, such as funding organisations and government bodies, are also critical to ensure a smooth completion of the project.
- There should be continuous training programs to ensure the community is being kept updated on the latest advancements in ICTs.
- It is imperative to focus on the very people that will use the ICTs because they are the one who will determine the success of the technologies in bringing socio-economic change. The deployment of technology is comparatively easier compared to the task of convincing the people to embrace change.
- The sustainability of the telecentre depends on the project initiator's ability to offer services which are tailored to the needs of the community. This is to ensure that the telecentre remains relevant to the community.
- There is a need to provide ICT training to community members who will then help to administer the telecentre. When the computers or the Internet access break down, these skilled community members can fix the problem right away. Other than that, trained community members can help to manage the daily operations of the telecentre, hence allowing them to be independent and empowered to dictate their own future (UNESCAP 2006).

Figure 3: Locations of the Roll-out sites: Barrio is the first site, other four sites are the replicated sites



The CoERI Replication Initiative: The Issue of Governance

As noted earlier, the eBario project was initially managed by a group of researchers from UNIMAS who shared the same vision and conviction in bringing profound change to isolated community in rural Borneo Malaysia. With the success of eBario, these researchers had the foresight to institutionalize the project, thus paving the way for the establishment of CoERI in 2007. By utilising the eBario model, CoERI aims not only to replicate the successful project to four sites (see Figure 3) but also enhance the approach used in deploying ICTs in the rural community. Apart from that, the CoERI research centre also seeks to provide the most sustainable form of technologies by constantly upgrading the computer and power system at the telecentre. Equally important is the diversification of the services offered at the telecentre, an area which CoERI has recently been exploring.

Administratively, the Director of CoERI and his Deputy managed the overall operations of the roll out with the help of panel of Advisors who were also former Directors and from a panel of International Experts who are respected figures within the field of rural informatics. To streamline the administration of its replicated projects, CoERI formed four research clusters under its wings; namely cultural and social, technology infrastructure, development and services, and information and research management. Each of these clusters performs complementary roles in ensuring the success of the eBario replication projects. Headed by senior research fellows, the clusters focus on the specific needs of the project. At the frontline is the cultural and social group. Comprised mostly social scientists, every member of this group leads the five replication projects that CoERI is currently undertaking. The project leaders are considered frontliners because they are the first one to engage with the community and oversee the overall implementation of the project. Their task is enormous. By engaging the community in various ways, project leaders will spend between 6 to 12 months just to understand the structure and dynamics of the community and subsequently rally their support towards the project. Once the community is ready and their needs are identified, the technology infrastructure group will be mobilised in order to oversee the successful implementation of the telecentre. During this process, project leaders play an important role in

advising and guiding the community. Once the telecentre is connected with Internet, the other two research clusters will kick into action. Basically, the development and services group will provide training to the local community and also provide other form of services to the community. The information and research management group will assist the community in managing the telecentre and also information related to the project.

The four research clusters complement each other and work in a synchronised manner every time a new project is being rolled out. An equally important party in the overall operation of CoERI's roll out program is its management arm. Led by a Project Manager and assisted by Research Assistants and a Finance Officer, the management team becomes the livewire to the roll out program by providing strong support to the project leaders and also the rest of the research members. With a strong leadership, dedicated members and efficient use of man power, CoERI becomes an integral part of the successful implementation of the ICT roll out program funded by the Malaysian government.

CoERI Replication Model: Stages of Rolling Out

Based on the eBario model, there are generally four different stages of roll out; planning, implementation, monitoring and evaluation. All the five sites have to go through the same process, albeit with different strategies and time frame. This is crucial to understand because every site is different in terms of its natural setting, the level of development (or lack of it), and the character of the community. Hence, the eBario model is not a development tool or strategy that fits all sites. It has to be reconstructed or even deconstructed in order to ensure the successful implementation of the telecentre project and also its sustainability within a specific community. Still, the eBario model proves to be a useful guide for implementing rural community ICT project as evident from the successfully replication of the model in four other sites throughout Borneo Malaysia.

1.10 Planning

This is the most crucial stage of the whole rolling out process. With a proper and meticulous planning, the sustainability of the telecentre project is almost ensured. At this stage, the goals of the project have to be clearly identified in order to give a clear direction to project leaders and also other team members. Apart from that, clear objectives will enable CoERI to later determine whether the project is successful or otherwise. In principle, the objective of CoERI's telecentre project is to provide rural community with access to ICTs especially the Internet. With this access, it could precipitate significant improvements in the lives of such communities (Harris and Tarawe 2009, p.1). Hence, the subsequent planning of the project has to take these objectives into consideration.

Next, CoERI has to identify the site that will receive its ICT's roll out project. In selecting a new site, a feasibility study based on the criteria outlined earlier has to be conducted. This process is not as easy as it looks. In the past, CoERI encountered many challenges in selecting new sites. A few potential sites in the Peninsular Malaysia, for example, had been identified but after conducting several feasibility studies, these sites proved to be unsuitable. In respect to CoERI's present sites, they were identified mainly by the research fellows from the cultural and social group. Long Lamai, for example, was proposed by a member of CoERI who has been conducting previous research in the community. After conducting a feasibility study there, Lamai met all the required criteria, hence making it eligible to receive CoERI's roll out project. The CoERI member who proposed the site was subsequently appointed the project leader.

The next step in the planning stage is to mobilise the community's support towards the project. In achieving this, CoERI will approach the community and explain to them the type of approach used in the project (i.e. PAR) and its potential benefits to the community. Here, it is also stressed that the project will

eventually be handed over to the community who has absolute ownership over it. At the end of this important meeting, the community has to decide whether they want to accept the project. If the community accepts the project, CoERI will subsequently issue an official offer letter which the former needs to reply in black and white. This represents a form of contract which CoERI and the community have to honour. The mobilisation program does not stop there. CoERI, especially the project leaders, has to plan many mobilization programs at different stage of the rolling out. Among the programs organised by project leaders in all the five sites are establishing local management committee, providing a platform for the community to make decisions relating to the project, organizing *gotong-royong* (volunteerism) in the construction of the telecentre and providing various types of training to the local community.

Another important planning process is designing the telecentre. In contrast to eBario, the floor plan of the telecentre in the other three sites was designed by the technology infrastructure group. Starting from eLamai, the infrastructure group came up with a floor plan and electrical wiring layout which later was used in Buayan and Larapan, albeit with minor modification in order to suit the unique location of the two telecentres. The replication of the telecentre design is only possible if the community agrees to allocate a piece of land that will house this structure. This was not the case in Ba'kelalan due to the scarcity of land in the area. Hence, an alternative plan had to be considered. Based on the consensus made by the people of Ba'kelalan, an under-constructed community hall was partitioned in order to house the telecentre.

The final stage of planning involves drawing up a systematic way to understand the socio-economic structure of the community, its dynamics and the power relations that exist within it. This priceless information is crucial in identifying the community's needs which subsequently used to design the community-centred services at the telecentre. To gather this information, several research methods would be used such as participant observation, interviews, focus group discussion and household survey. The utilization of these methods requires the project leader to make monthly site visits at the early stage of the project (6 to 12 months) implementation. By making this visits, the project leader will not only understand the needs of the community but also able to build a strong rapport with the community, another essential ingredient in the successful implementation of the project.

1.11 Implementation

The implementation stage is basically a process of executing all the plans that have been carefully made earlier. Although the planning adopted in the CoERI's roll out project is based on the eBario model, the actual implementation of the project is not bounded within this model. Project leaders have to constantly modify the approaches used in the implementation of the roll-out project in order to suit the uniqueness of each of the sites. What works in one community does not necessarily work in the other community even if they share a lot of similarities. On the onset, project leaders initiate the mobilisation programs by first of all establishing a local steering and management committee. The former consists of community leaders (village head, chairman of village committee, teachers, church or mosque leaders, chairman of the management committee) who guide and advise the management committee in the running of the telecentre. The latter, on the other hand, manages the day-to-day operation of the telecentre with the Chairman playing a very influential role in ensuring the sustainability of the project. Considered the local champion of the project, the Chairman of the management committee provides the vision and support that the project initiator requires. In all the sites, the same management structure is maintained but in the case of Larapan the steering committee is subsumed under the management committee since the members of the former sits in the latter. These two committees act as a bridge between CoERI and the community, a core principle in CoERI's community participatory approach in implementing ICT projects. Usually, any issues concerning the administration of the project will be brought to the attention of the two committees for their further action. This is true in the case of Bario since the community is a socially stratified community with local aristocrats dominating the two committees. However, in the case of Lamai where the community is considered to be egalitarian, decisions relating to the telecentre are discussed with the

local committees in the presence of other community members. Whereas in Larapan, discussion is opened to other community members in order to further empower them and also to decentralize decision making process although the community is socially stratified like the Kelabits in Bario.

Immediately after setting up the local committees, the arduous task to identify the needs of the community begins. This process starts by observing the community and immersing in their daily activities. Apart from that, project leaders interview various individuals in the community and hold focus group discussion among the women, youth, and religious groups. A very important method in collecting valuable data of the community is the household survey. Conducted at the early phase of the implementation stage, this survey is aimed at capturing the profiles of the households, spending trend, material wealth, level of health, level of education, types of communication used and perception towards ICTs. This data is not only useful in framing the kind of services that the telecentre ought to provide but it also acts as baseline data that could assess the level of change in the community after the introduction of the ICT project.

The next step in the implementation stage is to identify the location of the telecentre. Through discussion with the community, a proposed site will be identified. Usually the community put aside a communal land for this purpose but in the case of Larapan, a well-to-do community leader donated a small piece of land for the project. The land proposed for the telecentre has to be big enough to accommodate the telecentre and also other supporting facilities such as the VSAT and solar panels. There should not be any structure nearby that could block the signal of the VSAT and sunlight. Preferably, the location of the telecentre should be within the proximity of the village so that it could be easily accessed.

When the location has been identified, the project leader and the community have to slowly plan the construction of the telecentre. As mentioned earlier, the community's contribution towards the successful implementation of the project is crucial because it could nurture their sense of ownership towards the project. Hence, the project leader would first of all seek the community's contribution which could be in the form of building materials or labour. In Lamai and Buayan, for instance, the community contributed most of the building materials (wood) which they extracted from their surroundings. The rest of the materials such as nails, roof and concrete were provided by CoERI. However, not all sites are blessed with timber resources. As a small island with no supply of timber, Larapan has to rely on CoERI's funding to purchase all the building materials. The process of gathering and purchasing building materials is a time-consuming process. The first process has to rely on the commitment of the community, their availability and also the weather. Meanwhile the second process involves the opening up of tender to procure building materials and also other ICT related technologies such as VSAT and solar system. At this stage, the community has to decide on how to carry out the *gotong-royong* (volunteer work) which could bring different connotation to different communities. Here, the project leaders have to spell out the meaning of *gotong-royong* which refers to a collective work aimed at completing a task without expecting any monetary rewards. The way the community organise themselves in the *gotong-royong* differs markedly from one community to another. The Penan of Lamai set aside two days over the duration of two weeks to complete the construction of the telecentre. Led by several experienced builders, the whole community regardless of gender and age worked together to build the telecentre. Whereas, in Larapan, only a handful community members were assigned to complete this task. The effort to rally the community's energy and time towards completing the telecentre can be a time-consuming, challenging and sometimes frustrating process. Along the way, the dynamics of the community could change, making it more difficult for the project leader to maintain the community's commitment towards the project. Due to these circumstances, the physical construction of the telecentre could be completed between six months (in the case of Larapan) to one year (in the case of Buayan).

After the telecentre is connected, the community will undergo a series of ICT training which aims at enabling them to use the computers and Internet and also carry out simple maintenance job. Again the

community has to decide the best way to do this. In Buayan, for example, the training focused on training the local trainers who would then train the other community members. But in the case of Lamai, the older community members refused to be taught by younger community members, hence the ICT training has to cater for everybody who is interested to learn. Once the community members know how to operate the computers and Internet, the telecentre would then be a new focal point in the community, attracting streams of patrons.

1.12 Monitoring

The monitoring stage basically assess whether project leaders have successfully carried out all the tasks that have been outlined in the planning and implementation stage. In doing this, Project Manager will monitor the site reports prepared by project leaders. These reports will be tabled to the Management Meeting chaired by the Director of CoERI. Apart from that, periodical meeting with the Project Leaders also help to monitor the progress of every site. Another aspect that is being monitored at this stage is the usage of the telecentre. If the level of usage is very low, the project leader has to identify the reasons behind it. Subsequently, remedial measures have to be taken so that the telecentre does not become another government's failed project.

1.13 Evaluations

The final stage of the roll-out program is the evaluation of the project. The main goal of the project which is to provide ICT access to rural community is fairly easy to determine. By analysing the users' logbook at the telecentre, CoERI could ascertain the level of access within that particular community. However, the second objective requires a more demanding measuring instrument. Here, CoERI has to conduct another household survey (using the same kind of questions asked in the first household survey) in order to measure any form of change within the community. This exercise is important because it helps CoERI to improve the level of community's participation and also maximize the full potential of the telecentre in improving the livelihood of rural community.

Lessons Learnt from the Replication

Replicating a successful development model like eBario proves to be a daunting task. The model does not offer workable solutions for every community because no community is the same. Still, the model is a very useful guide in implementing ICT projects in the rural community as evident from the successful rolling out of the project in Long Lamai, Buayan, Ba'kelalan and Larapan. It is important to note here that during the rolling out process, the eBario model has been constantly deconstructed and reconstructed, leading the birth of a new model known as the CoERI's Replication model.

At the core of this replication model is the knowledge that a development tool like eBario is not a one-size-fits-all type of project. Project leaders have to constantly find new innovative ways to tackle issues and challenges that confront them throughout the rolling out process. Based on the experience in rolling out the eBario model in four other sites in East Malaysia, four important lessons could be learnt. These lessons help to enhance our knowledge and understanding in replicating ICT project in rural community.

1.14 Establishing New Partners and Collaborators

During the process of rolling out, CoERI has established new partnership with technology providers who could offer competitive price, better services and support compared to its former partners. This would allow CoERI to provide the best technologies to all the sites under its wings. With the competition among technology providers getting stiffer, CoERI is open to future negotiations that ultimately enhances the

services provided by rural telecentres. Other than technology providers, CoERI has established new collaborations with institutions of higher learning such as Universiti Malaysia Sabah (UMS) and Universiti Teknologi Malaysia (UTM) and also local NGO such as eHomemakers. These collaborations allow CoERI to share its knowledge and experience and at the same time learn new things from others.

1.15 Exploring Cheaper and More Sustainable Form of Technologies

As technology becomes more sophisticated and green, CoERI always attempt to find the cheapest and most sustainable form of technologies to power up its telecentres. Hence, the rolled out sites receive the latest generation of solar system with some sites going hybrid with hydro power. The type of computers provided at the new sites is also quite different from Bario in terms of its power consumption. By exploring new technologies, CoERI could ensure an efficient use of power at the telecentres, hence saving the rural community a lot of money.

1.16 Improving Local Governance

The whole community has to be involved in the decision making process relating to the telecentre regardless of the community's social structure. Decision making process should not be confined within the realm of dominant power in the community because this will further marginalise the minorities. As the project initiator, CoERI has to sometimes intervene in the community's decision so that transparency and accountability will be upheld.

1.17 Providing Training beyond ICT based Knowledge

In replicating the eBario model in four other sites, CoERI realizes that the community needs more than just ICT training. It is wrong to say that since this is an ICT project, the community will receive only ICT training. The community needs leadership and management training in order to help them lead and manage the project. Other than that, the community also needs homestay training as part of their preparation in receiving tourists including the researchers from CoERI.

1.18 Establishing Business Model for the Telecentre

To be sustainable, the telecentre has to be financially independent. Therefore, it needs to have a business agenda which could generate income for the telecentre. One of the business models that are being planned for all the four telecentres is a homestay project. The telecentre will act as a medium of information and communication between homestay operators and tourists. The former have to pay a small portion of its profits to the telecentre's fund which will be used to maintain the telecentre.

Summary

The CoERI Replication Model is still being developed and requires further refinement. Given the different needs and demands of the community, and the different programs that will be deployed (e.g. tourism as opposed to medical informatics programs), more in-depth studies need to be conducted at each of the site. The end goal of the research will be an established COERI Replication Model; a model that can be used for not only national but also international roll-outs.

References

- Anderson, J., Crowder, V. L., Dion, D., & Truelove, W. (1999, 7). Applying the lessons of participatory communication and training to rural telecentres. *The first mile of connectivity* .
- Benjamin, P. (2001a). Telecenters in South Africa. *The Journal of Development Communication* .
- Benjamin, P. (2001b). The Gaseleka Telecentre, Northern Province, South Africa. In C. Latchem, & D. Walker, *Telecentres: Case studies and key issues* (p. 10). Vancouver: The Commonwealth of Learning.
- CHRS. (2010). *Filling the Digital Void*. Islamabad: Complete Human Resource Solutions.
- Drishtee Foundation. (2006). *Home*. (Drishtee Foundation) Retrieved 07 1, 2010, from Drishtee Foundation: <http://www.drishteefoundation.org/>
- Garcia, L. D., & Gorenflo, N. R. (1999, April). Rural networking cooperatives: lessons for international development and aid strategies. *The first mile of connectivity* .
- ITU. (2002). Nakaseke Uganda – Connecting People from Timbuktu to Kabul. *ITU News magazine* (5).
- Mayanja, Meddie. (2001). The Nakaseke MCT in Uganda
- Razak, N. A., & Malek, J. A. (2008). Bridging Digital Divide in Malaysia: Cyber Learning for the Marginalized Communities. *Distance Learning and the Internet Conference*. Tokyo: Waseda University.
- Songan, P., Hamid, K. A., Yeo, A. W., & Gnaniah, J. (2006). Bridging the Digital Divide: Challenges to Community Informatics. In S. T. Marshall, *The Encyclopedia of Developing Regional Communities with ICT* (pp. p85-89.). Idea Group. .
- Tajudin, U. (2010). *From Pilot to national Initiative: Case Study I*. MCMC. ITU.
- UNESCAP. (2006). *Guidebook on Developing Community E-Centres in Rural Areas: Based on the Malaysian Experience*. New York: United Nations.
- UNESCAP. (2007). ICT for the Economic and Social Development of Rural Communities. *Policy Brief on ICT Applications in the Knowledge Economy* (3), pp. 1-4.
- UNESCAP. (2008). *Overview of telecentre development in the Asia and Pacific Region*. Retrieved 1 15, 2010, from http://www.unescap.org/idd/events/.../ESCAP_regional%20overview_rev4.pdf
- UNESCO. (2002). An Adult Computer Literacy Training Programme for Underserved Villagers in Malaysia. In UNESCO, *Innovations in non-formal education: a review of selected initiatives from the Asia-Pacific Region* (p. 12). Bangkok: UNESCO Bangkok.
- White, J. (2010). GYANDOOT (Messenger of Informant) an e-government project initiative taken by Village Community in a small district of India.