

## **ICTs for Effective Governance: Examining the Connection between Content Availability and User Awareness in Public Service Deliveries**

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### **Abstract**

The paper explored the association among content availability and effectiveness of public service deliveries through ICTs. A moderation model was also proposed in the aforesaid relationship by examining the moderating effect of awareness. Statistical tools like factor analysis, correlations, multiple regressions and Process MACRO Model 1 were used for obtaining the results from a primary dataset of 109 respondents from rural area of Haryana. The results discovered a significant and positive effect of content delivery on effectiveness. Findings further disclosed the moderating effect of awareness between the association of content delivery and effectiveness public service deliveries through ICTs. The indirect effect of content delivery on effectiveness was also found significant at various levels of awareness and stronger at higher level of awareness.

**Keywords:** Content availability, effectiveness, awareness, public service deliveries, ICTs.

### **Introduction**

E-government has been defined in the World Bank website (2005) as: “information technologies... that have the ability to transform relations with citizens, businesses, and other arms of government... (and) 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... benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.”

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The study of Heeks (2001) indicated the significant role of information and communication technologies in relation to achieve good e-governance objectives. The study of Sachdeva (2002) indicated that the success of e-governance can be attained by improving the content availability and reducing the barriers of e-governance. In addition, the study identified a number of difficulties related to e-governance efforts, including funding, change management, privacy, confirmation, and interoperability; service delivery; standardisation; technical issues; and the use of local languages. So, the current study has tried to explore empirically the impact of content availability on effectiveness of public service deliveries through ICTs.

Awareness among citizens about public service delivery through ICTs has become a major concern nowadays (Khasanabis *et al.*, 2021). The study further indicated that if general public is more aware about the content delivery of e-government portal, it will lead to achieve the overall effectiveness in relation to time and cost. In contrast to that, citizens with low level of awareness find it difficult to use e-government portal for public service deliveries through ICTs. Understanding the need, the current study has tried to explore the moderating effect of awareness in the relationship of content delivery and effectiveness of e-governance public service deliveries.

The available literature has shown that there might be a relationship between content availability and effectiveness of public service deliveries through ICTs (Heeks, 2001; Sachdeva, 2002) but no empirical testing of the relationship has taken place. Also, so far our knowledge is concerned; there is no study which has revealed moderating effect of awareness in the association of proposed variables. Thus, the study aims to assess the role of content availability and awareness in increasing the effectiveness of public service deliveries through ICTs.

## **Review of Literature**

### **Effect of content delivery on effectiveness of public service delivery through ICTs**

The study of Heeks (2001) indicated the power of ICTs in form automation, information and transformation as three basic change potential which can bring two major benefits to governance in form of development. Carrying ICTs to work can individual or unified benefit the government

in form of efficiency and effectiveness. The study of Sachdeva (2002) indicated that the success of e-governance can be attained by “e-readiness” in form of reducing the barriers of e-governance, strengthening the infrastructural inadequacies and drivers to e-governance.

The study of Kiran (2013) has stated that for effective functioning of e-government public service deliveries, content delivery is the prerequisite. The study further stated that it is important to have a simplified designing and developing of the e-government system, so that, general public may feel easiness during their transactions. In the same line of thought, there are a few studies who indirectly portrayed the role of better content delivery of e-governance for evolving into e-inclusive systems (Sachdeva, 2002; Gupta and Jana, 2003; Koneru, 2007). On the basis of above literature, the following hypothesis was proposed:

*H1*: Content delivery has a positive and significant impact on effectiveness of e-governance public service deliveries.

### **Moderating effect of awareness**

In the study of Evans and Yen (2006), positive changing attitudes of citizens were shown in context of increasing information and communication technologies for government countries. This change in attitude is important for both government as well as citizens, as gives both time and cost effectiveness. Government can easily collect the data at one time from all the citizens which can be used to process the information more efficiently and can also provide customer satisfaction. The study of Roy (2008) stated, “It is not difficult to succumb to cynicism or pessimism (or both) when envisioning e-Government's prospects in the poorest regions of the world, notably Sub-Saharan Africa” (p. 329). He addressed a big gap to study the e-government projects in developing countries specifically in India and how these ICTs based public service deliveries help in overall development and maintenance of democratic societies so that the same can be implemented in African countries.

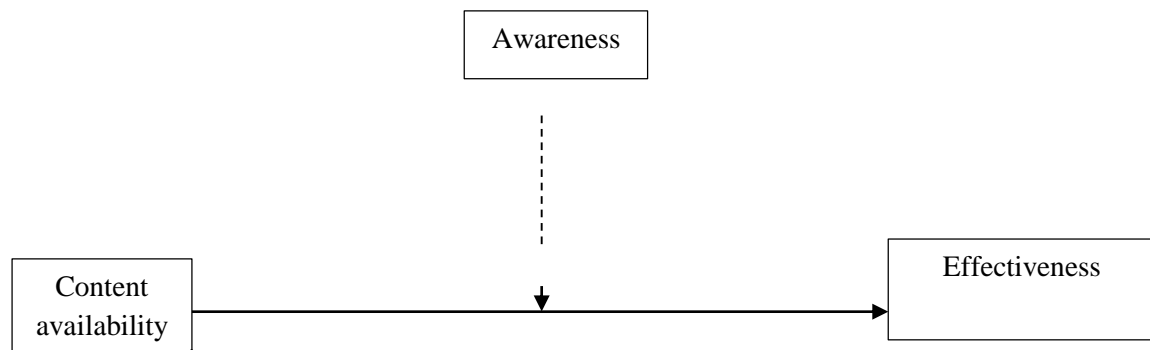
Nowadays, Indian government is trying to figure out the major factors that can lead to improve content delivery and effectiveness of e-government systems. The study of Heeks and Santos (2009) portrayed a major strand in form of current public innovation in e-government system. The study

showed the reason of poor adoption rates i.e. due to some of e-Gov project failures. The major challenge e-Gov systems faced is the awareness challenge. The study of Kiran (2013) outlined awareness as one of the major ingredient in improving this relationship. The study of Belwal and Zoubi (2008) also portrayed how people perceive about e-government schemes and services if they are adequately aware. The study dictated that people having high level of awareness are more prone to avail e-government schemes and services. In the same line of thought, the study of Khasanabis *et al.*, (2021) theoretically portrayed the importance of awareness among citizens about public service deliveries and its significant impact on the effectiveness of e-government systems. In consideration to the above literature, the following hypothesis was proposed:

*H2a.* Awareness moderates the association of content delivery and effectiveness of e-governance public service deliveries.

*H2b.* The effect of awareness on content delivery and effectiveness relationship is conditional in such a way that the association is stronger with high-as opposed to low levels of awareness among public.

**Figure 1: Hypothesized research model**



**Note:** Awareness is used as a moderator.

**Research methods***Sample and data collection*

In order to collect the primary data, unstructured questionnaire was administered to 200 respondents from rural area of state Haryana. However questionnaire was confirmed via pilot survey on 50 respondents whose responses were not counted in the study. Afterwards, 200 questionnaires were distributed out of which 132 responses were received including 27 incomplete responses, so dropped. So, the usable responses remained 109 received from citizens of rural area of Haryana, India (See Table 1). The response rate is 54.5 percent which is considered adequate for social science research (Alreck and Settle, 1995).

**Table1. Sample characteristics**

Variables	Categories	Count	Percentage (%)
1. Nature	Manufacturing	91	83.49
	Service	18	16.51
	Total	109	100
3. Sector	Public	17	16.04
	Private	92	83.96
	Total	109	100
4. Gender	Male	70	64.22
	Female	39	35.73
	Total	109	100
5. Qualifications	Basic education	59	54.12
	Senior Secondary	35	32.11
	Bachelors	15	13.77
	Total	109	100

**Notes:** Count means number of respondents

### *Measures*

*Content availability (Independent variable):* Content availability was measured using three items including “There is a separate section for help”, “There is a separate section on frequently asked questions” and “There is availability of site map”. For this scale, the Cronbach's alpha was 0.787.

*Awareness (Moderating variable):* To measure awareness, three items were taken including “I have enough information about e-government portal and its benefits”, “E-government portal keeps all the promises and commitments of its users” and “I am aware about the fees obligated to avail any service through e-government portal”. Cronbach's alpha for the scale was 0.768.

*Effectiveness (Dependent variable):* To measure effectiveness, three items were taken including “I am satisfied with the quality of service”, “There is a continual improvement in public service delivery” and “I found guidelines on application process useful”. The scale's Cronbach's alpha was 0.761.

*Control variables:* The variables used in this paper as control variables were nature of organization under which respondent is currently working, sector and gender of the respondents.

### **Analysis of data and testing of hypotheses**

#### *Initial analysis*

To evaluate the loading of the observed items, an exploratory factor analysis was performed on all 9 items. After applying varimax rotation with eigenvalues greater than one, the results showed 3 variables. After that, confirmatory factor analysis was performed on all 3 components, and the findings showed a model that fit the data well (CMIN/DF = 4.586; CFI = 0.919; GFI = 0.929; TLI = 0.873; NFI = 0.892; RMSEA = 0.08). After that, Cronbach's alpha values were discovered to be within the acceptable range of 0.761 to 0.787 (Hair *et al.*, 2010). After that, the composite reliability (CR) values were examined, average variance was extracted (AVE), and AMOS 21 was used to determine the convergent validity of all nine items. According to Hair *et al.* (2010), the acceptable CR value for each component was found to be 0.70. According to Hair *et al.* (2010) (See Table 2), calculated values of AVE were discovered to be greater than the permissible value of 0.50. Then, the discriminant validity of the components was assessed by comparing AVE with the maximum

shared variance (MSV) and average shared variance (ASV), and it was discovered that AVE values were greater than both of MSV and ASV (Fornell and Larcker, 1981; Hair *et al.*, 2010).

**Table 2: Factor loadings, reliability, and validity values for measurement variables**

Factors and measured items	EFA loadings	CFA loadings	Cronbach's alpha	Composite reliability	Average variance extracted
<b><i>Content Availability</i></b>			<b>0.787</b>	<b>0.743</b>	<b>0.500</b>
There is a separate section for help.	0.733	0.753			
There is a separate section on frequently asked questions.	0.722	0.820			
There is availability of site map.	0.859	0.513			
<b><i>Awareness (Moderator)</i></b>			<b>0.768</b>	<b>0.800</b>	<b>0.501</b>
I have enough information about e-government portal and its benefits.	0.643	0.760			
E-government portal keeps all the promises and commitments of its users.	0.956	0.672			
I am aware about the fees obligated to avail any service through e-government portal.	0.950	0.707			
<b><i>Effectiveness</i></b>			<b>0.761</b>	<b>0.774</b>	<b>0.536</b>
I am satisfied with the quality of service.	0.733	0.832			

There is a continual improvement in public service delivery. 0.722 0.682

I found guidelines on application process useful. 0.852 0.666

**Notes:** CMIN/DF = 4.586; CFI = 0.919; GFI = 0.929; TLI = 0.873; NFI = 0.892; RMSEA = 0.08

### *Descriptive statistics and analysis of correlation*

Means, standard deviations, correlations and discriminant validity were shown in Table 3. The correlations among variables were checked to assist the hypotheses and found significant.

**Table 3: Means, standard deviations and correlations**

Variables	No.	Mean	SD	1	2	3	4	5	6
of item s									
Nature	-	1.82	0.314	-					
Sector	-	1.84	0.364	-0.151	-				
Gender	-	1.36	0.482	-0.227**	0.215*	-			
Content availability	3	4.21	0.432	0.175*	-0.038	-0.119	<i>0.707</i>		
Awareness	3	3.74	0.571	-0.021	-0.076	0.100	-0.163	<i>0.708</i>	
Effectiveness	3	3.80	0.442	-0.003	0.055	-0.286**	0.246***	0.204*	<i>0.732</i>

**Notes:** \*\*\*  $p \leq 0.001$ ; \*\*  $p \leq 0.01$ ; \*  $p \leq 0.05$ ; discriminant validity is shown diagonally in italics

### **Hypotheses testing**



*Regression analysis*

In order to check the hypothesis impact of independent variable on dependent variable was checked by using Hayes' (2013) PROCESS Macro in SPSS. Table 4 showed this direct relationship. It indicates that this direct relationship has significant direct effect by discovering the significant and positive effect of content availability on effectiveness. Hence, *H1* was fully supported.

**Table 4: Results of multiple regression analysis**

Independent variable	Effectiveness	
	Model 1	Model 2
Nature	-0.084	-0.136
Sector	0.140	0.118
Gender	-0.298**	-0.277**
Content availability	-	0.229**
$R^2$	0.099	0.147
Adjusted $R^2$	0.074	0.114
$F$ Statistics	3.860**	4.486***
N	109	109

**Notes:** \*\*\*  $p \leq 0.001$ ; \*\*  $p \leq 0.01$ .

*Moderation analysis*

In order to test moderation, Model 14 of Hayes' (2013) was used. Results displayed the stepwise interaction and conditional indirect effects. Table 5 showed the interaction of content availability and awareness is significant (0.493,  $p \leq 0.001$ ) and supported *H2a*. The graphical representation of moderating effect of awareness was shown in the below figure. It explained that the relationship of content availability and effectiveness would be stronger with high level of awareness among citizens as compared to the low level.

**Table 5: Moderating effect of awareness between the relationship of content availability and effectiveness of public service delivery through ICTs**

Variables	$\beta$	$R^2$	$\Delta R^2$	F-value
Step 1		0.170		10.083
Content Availability	0.275**			
Awareness	-0.061			
Step 2			0.081	18.248
Content	0.493***			
Availability×Awareness				

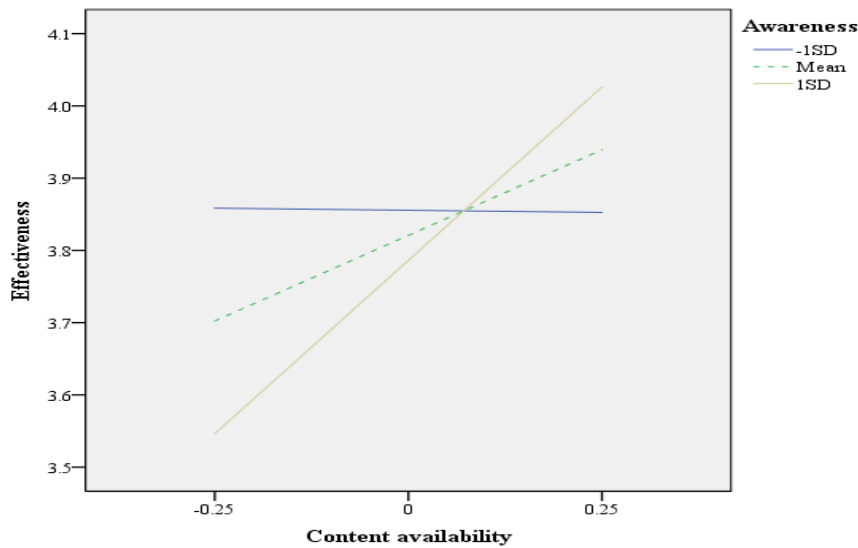
**Notes:** \*\*\* $p \leq 0.001$ ; \*\*  $p \leq 0.01$ .

Table 6 showed conditional indirect effects of the model. According to the table, the impact of content accessibility on effectiveness was best at the highest degree of awareness (+1 SD) and weakest at the lowest level of awareness (-1 SD) (Conditional effects are depicted in Figure 2). Thereby, *H2b* was supported.

**Table 6: Moderation index and conditional effects of content availability on effectiveness at different values of awareness ( $\pm 1$  SD)**

Independent	Awareness	Conditional effect	BootSE	Bootstrapping	
				Lower	Upper
Content availability	-1SD (0.571)	-0.007	0.091	-0.205	0.192
Content availability	Mean (0)	0.275	0.084	0.109	0.440
Content availability	+1SD (0.571)	0.556	0.112	0.334	0.778

**Figure 2: Conditional effects of content availability on effectiveness at different values of awareness ( $\pm 1$  SD)**



## Discussion and conclusion

The study by addressing the impact of content availability on effectiveness of public service deliveries through ICTs adds a new more insightful empirical research in the existing literature. The direct relationship indicates that having a correct content on e-government portal is one of the key factors that induce effectiveness of these deliveries for citizens. It dictates a very crucial understanding empirically that government should focus on creating such e-platform for citizens who can help them understanding the whole process and status of their services availed. Availability of necessary content will help in increasing the satisfaction, continual improvement and quality of services, creating the overall effectiveness.

Awareness has been included as a new dimension in form of moderator in the relationship of content availability and effectiveness. In Figure 2 of moderation analysis, the relationship of content availability and effectiveness is stronger at higher level of awareness among rural citizens of Haryana. However, the impact of awareness will affect strongly in case of high level of content availability as compare to lower level. This is the rationale that in earlier stages the higher level of awareness provided steered low affect on effectiveness when low content availability is there. Afterwards, with improvement in content availability, the presence of higher level of awareness shows higher effect on effectiveness of availing public service deliveries through ICTs.

The implications of the study are advantages for management as well as practitioners. Firms should focus on increasing awareness among citizens to generate effectiveness in case of high level of content availability. Government can aware the citizens by promoting the e-government portal and its usage in relation to cost and time effectiveness, conducting special camps and workshop for making people aware in rural area of Haryana.

### **Limitation and future research direction**

Study is inhibited with few limitations in implementation. The first limitation is related to research design. The data collected for this paper is cross sectional in nature whereas it is recommended to future studies to collect the data through longitudinal design. Second constraint is related to the size of sample. Results would be much clearer if sample size would be increased. Third, we have checked awareness as moderator in the direct effect of content availability and effectiveness. Future researches are suggested to check it as an intermediating variable also. Not only this, further researchers should check the relationship of content availability on effectiveness by considering perception of general public, avoidance and gender as probable moderators for a better understanding.

### **Acknowledgement**

This is here to address that this research paper is the outcome of the funded research project entitled **“Effectiveness and Accessibility of public service delivery across Information and Communication Technologies (ICTs) in Rural development of Haryana”** by ICSSR. The financial support offered by ICSSR has been instrumental in making this research project a reality and has significantly contributed to the advancement of social science research in India.

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