

E-Government: Study of Factors significantly affects Adoption and Acceptance in State of Punjab

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Abstract- The main objective of this research paper is to study e-government adoption from demand side perspective which examines the elements that affect the citizens to adopt and use e-government services (Reddick, 2005) (Carter L. &, 2005). These elements include trust, culture, perceived usefulness, and perceived ease of use, experience and attitude. Although, a large portion of the academic literature focus on supply side of e-government adoption, comparatively little is known about why and under what circumstances, citizens adopt e-government services. (Carter L. &, 2005) (Kumar, 2007) (Reddick, 2005) Hence, the central point of this research study is the citizen's adoptions of e-government i.e. demand side. After explaining the research objectives, this research paper discussed the literature review about the e-government adoption. Based on the literature review, eleven research hypotheses have been developed and a research model was proposed having seven constructs. These seven constructs and eleven hypotheses were tested by a structured questionnaire. Questionnaires were distributed to 200 participants. Of the 200 surveys collected, 22 were considered unusable because they had many missing response items. The remaining 178 surveys were used in the analysis. The findings indicate that all the constructs contribute significantly to citizen adoption of e-government services in the state of Punjab.

Keywords- Perceived Usefulness, Perceived Ease of Use, Trustworthiness, E-Government Adoption

1. INTRODUCTION

This research paper reports on empirical research into the citizen adoption of e-government services in state of Punjab. It is inspired by the problem of low level adoption of e-government by citizens in developing states such as Punjab. If the e-services are not used by the public, then these cannot enhance public service delivery. Therefore, the prime aim of this research is to obtain a better understanding of the factors that impacts the citizen's adoption of e-services. Recognizing such elements will refine the likelihood of growing the adoption rate of these services by deepening the knowledge about the factors which ease or hamper the process of adoption. The second inspiring factor of this study is the lack of empirical e-government services adoption research that emphasize on the adoption of such services in the Asian world including India. Therefore, filling this gap in the literature is one of the motivations for conducting this study in state of Punjab, with different cultural and social values.

2. RESEARCH OBJECTIVES

The major objectives of the research are concerned with answering the following questions-

1. What are the elements that affect the citizen's acceptance and adoption of e-government services in Punjab?
2. What is the relative importance of these elements and relationship among them?
3. How can the findings of this research accommodate Punjab in planning and up-taking e-government adoption?

3. LITERATURE OF E-GOVERNMENT-

There is no comprehensive accepted definition of e-government. E-government is also known as electronic government, electronic governance, digital government, online government, e-gov etc (Gronlund, 2004). There are many definitions of e-Government. (Fang, 2002) defines e-government as a way for governments to use the most innovative information and communication technologies, specifically web based internet applications, to offer the citizens and businesses with more suitable access to government information and services, to enhance the nature and status of services and to provide great chances to participate in democratic institutions and processes. World Bank defines E-government- "E-Government refers to the use by government agencies of information technologies such as Wide Area Network, the Internet and Mobile Computing that have the ability to transform relations with citizens, businesses and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth and /or cost reduction." (Palvia & Sharma, 2007). The United Nations and American Society for Public Administration (ASPA) (2002, p.1) define e-government as "using the internet and world wide web for providing government information and services to the citizens. Likewise, Heeks (2003, p.2) defines e-government as "the use of (ICT) information and communication technologies to upgrade the activities of

public sector organizations". Similarly Hernon et al. in (Jaeger, 2003) thinks that e-government "employs technology, especially the Internet, to enhance the access to and delivery of government information and services to citizens, businesses, government employees, and other agencies". On the contrary there are e-government definitions that not only highlight the use of technology, but also shed light on the purpose of such technology. For example, DGSNA (Digital Government Society of North America) defines e-government as "the use of information and technology to support and improve public policies and government operations, engage citizens and offer comprehensive and timely government services". In the same way, (Riley, 2007) defines e-government as "a central theme in information society at all levels such as local, national, regional and global as well. E-government has, or can transform public sector internal and external relationships through the use of ICT to promote greater accountability of the government, increase efficiency and cost effectiveness, and create greater constituency participation".

However, in spite of diversity of e-government definitions in literature, there is a common fundamental concept that underlies all these definitions- the consumption of web based tools and applications for public service delivery.

As there is no clear definition of Government to Citizen e-government adoption (Kumar, Mukerji, Butt, & Persaud, 2007) So, analysts refer to it as the 'intention' (Carter & Belanger, 2005) (Warkentin, Gefen, Pavlou, & Rose, 2002) or 'eagerness' (Gilbert, 2004) to use e-government applications. Warkentin et al. (2002, p.159) define e-government adoption as "the intention to 'engage in e-government', which encompasses the intentions to receive information, to provide information and to request e-government services". Likewise, Kumar et al. (2007, p.69) define it as "a simple decision of using, or not using, online services". For the motivation of this research study, e-government adoption refers to the desire or determination of citizens to use e-government information and services.

Growingly, governments all over the world have become aware about the significance of offering information and services through the internet. Therefore, many of the national governments around the world have an online website. As per the UN Global E-Government Readiness Survey conducted in 2005, 94 percent of the United Nations member states have an online presence (Nations, 2005). At the local government level, the rate of website adoption is high as well. In fact, an e-government survey conducted in the US described that 85.3 percent of municipal governments had their own websites (Moon, 2002).

In spite of broadcasting of e-government websites and the increasing speculation in e-services at both national and local government levels, various researchers reported the issue of low level citizen adoption of e-government services (Belanger F. &, 2008) (Carter & Belanger, 2004). (Dwivedi & Bharti)

Researchers found that citizens are still more likely to use conventional methods in spite of growing rate of investments in e-services. For example phone calls or in-

person visits, than the internet to interact with the government. Kumar et al. (2007, p.63) also emphasize the same issue when they discovered that the rate of adoption of e-government has worldwide fallen below suppositions.

The prospective of ICT in impacting the live of the rural poor in a number of ways is now being extensively identified. Identification of prospective comes from a few successful tele-center pilots in some developed and developing countries. (Sinha, 2006) emphasized that in last twenty years, India has been gone through dramatic increase in the development and the spread of information and communication technology along with the emergence of the user friendly computing systems and networking. (Bhatnagar & Schware, 2000) provides key insights and practical guidelines on – ways to successfully implement e-government projects, selecting application areas, project designs, strategies and their implementation, benefits and impact of e-government on public sector reform, poverty reduction and empowerment methodology for evaluating e-government projects and overall strategy formulation.

State of Punjab is an agricultural based state and most of the people live in villages, therefore by offering ease of use of the government services can help in enhancing their economic and social life. According to the Dataquest- IDC e-governance satisfaction study, state of Punjab has 16th rank on the basis of satisfaction level and 5th rank on the basis of e-readiness. Government of Punjab is implementing the e-services in a quickly way (Singh & Subhash, 2013).

(Vikram & Subhas, June 2012) states that government of state of Punjab has done significant work in development of e-governance. People of Punjab are getting great advantages from the e-services offered by Punjab government. People are unable to learn IT because low rate of IT literacy level. Research shows the necessity of awareness about the computer and internet among the citizens for the effective implementation of e-governance

4. RESEARCH MODEL AND HYPOTHESIS

Based on the literature review, the following research hypotheses have been developed. These hypotheses will be tested in this study to empirically validate the proposed research model of e-government adoption in Punjab. The research model that guides this study is depicted in Figure 1.

- H1-** There is straight and definite relationship between perceived usefulness and the behavioral intentions to use e-government services.
- H2-** There is straight and definite relationship between perceived usefulness and the attitude towards using e-government services.
- H3-** There is straight and definite relationship between perceived ease of use and the perceived usefulness of e-government services.
- H4-** There is straight and definite relationship between perceived ease of use and the attitude toward using e-government services.
- H5-** There is straight and definite relationship between attitude and the behavioral intentions to use e-government services.

- H6-** There is straight and definite relationship between perceived usefulness and the culture towards e-government services.
- H7-** There is straight and definite relationship between culture and the perceived ease of use of e-government services.
- H8-** There is straight and definite relationship between perceived public value and the perceived usefulness of e-government services.
- H9-** There is straight and definite relationship between perceived public value and the perceived ease of use of e-government services.

- H10-** There is straight and definite relationship between trustworthiness and the perceived usefulness of e-government services.
- H11-** There is straight and definite relationship between trustworthiness and the perceived ease of use of e-government services.

The research model has seven constructs. The definition of these constructs are summarized as follows in Table 1

Figure 1: Research Model

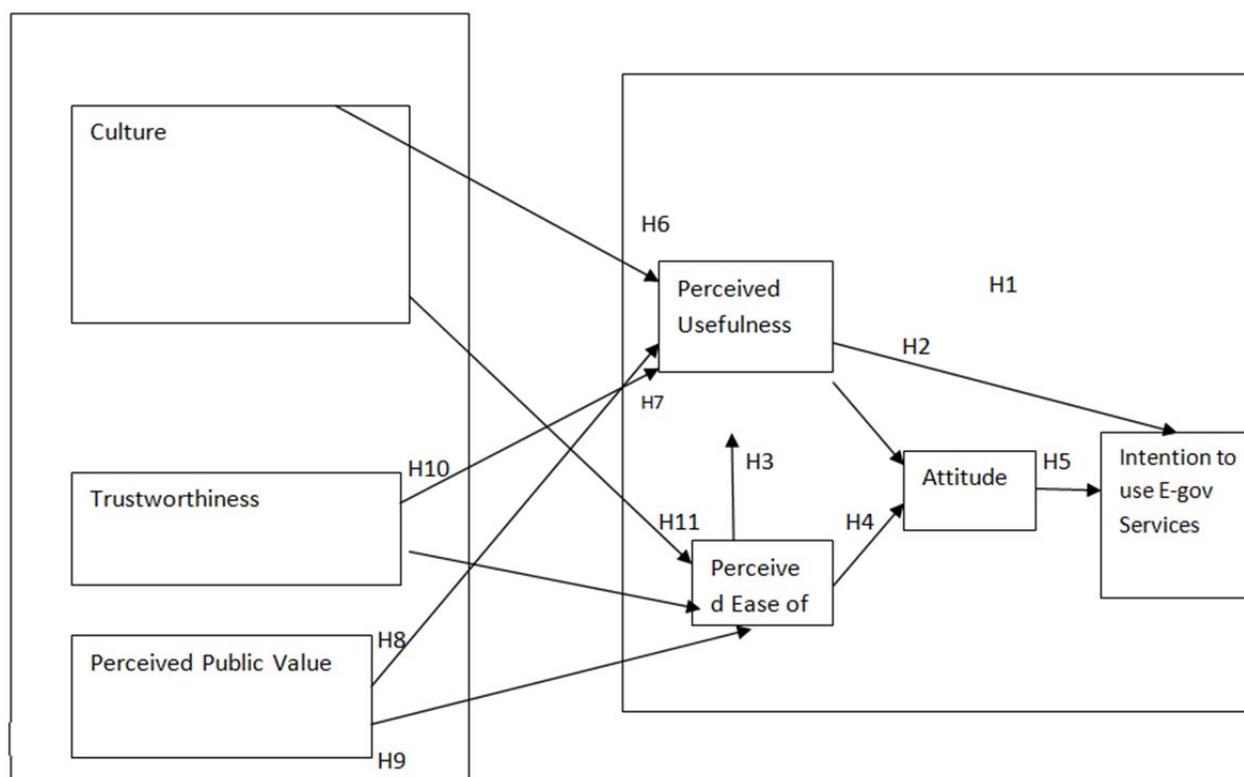


Table 1

Construct	Definition	Reference
Perceived Usefulness	The degree to which a person feels that using a specific system would improve his/her job performance.	<i>Davis(1989, p.320)</i>
Perceived Ease of Use	The degree to which a person feels that using a specific system would be free of effort.	<i>Davis(1989, p.320)</i>
Perceived Public Value	Public Value refers to the value created by government through services, laws regulations and other actions	<i>Kelly et al.(2002, p.4)</i>
Trustworthiness	As the word itself implies, an exchange partner is trustworthy when it is worthy of the trust of another. An exchange partner worthy of trust is one that will not exploit another’s exchange vulnerabilities.	<i>Barney and Hansen (1994, p.176)</i>
Attitude	An individual’s positive or negative feelings (evaluative affect) about performing the target behavior	<i>Fishbeinand Ajzen, (1975, p.216)</i>
Culture	The collective programming of the mind which distinguishes the members in one human group from another	<i>Hofstede’s (1980, p.21)</i>
Behavioral Intention to Use	Strength of one’s intention to perform a specified behavior	<i>Fishbein and Ajzen (1975, p.216)</i>

5. DATA ANALYSIS

5.1 DESCRIPTIVE STATISTICS- Questionnaires were distributed to 225 participants randomly chosen from Thapar University students, members of Patiala Bar Council and internet users in Punjab. A total of 200, (88.88%) of surveys were returned. Of the 200 surveys collected, 22 were considered unusable because they had many missing response items. The remaining 178 surveys were used in the analysis. 106 (59.6%) of the respondents from the e-government adopters were male and 72 (40.4%) were female. This indicates that the percentage of female who adopt e-government services in Punjab is higher than the percentage of male.

The highest age range was 26-45 with 55%. Followed by both (21-25) and (46-55) group with 25.8% and 14.0%. The percentage of the age group from above 55 years was 5.1%. The highest percentage i.e. 80.3% of the respondents was from PG degree level. 19.1% of the respondents were from Bachelor degree level, while .6% of the respondents were from College degree level. 52.2% of the respondents belong to Hindu religion and 47.8% of the respondents were from Sikh religion. The majority of the respondents were Private Employee with 52.8%. The percentage of Govt. Employee and students are 27.0% and 18.5% respectively, whereas the percentage of Not Employed was 1.7%. Out of 178 respondents 69.7% of the respondents use Internet several times a day and 10.1% respondents used the Internet about once a week and few times a week as well. On the other hand 6.7% of the respondents used the Internet a few times a month, whereas 3.4% of the respondents used the Internet once in a month. The highest percentage i.e. 30.3% of the respondents used the e-government services once a month. 24.7% of the respondents used the e-government services a few times a week. 23.6% of the respondents used e-government services a few times a month. 9.0% of the respondents used the e-government services about once a day and only 7.3% of the respondents used e-government services several times a day, whereas 5.1% of the respondents are revealed as non-users

Table 2 Respondent Background.

		Frequency	Percent
Gender	Female	106	59.6
	Male	72	40.4
Age	21-25 years	46	25.8
	26-45 years	98	55.1
	46-55 years	25	14.0
	Above 55 years	9	5.1
Education	College degree	1	.6
	Bachelor degree	34	19.1
	PG degree	143	80.3
Religion	Hindu	93	52.2
	Sikh	85	47.8
Profession	Student	33	18.5
	Government employee	48	27.0

	Private employee	94	52.8
	Not employed	3	1.7
Internet Usage	Once a month	6	3.4
	A few times a month	12	6.7
	A few times a week	18	10.1
	About once a day	18	10.1
	Several times a day	124	69.7
How often access E-Government Services	Once a month	54	30.3
	A few times a month	42	23.6
	A few times a week	44	24.7
	About once a day	16	9.0
	Several times a day	13	7.3
	None	9	5.1

A reliability test was carried out using Cronbach’s Alpha, which measures the internal consistency of research constructs. The recommended minimum acceptable limit of reliability “alpha” for exploratory study is .60. The result of alpha values for all research constructs are above recommended value except Culture and IOU as shown in table 3. Therefore, it can be concluded that the scale has internal consistency and reliability.

Table 3: Cronbach’s Alpha for Research Constructs

Scale	No. of Items	Cronbach’s Alpha
Attitude	5	.604
Culture	3	.562
Ease of Use	4	.788
Intention to Use	2	.517
Perceived Public Value	4	.706
Trustworthiness	4	.753
Usefulness	4	.685
Total	26	

5.2 T-TEST AND ONE-WAY ANOVA- First, the Independent T-test to examine if there are any differences between male and female citizens in terms of adopting and accepting e-government regarding all the variables such as Usefulness, Ease of Use, Attitude, Trustworthiness, Perceived Public Value, Culture and Intention of Use. Table 7.3 shows that for Usefulness variable (t-value=-.515, p value=.607), Ease of Use (t-value= 1.413, p value=.159), Attitude (t-value= .030, p value=.976), Trustworthiness (t-value= 1.494, p value=.137), Perceived Public Value (t-value=.486, p value=.627), Culture (t-value= .593, p value=.554) and Intention of Use (t-value=-

.585, p value=.559). The P-value to all the variables are >.05 i.e. non-significant. Thus, there are no-differences between male and female Punjabi Citizens in terms of

accepting and adopting the e-services in relation to above said variables, also mentioned in Chapter 4, section 4.3.

Table 4 Independent Sample T-test

Variables	Gender	N	Mean	St. Dev	Standard Error Mean	t-value	Sig. (2-tailed)
Usefulness	Male	106	3.9953	.40382	.03922	-.515	.607
	Female	72	4.0382	.62329	.07345		
Ease of Use	Male	106	3.9292	.60233	.05850	1.413	.159
	Female	72	3.7887	.71170	.08446		
Attitude	Male	106	4.1321	.39220	.03809	.030	.976
	Female	72	4.1296	.61934	.07299		
Trustworthiness	Male	106	3.9505	.50993	.04953	1.494	.137
	Female	72	3.8160	.69072	.08140		
Perceived Public Value	Male	106	3.9245	.59479	.05777	.486	.627
	Female	72	3.8785	.65541	.07724		
Culture	Male	106	3.4264	.58819	.05713	.593	.554
	Female	72	3.3750	.53491	.06304		
Intention Of Use	Male	106	4.1085	.58961	.05727	-.585	.559
	Female	72	4.1597	.56185	.06622		

Table 5.1 One Way ANOVA test for demographic information

ANOVA for Age					
Construct	Sum of Squares	df	Mean Square	F*	Sig.
Usefulness	2.326	3	.775	3.177	.025
EOU	1.520	3	.507	1.203	.310
Attitude	4.548	3	1.516	6.791	.000
Trustworthiness	3.399	3	1.133	3.366	.020
PPV	8.609	3	2.870	8.445	.000
Culture	5.841	3	1.947	6.654	.000
IOU	2.673	3	.891	2.751	.044

ANOVA for Education					
Construct	Sum of Squares	df	Mean Square	F*	Sig.
Usefulness	1.750	2	.875	3.557	.031
EOU	.041	2	.020	.048	.953
Attitude	.466	2	.233	.951	.388
Trustworthiness	.652	2	.326	.931	.396
PPV	6.995	2	3.498	10.077	.000
Culture	7.331	2	3.665	12.979	.000
IOU	5.188	2	2.594	8.431	.000

Table 5.2

ANOVA for Profession					
Construct	Sum of Squares	df	Mean Square	F*	Sig.
Usefulness	4.813	3	1.604	6.985	.000
EOU	2.193	3	.731	1.751	.158
Attitude	2.736	3	.912	3.904	.010
Trustworthiness	3.469	3	1.156	3.440	.018
PPV	13.855	3	4.618	14.913	.000
Culture	8.933	3	2.978	10.835	.000
IOU	10.066	3	3.355	11.924	.000

ANOVA for Internet Usage					
Construct	Sum of Squares	df	Mean Square	F*	Sig.
Usefulness	5.441	4	1.360	5.982	.000
EOU	2.981	4	.745	1.795	.132
Attitude	1.686	4	.421	1.749	.141
Trustworthiness	6.008	4	1.502	4.645	.001
PPV	5.296	4	1.324	3.668	.007
Culture	8.048	4	2.012	7.146	.000
IOU	3.421	4	.855	2.661	.034

Table 5.3

ANOVA for E-Government USage					
Construct	Sum of Squares	df	Mean Square	F*	Sig.
Usefulness	5.206	5	1.041	4.525	.001
EOU	9.114	5	1.823	4.775	.000
Attitude	4.687	5	.937	4.166	.001
Trustworthiness	6.119	5	1.224	3.770	.003
PPV	13.434	5	2.687	8.510	.000
Culture	5.137	5	1.027	3.424	.006
IOU	8.211	5	1.642	5.558	.000

Table 5.1 shows that demographic attribute age has no significant effects on user’s responses on the dimensions “Ease of Use (EOU) and Intention of Use (IOU)” since the p-value>0.05. On the other hand, age factor has a significant effect on the other dimensions such as “Usefulness p=.025”, “Attitude p=.000”, “Trustworthiness p=.020”, “Perceived Public Value (PPV) p=.000”, and “Culture p-.000”, since all these p-values are less than .05, this indicates that age factor has a significant effect on Usefulness, Attitude, Trustworthiness, PPV and Culture. Similarly, demographic attribute education has no significant effects on user’s responses on the dimensions “Ease of Use (EOU) p = .953”, “attitude p= .388”, “trustworthiness p=.396”, since the p-value>0.05. On the

other hand, education factor has a significant effect on the other dimensions such as “Usefulness $p=.031$ ”, “Perceived Public Value (PPV) $p=.000$ ”, “Culture $p=.000$ ” and “Intention of Use (IOU) $p=.000$ ”, since all these p-values are less than .05, this indicates that education factor has a significant effect on Usefulness, PPV, Culture and IOU.

Table 5.2 shows that demographic attribute profession has no significant effects on user’s responses on the dimensions “Ease of Use (EOU)” since the $p\text{-value}>0.05$. On the other hand, profession factor has a significant effect on the other dimensions such as “Usefulness $p=.000$ ”, “Attitude $p=.010$ ”, “Trustworthiness $p=.018$ ”, “Perceived Public Value (PPV) $p=.000$ ”, “Culture $p=.000$ ” and “Intention of Use (IOU) $p=.000$ ”, since all these p-values are less than .05, this indicates that profession factor has a significant effect on Usefulness, Attitude, Trustworthiness, PPV, Culture and IOU. Similarly, demographic attribute Internet Usage has no significant effects on user’s responses on the dimensions “Ease of Use (EOU)” and Attitude since the $p\text{-value}>0.05$. On the other hand, Internet Usage factor has a significant effect on the other dimensions such as “Usefulness $p=.000$ ”, “Trustworthiness $p=.001$ ”, “Perceived Public Value (PPV) $p=.007$ ”, “Culture $p=.000$ ” and “Intention of Use (IOU) $p=.034$ ”, since all these p-values are less than .05, this indicates that Internet Usage factor has a significant effect on Usefulness, Trustworthiness, PPV, Culture and IOU.

Table 5.3 shows that E-government Usage factor has a significant effect on all the dimensions such as “Usefulness $p=.001$ ”, “Ease of Use (EOU) $p=.000$ ”, “Attitude $p=.001$ ”, “Trustworthiness $p=.003$ ”, “Perceived Public Value (PPV) $p=.000$ ”, “Culture $p=.006$ ” and “Intention of Use (IOU) $p=.000$ ”, since all these p-values are less than .05, this indicates that E-government Usage factor has a significant effect on Usefulness, Ease of Use, Attitude, Trustworthiness, PPV, Culture and IOU.

6. CONCLUSION

One of the research questions was concerned with how the findings of this research study could help the state of Punjab and its adjacent areas in similar situations in the planning and increasing the rate of e-government adoption. This research provides e-government officials and policy makers with a practical and communicable checklist of cultural, social, political and technological factors, which are combined flawlessly and that cover the citizen’s perspectives. This checklist should be considered as the foundation for any e-government project. The survey conducted to complete this study disclosed that the cultural, trustworthiness, perceived public value, perceived usefulness, perceived ease of use and the attitude-contribute significantly to citizen adoption of e-government services in the state of Punjab. Since the state of Punjab is facing the obstacle of low level of citizen adoption of e-government services, the results of study are believed to help government officials and policy makers from Punjab and other states with similar characteristics, to better position their strategies to encourage faster and more

efficient adoption of these services. The findings of the study suggested that e-government officials need to pay attention to the dominant culture. For example, by offering the necessary training to reduce the anxiety could lead to better acceptance of IT/IS applications such as e-government.

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