Community Attitudes towards the Telecentre in Bario, Borneo Malaysia: 14 Years on

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***Abstract*—The overall aim of this study is to examine the community perceptions and attitudes towards the use of the telecentre in Bario, Sarawak, Malaysia. A qualitative research approach was chosen as it offered an avenue to investigate perceptions, attitudes and motivations. In-depth interviews were conducted, using a structured questionnaire, to collect qualitative data from local community persons (including telecentre users and non-users) in Bario. A total of 20 people were interviewed. The study was conducted in June 2012. The study revealed that a significant number of the respondents did not currently use the telecentre, due to, inter alia, the presence of alternative internet access methods, the perceived high cost of using the telentre and slow/problematic internet connection at the telecentre. General opinion of the telecentre is positive, in that it is a communication tool for personal and business matters. In terms of perceived ease of use, the telecentre is not considered difficult to use; however very few respondents exhibited enjoyment in its use, citing that it was only a means to an end. Respondents perceived the telecentre to be useful overall, and some of those who were not able to use ICT or the telecentre nevertheless perceived that it had a business value to them. As this study is qualitative in nature, the sample size is considered small; hence, the generalisability of the research may be affected. Extension of the research findings using quantitative methods would prove beneficial for the validation of the findings. This is a first baseline study on communities' attitudes towards the telecentre more than a decade after the said telecentre was set up. The findings will be relevant to future studies of community-based ICT initiatives and the broader areas of information-seeking, information-seeking behaviour, and user needs.**

***Index Terms*—Telecommunications, communication technologies, telecentre, malaysia, rural areas, community attitudes.**

I. Introduction

The information (or digital) age came into its own with the invention of the world wide web (WWW) in 1989, and shortly after, the internet transformed into a global network. Today the internet is widely recognized as a global platform for accelerating the flow of information. Because of the internet, people are more intellectually engaged than ever before [1]. However, the internet as a resource is not equally available to (and exploited by) all. Digital divides – gaps between individuals, households, businesses and geographical areas with regard to their opportunities to access ICTs and the use of the internet [2]–do exist. In other words, different groups of people will have different levels of access towards and abilities in using the internet. These divides have been researched into and classified differently, for example, social digital divide (involving gender, age, race/ethnics) [3]–[5], economic divide [6]–[8] and education divide [9]. Reference [10] saw the digital divide in three stages: economic, usability and empowerment. The first stage, economic, simply refers to the different levels of ability to afford ICT and internet. Usability refers to the different levels of ability to use ICT and internet, due to literacy and educational issues. The last stage, empowerment, refers to the different levels of participation in (and exploitation of) ICT and internet, due to initiative and skill – a knowledge gap, so to speak. The Nielsen classification is a good way to view the rural/urban digital divide. Rural areas are physically remote and potential users in such areas would experience the short end of the divide at all three stages. Firstly, the implementation of ICT networks and services is challenged due to issues in equipment installation, lack of mains power supply, lack of funds for initial capital investment, operation and maintenance, affordable coverage, lack of technical support and computer repair facilities and multiple players in ICT design and implementation [11]–[13]. This impedes internet accessibility. As a result, people in rural areas generally suffer a lack of ICT (and general) education, leading to lack of empowerment in ICT and the internet arena.

Hence, the research aims to understand the perception of the local community towards the telecentre, in terms of perceived ease of use and perceived usefulness.

II. Literature Review

A. Telecentres

To bridge this rural/urban digital divide, telecentres (sometimes known as "community information centres") have been proposed and implemented. These are centres that are set up for the general use of the community – for accessing the internet, and the use of e-applications and other ICT-related services. The role of telecentres have been identified as, *inter alia*, a provider of applications for citizen services and government interactions, a virtual site for the community to meet and interact, a provider of trade, commercial and government-related information, a general information centre, a communications portal and facilities

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centre and a platform for knowledge sharing [14]-[17].

B. The E-Bario Telecentre

Bario is situated in a very remote area in Sarawak, reachable only by a 16-seater plane or via unsealed logging roads. As of 2000, more than 90 per cent had never used a computer and had never connected to the internet [18]. Nevertheless, research at the time indicated that the residents were eager for new information resources, and that the majority of teachers and students were well prepared for ICT adoption [19]; all the 13 secondary school teachers polled had an intermediate to advanced level of IT understanding [20]. Against such a backdrop, the eBario Telecentre - gatuman@bario – was started in 1998 as a research project under Universiti Malaysia Sarawak (UNIMAS). It was initially funded by the International Development Research Centre of the Canadian Government and then subsequently via the Malaysian Government's Demonstrator Application Grants Scheme [21]. When designing, implementing and customing the telecentre, the technological needs of the community were analysed; representative members of the community were also invited to participate throughout the duration of the project [22]–[23]. Teachers were trained in ICT and the new technology, and then school children were taught by the teachers. Using the "train-the-trainer" method, ICT training was provided to the rest of the community. In 2006, the telecentre was handed over to the community, which meant that it had to be financially self-supporting [22].

The telecentre supports education, e-government services, e-commerce, e-health, tele-medicine and personal communication. Energy-wise, it is powered by an innovative hybrid system of solar panels and a diesel generator. Internet access is provided through the use of solar-powered VSAT (very small aperture terminal) and a satellite telecommunication system [21].

The role of the telecentre in Bario has been mainly communicational in nature. For example, owners of various lodge/hotel/backpacker establishments used the telecentre to communicate with their guests for accommodation and guide bookings. Other community members have made use of the telecentre to communicate with the outside world – with family members living outside Bario – and for generating official documents. Certain international events, such as the Slow Food Festival and the eBario Knowledge Fair (a developmental conference held in Bario), have showcased the telecentre [22]. The eBario project, being a pioneering work of its kind, has received numerous international and national awards for its impact on the local community [21].

A study reviewing the status of the eBario in 2011 [22] noted that much of its equipment have become obsolete, the number of users had declined and the needs of the people in Bario have changed. In view of the foregoing, it is pertinent to investigate the current perception and attitudes of the local community towards the telecentre.

III. Methodology

This study was conducted through a qualitative research approach, as it offered an avenue to obtain in-depth knowledge and understanding of communities' perceptions, attitudes and motivations.

A convenient non-random method was employed in choosing the samples for data collection, which is consistent with other business research [24]. The main criterion for the sample selection were that respondents had to be income earners and business owners, as well as had some history of residing in Bario (so that they could observe the impact of the telecentre on the community, particularly from the economic perspective) – this would enhance the validity and reliability of data collected. All of the participants gave their responses on a voluntary basis.

In-depth interviews were conducted to address the research objectives. Such an approach was deliberately chosen as it offered adaptability in data collection, whereby ideas can be followed up on, responses can be further probed and motives and feelings can be further explored. A standard semi-structured interview sheet was used to ensure coverage of the research objectives; it acted only as an interviewing guide and was not directly administered to the respondents. Leeway was given to the respondents to expand on their views as necessary, with minimal interruption from the interviewers. Researchers would provide further clarification or prompt the respondents with suggestions or hints only when respondents were unclear about what was asked. Two interviewers were present at the interview with the respondent: one to conduct the interview and one to record down the responses. This ensured that the first interviewer was able to fully concentrate on answers provided and ambiguity minimised. The recording of the responses also enabled the interviewers to immediately seek further clarification if the answers given were vague, or to probe further if any interesting areas or issues emerge. This would not have been possible if a voice recorder was used, as the interview would only be fully transcribed later.

The interviews were scheduled as per the convenience of the interviewees to ensure minimal disruption and to their working schedule. The interviews lasted an average of 45-90 minutes. Given the qualitative nature of the interviews, there was no predetermined sample size, and the total number of respondents was achieved when no further information was gained and a saturation point was reached. Data was collected over a five-day period in June 2012. Each interview was preceded by an introduction about the objectives of the research project.

The following questions were probed in-depth for each respondent:

1) Do you use the telecentre?
2) If yes, what do you use it for?
3) How often do you use the telecentre?
4) What do you feel about the telecentre?
5) How has your household income improved due to the telecentre?
6) Do you feel that the telecentre is easy to use?
7) Are you able to use the telecentre independently?
8) Do you have the control, knowledge and resources to use the telecentre?
9) Do you feel anxious/nervous when using the telecentre?
10) Do you enjoy using the telecentre?
11) Do you find the telecentre useful in your business/work/leisure?

12) Are you influenced by anyone in your use of the telecentre?
13) Do you feel that using the telecentre brings increased prestige to you?
14) Does the telecentre reduce the cost of doing business/work for you?
15) Can you communicate to others the consequences of using ICT/the telecentre?

At this point, it must be clarified that Questions 6 – 15 pertain to the perceived ease of use and perceived usefulness of the ICT/telecentre. The questions were simplified to avoid jargon and technical terminology for the convenience of the respondents. More discussion on perceived ease of use and perceived usefulness will follow in the Results and Analysis section.

Content analysis was performed on the respondents' verbatim comments. The data was analysed based on a qualitative-phenomenological approach, which is data and conceptually-driven. The data analysis sought to understand the people studied and interpret meaning from the data [25]. The unit of coding was based on a single phrase or several significant statements that were meaningful and generated themes relating to the perceptions and attitudes of the telecentre in Bario. The responses were read and re-read, and analysed by drawing out the key themes and variables. The dimensions/themes identified from the data were grounded in the respondents' own descriptions, thus enhancing the reliability and validity of the findings.

IV. Results and Analysis

The participants of this study totaled 20, and their demographics are summarised in Table I below:

TABLE I: Demographics of Participants

Attribute	Item	Frequency	%	Cum %
Gender	Male	14	70	70
	Female	6	30	100
Age	21-30 years	1	5	5
	31-40 years	6	30	35
	41-50 years	7	35	70
	51-60 years	3	15	85
	Over 60 years	3	15	100
Employment status	Employed	5	25	25
	Self-employed	4	20	45
	Businessperson	11	55	100
Residential status in Bario	Living full time in Bario	17	85	85
	Living full time in Bario, but travels often	1	5	90
	Owns a residence in Bario and visits frequently	1	5	95
	Owns a resident in Bario and visits occasionally	1	5	100

The participants comprised of homestay owners/operators, self-employed guides, owners of business establishments such as canteens, retail shops, farm and employees. Many of the participants held multiple roles at the same time. For example, a homestay owner could also own a cattle farm, a paddy field and be involved in road-building contracts. A self-employed guide could also be involved with a salt-making business.

As for residential status, two of the participants do not live full time in Bario. One owns a homestay located in Bario but frequently stays in Miri, the nearest town, to be with her family. The other grew up in Bario and still has family there, but has since moved out to find employment outside of Bario.

In terms of telecentre usage, the findings revealed that out of the 20 respondents, 14 did not currently use the telecentre. The reasons for non-usage given included: incapability to use ICT, the presence of alternative ways of achieving access to the internet (data plans for cellphones/laptops, free wifi service at the local airport), perceived high cost of using the telentre and slow/problematic internet connection at the telecentre. The last factor stemmed from 2 causes: one, the telecentre is run on solar power--during non-sunny days, the battery would be depleted and weather conditions would have to correct for the battery to recharge. Hence, the telecentre would be non-functional during that downtime. Two, the internet connection is satellite-linked, and cloudy days would mean poor/slow connection. The slow connection factor is related to the perceived high cost of telecentre usage--2 respondents informed us that telecentre usage is charged based on time, but the slow connection meant that they were paying for the 'waiting time' as well. When asked what they used the telecentre for, respondents cited mainly sending emails (mainly for the running of their business/work. Some respondents cite browsing websites and surfing as another use. Some respondents also avail themselves of telecentre services such as printing and typing. A respondent informed us that tourists using the telecentre would burn discs, presumably to save photos, and utilise the terminals for social networking.

Interestingly, 2 of the respondents, who were not able to use ICT, stated that they would like to learn how to leverage on it to promote their lodges/homestays. It must be noted that these 2 respondents were aged 60 years and over. Eventhough they were ICT-illiterate, they still perceived a certain value in ICT as long as it can be harnessed to increase the volume of their businesses.

Respondents who are current or past users of the telecentre cited different lengths of usage history, ranging from since the telecentre was established, to 2 years. There is a range in the frequency of usage too: from every day to a once a week.

In terms of economic impact, and specifically increase in household income, 5 respondents attributed a significant increase in their income levels to the telecentre. It is pertinent that all five of these respondents are lodge/homestay owners, the main telecentre users. The magnitude of the increase ranged from 20% to 100%. However, one lodge owner reported a minimal effect in household income levels before and after the telecentre came into existence., as guest bookings were accepted via

direct phone calls. Incidentally, the same respondent also informed us that he has not been using the telecentre for the past 3 years, but now accesses the internet via cellphone.

The findings and themes pertaining to attitudes towards the telecentre which emerged from the in-depth interviews can be summarised in the following paragraphs.

The general attitude towards the telecentre is positive. It was cited to be an important communication tool with the outside world, either personal contacts or clients/customers. Another role of the telecentre was to facilitate knowledge sharing and online banking transactions such as Paypal. However, on the downside respondents again cited technical difficulties and cost as deterrents in telecentre usage.

For telecentre users, past and present, we then investigated the perceived ease of use of the telecentre, in a preliminary attempt to establish a link between perceived ease of use and actual usage of the telecentre. Perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort", or effort expectancy. In other words, an ICT application perceived to be easier to use than another is more likely to be accepted by users [26]-[27]. However, there are different aspects of perceived ease of use, among them: perceptions of external control (facilitating conditions), perceptions of internal control (computer self-efficacy), computer anxiety and perceived enjoyment [26]-[27]. Perceptions of external control pertains to individual perception of technology and resource facilitating conditions, e.g. availability of support staff and prior experience with technology [28]-[29]. Perceptions of internal control, or computer self-efficacy, refers to a person's belief in his/her ability to perform a specific job/task using a computer [30]. Computer anxiety refers to an individual's apprehension or fear when facing computer usage [31], and is a negative affective reaction towards computer use. Perceived enjoyment, on the other hand, is a positive reaction; it is the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use [32]. The afore-mentioned factors are predictors of perceived ease of use; if perceptions of external and internal control are positive, and there is minimal computer anxiety and perceived enjoyment in the use of computers, a user would therefore find ICT easy to use – and would in turn use the facilities (in this case, the telecentre) available.

The respondents in Bario, other than those who are not able to use ICT, are generally intermediate users and able to use ICT/the telecentre independently, although 2 respondents say that they needed occasional help or support. In terms of computer self-efficacy, respondents were of the opinion that they had the control, knowledge and resources to use the telecentre. In other words, perceptions of external and internal control appeared to be positive overall. In the same vein, no respondent who was a telecentre user said he/she was anxious when faced with using computers. However, in terms of perceived enjoyment, 5 respondents cited that they enjoyed using ICT, but 4 stated that it was just a means to an end to get things done in their work/business. In other words, they did not derive enjoyment from using ICT or the telecentre in its own right.

Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance his or her job performance [26]. Reference [33] found that perceived ease of use, subjective norm, image, and result demonstrability were significant predictors of perceived usefulness. Hence, in our study, we also investigate the community attitudes towards ICT and the telecentre from these perspectives. Subjective norm is defined as a person's perception that people who are important to him think he/she should or should not use ICT. It is a form of peer pressure; a person would be more inclined towards the use of ICT if there is a perceived pressure to do so. In a similar vein, image is the degree to which one perceives the use of technology as a means of enhancing one's status within a social group. Therefore, one would be more inclined to use ICT or the telecentre if one's social group perceives it to indicate a higher status. The last predictor of perceived usefulness is result demonstrability, which is the tangibility of the results arising from the use of ICT. Therefore, if a person perceives the existence of concrete, positive results from his/her use of ICT and the telecentre, he/she would be more inclined to continue in ICT/telecentre usage.

Our study revealed that the respondents who have used the telecentre generally found it useful. In particular, it helped improve their work/job performance, helped them perform tasks more quickly and enhances their effectiveness. However, not all respondents could agree that it improves the quality of their work, but this could be due to the nature of their work which is not ICT-dependent. Again, the technical problems and poor connection at the telecentre was cited to negatively impact the usefulness of the telecentre. From the perspective of subjective norm, most of the current and past telecentre users said that they were not influenced by anyone in their ICT/telecentre use; they decided to use ICT on their own initiative. However, one lodge owner admitted that he was encouraged to use the telecentre when he noticed other lodge operators doing so. On image, some respondents were of the opinion that usage of ICT and the telecentre did not indicate a particular status symbol or a form of increased prestige, as most people nowadays have access to ICT. However, we noted a significant number of respondents who felt the opposite – to them, being able to use ICT and the telecentre indicated that a user was modernised, educated, advanced, developed and knowledgeable. Some also felt that it differentiated between a person who was computer-literate and one who was not. A lodge operator felt that it indicated that one had more business to other lodge operators, which was a form of status symbol in itself. Finally, on result demonstrability, respondents generally agreed that ICT and the telecentre was able to reduce the cost of doing work/business for them. One respondent cited the speed of connecting with clients as a tangible benefit. Most of the respondents also agreed that they were able to communicate the benefits of using ICT and the telecentre to other people.

At this stage, it is pertinent to note that during the time of the study, the telecentre was temporarily closed. We were informed that this was due to the fact that the telecentre manager, working on a voluntary basis, had expressed her intentions to pursue other activities. However, the wifi services offered by the telecentre was still functional.

In summary, eventhough perceived ease of use and perceived usefulness of the telecentre in Bario was generally confirmed by the respondents, this did not translate to a higher rate of usage of the telecentre. This was due mainly to the presence of alternative methods of achieving internet access (as mentioned earlier), compounded by the technical problems and poor/slow connection experienced at the telecentre.

V. Conclusion

It would appear that the telecentre in Bario is no longer in the limelight and its benefits have plateaued. At its inception, it was the only way to access the outside world and therefore its value to the Bario community was immeasurable in that respect. However, the standard of living in Bario has improved via tourism development (amongst other things), and the digital divide has been largely bridged with the availability of data plans and smartphones, which have democratised the internet with their increasing low costs [34]. The role of the telecentre should change to reflect this reality.

In spite of the foregoing, a knowledge divide still appears to exist [35], as there are pockets of community that still do not know how to use the internet or ICT. As mentioned earlier, our findings revealed instances of an empowerment gap [10] whereby certain respondents saw the value of leveraging on ICT to promote their businesses, but were incapable in the creation and placement of the necessary content on the internet.

Hence, there is an opportunity for the telecentre to either conduct ICT training, specifically to business owners, on ways and means to harness ICT to promote and increase business volume. Alternatively, there is an avenue to provide a marketing services via ICT by the telecentre. In the same vein, computer classes can be designed for the community, based on a common syllabus to ensure consistency in course content. In this respect, the telecentre could be partnered with an existing IT institution/body for the offering of courses and joint certification could be issued to participants thereafter. These courses could be taught on an ongoing basis to benefit all levels of community.

In terms of telecentre staffing, it is recommended that the teachers from the primary and secondary schools run the telecentre on a voluntary, rotational basis.

For the enhancement of business model sustainability, telecentre services can be further diversified in line with the needs of the community. If services can be offered accordingly, usage can be improved. The smartphone revolution can be piggybacked on by offering related services, perhaps to train and establish a maintenance section to service and repair smartphones owned by the community. There is also an avenue for an advisory service for the usage and downloading of apps. The telecentre can even partner with existing mobile service providers to sell smartphones together with data plans (and earn a commission on the sale). The same could be explored for laptops and tablets–again, in terms of a service centre, an advisory service and product sale. Tablets have an increasing role in bridging the knowledge gap, especially amongst the middle to late middle-aged folks, and therefore represent an opportunity in the market that can be exploited.

For the tourists, the telecentre can offer an energy charging station for phones, laptops and cameras, using its solar power, together with the line of services currently being offered.

The value of this study lies in the investigation of community attitudes towards the telecentre, more than a decade after its establishment. At this point, the digital divide has been largely bridged and the role of the telecentre has to change in line with that fact. Therefore, this paper not only contributes to the literature on bridging the digital divide amongst rural communities in general, but also to the changing roles of a telecentre after the said divide has closed to a certain extent.

Despite efforts by the researchers to ensure a rigorous qualitative approach and data collection techniques for the purpose of a sound research, the findings of the present research, like those of any empirical investigation, are subject to limitations. A study of this nature cannot achieve the same outcomes, in terms of generalisability, as that of quantitative methods. Other limitations include the small sample size, and the low percentage of people aged between 20-30 years, as these might be more active users of the telecentre. The use of cross-sectional data methodology focused only on the periods of primary investigation and provided a ‘snapshot’ of one particular group at one moment in time. Thus, it is limited in a temporal context. Hence, the second stage of the study will be of a quantitative nature. Standard questionnaires, incorporating the findings from the current qualitative stage, will be widely administered to the community in Bario to validate the current findings.

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