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INAUGURAL LECTURE

Leveraging Research & Innovation in ICTs for Socio-Economic Development in Malaysia

Alvin Yeo Wee

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Leveraging Research and Innovation in ICTs for Socio-Economic Development in Malaysia

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Leveraging Research and Innovation in ICTs for Socio-Economic Development in Malaysia

Alvin Yeo Wee

Universiti Malaysia Sarawak
Kota Samarahan, Sarawak

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Abstract

Universiti Malaysia Sarawak (UNIMAS) has been involved in ICT for Rural Development research projects since 1999, starting with eBario, a telecentre implemented to provide equal access to information and communications technologies (ICTs) to a rural and remote community, in Malaysian Borneo. Employing a holistic, multi-sectorial, multi-disciplinary and participatory approach, eBario has delivered significant socio-economic changes to the Kelabits, an indigenous group living in Bario. The eBario model has been replicated to four other indigenous communities, also in remote and rural locations in East Malaysia, as well as to four other Orang Asli sites in West Malaysia. Two of the exemplary projects, eBario and eLamai, demonstrate the ripple effects of the participatory approach in generating diverse research and innovation opportunities in areas of anthropology, renewable energy, indigenous knowledge conservation, indigenous tourism, and handicraft making. These projects, implemented by the Institute of Social Informatics and Technological Innovations, UNIMAS, demonstrate how research and innovation in ICT for development projects can create pathways to academic and socio-economic impacts as well as shape policies which govern the deployment of ICTs to underserved communities in Malaysia.

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Foreword

The dawn of the information society heralded a wave of optimism around the impact that Information and Communication Technologies (ICTs) would have on the world's social and economic development; not the least in Malaysia at a time where the technologies were extolled in pop-songs and promoted as the basis for the Nation's bold ambitions towards Vision 2020. As academic researchers, we are required to closely examine such claims, to question their veracity and their applicability to the variety of contexts that constitute wider society. It was in 1998 with these thoughts in mind when I first stepped foot in Bario in the remote and isolated Kelabit highlands of Sarawak in the middle of Borneo with the simple question, "How can ICTs be put to good use here?"

Professor Yeo ably answers that question in this publication. From its inception as an admittedly wild idea, what became the eBario project - along with its spinoff initiatives - has pioneered a pathway towards the realisation of the full promise that the information society holds for isolated and underserved communities everywhere, especially those indigenous minority groups whose development needs and aspirations often differ from those of mainstream society. Through its ground-breaking research, the UNIMAS-ISITI team, under Alvin's capable and inspiring leadership, has assembled a formidable body of knowledge that can be put to good use in empowering such communities towards the identification and realisation of their own development priorities through the targeted deployment of ICTs. The effects of the research that Alvin modestly describes here as "ripples" can be more accurately characterised as waves; impacting as they do the wider areas of professional practice and policy formulation that are so often beyond the scope of research that typically emanates from universities.

It is now evident that what happens as a result of ISITI's research in, say, Long Lamai, a tiny remote and isolated settlement deep in the heart of the Borneo rainforest, has relevance for other similar communities in far distant lands – across the rest of Asia, Africa and

Latin America where small underserved indigenous groups encounter the same struggles to maintain their cultures and to engage with the 21st century on their own terms. The technologies that urbanites take for granted within our daily communication needs have far greater relative significance for such peoples living in remote isolation, provided they are introduced in a manner that is sensitive to their potentials and limitations; along the lines that Alvin describes in this important and timely publication.

Why is this document important now? The world is belatedly acknowledging the contribution that the traditional knowledge and wisdom of indigenous peoples can make in sustainably managing the global environment. Indigenous knowledge has been shown to be capable of contributing considerably to a better understanding of climate change and its impact on fragile eco-systems as well as providing important insights into the adaptation methods that can mitigate its effects. For such knowledge to achieve the fullest potential of its contribution towards global development that is sustainable, ICTs will inevitably be deeply implicated and they will be introduced along the lines described here.

Roger W. Harris
Roger Harris Associates
Hong Kong
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PROFESSIONAL LECTURE SERIES (INAUGURAL LECTURE)

Leveraging Research and Innovation in ICTs for Socio-Economic Development

by

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1 ICT for Development

It is generally acknowledged that providing access to Information and Communication Technologies (ICTs) for rural and remote communities can assist in alleviating poverty as well as improving their socio-economic status. This utilisation of ICTs to bring about development is covered under the term, ICT4D (Information and Communication Technologies for Development). Among the numerous benefits of having ICT access include giving access to unlimited information resources for teaching and learning (e.g. eLearning), providing health related services (telediagnosis), increasing employment and business opportunities (eCommerce), and access to government services (eGovernment websites) (Siew, Yeo & Zaman, 2013). There is also evidence to suggest that rural dwellers gain more benefit than urban dwellers from any increase in access to ICTs (ITU, 2010), but

the absence of relevant experience, local content and skills are major barriers for rural ICT usage (Gurstein, 2003; Pringle & David, 2002).

Typically, the more difficult the geographical locations, the higher the financial costs of setting up and providing ICT access to such areas. Adding to these challenges, remote areas typically do not have mains power or telecommunication access. As such, the access to ICTs is delivered through telecentres (also known as ICT access points, Internet centres, community broadband centres, knowledge centres). Telecentres are similar to cybercafés except that, unlike in urban areas, the telecentre is managed for the community, by the community for the purpose of local development. Telecentres can be run by either public, private individual(s), or both, for public consumption. In this monograph, the term *telecentres* refers to any centre or facility whereby the community is able to access ICTs and use the Internet or services provided for the purpose of stimulating local development.

Given the importance of the telecentre as a means to provide ICT access to rural communities, UNESCAP (2007) indicated that over half a million telecentres are needed in order to serve its expanding population. In Malaysia, there are several initiatives with this aim, including *Medan Info Desa*, *Pusat Internet Desa*, Community Broadband Centres and *Pusat Internet 1 Malaysia*, run by the various ministries and private entities in Malaysia. At one stage, there were more than 2,500 telecentres in Malaysia.

Unfortunately despite much technological advancement, solutions to problems such as the sustainability of telecentres and scaling-up the deployment of telecentres remain elusive. Other challenges include financial constraints, difficulties in rallying the community's support, building and maintaining telecentres, the monumental task of ensuring sustainability, selection of products and services which address the needs of the community, and the ultimate test of delivering positive change to the community.

This monograph describes a number of research projects located at remote and rural telecentre sites; projects which have been carried out by the Centre for Rural Informatics at the Institute of Social Informatics and Technological Innovations (ISITI), Universiti Malaysia Sarawak (UNIMAS), henceforth UNIMAS-ISITI.

By showcasing these projects' outputs and outcomes, we aim to demonstrate:

- How ICTs have contributed to bringing about socio-economic development
- How ICT4D research projects have benefited the communities involved, the University, State, and the Nation
- How these projects have contributed to the body of knowledge of ICT4D, not just theoretically but also from a practical perspective, in other words, praxis.

We believe that by sharing the reflections conducted, showcasing the experiences and lessons learnt, and by demonstrating the pathways of ICTs to socio-economic development, we can assist academia, Government and industry to improve the way technology is deployed to benefit other underserved communities.

In this monograph, the projects will be presented in approximately chronological order. We start with the eBario Project in 1999, the replication of the eBario Model to four sites in East Malaysia (Demonstrator Application Grants Scheme - DAGS) and then the replication to four sites in West Malaysia (Telecentre Programme for Orang Asli - TPOA). The research findings and knowledge garnered were then used for training of personnel in *Pusat Internet 1 Malaysia* (1Malaysia Internet Centre) run by MAXIS (a telecommunications service provider) under the Universal Service Provision (USP) funding by Malaysian Communications and Multimedia Commission (MCMC). (Please refer to MCMC's website, http://www.skmm.gov.my for details on USP and MCMC's role in ICT4D.)

The monograph will specifically showcase selected projects in two sites, namely Bario, and Long Lamai, where a majority of the projects have been implemented.

All the telecentres presented, namely, eBario, DAGS, and TPOA are located in remote and rural areas. In this monograph, we define *rural* as areas with a population of less than 5,000 people. We define *remote* as those areas which we need to travel more than 3 hours (be it by four-wheel drive (4WD), boat or small plane) from the nearest urban centre or town. These remote and rural areas typically do not have 24-hour mains-provided electricity supply nor telecommunication access.

Figure 1: Paddy fields in Bario

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2 Bario and eBario

Bario is a remote rural community located in Malaysian Borneo. It is situated close to the Sarawak (Malaysian) Kalimantan (Indonesian) Border. Flying to Bario on a 19-seater Viking plane operated by MASwings, is the only practical way to get there. In 1999, there was no road access, and a land expedition would comprise a river journey and an additional 14-day trek across forested mountains. Today, access by land is via a 14 to 18 hour journey by 4WD on logging road from Miri, the nearest urban centre.

Bario comprises 12 longhouses, which are home to more than 1,000 people. The majority of the Bario population are Kelabits, one of the smallest ethnic groups in Sarawak. The Kelabits in Bario are predominantly farmers planting the fragrant and famous Bario rice (see Figure 1).

2.1 eBario Project

UNIMAS initiated the eBario Project as a study to determine how ICTs can improve the lives of a rural community. The researchers conceived the idea of bringing the Internet to Bario as a research project to ascertain opportunities for social development available from the deployment of ICT within remote communities in Sarawak. Promising results from studies in other developing countries convinced the team to work with these communities in Sarawak to give them equal access to ICTs, specifically the Internet, with the expectation of providing significant improvements to the community's lives.

eBario's objectives include the following:

- To define the extent to which contemporary ICTs could deliver sustainable social and economic development to the lives of the remote rural communities

- To identify further needs and opportunities within such communities that can be satisfied by the innovative use of contemporary ICTs
- To demonstrate how significant and sustainable development can be achieved by remote communities

Why Bario? In 1999, while there were many communities in Sarawak that satisfied the criteria of a rural remote location, Bario was selected because of its extreme remoteness. In addition, back then there was minimal basic infrastructure (no 24-hour electricity supply and no telecommunication service). Given its remoteness, the catchphrase was that if you could successfully implement such a project in Bario, you can do so anywhere.

Participants in the eBario project comprised a multidisciplinary research team from UNIMAS, the Bario community, Government, industry, and the primary and secondary school in Bario.

We at UNIMAS-ISITI recognise the pioneers of eBario, from UNIMAS: Prof Dr Roger Harris (who initiated the idea of eBario), Associate Prof Dr Poline Bala (eBario site leader), Prof Datuk Dr Khairuddin Ab Hamid, Prof Dr Peter Songan, Bario community: Pn Lucy Bulan (then Principal of the Bario Secondary School) and Cr. John Tarawe (now Councillor at Marudi District Council).

Prof Dato' Zawawi Ismail, the then UNIMAS Vice Chancellor, supported the project and situated it under the eLearning and eCommunity component of the Malaysian National IT Council Agenda. Initial funding came from the International Development Research Centre (IDRC) of the Canadian Government, and the Malaysian Government Demonstrator's Application Grant Scheme (DAGS). The project received a funding of USD 213,000 (about USD 213 per person in Bario) of which 13% went to transportation costs; everything (computers, satellite dish, furniture, batteries, solar panels) then had to be flown in.

2.2 Implementation

By 2001, the Bario Secondary School was equipped with a computer laboratory and Internet access. In 2002, the telecentre (see Figure 2) opened, equipped with 10 computers and Internet access. Internet connectivity was via a Very Small Aperture Terminal (VSAT) satellite communication system. The research team had organised computer literacy train-the-trainer training prior to the deployment of the ICTs. Participants then included members of the community, teachers, and secondary school students.

Participatory Action Research (PAR) was chosen as the research methodology for the project. It was deemed necessary that:

- the researchers should learn about life in Bario from the community;
- the community should learn about ICTs from the researchers;
- community members should perform major portions of the research;
- the researchers should be able to identify with the community; and
- as a team, the community researchers should be capable of achieving mutually beneficial outcomes from the project by reflecting on iterative cycles of action (Bala, Harris & Songan, 2003).

Figure 2: Opening of eBario Telecentre

2.3 Initial Use of Telecentre

At the telecentre, the main users were the tourist lodge operators who used email to communicate with their potential clients, and members of the various committees in Bario who used wordprocessors to type up the minutes of meetings or official letters.

The more senior community members were also indirectly using emails; a staff member at the telecentre acted as the intermediary to access their email accounts. The senior citizens were reported to be keen users of email given that they were able to keep in touch with their families living outside Bario, and could see their grandchildren's photographs (Bala, 2011). The telecentre charged both the locals and visitors for the use of the computers. The collection per month ranged between USD160 and USD266 a month. Given that the telecentre is run by volunteers, and used solar power to run the computers, this collection is considered the first step towards achieving a sustainable model.

2.4 Impact of eBario

With the community's access to ICTs, there was increased computer literacy among the students, teachers and community. According to Lucy Bulan, the then Bario Secondary School Principal, " ... *rural students always started at a disadvantage when they left Bario*" but with the ICTs access, they were able "... *to bridge the gap between the shy, unexposed students and their aggressive, well informed counterparts in town*". In other words, when the students in Bario go to Miri or Marudi to continue their studies; they would be just as adept as their urban counterparts at using computers. The community is now able to communicate with the rest of the world. Examples of noticeable improvements include improved communication between Bario and the respective government headquarters, as well as emergency calls for assistance with the Internet or public telephone.

eBario also played an important role as the communication centre for a search and rescue operation near Bario in July 2004. The search and rescue operation for a missing helicopter which was conducted over 12 days, involved the Police, Military, Royal Malaysian Air Force and their allies as well as locals. This massive operation required much coordination and communication in the remote location. With eBario, the search and rescue operation had access to phones, fax, and the Internet, where timely press releases and reports were made available.

2.5 Leveraging on Natural Assets

The people in Bario are very hospitable. Bario is also steeped in culture (see Figure 3) and has wonderful nature treks, nice cool weather and great sceneries. As such, the biggest impact of eBario was on the tourism industry. Prior to eBario, bookings were made in the form of letters, or information brought by people flying into Bario. Lodge operators capitalised on the communication access and were now able to liaise with their potential clients directly via email and promote their tourist services online. The increase in tourists resulted in enhanced employment opportunities, which further translated to more revenue for the community. In addition, more youths and their families were staying back in Bario to operate the accommodation and tourist activities. In 1999, there were 2 homestays, 10 in 2006, and today, there are more than 20 homestays. Another indication of increased visitors is the frequency of flights into Bario; in 1999, there was only one flight a day. In 2003, the number of flights increased to 2 flights daily, and today there are 3 daily flights into Bario.

In 2007, we conducted a survey of the number of visitors (as recorded in the lodge's visitor books) from year 1997 to 2006 (see Figure 4). We believe this increase in visitors was attributed to the Internet connectivity provided by the telecentre. The positive effect of the telecentre on tourism was supported by a study (Lo et al., 2013a).