

ISSUES IN INTERNET ADOPTION AND RURAL DEVELOPMENT: THEORY OF THE DIFFUSION OF INNOVATION

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New communication technology plays an important role in most people's day-to-day lives. The new media such as internet and other wireless media have also become successful development communication media at national and international levels. The internet is also a vehicle to reach rural development goals such as promoting the rural economy and social infrastructure (Updated UNESCO Discussion Paper 2013). The internet serves as an agent of change in rural areas and it has the potential to bridge the digital divide between the information rich and the information poor in developing countries. It has had a positive effect on the livelihood, health, education and economic situation of many rural people (Zhao 2008). Most of developing countries have low access to new communication media for rural development purposes, making a great digital divide between rural and urban communities (Xiaoming & Jinqiu 2008).

‘The study has proven that infrastructural facilities, affordability and computer skills are negatively contributing to internet adoption. Therefore, suitable solutions should be taken by responsible government and private authorities to develop infrastructural facilities in rural areas, improve computer skills of the respondents and increase economic condition of these communities in order to increase internet adoption.’

United States of America has the highest internet usage in the world with some 81% of residents use internet for their daily lives. The Malaysian internet usage remains 65.8% in 2012. However, most of the developing countries in Asia, Africa and Latin America have less internet facilities. Some 75% of the rural people in Sri Lanka remain separated from internet facilities. Sri Lankan internet user percentage was a mere 18.3% in 2012

(World Bank Report 2013). The internet medium is still an innovation in Sri Lanka when compared with developed and other developing countries in the world. It is ironic that Sri Lanka is trying to enter 'the information superhighway' while having such a critical situation.

The purpose of this paper is to propose a new model to look at the variables related to issues of internet adoption based on Rogers' Five Stages Innovation-Decision model in his theory called the Diffusion of Innovation. This study identifies the issues of internet adoption among rural communities in Sri Lanka according to the Five Stages Innovation-Decision model. Specifically, it means that this study identifies the reasons for rejection, discontinuance, or late adoption of the innovation (the internet) among rural communities in Sri Lanka. This paper also reports the relationship between internet adoption (DV) and infrastructural facilities, adopter characteristics of rural communities, technology characteristics and affordability (IVs) based on results of correlation.

Literature Review

Issues in Internet Adoption among Rural Communities in Sri Lanka

Wattegama (2005) has identified a number of critical issues that have prevented the successful distribution of the internet in Sri Lanka in his report titled 'Development of Information Technology for Human Enhancement' that was submitted to the Sri Lankan government. These critical issues are: higher internet charges in the rural sector, the lack of computer skills and English language skills, attitudinal problems and the lack of infrastructural facilities in rural areas.

Furthermore, the Department of Census and Statistics of Sri Lanka has identified some issues in internet adoption among rural communities by the survey titled 'Internet Usage in Sri Lanka' in 2009. This survey finds that computer and internet usage are highly influenced by English language skills, computer skills and the educational level of the users.

Liyanage (2007) notes that NGOs and ICT based projects do not help to empower rural communities with internet facilities. Many ICT programmes really do not understand the information need of the rural communities and these projects are only based in specific areas. Gunasekera (2008) finds that lack of infrastructural facilities in rural areas and affordability issues are critical problems in internet adoption among rural poor in Sri Lanka.

Galpaya (2011) finds that people who are attached to low socioeconomic status appear to be lagging behind in terms of internet facilities.

The Theory of Diffusion of Innovation

The main theoretical framework for this study is the Theory of Diffusion of Innovation. Everett Rogers, a professor of rural sociology introduced Diffusion of Innovations, which aims to explore the reasons that may influence an individual to adopt an innovation or a new technology. The diffusion process guides individuals to accept or reject the new innovation. This model explains how innovations are adopted by the members of a social system over specific time. An innovation is defined as new idea, knowledge, behavior, attitudes, or object that is perceived by that society and diffusion is a type of social change, it happens when people adopt or reject the innovation (Rogers 2003).

Several scholarly researches have been conducted based on the Diffusion of Innovation theory. Salman (2008) on his study titled 'Sustainability of Internet Among Malays in Kota Baru' went beyond the Diffusion of Innovation theory and introduced a new model of internet sustainability. Nugroho's (2010) study of 'NGO's, the Internet and Sustainable Development', show the pattern of technological adoption proposed by diffusion theory and prove that 'innovators' and 'early adopters' lead to adoption, followed by 'early majority', 'late majority', and 'laggards', forming a bell-curve and, cumulatively, an S-curve.

This study is mainly based on Rogers' Five Stages Innovation-Decision model in his theory of the Diffusion of Innovation'. There are five stages in the Innovation-Decision model: knowledge, persuasion, decision, implications and confirmation. Some prior conditions such as previous practices, needs, problems, innovativeness, and norms of the social system, take place before entering the knowledge stage. The prior conditions of diffusion have an effect on the adoption of an innovation.

Rogers (2003) identifies three types of knowledge: awareness-knowledge (lead an individual to seek for the other two types of knowledge); how-to-knowledge (information necessary to use an innovation) and principle knowledge (information dealing with the functioning principles on how an innovation works). Socioeconomic characteristics, personality variables and communication behaviors play significant role in decision making units. Rogers (2003) outlines five perceived characteristics of the innovation in persuasion stage: relative advantages, compatibility, complexity, trial ability

and observability, it plays a vital role in adoption decisions after obtaining knowledge about the innovation.

An individual or other decision-making unit leads to the adoption or rejection of an innovation at the decision making stage. The classification of members of a social system on the basis of innovativeness include: innovators, early adopters, early majority, late majority, and laggards. Adopter characteristics depend on their socioeconomic status, personality variables, innovation, compatibility, communication behavior, and needs. Discontinuance plays an important role at the confirmation stage; it also depends on the above mentioned factors such as socioeconomic status, personality variables, innovation, compatibility, communication behavior, and social needs. Communication channels such as mass media and interpersonal channels like friends, opinion leaders and change agents bring about awareness concerning an innovation. Rogers' Five Stages Innovation-Decision model is as follows.

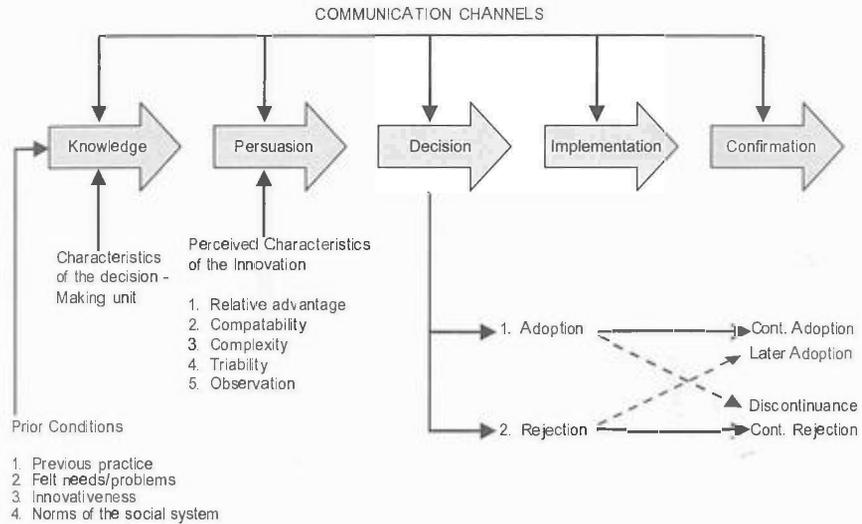


Figure 1: Model of Five Stages of Innovation - Decision Process

From the literature review, majority of rural people in Sri Lanka are facing numerous issues concerning internet adoption such as: lack of infrastructural facilities, affordability issues, lower literacy in computer usage and English, attitudinal constraints, and technological issues. The Five Stages Innovation-Decision model helps to identify the issues of internet adoption among rural communities and propose a new model to look at the variables related to issues of internet adoption.

Research Method

This study used the survey method to obtain data from rural communities (purposive random sample) in Bibile of Monaragala district, Sri Lanka. Viraj (2011) notes that Uva Province has the highest incidence of poverty (poverty head count index is 27%) and Monaragala which is attached to Uva Province is the poorest districts (poverty headcount index 33.2%). Some 470 questionnaires were distributed among the people in Bibile area. To get equal representation of gender, the sample consisted of equal number of males and females and the age component contains of three groups comprising 18-30, 31-40 and 41+. A total of 413 questionnaires were collected and 400 questionnaires were found usable for analysis. Therefore, the return rate of questionnaires was 87.87%. The data is analysed using Statistical Package for Social Sciences (SPSS version 20.0). Both descriptive and inferential analysis have used in this study. For the inferential statistics, correlation analysis was used. Internet adoption is the dependendent variable while the independent variables are infrastructural facilities, adopter characteristics (needs, relevance, attitudes, computer skills and English language skills), technology characteristics (ease of use, perceived benefits) and affordability.

Results

This section discusses the results of this study. It explains the correlation analysis between internet adoption and the independent variables, and introduces the proposed model for the study.

Correlation Analysis between Internet Adoption and the Independent Variables

Table 1 presents the Pearson correlation analysis between internet adoption and other independent variables. There exists a strong and significant negative relationship ($r = -.960^{**}$, $p = .000$) between internet adoption and infrastructural facilities. There is a strong positive relationship between internet adoption and needs ($r = .927^{**}$, $p = .000$). Furthermore, the results show that there is a strong relationship ($r = .873^{**}$, $p = .000$) between relevancy and internet adoption. Results of the correlation indicate that internet adoption is highly relevant for respondents. There is a strong and significant positive relationship ($r = .898^{**}$, $p = .000$) between internet adoption and attitudes.

The results also show there is a strong positive relationship between internet adoption and English language skills ($r = .857^{**}$, $p = .000$). Plus, there exists a strong and significant negative relationship ($r = -.944^{**}$, $p = .000$) between internet adoption and computer skills. The results also show there is a strong positive relationship ($r = .927^{**}$, $p = .000$) between ease of use and internet adoption. Perceived benefit has a strong significant positive relationship ($r = .948^{**}$, $p = .000$) with internet adoption. In addition, the results show there exists a strong and significant negative relationship ($r = -.948^{**}$, $p = .000$) between internet adoption and affordability.

It can be concluded that infrastructural facilities, affordability and computer skills play negative roles in influencing internet adoption among respondents in Bibile. In other words, these are the main issues on internet adoption among rural communities.

Table 1: Pearson Correlation Analysis between Internet Adoption and Independent Variables

Internet Adoption	r	p
Infrastructure	-.960**	.000
Needs	.927**	.000
Relevancy	.873**	.000
Attitudes	.898**	.000
Computer skills	-.944**	.000
English skills	.857**	.000
Ease of use	.927**	.000
Perceived benefits	.948**	.000
Affordability	-.948**	.000

N = 400 Correlation is significant at the 0.01(2-tailed)

The Proposed Model for the Study

The proposed model for this study identifies the issues of internet adoption among rural communities. The variables, which have relationship with internet adoption, are the IVs (Independent variables) in the diffusion and adoption process. Adoption, rejection or discontinuance also depend on the previous practices, needs, problems, innovativeness, social norms, socioeconomic characteristics, personality variables and communication behaviors. This is evident in the results of this study where adoption has been shown to depend on the adopter's characteristics and affordability.

From the correlation results, adopter characteristics such as needs, attitudes, computer skills and English language skills (personality variables,

communication behavior and needs from Rogers's model) have significant relationship with internet adoption. Also, it is proven that needs, attitudes and English language skills have a positive relationship with internet adoption, while computer skills have a negative relationship with internet adoption. This study has introduced relevancy as an adopter characteristic for internet adoption. Furthermore, the results have also determined that affordability (economic characteristics in Roger's model) has a significant negative relationship with internet adoption. Additionally, this study has identified that infrastructure and technology characteristics are important factors in internet adoption. The proposed model for the study is as follows.

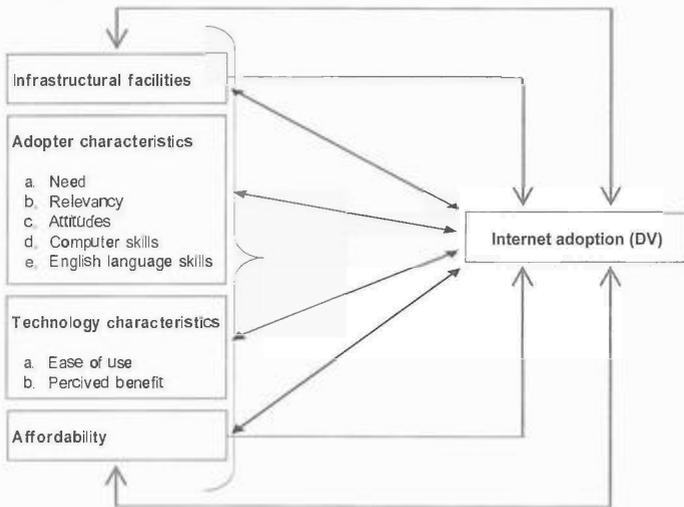


Figure 2: The Proposed Model for the Study

The proposed model for this study goes beyond Rogers' five stages of innovation decision model to look at other variables related to issues of internet adoption. The proposed new model contributes additional variables such as infrastructural facilities, relevancy and technology characteristics to identify the issues of internet adoption. Dependent Variable is internet adoption while infrastructural facilities, adopter characteristics (needs, relevance, attitudes, computer skills and English language skills), technology characteristics ('Ease of use' and 'Perceived benefits') and affordability are the Independent Variables (IV) in this proposed model for study. It means that the internet adoption process depends on infrastructural facilities, adopter characteristics, technology characteristics and affordability. Issues in internet adoption among rural communities in Sri Lanka are worth researching for

the country's national development. Therefore, issues in internet adoption provide the foundation for this study.

Discussion

The internet medium was introduced in Sri Lanka in 1990, but still, the internet remains an innovation in Sri Lanka. Therefore, this study identified the issues in internet adoption among rural communities in Sri Lanka based on Rogers' five stages of innovation decision model. The proposed model of this study contributes additional variables such as infrastructural facilities, relevancy and technology characteristics to identify the issues of internet adoption. Based on the results of the study, there are strong significant relationships between all independent variables and internet adoption (DV). From correlation results, there are strong negative relationships between internet adoption and infrastructural facilities, computer skills, and affordability and adopter characteristics (needs, relevancy, attitudes and English languages skills), whereas, technology characteristics (ease of use, perceived benefits) have positive relationships with internet adoption.

The results of the study have proven that infrastructural facilities, affordability and computer skills are negatively contributing to internet adoption. Therefore, suitable solutions should be taken by responsible government and private authorities to develop infrastructural facilities in rural areas, improve computer skills of the respondents and increase economic condition of these communities in order to increase internet adoption. Kapadia (2005) says there should be considerable government involvements to build the ICT infrastructure and capacity to use the technology in rural areas. The government should also establish large-scale ICT education, just like it does with regular education, develop rural economy, and create rural employment and political empowerment.

Conclusion

The proposed model for this study goes beyond Rogers's model to look at other variables related to issues of internet adoption. These additional components are infrastructural facilities, relevancy, and technology characteristics (ease of use and perceived benefits). This model has identified the reasons for rejection, discontinuance, or late adoption of the innovation (the internet) among rural communities in Sri Lanka.

Majority of rural communities remain separated from the internet facilities. The internet has the potential to bridge the digital divide among urban and rural communities and empower the rural communities in Sri Lanka. Therefore, responsible bodies must address the issues hampering the diffusion of the internet among the rural communities. The results show that there are strong negative relationships between internet adoption and infrastructural facilities, computer skills, and affordability.

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