

## Empowerment Digital Divide: Case Of Internet Adoption In Uganda's Rural - Urban Areas

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### Abstract

Over the years the concept of digital divide has shifted from having to do with those who have access to technology and those who don't because technology has become more mobile. There is wide increase in computer access in schools and personal ownership, slight decrease in computer costs, increase in internet access and wide spread access to mobile phones and services. It is no longer an issue of lack of access but being empowered to optimally use the technology or internet. Taking a rural-urban stride in Uganda's use of Internet, it is revealed that a regional imbalance still exists. Urban dwellers are highly empowered to use internet compared to rural dwellers as this paper will reveal. This paper therefore sets out to explore the empowerment of rural-urban dwellers to adopt Internet as an innovation taking a case of Uganda. **Methodology:** Quantitative and qualitative approaches were used to accomplish the study. Interview guides and questionnaires were used to collect qualitative and quantitative data respectively from internet café owners and users. **Findings:** Findings suggest that relative advantage, complexity, compatibility as well as trialability being strong predictors of internet adoption. Relative advantage of the internet was found to be the strongest predictor of internet adoption in the rural urban areas. The concept of empowerment of users was found lacking and that explained the low scores on the trialability concept.

**Key words:** Rural - urban areas, Digital divide, Internet access, ICTs, Innovations, Diffusion

### INTRODUCTION THE INTERNET

The Federal Networking Council (FNC) provides an agreed technical definition of Internet as a global information system that "(i) is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons; (ii) is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions, and/or other IP-compatible protocols; and (iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein". In simple terms Cho et al., (2003) states that internet brings together a global network of networks with various capabilities to enforce change in different aspects of people's lives. Internet can be considered as a form of disruptive technology that has vastly changed the way business is conducted.

### Business value of internet

The internet provides seamless and borderless access to business information which was not the case ages ago. It is therefore upon the organisations to make value out of this data it provides by aligning it to their goals. For organisations that have taken opportunity over internet have been able to regress resource optimisation and efficiency to reduce cost of production, grab new market opportunities previously not available, improve quality of their services and products, make use of social media to reach new markets, improve customer relations management, and develop new products for new and old markets through research and development. With internet corporate trading companies boast of e-commerce, education institutions pride in e-education, service companies provide e-services, and banking

institutions enjoy e-banking and e-financial services, all to the beauty of internet (Mutula, 2001). These together yield profitability, scalability and growth of these organizations.

Despite the business and personal value of internet, its wide scale adoption and optimisation remains unevenly spread in Uganda's rural urban areas. The internet sporadic use has remained largely skewed to the urban dwellers that seem empowered to use the technology notwithstanding efforts by service providers to make it ubiquitously available. This has created empowerment digital divide in the adoption and use of Internet in Uganda.

Empowerment digital divide negatively affects the transformation potential for development of commercial, educational and social sectors and above all improvement of living standards in Uganda (Flor, 2001; Rena, 2008; Mutula, 2001). Consequently, such areas lag behind in many aspects of life emphasising the drastic effect of digital divide and empowerment divide in particular.

Digital divide is the disparity between the technologically advantaged and the technologically disadvantaged communities and it is by and large seen as the gap in access to the internet and computing infrastructure (Foley, 2007; Arch & Rodrigues, 2002). Digital divide takes the form of economic divide, usability divide and empowerment divide. In this paper the empowerment divide is more emphasised on the basis between rural and urban areas of Uganda. Empowerment divide describes the ability to make full use of a given technology (in this case internet) to its full potential. According to Nielsen, (2006), the economic divide is a non-issue, but the usability and empowerment divides alienate huge population groups who miss out on the Internet's potential.

To support the growth of internet all over the country, the government of Uganda established a national backbone to ensure access of internet to different parts of the country. Such efforts seem to have catered for access but not empowerment concept of the digital divide. Upon this background, the paper sets to present derailing effect of empowerment digital divide in the adoption of internet in rural-urban areas of Uganda using the DOI as a guiding framework.

### **THEORETICAL BACKGROUND**

Technology adoption theories and models have been developed to explain the adoption of innovations (Ajzen, 1995, 1991; Davis, 1989; Davis et al., 1989; Mathienson, 1991; Moore, 1987; Rogers, 1962; Taylor and Todd, 1995). What stands out in these theories are guidelines they present towards which new technologies can be incepted in organisations. Some of these theories include;

Technology adoption model (TAM) proposed by Davis, (1989) states that the decision to adopt new technologies is influenced by the Perceived Usefulness and Perceived Ease of Use. Perceived ease of use refers to the degree to which a user believes that using a particular technology is free from effort while Perceived usefulness refers to the degree to which an individual perceives that using a system would enhance his or her job performance. TAM has been widely applied with extensive empirical support through validations, applications and replications (Davis et al., 1989; Mathienson, 1991).

Theory of Reasoned Action (TRA) by Fishbien and Ajzen, (1980) uses behavioural intention, attitude and behaviour to predict adoption. TRA suggests that people's behavioural intention depends on their attitude about the behaviour and subjective norms.

Theory of Planned Behaviour (TPB) by Ajzen, (1991) states that attitude; perceived behavioural control and subjective norm are determined by behavioural intention. Perceived behavioural control is the perception of ease/ difficulty to perform behaviour. Subjective norm refers to beliefs about whether society thinks that one should engage in an activity. The limitation of the cited theories is that they make it hard to predict individual adoption behaviour but rather adoption for group or organisation (Chau and Hu, 2001).

Unified theory of Acceptance and use of technology (UTAUT) by Venkatesh et.al ( 2003) explains user intentions to use new systems and subsequent usage behaviour. UTAUT presents variables of performance expectancy, effort expectance, social influence and facilitating conditions as direct determinants of usage intention and behaviour mediated by gender, age, experience and voluntariness (Venkatesh et al., 2003).

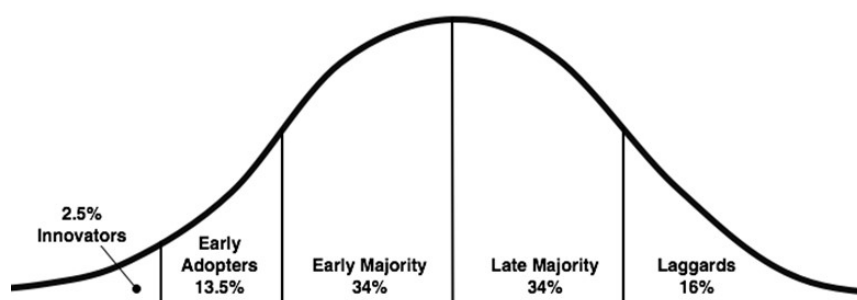
Diffusion of Innovations (DOI) by Rogers, (1995) presents determinants of innovation adoption as perceived attributes of an innovation, the voluntary nature of the decision to adopt it and the communication channels through which the innovation reaches the adopter. These induce adoption to take place at different rates over a period of time. However, Gatignon and Robertson, (1985) argue that there is no agreed consensus on adoption attributes because they vary with the type of innovation. DOI highlights communication as being important and thus individuals go through five stages in adopting an innovation:

Knowledge, Persuasion, Decision, implementation and confirmation. It is worth noting that communication has no scientific means of measurement and highly subjective to influence diffusion of innovations.

### RELATED WORK

DOI developed by Rogers (1995) is widely used to study adoption of ICTs, internet (Wolcott et al., 2001) and various internet-related applications (Black et al., 2001; Polatoglu and Ekin, 2001) as well as software products (Karahanna et al., 1999; Kautz and Larsen, 2000). Under DOI an innovation refers to an idea perceived to be new by an individual or other unit of adoption. Whereas adoption refers to the process by which an innovation is communicated through channels over time among the members of a social system.

The theory suggests that there are adopter categories of innovations which Rogers defines as individuals within a social system on the basis of innovativeness. He defines a total of five categories of adopters in diffusion research and postulates that the adoption of an innovation follows an „S“ curve when plotted over length of time. The categories of adopters are: innovators, early adopters, early majority, late majority, and laggards (Rogers 1995) as illustrated in the figure below;



Rogers (1995) further affirms that the most powerful indicators of adoption rate are the perceived attributes of an innovation which account for between 49% and 87% of the variance in the adoption rate. The perceived attributes are those intrinsic characteristics of innovations that influence an individual's decision to either adopt or reject an innovation. These include: the innovations relative advantage to existing solutions, compatibility level of the innovation with an individual's life, complexity or simplicity of the innovation, trialability or how easy an innovation may be experimented and lastly observability – the extent of the visibility of the innovation to others.

Kent et al., (2008) in their study of internet banking in Estonia found out that there was great influence of complexity, compatibility, relative advantage and perceived risk on consumers' adoption of internet banking in Estonia. Relative advantage and complexity presented the strongest influence on adoption of internet banking. Other scholars in the area of personal innovativeness have argued that personal traits impact differently on the users' perception to adopt an innovation (Lu et al., 2005; Yi et al., 2006).

### **Limitations of DOI**

Some aspects have not gotten attention of researchers that have used DOI, for instance Cultural differences and financial abilities of the intended adopters. In the developing countries where the majority of the targeted audience lives on less than a dollar a day *visa vi* the cost of technology, it is only fair that this aspect be considered in analysing adoption of technology in these regions as Kent et al, (2008) cites in Estonia that the consumers of online financial services have higher incomes and greater ICT empowerment.

Perceived risk of an innovation as a deterrent to innovation adoption has also been under looked (Kent et al., 2008; Ostlund, 1974; Polatoglu and Ekin, 2001; Tan and Toe, 2000). Risk of an innovation is important to consider if the innovation is to be propagated.

Lastly the empowerment concept is not emphasized as compared to economic and usability concepts of digital divide and thus a need to consider it, for instance through training.

### **METHODS AND SAMPLES**

Quantitative and qualitative approaches were used to collect data collected from Internet cafe owners and internet users. Additionally 300 questionnaires were administered and 285 (95% response) were returned. Data was processed and analysed using SPSS. Data was captured using a five-point likert scale ranging from strongly agree to strongly disagree. Cronbach Alpha was used to test the reliability while factor analysis was used to assess construct validity of initial research models and uncover any additional factors influencing empowered use and adoption of the internet. Bivariate analysis was used in establishing relationships between dependent and independent variables. Pearson statistic was used to determine the relationship between the spread of usage of the internet and each of the independent variables using (0.05) as the level of significance.

**Table 1: Variable factor loadings**

No	Dimensions	Factor Loadings
	<b>Relative Advantage (RA)</b>	
1	Internet is easier and convenient to use	0.728
2	The internet provides more access to information	0.726
3	The internet makes communication with friends and partners easier	0.624
4	The internet reduces the cost of doing business	0.682
5	I value speed in my business transactions	0.639
	<b>Complexity (COMP)</b>	
6	The Internet is easy to learn	0.879
7	I adopt to changes fast	0.861
8	The internet is simple	0.865
	<b>Compatibility</b>	
9	I like new gadgets	0.870
10	I like using new technology	0.807

NOTE: Rotated Component Matrix with Kaiser Normalization. Source: Primary data

### DATA ANALYSIS

Reliability was tested using Cronbach Alpha yielding values between (0.62 – 0.695), this meant moderate level of consistency in scales. Construct validity was assessed using Factor analysis to understand any additional factors influencing empowered internet adoption in rural urban areas. To determine the predictive powers of independent variables over the dependent variables multi linear regression analysis was conducted to ensure consistency with earlier studies that used DOI theory. Relative advantage, complexity, compatibility and trial- ability as variables of innovation adoption were analysed using factor analysis. Relative Advantage: Internet was perceived to provide cost effective connection to friends, family and business partners compared to traditional means. User perception of internet as having an edge over other means of connection induces adoption behaviour.

Complexity: Complexity refers to ease with which to work with a technology. User perception of ease to work with a technology creates positive impression to adopt such it. Compatibility describes social system, user characteristics, lifestyle and norms of such people. Social influence is important in determining acceptance and usage behaviour of new adopters of innovations (Malhotra & Galletta, 1999).

Trial-ability describes the element of testing an innovation with a limited basis. Once tried, user perception of failure of the innovation and uncertainty about it is reduced and thus confidence to adopt is built.

### FINDINGS AND DISCUSSION

Findings revealed that relative advantage, ease of use, compatibility and trial-ability strongly influence internet adoption by the users. This concurs with other works of technology adoption (Davis, Rogers, 1989). Table 2 presents regression analysis results showing the extent to which Relative Advantage, Complexity, Compatibility and trial-ability influence Internet adoption. Relative advantage and complexity pose the strongest influence.

**REGRESSION ANALYSIS**  
**Table 2: Regression Analysis**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.286	1.182		112.55	.000
Relative Advantage	.224	.080	.332	2.785	.000
Complexity	.006	.062	.281	.091	.002
Compatibility	.002	.069	.003	.034	.000
Trial-ability	.025	.057	.002	.023	.973

Source: Primary data

A critical view of the data shows that beta values of the standardised coefficients for relative advantage are 0.332 which shows a higher level of influence in affecting user decisions to adopt internet. This was so because users of internet found it a powerful and faster communication tool.

Complexity yielded 0.281 as per table 2 implying that ease or difficulty with which a technology is used highly influences its adoption. Internet was found easy to use after all it is such an interesting technology. This was so for the youth and elite class that works with the districts and are categorised as empowered group. However if one is not empowered to use internet it remains useless and unusable. Users should be empowered to use the technologies through trainings and availing them for use.

Trial-ability scored low (.002) predictability to adoption. This also indicates the lack of empowerment that exists to use internet. Empowerment lacks in terms of low skills, lack of support while using internet and illiteracy. This could however be amplified by the lack of free public internet access places or hot spots, for example tele-centers would exist at least in the different district centers but all are almost not existent.

### CONCLUSION

Internet is key driver in economic development for individuals, individuals and countries and as thus, writing about its uptake and modalities that surround it is worthwhile. Many theories and many researchers have studied technology acceptance, utilisation and optimisation, however while considering the digital divide, the element of empowerment is understudied.

It was therefore useful to give it a consideration.

It was worth noting that Relative advantage of the internet is a strong predictor of internet adoption in the rural urban areas. Young people use internet most due to perceived benefits it provides just as earlier cited studies proved so. Relative complexity plays a central role in the adoption process though not as significant as the latter just as confirmed from studies of Davies et al (1989) who concluded that users adopt a technology mainly because of the functions it provides and then easiness of benefiting from those functions.

Challenges still exist that have created empowerment digital didvide that need attention if interenet is to be wholesomely adopted in rural urban areas in Uganda. Such notable challenges

include: high cost of the internet, inadequate power supplies, poor connectivity, illiteracy, high costs of training, poverty, cultural factors among others. When attended to, such challenges would be addressed and then internet easily adopted by empowered users.

### RECOMMENDATIONS

The installed National backbone Infrastructure (NBI) should be operationalized to roll out fibre connections to last mile connections in different parts of the country to speed up access and fast connections.

Additionally Alternative sources of energy should be sought as alternative to electricity. For instance, green energy, use of Invertors among others. electricity remains a big challenge leading to little or no access to the internet at all in most of the rural urban areas in sub Saharan Africa.

Training centres should be provided at each sub county to equip the people with the necessary skills to use the computer and the internet. This will empower users with confidence to use internet and adopt it easily.

Lastly public-private partnerships should be established, and seek donors to extend the reach of the internet to the under privileged areas.

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