

# Providing Equal Access to ICTs for Rural Communities: A User-Centred Design Perspective

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## ABSTRACT

*The eBario pilot project has demonstrated a people-centred approach in providing ICTs to an isolated rural community in Bario, Malaysia. By engaging the community prior, during, and after the deployment of ICTs, Bario now has access to telephones and the Internet, and are applying ICTs to enhance their livelihood. The project has been acknowledged at the local and international level as a successful bridging-the-digital project. In this paper, we will provide a perspective from the human-computer interaction area..*

## 1.0 Introduction

In this paper we describe the project, its implementation and impact on the community. We then provide a short discussion of the project from a user-centred design perspective.

### 1.1 Bario

Bario is a remote rural community, located on the island of Borneo, close to the border between Kalimantan and Sarawak, Malaysia. Flying to Bario, is the only practical way to get there. There is no road, and a land expedition requires a river journey plus an additional 14-day-long trek across forested mountains. Bario comprises 12 longhouses which are homes to 1,000 people. The majority of the people are Kelabits, one of the smallest ethnic groups in Sarawak, and are mainly farmers.

While there were many communities in Sarawak that satisfied the criteria for choosing a rural remote location, Bario was selected because of its *isolatedness*. In addition, it has basic infrastructure (no 24-hour electricity supply) and no telecommunication service. Given its remoteness, the catch-phrase was that *if you could successfully implement such a project in Bario, you can do so anywhere*.

### 1.2 eBario Project

The eBario pilot project was conceived as a research project by Universiti Malaysia Sarawak (UNIMAS). By applying a people-centred/participatory approach, the project aims to deploy the Information and Communication Technologies (ICTs), empower and train the Bario community to apply ICTs in improving their livelihood. Participants in this project include a multi-disciplinary research team, the Bario community, Government, private industries, and schools. The project costs USD213,000 (about USD213 per person in Bario) of which 13% went towards transportation costs; everything (computers, furniture, satellite dishes, batteries, solar panels) had to be flown in.

## 2.0 Project Implementation and Adoption

The project was implemented in 2001, and realised a computer laboratory in the Secondary school equipped with 16 computers and Internet access. A telecentre equipped with 10 computers and Internet access was realised in 2002. Prior to the deployment of the ICTs, computer literacy training was conducted based on the training-of-the-trainer method. Interested members of the community, teachers and secondary school students were instructed using this method.

At the telecentre, the main users are the lodge operators using email to communicate with their potential clients, and members of the various committees using word-processors to type up the minutes of meetings or official letters. The community members that are advanced-in-age are also using emails, albeit, a staff member at the telecentre acts as the intermediary to access their email accounts. The senior citizens are keen users of email given that they are able to keep in touch with their families and see pictures of their grandchildren who are living outside Bario. The telecentre charges both locals and visitors for the use of the computers. The money collected thus far average between USD160 and USD266 a month. Given that the telecentre is run by volunteers, and uses solar power to run the computers, this collection is considered the first steps towards achieving a sustainable model.

### 3.0 Impact

With the community's access to ICTs, there is increased computer literacy among the students, teachers and community. Students from Bario would no longer be disadvantaged when they go to the urban areas to continue their studies – they would be just as adept at using computers as their urban counterparts.

The community is now able to communicate with the rest of the world. In addition to improvement in quality of lives (see Box 1), the community's livelihood has improved as well. The lodge operators are now able to liaise with the potential clients via email and promote their tourist services online. The increase in tourists has resulted in enhanced employment opportunities, which further translates to more revenue for the community. Also, more youths and their families are staying back in Bario to operate the accommodation and tourist activities; today Bario has 7 lodges and 3 homestays.

*"The only daughter of one of my staff was very ill last week. The flight turned back because of bad weather, like yesterday, but was persuaded to return in the afternoon when the weather cleared because **thanks to the phone**, we were able to communicate with the authorities concerned."*

Principal of Bario Secondary School

*Box 1: Impact of ICTs on lives of teachers*

### 4.0 Project from A User Centred Design Perspective

#### 4.1 Active User (People) Involvement

The eBario project is one of the first projects in Malaysia that has not only successfully deployed ICTs in a rural community, but also successfully engaged the community to apply ICTs in their daily lives. This was achieved through the innovative use of the Participatory Action Research approach. Through this *people-centred approach* (guided by the research team), the Bario community was involved in the process of generating knowledge about their own conditions (their problems) and how it can be changed (solutions to their problems). The project resulted in an *effective organization change*, in that the community identified with the project, and were motivated to make the necessary changes (such as the acceptance of new technologies) to improve their lives.

#### 4.2 Context of Use

As a result of the involvement of the users, and discussions conducted to identify solutions, appropriate technologies were implemented. One of the technologies was the innovative use of a satellite telecommunication system, the Very Small Aperture Terminal (VSAT) to provide telephone, and Internet access to Bario. This novel application was acknowledged by the Society of Satellite Professionals International whereby eBario was awarded the *Industry Innovators Award for Systems Development & Applications*, in providing access to communities in sparsely populated areas.

#### 4.3 Iterative Design

Given its remoteness, Bario is located too far away from the electricity grid. To solve the power problem, a hybrid generator-set and solar power design was implemented. As diesel had to be flown in, and due to lack of cargo planes to transport the diesel, the costs of fuel sky-rocketed. A gallon of diesel costs approx US \$8.50 per gallon in Bario; in the urban area, US \$1.40 per gallon. In the end, the total power was supplied from solar panels.

#### 4.4 Multidisciplinary Teams

The eBario research team comprised not only of those from ICT background (computer science, engineering), but also experts from Social Science, and Human Development. This was a critical success factor given that challenges faced were multi-faceted.

### 5.0 Conclusion

One of the project findings has been the fact that the project was not about technology, but about people. In particular, people-centred approach employed in engaging the community to participate in the project, was *the key critical success factor*. The current challenge for the eBario Project is the sustainability of the telecentre. Today, they have a consistent income from which they are able to pay for the services of the technical support personnel. In addition, more activities are being planned – for example the further promotion of Bario through [www.eBario.com](http://www.eBario.com) as a portal to promote not only accommodation and tourist activities, but also, products from Bario, such as, rice and handicrafts. Activities to promote local food to international community are being planned.

### Relevant Links

eBario Web Site. <http://www.unimas.my/ebario>. (The bibliography is available at this site under research output.)

eBario Tourism Website. <http://www.ebario.com>