

Exploring Socioeconomic and Sociocultural Implications of ICT Use: An Ethnographic Study of Indigenous People in Malaysia

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Abstract. In some countries, it is revealed that the ICT usage by indigenous people is possible to be accomplished and utilized to deliver benefits. For the purpose of development and advancement of Orang Asli (one of the indigenous groups in Malaysia) and in support of the national aspirations in Vision 2020, ICT exposure to Orang Asli requires holistic implementation. Therefore, the predominant issue to be discovered comprehensively is about Orang Asli and it is imperative to understand their needs and requirements in terms of ICT acceptance, appropriation, barriers, as well as infrastructure and infostructure issues. In conclusion, we found four main aspects to be considered in research involving Orang Asli's use of ICT and benefit ICT: (i) the influential people, (ii) infrastructure barriers (iii) social development issues, and (iv) motivational factors.

Keywords: Indigenous · Orang asli · Malaysia · Socioeconomic · Sociocultural · ICT use · Focus group · Thematic analysis · Card sorting · Expert reviewer

1 Introduction

Malaysia is a multicultural and multilingual country. Based on the historical findings, the indigenous groups that originally occupied Malaysia consisted of Malays, the Orang Asli that only settled in Peninsula Malaysia [1], and the native ethnic groups in Sabah and Sarawak [2, 28]. Among the four groups, Orang Asli community was and still is a minority and their existence is less known to the public. Their socioeconomic development is not as fast as other communities in Malaysia, especially in context of technological development, particularly ICT adoption. Orang Asli's acceptance of ICT is quite slow and not comprehensive. Drawing from the work looking into the improvement of indigenous groups in other countries, it is believed that these communities can be improved with the aid of ICT projects such as website containing information on arts and culture of indigenous people, learning using multimedia in indigenous languages, e-businesses that preserve traditional crafts while strengthening local economies and so on. Besides, there are also successful projects in Malaysia

known as e-Bario and e-Bedian which were developed specifically for indigenous community in Sarawak [3]. However, the ICT project for Orang Asli as far as Department of Orang Asli Development (JAKOA) is concerned, are restricted to providing laptops for Orang Asli's children who were offered to pursue their studies at universities and another initiative is a computer training centre located in Kluang, Johor while in reality Orang Asli communities are spread across the entire Peninsular Malaysia. ICT development for them is not sufficiently implemented partly due to their lack of ICT adoption [2]. Based on the justification for socioeconomic development of Orang Asli communities, they would certainly benefit from ICT use. This is in line with Malaysia's aspiration in the Vision 2020 of the overall development for all citizens, closing the socioeconomic gap [4]. One out of nine main goals of Vision 2020 is to create a scientific and progressive society that is innovative and advanced in technology use and development. Hence, our motivation is to explore the breadth and depth of the socioeconomic and sociocultural implications of ICT use among the Orang Asli. Our aim is to understand the needs and requirements for technology acceptance and appropriation as well as the barrier of ICT adoption in the target community. This will give us an insight into their learning ability, economic capability, cognitive style, daily practice and behaviour towards ICT.

2 Research Background

2.1 Orang Asli in Malaysia

Based on the recorded history, Orang Asli originated from neighbouring Champa, Indo China, Burma and Sumatra [5] and was the earliest group of people that came to Malaya (now known as Malaysia). They settled in some parts of Peninsular Malaysia long before the Malay community. The terminology of Orang Asli as an ethnic category only existed after 1960 [2]. Previously there were many terms used by anthropologists and administrators to categorize this group such as 'Orang Darat', 'Orang Laut', 'Bersisi', 'Mantra' and 'Orang Mawas' [2] (Fig. 1).

Orang Asli in Malaysia is not a homogeneous ethnic minority. They represent a heterogeneous community because they have unique differences, particularly in terms of sociocultural for each ethnic group. The rationale behind this difference is related to the Orang Asli background itself that officially consisted of 18 tribes in Peninsular Malaysia



Fig. 1. Environment of Orang Asli

and they are categorized into three main groups based on their mother tongues and customs: they are Negrito, Senoi and Proto-Malay. Negrito, is an ethnic group which contains Kensiu, Kintak, Jahai, Lanoh, Mendriq and Bateq. For Senoi group, it comprises of the Semai tribe, Temiar, Jahut, Che Wong, Mahmeri and Memoq Beri while Proto-Malay group consists of Temuan, Semelai, Jakun, Kanaq, Kuala and Seletar [22].

In the past, a majority of them lived in the forest and practiced the traditional way of life that was deeply influenced by the natural environment and maintained the old practices of their ancestors. However, the development of Orang Asli has experienced significant changes as the results of Malaysian government transformation and approach through the establishment of JAKOA in 1954. Various drastic development programs were carried out specifically for Orang Asli after the end of crisis in late 1980 s. Among the development programs, focuses were given to providing housing aid, basic infrastructures, social facilities, educational programs, and health programs. It also aimed to increase residents' income and alleviate poverty through farming and agricultural projects [2].

2.2 Orang Asli's Socioeconomic and Sociocultural Development

The formation of a sovereign Malaysia on 16 September 1963 opened new paths for Orang Asli's socioeconomic development because JAKOA's role has been expanded to develop their socioeconomic status and living conditions. Orang Asli has shown significant improvements socioeconomically compared to 20 years ago [6] and this included family economy [7, 22], education [8, 23], healthcare [9], and technology [10]. They are no longer considered a "traditional" community that opposes self-development and advancement. Generally, Orang Asli was exposed to two types of developments which are, the one designed specifically for them and the general national development that has a direct impact on them. However, at that time, the general public often assumed that Orang Asli did not want to participate in economic progress; hence they failed to contribute to the nation's development [11]. Therefore, efforts to provide development to Orang Asli community faced tough challenges. Among the key areas that need to be handled are problems of poverty, lack of education, lack of political power and attitude change.

However, JAKOA commitment in delivering development to Orang Asli has increased after several decades of work especially in the context of social development, education and health [9]. It also implemented with more systematic, planned approaches which are more in line with Orang Asli's culture. Despite the erosive impact of the Orang Asli culture due to some development initiatives implemented [6], these development efforts largely received positive responses from Orang Asli community. In fact, it is a matter of how the development was brought to them.

Apart from socioeconomic development, sociocultural aspects of Orang Asli are also an important part that needs to be investigated in order to know them well. 18 Orang Asli tribes each possess their own sociocultural identities. Among the ceremonies that are mostly emphasized are weddings, births, deaths, and appointment of a chief or more commonly known as Batin. Other than the diversity of their ritual practices, Orang Asli is also known to have a lot of ancestral beliefs and taboos.

Among the most significant ones are taboos in nutritional aspects, the current relationship of humans or between humans and animals, as well as medical [5, 12] beliefs. Although every ethnic group has differences in practice of their traditional ceremonies and taboos, it is fair to say that they share some fundamental cultural practices.

The Orang Asli community puts an emphasis in appointment of the chairman or better known as Batin appointed among men. For each ethnic group, Batin has the authority over all issues in the village including marital affairs and death, as head of customs and administrative of the village's socioeconomic activities [5]. Batin's appointment can be accomplished through heredity or by the individual's ability and personality through villagers election, selected by management team member or the will of previous Batin. In every Orang Asli group, Batin is highly respected. Villagers will obey his instructions because he has the highest authority. At present, a Batin's role has also been widely received as a liaison person with government agencies and neighbouring villages.

Another important ceremony, known as 'Sewang' consists of music, dancing and singing especially in the wedding celebration and sometimes is a ritual to medicinal procedures [5]. This is because from the medical perspective, these rituals predate the views and opinions of shaman. Normally Orang Asli will get cures from shaman before getting hospital treatments.

2.3 ICT Adoption of Orang Asli in Malaysia

In general, local researchers agree that Orang Asli does not reject ICT development [4, 10] because the community thinks that ICT is a platform to help them advance and succeed in the modern world. However, according to W. Amir Zal [11] the acceptance of any new things or ideas is often related to their cognitive styles, attitudes, behaviours and norms.

It is well-known that ICT adoption among Orang Asli is very slow compared to other communities in Malaysia [2]. Among the main contributors to this problem are the educational and economic constrains [10]. Appropriate and effective strategies to pro-mote Orang Asli use of ICT are still not fully grasped by the government nor NGOs. This is evident because there are no other successful ICT projects for Orang Asli apart from e-Bario and e-Badian which targeted Sarawak's indigenous. This indicates that Orang Asli has somehow lagged behind in ICT use even though there are a few individuals among them who are skilled and follow the development of ICT on their own.

3 A Global View on Indigenous Groups' Attitude Towards ICT

Globally, advancements in ICT are rapid, and in some cases, even a fully developed and semi-developed society fails to catch up with the latest technological changes. Given this, it is not hard to imagine the difficulty faced by the indigenous groups worldwide in regards to ICT adoption. Therefore, their ability to pursue modernization and development of ICT has become an important topic addressed by researchers worldwide.

Exposure to ICT usage is not only focused on the technical aspect but it is a holistic change, involving technological implications in line with their culture, language, lifestyle, as well as level of education and economic ability to accommodate the needs. Thus, studying the level of ICT acceptance of the indigenous group is inherently complex. It is therefore not surprisingly the level of ICT acceptance varies widely across the world. However, some researchers stated that the most important aspect for indigenous groups to accept ICT is their awareness [13]. They need to be exposed to the importance, benefits and values of ICT. But, for the researchers of this study, all aspects need to move in tandem so that the acceptance of ICT is not limited only to the physical capabilities which are from the aspects of cost, skills and facility but mentally and psychology as well.

Effort to provide ICT exposure to the indigenous people is very active around the world. As specified by Native American observers, the evolution of cultural change is always happening based on current technology. Unlike the past in which iron knives and horses left an impact, today, the Internet is able to provide opportunities for Native American to support themselves and their tribes [14]. Therefore, the role of ICT is reflected as being very significant and powerful.

Some administrative personnel have to work hard to provide exposure and awareness on Internet use for the indigenous group such as in Northern Territory of Australia. It is a very remote and economically backward region. However their indigenous students are supplied with wireless-enabled laptop Internet called the 'XO' for free. These devices were supplied by a charitable organization on an initiative named One Child One Laptop (OLCP) and the XO is specifically designed to survive the harsh conditions there [15].

Efforts must not only be focused on infrastructure: further work should involve the effort to expose them to "infostructure" such as system and software to receive and disseminate information relating to indigenous information. For instance, Ashninka, the indigenous communities of Peru, were introduced to Telematic Network for Indigenous Populations in 2000 as an innovative project of indigenous e-commerce that aims to provide the indigenous people with an online purchasing portal that allows visitors to buy their products, including music, handicrafts and food [16]. In addition, the eThekwini Municipal Library's Libraries and Heritage Department has developed a localized Wiki containing local knowledge and histories of indigenous community in Durban, South Africa [21].

The indigenous community in Brazil also had the opportunity to enjoy Internet connectivity when Brazilian scientists established collaboration efforts to co-write articles with scientists from 114 countries from 1995 to 1997. Therefore, the Brazilian indigenous people were able to work together in order to solve environmental, social, and political problems of common concern [14].

Although there are many positive responses from the indigenous individuals which proved that they are willing to embrace ICT and economic progress through the use of ICT, creating the awareness is not an easy process. The acceptance of ICT by the indigenous people is still not comprehensively achieved worldwide because there are areas with low percentage of ICT use such as those in Australia. Findings showed that the ICT adoption by indigenous communities in very remote areas is very low particularly in using the Internet [17, 18]. The same situation also happens to the Orang

Asli in Malaysia: their acceptance of ICT usage is still low. This is supported by a report published in *The Indigenous World 2014*; indigenous groups over the world are lagging in a few areas such as education, work, entrepreneurship, regional development, as well as science and technology [19].

4 Methodology

In this study, we employed a qualitative approach to carry out an empirical study aiming to identify the influence of socioeconomic and sociocultural of Orang Asli towards acceptance and use of ICT. Focus groups and observations were conducted with 75 Orang Asli considered as informer from 5 villages in Peninsular Malaysia. Thematic analysis was conducted to analyse the rich qualitative data. To support the result obtained from thematic analysis, a card sorting exercise and open-ended interviews were carried out with six experts from three different fields.

4.1 Focus Group

We decided to conduct focus groups in order to collect in-depth information about this complex topic in a relatively short space of time, since the aim of the focus groups was not to achieve consensus [24] but more on the simulation of new ideas and high level of discussion. Five Orang Asli's villages were chosen for this study. Each village provided the researchers with 15 informers, resulting in a total of 75 informers, aged between 15 and 80 years old from diverse backgrounds (Tables 1 and 2).

Although some researchers favour participant selection characterized by homogeneity [20, 25, 26] such as occupation, age, gender, education level, or health problem; due to the need of considering the perspective from multiple perspectives, the homogeneity issue is not emphasized and only three aspects are taken into consideration:

- original Orang Asli – there are outsiders living in the Orang Asli's village due to inter-marriage, so they were not selected;
- past the age level of at least 15 years old – at this age he/she should be able to read if he/she attends the government school as recommended;
- possess knowledge of technology –those who were selected have some minimal knowledge about television, radio, telephone and computer to ensure that they can discuss issues related to technology.

Focus groups were conducted to cover four aspects namely healthcare, education, subsistence, and ICT adoption with the aim to discover current socioeconomic

Table 1. Selected orang asli village for focus group

Category	Village
Urban	Kampung Orang Asli Bukit Lanjan, Selangor
Sub-Urban	Kampung Orang Asli Ulu Jelintoh, Perak
	Kampung Orang Asli Bukit Payung, Malacca
	Kampung Orang Asli Donglai Baru, Selangor
Rural	Kampung Orang Asli Bukit Choh, Perak

Table 2. List of expert reviewers

Name	Expert Area	Additional Information
Associate Professor Dr. Juli a/l Edo	Anthropology	Lecturer in Anthropology and Sociology of Orang Asli at University of Malaya, Malaysia and an Orang Asli descent
Dr. Wan Ahmad Amir Zal bin Wan Ismail	Anthropology	Lecturer from School of Social and Economic Development, Malaysia Terengganu University
Dr. NurulFadzilah binti Deraman	Medical Practitioner	7 years' service at Hospital Orang Asli Gombak and act as Head of Medical Section
Dr. Nabil Muhammad bin Al Kuddos	Medical Practitioner	3 years' service at Hospital Orang Asli Gombak and an active doctor in the 1Malaysia Mobile Clinic program specifically for Orang Asli.
Mr. Mohd Jiwa bin Zulkifli	Development and growth on Orang Asli community	Has served for 40 years with JAKOA: began in 1974 and he is very knowledgeable about the development of Orang Asli, as he becomes a spokesman for the museum Orang Asli Gombak and the main reference for local and international researchers.
Mrs. Jasmin	Development and growth on Orang Asli community	Has 13 years of service in JAKOA and also an Orang Asli descent from Semai tribe and her husband is from the Jakun tribe

development of Orang Asli in Malaysia. Once the data and information was gathered, thematic analysis was carried out by combining and cataloging similar patterns into high level themes and low level themes. Themes are defined as units derived from conversation topics, vocabulary, recurring activities, meanings, feelings, or folk sayings and proverbs [27]. The structure is able to provide a comprehensive view of the information and it made it easier to see a theme emerging.

At the same time, the observation was meant to find out individuals who are more likely to use technology, how far they use the technology, and are there any issues while they were handling the technology. Informer's activities of using technology will be observed for 10 h, from 8.00 am until 6.00 pm without them realizing it. The technology usage that was observed was activities involving television, radio, computer or laptop, mobile phone and any related electrical appliances.

4.2 Expert Reviewer

After the thematic analysis was finalized, the card sorting method [29] was conducted to ensure that the themes used and interpreted were in line with experts view. Six experts were involved from three different fields. In this process, other than getting views on themes that were used, they were also interviewed to gain insights related to four topics listed below:

- their opinion on cognitive style of Orang Asli
- their opinion on socioeconomic development of Orang Asli
- their opinion on sociocultural condition of Orang Asli
- their opinion on ICT usage among Orang Asli

5 Findings

The main objective of this study is to determine the socioeconomic and sociocultural situation of the Orang Asli and how these may affect their acceptance and use of ICT. From the focus groups, observation studies, and expert reviews; a summary was presented in Tables 3 and 4.

Table 3. Thematic analysis and expert interview findings

High Level Theme	Low Level Theme	Expert Interview Finding
Ability for informer who does not use ICT	Lack of Technology Knowledge and Skills	1. They do not reject the use of ICT 2. Young people are more likely to accept ICT than older ones 3. Issues in ICT adoption are literacy, costs, and lack of facilities especially network coverage and electricity 4. Tend to use ICT for entertainment
	Lack of Facilities	
	Illiterate	
	Techno-phobia	
	Aged	
Preference in social media application	Low Necessities	
	Awareness towards Technology	
	Influence by social media New cultural acceptance	
Traditional cognitive style persisted	Cost Avoidance	1. Prioritize the Batin’s opinion 2. They do not reject modernity 3. They still hold strongly to their customs and ancestral beliefs 4. External factors can affect their attitude 5. They like to be humble because it is an expression of being respectful to others 6. They are sensitive but do not become angry if disheartened but will not cooperate. 7. They emphasized good relations
	Fear for uncertainty	
	Easily demotivated	
	Feel Sufficient	
	Dislike force	
Motivation in receiving assistance and progress	Needs for Technical Support	
	Curiosity	
	Self-learning	
	Aspiration	

Based on the finding, it was found that there are four main aspects to be considered in efforts to attract Orang Asli to use and benefit from ICT. These are (i) influential people, (ii) infrastructure barriers, (iii) social development issues, and (iv) motivational factors.

Influential People. In their daily lives, the most ‘influential individual’ is the Batin and he is able to influence the villagers to be more open minded and to explore ICT. In addition, school students are influenced by school teachers as they receive formal education on ICT. Most of them have been able to use ICT effectively, probably due to

Table 4. Observation finding

Observation Aspect	Village Category	Age Group	Observation Finding
The use of technology by age group and level of technology usage	General	General	Almost all were capable of using television and radio at least by switching on and off the appliances.
	General	Elderly	A small number of mobile phones used and none used computer or laptop. Mobile phone was mainly used only to make calls for certain numbers that they remember or memorize and received calls only.
	General	Adult	Almost all use mobile phones and none use computer or laptop. Some used smart phone as well as tablet depending on income
	General	Youth	A large number of youth that have jobs were able to use mobile phones. Some used basic mobile phone and the others used smart phone depending on their job and income.
	Sub-Urban and Rural	Youth	No youth used laptop

the formal education, as well as the students' own initiative and enthusiasm due encouragement and guidance from friends of other ethnic groups. Positive response from school students can be utilized to influence others to use ICT.

Infrastructure Barriers. The second aspect is 'infrastructure barriers' since these may affect their physical ability to use ICT. There are three identified barriers which are (i) cost to be borne, (ii) lack of training materials or training centres, and (iii) lack of facilities especially network coverage and electricity. Barrier related to cost can be mostly related to their standard of living that is still relatively low. Regarding ICT training facilities, they need support from external parties such as the government, NGOs or commercial organizations to provide them.

Social Development Issues. The third aspect is 'social development issues' which relate to cognitive styles and lifestyles. We had identified two issues related social development: (i) illiteracy, and (ii) preservation of tradition and culture. Illiteracy is an issue related to their education level because awareness on education is still not strong among Orang Asli. Apart from that, Orang Asli especially adults; are very concerned about the impact of technologies on their belief and culture.

Motivational factors. 'Motivational factors' are an important aspect in regards to providing ICT facilities and services to Orang Asli. Among the factors that should be considered are (i) elements of entertainment and enjoyment, (ii) the evidence of benefits ICT can provide, (iii) positive attitudes especially to build good social relationship, and (iv) respects to their ancestral beliefs and customs. ICT projects for Orang Asli should not simply focus on addressing the basic needs such as food, education and healthcare, but should encompass wider social aspects, including entertainment, social networking, and cultural heritage.

6 Future Work

The next step of the research study will focus on the development of an application for raising the healthcare awareness among Orang Asli. From the results, it is clear to us that the application design will need to be more than just to provide basic healthcare information. Therefore, the future work is to conceptualize the requirements needed for appropriate technological design and development for this selected indigenous people group by taking into consideration the four main aspects derived from this study. Further, a prototyping of healthcare application will be developed and a series of user studies will be conducted.

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