An Analytical Study on the Role of ICT in e-Governance

[1]Resham Dhillon, [2]Dr Vijay Laxmi

[1]Asstt. Prof., Guru Kashi University Talwandi Sabo, Punjab, India
[2]Prof., GKU Talwandi Sabo, Punjab, India

Abstract

The developments in the field of Information and Communication Technologies (ICT) have helped a lot to the governments and the people. The people have been able to use the services provided by the governments with ease. The government effort has been able to administer the services meant for the people efficiently after implementing ICT. The very first application using IT tools helped in managing information for planning and monitoring. With the introduction of internet/intranet the efficiency and effectiveness of government services improved.

Keywords

ICT, E-governance

I. Introduction of E-governance

E-Government is a multidimensional and complex concept. Several people have defined e-Governance differently. The crucial element of all the definitions is the use of ICT tools to make governing activities transparent and administer interrelationship with the customers and the business community. The success of e-government initiatives and processes are highly dependent on government's role in ensuring a proper legal framework for their operations (Valentina, 2004).

II. Objectives of the Study

1. To analyze the impact of ICT projects in reaching out to the population in the state of Punjab.
2. To find out the factors responsible for low participation of rural people in e-governance projects.
3. To find out local development priorities and perspectives, strategies for integration of e-governance services with public administration systems at district level.
4. To evolve a model that will effectively address the cornerstones of e-governance – participation, inclusion of various stakeholders for effective rural e-governance projects in the state of Punjab.
5. Develop an algorithm for assessment of e-governance projects.

This study used a mixed questionnaire, which comprised a number of sections all incorporating both open-ended and closed questions. These different sections sought responses on attitudes and opinions on factors that influence access to electronic government information and e-government adoption in Punjab. The Punjabi version was used to collect the data (as the target population is Punjabi speaking) while the English version remained for the documentation purposes of this study. A questionnaire draft was prepared using information from the literature and the research questions. This questionnaire draft was pre-tested using convenience sampling in order to increase the reliability and validity of the findings.

Table 1 provides a summary of above discussed factors that influence adoption in the context of e-government services with the corresponding sources of references.

Table 1: Factors Employed in Existing Studies to Examine Technology Adoption

Construct	Description	Possible Source	Sources
Performance Expectancy	The degrees to which individuals believe that using a system will help them improve their job performance and contain five variables: performance expectancy, extrinsic motivation, job-fit, relative advantage and outcome expectations.	Literature Questionnaire	Venkatesh et al.(2003); Compeau and Higgins (1995); Davis et al.(1989, 1992); DeLone and McLean (1992); Thompson et al.(1991).
Effort Expectancy	The degree of ease associated with the use of the system; effort expectancy is made up of: perceived ease of use, complexity and actual ease of use.	Literature Questionnaire	Maheshwari et. al. (2007); Siau and Long (2005); Rogers (2003); Venkatesh et al. (2003); Wilson (1996); DeLone and McLean (1992); Davis (1989).
Social Influence	The degree, to which peers influence use of the system, be it positive or negative.	Literature Questionnaire	AlAwadhi and Morris (2008); Venkatesh et al. (2003).
Facilitating Conditions	The degree to which an individual believes that an organizational and technical infrastructure exist to support the system. Facilitating conditions are comprised of three root constructs: perceived behavioral control, facilitating conditions and compatibility.	Literature Questionnaire	AlAwadhi and Morris (2009); Venkatesh et al. (2003); Venkatesh and Davis (2000).

Behavioral Intention to adopt	Intention is an immediate predictor of behavior (towards an innovation).	Literature Questionnaire	Verhagen et al. (2006); Carter and Belanger (2005); Venkatesh et al. (2003); Ajzen (1991); Davis (1989); Venkatesh et al. (2000; 2003); Wilson (1996); Davis et al. (1989).
Gender	Hierarchical separation between women and men embedded in both social institution and social practices.	Questionnaire	Dwivedi and Lal (2007); Choudrie and Papazafeiropoulou (2006); Choudrie and Lee (2004); Venkatesh et al. (2003); Jackson and Scott (2001); Morris and Venkatesh (2000); Venkatesh et al. (2000); Anderson and Young (1999); Gefen and Straub (1997).
Age	Different age categories of the adoption of innovation	Questionnaire	Dwivedi and Lal (2007); Choudrie and Papazafeiropoulou (2006); Venkatesh et al. (2003); Morris and Venkatesh (2000).
Education Level	Different demographic education level between citizens	Questionnaire	Dwivedi and Lal (2007); Choudrie and Papazafeiropoulou (2006); Choudrie and Lee (2004); Venkatesh et al. (2000); Burgess (1986).

III. Research Methodology

A quantitative research methodology using a survey questionnaire was selected as the primary data collection method for this study. A survey questionnaire was utilised as it is inexpensive, less time consuming and has the ability to provide both quantitative scale and qualitative data from a large research sample (Cornford and Smithson, 1997; Miles and Huberman, 1984; and Yin, 2005). Questions were compiled from information technology adoption literature to represent the constructs in the proposed research model and wording of the questionnaire was modified to fit the research context and background information collected. Thirty Five closed format questions were used limiting individual responses to multiple choice answers, for example, ranking using likert scale (5-point scale) and 'yes' or 'no' answers (Yin, 2008; Field, 2005). This enabled the information to be grouped and analyzed statistically (Leung, 2004). Since the answers can be influenced by the order the questions are presented, this was carefully planned with an introduction that explained who the researchers represent, purpose of the research and how and why the respondents were selected for the research, and the importance of their answers to the research. The main body contained topical questions ordered logically and in a manner non-threatening to respondents (Liinamaa et al., 2004). After the questionnaire was designed, a limited testing was done using hundred participants. This was important to improve the questions and to test respondents' comprehension and clarity before the actual survey was administered (Miles and Huberman, 1994). Additionally, the researchers employed interview as a content validity as a pre data collection validity. The pilot testing led to the removal of anomaly and modification to another. The survey questionnaire was distributed to a total of 100 participants in the month of January 2015.

IV. Data Analysis

The questionnaire offered a brief explanation of the purpose of the research to the participants and participation was on a purely voluntary basis. The questionnaires were completed in an environment free from external pressures and at the respondents own pace. The questionnaires were collected after a period of around 15 minutes from the respondents. The questionnaire was distributed in Punjabi. To check the responses of the questions, the first stage of the data analysis consisted of checking the responses and tagging them with a unique number.

V. Factor Analysis

In order to verify the construct validity, a factor analysis was conducted. Factor analysis using the principle components with vary max rotation was used to evaluate construct validity. The analysis revealed that the items are loaded properly in the construct discriminate validity (loaded with at least .40, and no cross loaded of at least than .40) (Straub et al., 2004; Dwivedi et al., 2006; Carter et al., 2008), and the factor analysis results satisfied analysis. This means that the collected data and the findings that were obtained from this instrument are valid and reliable. Findings from both the reliability test and the factor analysis confirm internal consistency of measures and construct validity.

VI. Reliability Test

The instrument validation processes that have been used in this study include content validity, construct validity and reliability. In order to have a reliable survey instrument and thus confidence in the research findings, the researcher employed content validity (interviews) as a pre-data collection validity, and a construct validity and reliability for post-data collection validity. These validity techniques are recommended standards in IS research (Straub et al., 2004). Cronbach's coefficient alpha value was assessed to examine the internal research consistency of measuring (Hinton et al., 2004; Field, 2005; Straub et al., 2004). Hinton et al., (2004) suggest four points of reliability, excellent (0.90 and above), high (0.70 - 0.90), high moderate (0.50 – 0.70), and low (0.50 and below). The reliability values reported in Straub et al.,'s (2004) study should be equal to or above (0.70) for a confirmatory study. The reliability for each construct is illustrated in Table 1. A high Cronbach's value for all constructs implies that they are internally consistent and measure the same content of the construct.

Table 1: Reliability of Measurements

Constructs	Sample Size	Cronbach's Alpha (α)	Type
Performance Expectancy	100	0.798	High Reliability
Effort Expectancy	100	0.828	Excellent Reliability
Social Influence	100	0.712	High Reliability
Facilitating Conditions	100	0.736	High Reliability
Behavioural Intention to Use	100	0.704	High Reliability

The aforementioned Table 1 illustrates Cronbach's coefficient alpha values that were estimated to test the internal consistency of the measure. Cronbach's results varied between (0.704) for the Behavioural Intention to adopt e-government and (0.828) for the Effort Expectancy constructs. Social Influence revealed a reliability of (0.712) and Facilitating Conditions possessed a reliability of (0.736). The remaining construct, namely Performance Expectancy had a Cronbach's score of (0.798). The findings show that all the alpha values indicates the study's instrument is reliable and the higher the Cronbach's (α) value of construct, the higher the reliability is of measuring the same construct (Dwivedi et al., 2006).

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