ICT AND E-GOVERNANCE INITIATIVES IN ASSAM: A POLICY PERSPECTIVE

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Abstract- **Information and Communication Technology (ICT) and e-governance are emerging as a promising area of study in communication, media studies and other social science disciplines. Its relevance is felt both in the academics and policy circles as a result of its increasing usage in education, entertainment, and governance. The role of ICT and e-governance in the daily lives of individuals has become so vital that now it is slowly being considered as an important parameters development. The rapid proliferation of ICT especially in the developing countries has attracted the attention of both the national and international agencies to evaluate its impact and prepare a roadmap for the effective implementation of ICT and e-governance initiatives. In India, the ICT initiatives have been implemented focussing on the development of rural economies with a promise of enhanced public participation in the governance. Though such initiatives, to a reasonable extent, have been able to increase people's participation in the governance process, it is not free from its own impediments. In this context, the study attempts to explore the challenges of ICT and e-governance in Assam from a policy perspective.**

Keywords- **ICT, e-governance, digital divide, information, technology**

I. INTRODUCTION

The impact of Information and Communication Technology (ICT) and new media on the social structure is often seen from contradictory positions. On the one hand, it has been assumed that new media and ICT intervention have bridged the earlier existing gap between different sections of the society on the basis of their accessibility and inaccessibility to media. On the other hand, it has been argued that new media and ICT intervention articulate new borders within a society that has often been termed as digital divide. The divide across societies in relation to ICT is being perceived from various directions. Further, the introduction of ICT in governance has created new forms of interaction among those who govern and those who are governed. It has also been stated that ICT has provided a platform for self governance. In the process, it has not only affected the social structure, but also, the democratic structure of a society which as some claim has attained a more inclusive status. However, such an assumption or claim is questionable, because, even after almost four decades of experiment with ICT and e-governance, it has not been able to derive the expected results, and a significant degree of digital divide still persists across regions of the world and within different countries.

Similarly, the story of ICT and e-governance implementation in the state of Assam though has provided opportunities for both the rural and urban folks; it is facing a number of challenges with respect to policy formulation, its usage, and awareness and understanding of ICT among the masses, which hampers the growth and further proliferation of ICT. There is no doubt that the government of Assam has taken some necessary steps to streamline the process of ICT and e-governance in the state, but the vicious cycle of digital divide has always been proved to be an impediment to it. Even if it is accepted that ICT and e-governance has brought many changes in the process of public service delivery, increased participation, more interaction between the government and citizens, and overall governance, the emerging perspectives along with the challenges faced by such ICT programmes have been under explored. Considering this fact, the researcher here has attempted to explore the weak areas with respect to ICT benefits to the people of the state of Assam. Further, the researcher has also analysed the challenges faced by the people of Assam with respect to ICT and e-governance implementation from the Uses and Gratifications perspectives considering the different factorial

elements of ICT and e-governance implementation in the state of Assam.

The impact of ICT and new media on the social structure is often seen from contradictory positions. On the one hand, it has been assumed that new media and ICT intervention have bridged the earlier existing gap between different sections of the society on the basis of their accessibility and inaccessibility to media. On the other hand, it has been argued that new media and ICT intervention articulate new borders within a society that has often been termed as digital divide. The divide across societies in relation to ICT is being perceived from various directions. Further, the introduction of ICT in governance has created new forms of interaction among those who govern and those who are governed. It has also been stated that ICT has provided a platform for self governance. In the process, it has not only affected the social structure, but also, the democratic structure of a society which as some claim has attained a more inclusive status. However, such an assumption or claim is questionable, because, even after almost four decades of experiment with ICT and e-governance, it has not been able to derive the expected results, and a significant degree of digital divide still persists across regions of the world and within different countries.

Even the problem of digital divide is critical especially in the developing countries. As Pippa Norris has written, "The issue of widening technological disparities around the world has generated considerable concern by international agencies and national governments" (Norris, 2001, p. 233). Though there are policy initiatives for availing the ICT and e-governance benefits, they have sometimes failed to derive the expected results. Such a condition has been attributed to either ineffective policy mechanisms that have ignored the user's capabilities before being implementing ICT and e-governance or a persisting knowledge gap across different societies on ICT and e-governance. The challenges with respect to ICT and e-governance are many which are often ignored by the policy makers and academic researchers. Sometimes, improper executions of ICT and e-governance policy without a holistic assessment of the needs and capabilities of their users have spelt disastrous effect on government process. As Eric P. Bucy and John E. Newhagen (2004) have pointed out: "Without the requisite training and motivation, a significant portion of population may left behind—socially, economically, and perhaps politically—not because they lack interest in the Internet, but because they do not have the appropriate skills, information processing ability, or self confidence necessary to hold their own in cyberspace" (Bucy and Newhagen, 2004, p. x).

At one point, it seems the ICT and e-governance initiatives of the state of Assam are more technology centred that focus on the dissemination and diffusion of only communication technology. At the same time, it has been observed that the knowledge and information related to ICT and e-governance have been emphasised less both in the policy and academic circles. ICT's and e-governance's relationship with the larger socio-cultural aspects of the Assamese society is less discussed and debated that has its own impact on policy initiatives of the Assam Government.

Though the success of ICT and e-governance primarily depends on the diffusion of new innovations, their practicality have not been accessed with respect to various other factors, that, one way or the other affect the implementation of ICT and e-governance programmes. There seems a dire necessity on the part of the Assam government to introduce ICT as a subject in the educational curricula starting from the school level to higher education for better results through e-governance. However, this area as an object of study neither has been explored by the researcher nor it has been given due importance by the policy makers. Of course, the National Knowledge Commission (NKC) advocates for inclusion of ICT in educational curricula of schools and colleges across the country. But this has not been reflected well in the planning and policy initiatives of the State of Assam.

Except a few efforts that promises to diffuse technological gadgets to a selected few in the state, the state government does not seem to have made enough efforts to reach out to them who are really disconnected from the government and the masses because of both not having access to technology and access to knowledge for adopting the new technologies. These may be considered as the biggest challenges for the government of

Assam in ICT and e-governance implementation. But an analytical look at the whole scenario of ICT and e-governance in Assam altogether gives a different picture to its challenges and perspectives. The ICT revolution is believed to have been partially bridged the rural urban divide. But it can tender more benefits if the existing challenges are addressed and new opportunities are created using the evolving information and communication technologies. But we should not forget the fact that sometimes technology generates "exaggerated hopes that machine can transform society and democracy" (Norris, 2001, p. 232).

Theoretical Framework

Theoretically, the study is framed by both the Uses and Gratification perspective formulated by Sandra Ball-Rokeach and Melvin DeFleur, and Diffusion of Innovations by Elihu Katz and Evertt M Rogers. In the context of the current study, the usefulness of Uses and Gratification approach is felt from the perspectives of the ICT users both the government and the citizens in articulating an interactive space. The Uses and Gratifications are valued in terms of users' responses with respect to different factorial elements of ICT and e-governance, and its usage by the respondents consisting of both the ICT users and policymakers. Then it is an evaluation of the Uses and Gratifications from both the ends of the users and service providers.

II. Literature Review

The present study gives the background of the existing research and academic materials on ICT and e-governance from a global to the local perspectives. Within the last few decades, Information and Communication Technology and e-governance related studies have generated a huge pool of resource that reflects upon the impact of ICT on government mechanism and other related areas. Research materials and evaluation reports of ICT and its impact on governance are available spanning across global to local and regional levels with variations in their approaches and the results they have generated.

The role of ICT in facilitating good governance has increasingly been associated with development. Acceptably, Information and Communication Technology for Development (ICT4D) now is being considered as an effort to reduce the existing digital divide and marginalisation of the masses on various grounds starting from their access to technology and knowledge on ICT to socio-cultural and political mobilisation using ICT. Digital divide is considered as low level of knowledge and low level of access to information technology. However, its scope is much wider than its usual understanding that has relationship with many other social and political events associated with ICT. Most of the studies that have been conducted worldwide focus more on the increasing digital divide in the developing countries. Considering this fact, ICT4D has already become an area of discussion in the international and national forums such as UNESCO, UNDP and United Nations to provide a facelift to the entire process of development and its impact on the lives of the people living in different geographical locations.

A good number of studies that are carried out by international agencies analyse how ICT and its application in the development process can bring equity on various grounds such as of gender, income, education, information, and employment. However, as the UN declaration (2005) states, "While the potential of ICT for stimulating economic growth, socio-economic development and effective governance is well recognised, the benefits of ICT have been unevenly distributed within and between countries" (UN declaration 2005, p. 2).

In the context of Assam, literatures related to ICT and e-governance though not sufficient enough to portray a clear picture of ICT scenario, but they provide the researcher sufficient ground for conducting further research on the challenges faced in ICT and e-governance implementation. They also give insight into the different emerging perspectives connected with ICT and e-governance revolution in Assam. ICT and e-governance in Assam are seen from various perspectives. While analysing the available literatures, one would certainly come to a conception that, accessibility is one among the major parameters of evaluating the challenges of ICT and e-governance in the state. Even the very concept of digital divide is based on accessibility to digital technology. But, one must also notice that ICT revolution in Assam and for that matter in the entire country has become technology centred ignoring the crucial aspect of

knowledge and understanding of ICT and e-governance mechanism and their resultant impacts on the process of governance. Awareness on ICT and e-governance as an area of study has been completely neglected by both the academic researchers and policy makers that could be the main reason for the supposedly ineffective results accruing out of ICT and e-governance revolution. Then, one could easily conclude that, the success of ICT and e-governance revolution in the state is not only dependent on access to technology but also it requires a greater understanding and knowledge on ICT and e-governance processes. But this aspect of ICT and e-governance implementation is overlooked by both the policy makers and academia.

III. ICT IN THE CONTEXT OF INDIA

In context of India, ICT revolution and e-governance initiatives by both the centre and state governments are directed towards rural development, as they connect the rural masses with the development discourse. The specific function of ICT as a facilitator of an inclusive growth that furthers better participation of the affected masses makes it worth an area of study which has a greater value both in the policy and academic circles. The role of ICT in education is increasingly becoming essential, whereas, its role in e-governance has turned it a part in policy initiatives of both the central and state governments.

IV. ICT AND E-GOVERNANCE IMPACT

Uttam Pegu (2012) in his article ***"Information and Communication Technology Implications: An Analysis of the Impact and Adoption of E-Governance in India"*** has talked about the impact of *Dharitree* (e-governance) in Sonitpur administration, Assam. He has used the multi-method research technique that includes case studies, in depth interview, surveys, and field notes to find out the overall assessment of Dharitree in Sonitpur district. The author has used a questionnaire that have been prepared on 5-point Likert scale with response types strongly disagree, disagree, neutral, agree and strongly agree and ANOVA and co-relation test were adopted in the methodology.

Stephen M. Mutula (2011) in ***"A Model for Building Trust in E-Government"*** has given an analytical understanding of the complex process of e-governance. It has been argued by the author that understanding e-Governance requires careful analysis and reflections on the organisations and institutions involved in the process. As the author writes: "It comprises the mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal and human rights, meet their obligations and mitigate their differences" (Mutula, 2011, p. 16). The author contends that governance has both negative and positive connotations. It can be both good and bad "depending on whether it brings positive benefits to the governed or the benefits merely serve to benefit the personal interests of a few individuals in government" (Ibid.). The author talks about the possibility of creating trust among the citizens on e-governance and opines that a very little attention has been paid in this regard and opens an opportunity for the researchers working in the field of ICT and e-governance to create and model e-governance plans that ensures greater reliability to the people and ensures trust.

V. ICT IN THE CONTEXT OF ASSAM

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The Information Technology Policy of Assam, (ITPA 2000) recognises the importance of IT in the growth and development of the state. In fact one of the basic objectives of the ITPA 2000 has been "to improve government services to the citizens of the state" (p.2). The policy also advocates for the inclusion of information and communication technology in school curricula along with its inclusion in the higher education. However, the policy framework of the Assam government is more biased towards technology up gradation ignoring the crucial aspect of digital exclusion. In simple terms, it can be stated that the IT policy has been more technology centred rather than knowledge oriented. It does not emphasise on the aspect of awareness and understanding about ICT and e-governance by the masses per se for their effectiveness.

For giving an insight to the ICT and e-governance initiatives, the researcher here has reviewed a number of articles. In the course of the study, it has been found out that research and academic materials relating to ICT and e-governance is abundant. Some of them take a theoretical perspective in analysing the impacts of ICT on development process and social condition, while, a few others are scientific research with rigorous statistical analysis. Many of the research studies on ICT and e-governance (to mention Borah, 2013; Pegu, 2013 in the context of Assam) have used simple statistical analysis; like variance analysis and percentage analysis to arrive at the results and conclusion of the study. It has been observed that problems and prospects relating to ICT and e-governance are more or less similar throughout the world. Poor ICT infrastructure, low levels of technical knowhow on ICT and lack of public awareness are some of the problems India is facing today in implementing ICT and e-governance. At the same time, the problems faced by the state governments are not totally different. Except a slight variation on the count of socio-economic variables that sometimes determine the degree of accessibility to new technology, ICT and e-governance in Assam is facing more or less the same types of problems as faced by various other states.

VI. ICT And Knowledge Economy: A New Paradox

It has been widely accepted that an ICT revolution propels a knowledge economy. But at the same time, it is not free from its own contradictions. The National Knowledge Commission (2009) recommended the need for a complete restructuring of the E-Governance mechanism in India. A special group formed under the chairmanship of Nandan Nilekani has recommended measures like, 1. Government Process Re-engineering before Any Computerisation, 2. To make effective Ten to Twenty Processes and Services, 3. Setting common standards for e-governance services in context of India and like many other measures to stream line E-Governance in India. The NKC also recommends for "Education Mission through ICT to leverage the potential of ICT to enhance the Gross Enrolment Ratio (GER) in higher education" (NKC report, 2009, p. 18). The plan also envisages the setting up of National Knowledge Network (NKN) interconnecting all knowledge institutions.

The Commission also advocates for public private participation for the growth and development of ICT infrastructure in India. It also suggests to include ICT in Health Education. As the report says, "Medical education needs to take full advantage of the power of ICT. A well-structured health informatics curriculum needs to be made as an integral part of Medical education at all levels" (Ibid., p. 37). The NKC also recommends the need for the availability of ICT to teachers and students alike in teaching learning processes. It also argues for the growth and dissemination of new literacy skills for the effective usage of ICTs.

K. V. Nagaraj (2013) in ***"ICT and Knowledge Economy: An Indian Contour of Polarities"*** has argued over the contradictory nature of knowledge economy fuelled by ICT centred development in an Indian parlance. The author has emphasised on the need for policy change especially in the ICT sector for better e-governance practices. Though ICT implementation has its own positive impacts on the socio economic conditions, it is not free from its own shortcomings

in India as the author opines: "Despite adoption of a broad-based ICT literacy strategy, the digital inequality is far and wide in the country" (Nagaraj, 2013, p. 220). Further the author has also argued that ICT under such unequal conditions can be an enabler but not a substitute.

VII. ICT AND ITS CHALLENGES

Challenges in the implementation of ICT and e-governance are many. One of them is material access to technology and the other one is the knowledge required to operate them. Even though people get access to ICT, lack of awareness on e-governance and lack of knowledge on ICT keep them away from the governance process. Keshabananda Borah (2013) in "*Implementation of citizen-centric e-Governance projects in Assam"* contends that there are two types of challenges in the field of e-governance in Assam such as front end and back end challenges. According to Borah, the front end challenges includes low rate of literacy, inadequate power supply, low broadband penetration, absence of user friendly interface, dearth of training manpower and lack of awareness, whereas, some of the backend challenges identified are lack of interoperability, resistance to change, poor projects planning and implementation, lack of defined outcomes and measurement mechanism, inadequate data safety, partial online execution services.

Anil Monga (2008) in his article ***"E-government in India: Opportunities and Challenges"*** gives a positive face to ICT and e-governance and their impact of service delivery mechanism. As the author suggests, this has brought a paradigm shift in the public service delivery with greater transparency and accountability. Instead of limiting the concept of e-governance only to the government administration, Monga has expanded its usage even by the civil society and other institutions for the promotion of dialogue and participation in the government processes. As the author notes: "Governance is not the exclusive preserve of the government. It extends to civil-society and private sector" (Monga, 2008, p. 54). But the study does not give an analytical account of the challenges faced by the government in the field of ICT and e-governance implementation. It gives only an informative account of different ICT and e-governance policies in various states.

Sanjay Kumar Dwiwedi and Ajay Kumar Bharti (2005) in their article ***"E-Governance in India- Problems and Acceptability"*** provide a reflective account of the problems faced by the government of India in implementing e-governance. As the authors have observed, poverty is a big problem in India in getting access to Internet. Basic minimum facilities for Internet connections such as telephone connections and electricity are out of the reach of the poor. This of course indicates to a severe digital divide that exists in India hampering the e-governance projects across the states. Basically it is a result of economic inequality among the Indian populace. It takes us to the view that before the government of India starts a massive e-governance revolution, it must ensure equal accessibility of ICT to all the sections of the population. Otherwise, the divide that persists now will persist for ever. Besides, as the authors have argued, technical literacy in India is a big challenge in the field of ICT and e-governance implementation. Further, "the dominance of English on the Internet constrains the access of non-English-speaking population" (Dwivedi and Bharti, 2005, p. 38). The authors also concede that, there is a lack of awareness among the masses about the positive benefits of ICT and e-governance. In these circumstances it is necessary to evaluate the level of awareness on ICT and e-governance among the population of the states of Assam.

VIII. ICT AND NEW RURALITIES

A. Thomas and M. A. Sudhir (2011) in their article ***"Social Transformation through ICT"*** have reflected upon the many facets of transformations in the social arena facilitated by ICT revolution. As the authors have opined, "ICT finds a significant place in rural development, not only in terms of technological development but also in terms of reducing poverty" (Thomas and Sudhir, 2011, p. 30). The authors have highlighted the potentiality of ICT in preserving the occupational diversity of the rural Indian society through easy access to market and enhanced knowledge capital. One of the most important benefits the farmers accrue through ICT is that they could dislodge the middle man and directly negotiate with the prospective buyers. However, the probable benefits that the ICT promises depend, as the authors have argued, on a complete social re-engineering.

IX. METHODOLOGY

The researcher has combined descriptive or analytical approach of survey technique in order to get a clear perspective of respondents' opinions and attitude towards ICT adoption and challenges in Assam. One advantage of the survey method is that it can be employed in natural and realistic settings. The geographical area of Assam is divided into four parts- Upper Assam, Middle Assam, South Assam and Lower Assam for the purpose of data collection. The respondents were of two streams. One group was of common computer literates and the other comprised policymakers and the IT entrepreneurs.

The questionnaire was constructed in the form of statements and sub-statements. The sub-statements had responses on a three-point Likert scale. The responses were like agree, disagree and can't say. This is done due to the need for greater reduction in responses for accurate findings. It is true that normally a five-point scale is preferred for factor analysis. However, many research studies have been conducted using a three-point scale for obvious reasons.

The major objective of the present research is to assess and analyze the e-governance policies, programmes and projects and in addition to study the challenges and opportunities vis-a-vis ICT initiatives in the development sector of Assam.

1. Know the respondents' perceptions of the ethical and security issues involved on the practice of e-governance.
2. Identify the perceived notion of respondents as to the role of ICT in women's empowerment

The researcher formulated certain research questions to explore the level of ICT penetration in society.

RQ.1) How best ICT can be used for a participatory development in Assam?
RQ.3) What are the challenges faced by the state government in adopting ICT for governance?

The researcher has applied the exploratory factor analysis for data analysis, using the Principal Component Matrix (PCA) method. This principal method is largely employed in uses and gratifications research. Since the research topic falls under this theoretical framework, the aptness of its applicability is justifiable. The researcher has also undertaken percentage analysis of selected statements to get a detailed view of both the respondents.

X. FACTOR ANALYSIS

Factors responsible on people's involvement
Participation in e-governance process depends on:

Rotated Component Matrix

	Component	
	1	2
Knowledge on available e-services	**.865**	.413
Availability of ICT service centre	**.832**	.057
Availability of ICT infrastructure	**.826**	.277
Knowledge on ICT	.699	.453
Interest in e-governance	.230	**.952**
Awareness on e-governance	.262	**.909**

For the above statement, the variables are: knowledge on available e-services, availability of ICT service centre, availability of ICT infrastructure have been clubbed together as per their factor loading and renamed as **'resource availability'**. Similarly, the variables like Interest in e-governance, awareness on e-governance have been taken together as '**awareness and interest'**. The factor analysis has reduced the number of variables from six to two. It can be concluded that people's participation in e-governance process depends on resource availability.

Total Variance Explained

Component	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**3.894**	**64.904**	64.904	3.894	64.904	64.904
2	**1.028**	**17.133**	82.038	1.028	17.133	82.038
3	.520	8.664	90.702			
4	.417	6.949	97.651			
5	.127	2.120	99.771			
6	.014	.229	100.000			

Communalities

	Initial	Extraction
Awareness on e-governance	1.000	.895
Interest in e-governance	1.000	.960
Knowledge on ICT	1.000	.694
Availability of ICT service centre	1.000	.695
Knowledge on available e-services	1.000	.918
Availability of ICT infrastructure	1.000	.760

Two components have been extracted depending upon suggested factor loading and also both the components have been kept depending on their initial eigen values. Since the eigen values which are greater than 1 to be extracted, obviously the first two principal components form the extracted solution.

Therefore, the component 1 **'resource availability'** has maximum variance **64.904** per cent after rotation with an eigen value of **3.894**. The second component '**awareness and interest'** with an eigen value=**1.028** has explained **17.133** per cent of variance after rotation. The percentage of variance explained by the given above components**,** we can interpret that 'resource availability' dominates and mainly determines the 'awareness and interest' level of ICT among residents of Assam.

Factors responsible on challenges of ICT and e-governance responsible:

The challenges of using ICT and e-governance in Assam

Rotated Component Matrix

	Component		
	1	2	3
Lack of ICT infrastructure	**.889**	.166	.214
low level of knowledge on ICT	**.888**	.126	-.116
Corruption	**.626**	.540	.156
Poor technological knowhow	.135	**.932**	.072
Poor telephone and mobile connectivity	.149	**.891**	-.076
Lack of promotion and publicity	.448	.478	.061
Cultural and linguistic diversity	-.126	.075	**.830**
Digital divide	.267	-.038	**.730**

For the above statement, the variables are: lack of ICT infrastructure, low level of knowledge on ICT, corruption have been joined together as per their factor loading and renamed as **'technical limitations'**. Similarly, the variables like poor technological know-how and poor telephone and mobile connectivity have been brought together and renamed as '**poor connectivity'**. The variable lack of promotion and publicity is below the cut-off value, so it is not included. In addition, the variables such as cultural and linguistic diversity and digital divide have been clubbed together and taken as '**digital divide'.**

The factor analysis has reduced the number of variables from eight to three. It can be summarized that technical limitations, poor connectivity and digital divide act as major challenges in implementation of ICT services and policies in Assam.

Total Variance Explained

Component	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**3.371**	**42.138**	42.138	3.371	42.138	42.138
2	**1.333**	**16.656**	58.794	1.333	16.656	58.794
3	**1.148**	**14.355**	73.149	1.148	14.355	73.149
4	.944	11.800	84.949			
5	.586	7.321	92.270			
6	.359	4.482	96.752			
7	.177	2.209	98.962			
8	.083	1.038	100.000			

Communalities

	Initial	Extraction
Low level of knowledge on ICT	1.000	.817
Lack of ICT infrastructure	1.000	.863
Poor technological knowhow	1.000	.892
Poor telephone and mobile connectivity	1.000	.822
Corruption	1.000	.709
Lack of promotion and Publicity	1.000	.433
Cultural and linguistic diversity	1.000	.711
Digital divide	1.000	.605

In the table, three components have been extracted depending upon suggested factor loading and the components have been kept depending on their initial eigen values. Since the eigen values which are greater than 1 to be extracted, the first three principal components from the extracted solution. As a result, the component 1 **'technical limitations'** shows maximum variance **42.138** per cent after rotation with an eigen value of **3.371**. The component 2 '**poor connectivity'** with an eigen value= **1.333**) has explained **16.656** per cent of variance after rotation. The component 3 '**digital divide'** shows maximum variance 14.355 per cent after rotation with an eigen value **1.148.**

The percentage of variance explained by the given above three components**,** we can conclude that 'technical limitations' can be considered as major challenges of using ICT and e-governance in compared to 'poor connectivity' and 'digital divide' issues in Assam.

Factor analysis on security issues related to ICT

Legal and ethical issues associated with the practices of e-governance

Rotated Component Matrix

	Component	
	1	2
Invasion of privacy and surveillance	**.863**	-.065
Copyright and violations	**.856**	.211
Cyber crime (e-crimes)	**.734**	.415
Hacking	.165	**.884**
Phishing	.088	**.841**

From the above statement, the variables identified are: invasion of privacy and surveillance, copyright and violations and cyber crime (e-crimes) and these have been joined together as per their factor loading and renamed as **'privacy and security'**. Similarly, the variables such as hacking and phishing have been considered together and renamed as '**internet crimes'**. The factor analysis has reduced the number of variables from five to two. Hence, it can summed up that 'privacy and security' and 'internet crimes' are legal and ethical issues associated with e-governance practices.

Total Variance explained

Component	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**2.552**	**51.036**	51.036	2.552	51.036	51.036
2	**1.210**	**24.207**	75.243	1.210	24.207	75.243
3	.633	12.653	87.896			
4	.427	8.550	96.446			
5	.178	3.554	100.000			

Communalities

	Initial	Extraction
Hacking	1.000	.809
Phishing	1.000	.715
Cyber crime (e-crimes)	1.000	.712
Invasion of privacy and surveillance	1.000	.750
Copyright and violations	1.000	.777

Two components have been extracted depending upon suggested factor loading and the components have been kept depending on their initial eigen values. Since the eigen values which are greater than 1 to be extracted, the first two principal components form the extracted solution. Therefore, the component 1 **'privacy and security'** shows maximum variance **51.036** per cent after rotation with an eigen value of **2.552**. The component 2 '**internet crimes'** with an eigen value= **1.210** has explained **24.207** per cent of variance after rotation. With reference to the percentage of variance explained by the given above two components, we can interpret that 'privacy and security' of digital data demands more attention than internet crimes associated with these.

Factor analysis on women's participation

Women's participation is essential for a successful e-governance in Assam as

Rotated Component Matrix

	Component	
	1	2
Women constitute a significant part of the total population	**.872**	-.174
Women's access to public institution is comparatively difficult	**.846**	.358

Women's participation is below satisfaction	-.174	**.884**
Women take wise political & economic decisions	.415	**.823**

The variables for the above statement are: women constitute a significant part of the total population and women's access to public institution is comparatively difficult have been joined together as per their factor loading and renamed as '**women's accesses'**. Similarly, the variables such as women's participation is below satisfaction and women take wise political & economic decisions have been taken together and renamed as '**women's participation'**. The factor analysis has reduced the number of variables from four to two. It can be analyzed that role of women and 'women's participation' is essential for establishment of successful e-governance initiatives in Assam.

Total variance explained

Component	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**1.988**	**49.712**	49.712	1.988	49.712	49.712
2	**1.307**	**32.669**	82.381	1.307	32.669	82.381
3	.486	12.150	94.531			
4	.219	5.469	100.000			

Communalities

	Initial	Extraction
Women's participation	1.000	.811
Women's access	1.000	.844
Women take wise political and economic decisions	1.000	.850
Women constitute a significant part of the total population	1.000	.790

Two components have been extracted depending upon suggested factor loading and the components have been kept depending on their initial Eigen values. Since the Eigen values which are greater than 1 to be extracted, the first two principal components form the extracted solution.

Therefore, the component 1 '**women's access'** shows maximum variance **49.712** per cent after rotation with an eigen value of **1.988**. The component 2 '**women's participation'** with eigen value= **1.307** has explained **32.669** per cent of variance after rotation. As per the percentage of variance explained by the given above two

components, we can interpret that women's access to ICT can only happen with their active participation in the formulation and dissemination of ICT policies among rural and urban masses.

Factor analysis, an advance statistical technique has allowed to extract multi-dependent variables from the given statement and reduce it to two or more components for precise calculation of various factors responsible for the changes in ICT initiatives and e-governance scenario in Assam.

Percentage analysis of a few statements

Frequency/Percentage Analysis of policy makers

ICT usage has the potential for women empowerment:

		Frequency	Percent
Valid	Agree	52	91.2
	Can't Say	5	8.8
	Total	57	100.0

The table above indicates that 91.2 per cent of the respondents have agreed to the fact that using ICT can be a potential factor for empowerment of women. 8.8 per cent respondents are not sure of the possible outcome of ICT usage and its contribution in women empowerment.

Frequency/Percentage Analysis of computer literate users

An ideal e-governance model ensures: Hassle free government

		Frequency	Percent
Valid	Agree	159	65.4
	Disagree	8	3.3
	Can't Say	76	31.3
	Total	243	100.0

65.4 per cent of the respondents have agreed to the fact that e-governance model ensures hassle free government. 31.3 per cent of the respondents do not have say on the fact that the government work would be efficient and planned.

Greater accountability in Government administration

		Frequency	Percent
Valid	Agree	195	80.2
	Disagree	14	5.8
	Can't Say	34	14.0
	Total	243	100.0

The above table indicates that 80.2 per cent of the respondents say that ideal e-governance ensures greater accountability in government administration. 5.8 per cent of the respondents have disagreed that e-governance model can bring accountability and 14.0 per cent of the respondents are not sure of the possibility of governance and accountability factor.

Frequency/Percentage Analysis of policymakers

An ideal e-governance model ensures: Hassle free government

		Frequency	Percent
Valid	Agree	51	89.5
	Disagree	2	3.5
	Can't Say	4	7.0
	Total	57	100.0

The table above shows that 89.5 per cent of the respondents have agreed that the problem of hassle and tedious government work and services can be solved with ideal e-governance model. 3.5 per cent of the respondents have disagreed that ideal-governance model cannot solve unmanaged government polices related work and 7.0 per cent of the respondents do not have clear understanding of the advantages of the e-governance model.

Greater accountability in Government administration

		Frequency	Percent
Valid	Agree	34	59.6
	Disagree	12	21.1
	Can't Say	11	19.3
	Total	57	100.0

59.6 per cent of the respondents have agreed with the statement that ideal e-governance model can ensure greater accountability in government administration. 21.1 per cent of the respondents have disagreed with the statement though. 19.3 per cent of the respondents do not have say on the fact that e-governance can confirm accountability.

XI. CONCLUSION

From both factor analysis and percentage analysis of a few statements, the study draws the conclusion that research specific objectives are appropriate and valid in terms of ICT and e-governance scenario in the context of Assam. The study explored the possible scope of ICT opportunities in Assam in terms of the advanced technological scenario. The comparative study of the common computer literate users and policymakers of the state, helped in drawing a detailed sketch of the perceived options related to ICT and e-governance. The study indicates to the fact that higher education that does not guarantee the adoption and acceptance of ICT and e-governance. The knowledge levels of the masses are dependent on awareness, ICT infrastructure and connectivity. It justifies to the fact that there is a dire need to bridge the rural-urban divide with the help of appropriate measures in both rural and urban regions of the state. The proposed e-governance model should be made citizen-centric, more participatory in nature so that people can easily access the information and get benefitted out it.

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