

Barriers for e-Governance Implementation in Higher Education in Haryana – A Review

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Abstract

E-Governance has emerged as a crucial tool for enhancing transparency, efficiency, and accessibility in the higher education sector. However, its implementation in Haryana faces several challenges that hinder its widespread adoption and effectiveness. This study provides a comprehensive review of the various barriers impeding e-Governance in higher education institutions across Haryana. The barriers are categorized into technological, organizational, financial, social, and regulatory challenges. Key issues include inadequate digital infrastructure, lack of awareness and digital literacy, data security concerns, resistance to change, bureaucratic hurdles, and insufficient funding. The study highlights the interplay between these barriers and their impact on the successful execution of e-Governance initiatives. By identifying and analyzing these challenges, this review aims to provide insights for policymakers, educators, and administrators to formulate strategic solutions that can enhance e-Governance adoption in Haryana's higher education sector.

Keywords: E-Governance, Higher Education, Barriers, Digital Transformation, Policy Implementation, Educational Institutions

Introduction

E-Governance has emerged as a crucial tool for transforming traditional government processes into efficient and transparent digital systems.

E-Governance is understood as the use of Information and Communication Technology (ICT) at all the level of the Government in order to provide services to the citizens, interaction with business enterprises and communication and exchange of information between different agencies of the Government in a speedy, convenient efficient and transparent manner. The Information and Communication Technology (ICT) and the Internet in particular have opened possibilities for the government and the citizens.

The Higher education system framework in Haryana can be understood by studying the Government colleges, Government Aided colleges and Self-Financing Colleges. The figure shows Self-Financing and Government Aided colleges offering higher education in Haryana. Government of Haryana has taken numerous initiatives to provide value education to the students of the state. There are 364 higher education institutions offering higher education in Haryana.

Universities in Haryana:

Type of Universities	No. of Colleges
Government State Universities	10
Government Central University	01
Government Skill University	01
State private Universities	29

(Source: Directorate of Higher Education Government of Haryana: 21st May 2024: <https://highereduhry.ac.in/forms/WebPages/Colleges>)

Colleges in Haryana:

Type of Colleges	No. of Colleges
Government Colleges	180
Government Aided Colleges	98
Self-Finance Colleges	86

(Source: Directorate of Higher Education Government of Haryana: 21st May 2024: <https://highereduhry.ac.in/forms/WebPages/Colleges>)

“The use of E-Government service in emerging market requires satisfaction of user community, user community involvement and performance indicators The e-Governance services can be realized through performance indicators, satisfaction of public service administrations and users involvement”

(**Ngoanamosadi Stanford Mphahlele, 2025**)

“Different aspects of e-governance in education and health in the state sectors in West Bengal to achieve the specific SDGs regarding education of high quality, that is, SDG-4 and health of good standard, that is, SDG-3”. The study shows that how E-Governance projects and new technologies effectively contribute towards sustainable development for quality education. (**Majumder, 2023**).

“e-learning if the future of the higher education institutions. All the stakeholders like faculties, admins, students in an institution will be benefitted by the use of e-Governance services. The institutions can save resources, students can access learning resources from anywhere, and admins can quickly access data, information through electronic platforms” (**Rushna Khalil Awan1, 2021**)

Research Objectives:

1. To identify the factors influencing eGovernance adoption in Government HEIs.
2. To identify and analyze the relationship among different factors influencing eGovernance adoption in

Literature Review

Themes	Barriers	Source	Remarks
Types of barriers for e-Governance implementation in Higher Education	Lack of trust on e-governance	Singh and Kiran (2013), Singh and Sharma (2014), Carter and Belanger (2005), Suri and Sushil (2012), Bhuiyan (2011),	Concerns about data privacy, hacking, and unauthorized access.
	Inadequate infrastructure	Dash and Pani (2016), Kim, Lee, Koo, and Nam (2013), Drew and Steve (2011), Suri and Sushil (2006, 2012), Neera Chopra, 2020, Vivek Mishra (2019)	Lack of high-speed internet, reliable power supply, and modern IT infrastructure.
	Data Security	Monika Singh and Ganesh Prasad Sahu(2018), Vivek Mishra (2019)	Concerns about data privacy, hacking, and unauthorized access.
	Lack of Digital Awareness	Shailendra Giri (2019), Anchal Gupta (2019)	Shortage of trained IT professionals and faculty with e-Governance expertise.
	Rigid process in government system	Vivek Mishra (2019), Delopoulos (2010), Unwin (2010), Shah (2007), Suri and Sushil (2012),	Faculty and staff reluctance to adopt new technology-driven governance.
	Lack of Administrative and Political Will	Anchal Gupta (2019), Alvaro Manuel Boavida Williams (2023), Sharma (2015), Rana et al. (2013),	Administrative complexities and rigid hierarchies slowing down digital adoption.
	Inadequate implementation planning	Dr. Mohammad Miyan, Dash and Pani (2016), Kim, Lee, Koo, and Nam (2013),	Weak institutional support and unclear planning for e-Governance.
	Resource Constraints	Harpreet Kaur, Deepika Arora, Choudrie et al (2005); Dossani et al. (2005); Pilling Boeltzig (2007)	
	User Acceptance	Vivek Mishra (2019), Dr. Meenu Maheshwari, Dr. Ashok Kumar Gupta, Dr. Shobhna Goyal(2021), M Nasiru Yakubu (2018), Mas Anom Abdul Rashid, Mohd Noor Azman Othman (2010), Sameer & Mohammed (2008),	Faculty and staff reluctance to adopt new technology-driven governance.
	Inadequate Funding	Gupta, M. P., & Jana, D. (2021)	Limited government support and budget constraints for digital transformation.

	Language and Accessibility Issues	Heeks, R. (2018).	E-Governance portals often not available in regional languages or accessible to differently-abled users.
	Intellectual Property Issues	Reddick, C. G. (2019).	Ownership and security of digital content.

Research Methodology

To achieve the research objectives, this study employs the ISM methodology. ISM facilitates the representation of a complex system’s structure through a carefully designed model that integrates both graphical and verbal elements. It aids in visualizing interrelationships among various factors influencing a system. Notable works by Singh and Kant (2008), Khurana et al. (2010), and Debata et al. (2013) have outlined the application of ISM across diverse service domains.

The step-by-step ISM process followed in this study is outlined below:

- **Identification of Factors:** Relevant factors influencing the system under investigation are identified through brainstorming sessions with subject-matter experts or respondents.
- **Establishing Contextual Relationships:** A contextual relationship is established among the identified factors to determine the nature of interactions between each pair.
- **Preparation of Structural Self-Interaction Matrix (SSIM):** The SSIM captures the direction of contextual relationships among the barriers based on pairwise comparisons.
- **Development of Reachability Matrix:** Using the SSIM, a reachability matrix is constructed and assessed for transitivity. Transitivity implies that if barrier A influences barrier B, and barrier B barrier barrier C, then barrier A also influences barrier C.
- **Final Reachability Matrix and Level Partitioning:** The final reachability matrix is used to partition the enablers into hierarchical levels. A canonical matrix is then developed, where most variables/barriers are represented as '0' in the upper half and as '1' in the lower half, thereby structuring the barriers (in this case, e-governance barriers) in a clear hierarchical format.
- **Construction of Digraph:** A directed graph (digraph) is constructed based on the relationships identified in the reachability matrix and the partitioned levels of each factor (barrier). During this process, transitive links are eliminated to enhance clarity and reduce redundancy.
- **Development of ISM Model:** The digraph is then transformed into an ISM model by replacing the variable nodes with corresponding descriptive statements that represent each barrier.
- **Model Review and Validation:** The developed ISM model undergoes a thorough review to identify and resolve any conceptual inconsistencies. Necessary modifications are made to ensure the logical consistency and accuracy of the model.

Interpretive Structural Modeling (ISM) Method:

ISM is a systematic, structured approach used to identify and analyze relationships among different factors in a complex system. The symbols in your description are part of a **Structural Self-Interaction Matrix (SSIM)**, which is a key step in ISM.

Symbol	Meaning
V	denotes that Factor i influences Factor j
A	denotes that Factor j influences Factor i
X	denotes that Factor i and j influence each other
O	denotes that Factor i and j are not related

The used symbols "V," "A," "X," and "O" are employed in this study to represent the relationships between the factors i and j where i- row, j-column.

Expert Panel Overview:

A total number of 5 experts were identified and selected from the government academic institutions who are having wide experience in the area of ICT implementation, electronic governance, and public administration. The profile of experts is as follows:

Name	Designation	Organization	Area of Expertise
R1	Associate Professor Head IT Cell	Government University	e-Governance, Digital Transformation
R2	Professor	Government Institution	Policy Design, Policy Execution
R3	Professor	Government Institution	e-Governance, GeM, e- Office
R4	Assistant Registrar	Government University	e-Office, e-Procurements
R5	Network Administrator	Government University	ICT Services Deployment

Identification and modeling on e-Governance barriers in Higher Education using ISM

Table 1. VAXO Model

i\j	Barriers for e-Governance	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
1	Data Security		O	O	A	A	O	A	V	O	O	O	V
2	Inadequate Funding			A	V	O	O	O	O	O	O	O	O
3	Inadequate implementation planning				V	O	A	O	O	O	V	O	V
4	Inadequate infrastructure					O	O	O	V	O	X	O	O
5	Intellectual Property Issues						O	O	O	O	O	O	O
6	Lack of Administrative and Political Will							O	O	O	O	X	V
7	Lack of Digital Awareness								V	X	O	O	V
8	Lack of trust on e-governance									X	O	O	V
9	Language and Accessibility Issues										O	O	V
10	Resource Constraints											O	O

Final Reachability Matrix (FRM)

By using these rules and integrating the transitiveness, we achieved the final reachability matrix. The final reachability matrix states that if first variable is related to second variable and the second variable is related to third variable then it assumes that the first variable is also related to the third variable.

The matrix is shown in Table III below: -

Table III: Final Reachability Matrix

Barriers for e-Governance		1	2	3	4	5	6	7	8	9	10	11	12	Driving Power
1	Data Security	1	0	0	0	0	0	1*	1	1*	0	0	1	5
2	Inadequate Funding	1*	1	0	1	0	0	1*	1*	1*	1*	0	1*	8
3	Inadequate implementation planning	1*	1	1	1	0	0	1*	1*	1*	1	0	1	9
4	Inadequate infrastructure	1	0	0	1	0	0	1*	1	1*	1	0	1*	7
5	Intellectual Property Issues	1	0	0	0	1	0	1*	1*	1*	0	0	1*	6
6	Lack of Administrative and Political Will	1*	1*	1	1*	0	1	1*	1*	1*	1*	1	1	11
7	Lack of Digital Awareness	1	0	0	0	0	0	1	1	1	0	0	1	5
8	Lack of trust on e-governance	1*	0	0	0	0	0	1*	1	1	0	0	1	5
9	Language and Accessibility Issues	1*	0	0	0	0	0	1	1	1	0	0	1	5
10	Resource Constraints	1*	0	0	1	0	0	1*	1*	1*	1	0	1*	7
11	Rigid process in government system	1*	1*	1*	1*	0	1	1*	1*	1*	1*	1	1*	11
12	User Acceptance	0	0	0	0	0	0	0	0	0	0	0	1	1
13	Dependence Power	11	4	3	6	1	2	11	11	11	6	2	12	

Table III presents the final reachability matrix and this matrix consists the **driving power** and **dependence** of each enabler. The *driving power* for an enabler is defined as the total number of enablers (including itself) that it can influence. Conversely, *dependence* refers to the total number of enablers (including itself) that influence a particular enabler.

Level Partitioning (LP)

This step helps categorize the barriers into different levels depends on their driving power and dependence. Key findings include:

- Inadequate Infrastructure and Resource Constraints have high driving power.

- Lack of Trust is significantly influenced by Data Security and User Acceptance.
- Bureaucratic rigidity cascades into multiple implementation failures.

Table IV: Levels of barriers for e-Governance implementation

RTEs	Reachability set	Antecedent set	Interaction set	Level
1	1, 7, 8, 9,12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,	1, 7, 8, 9,	2
2	2,1,4,7,8,9,10,12	2, 3, 6, 11,	2,	4
3	3,1,2,4,7,8,9,10,12	3, 6, 11,	3,	5
4	4, 10,1,7,8,9,12	2, 3, 4, 6, 10, 11,	4, 10,	3
5	5,1,7,8,9,12	5,	5,	3
6	6, 11,1,2,3,4,7,8,9,10,12	6, 11,	6, 11,	6
7	1, 7, 8, 9,12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,	1, 7, 8, 9,	2
8	1, 7, 8, 9,12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,	1, 7, 8, 9,	2
9	1, 7, 8, 9,12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,	1, 7, 8, 9,	2
10	4, 10,1,7,8,9,12	2, 3, 4, 6, 10, 11,	4, 10,	3
11	6, 11,1,2,3,4,7,8,9,10,12	6, 11,	6, 11,	6
12	12,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,	12,	1

Final ISM Model:

Post obtaining the final reachability matrix, the structural model is generated using nodes and lines of edges. If an association/ relationship exists between the barriers, an arrow is drawn from barrier i to barrier j. The graphical structure prepared this way is called a diagraph or directed graph. After removing the transitivity's, the diagraph is converted into the final ISM model shown in Figure 4. (EGB stands for e Governance Barrier)

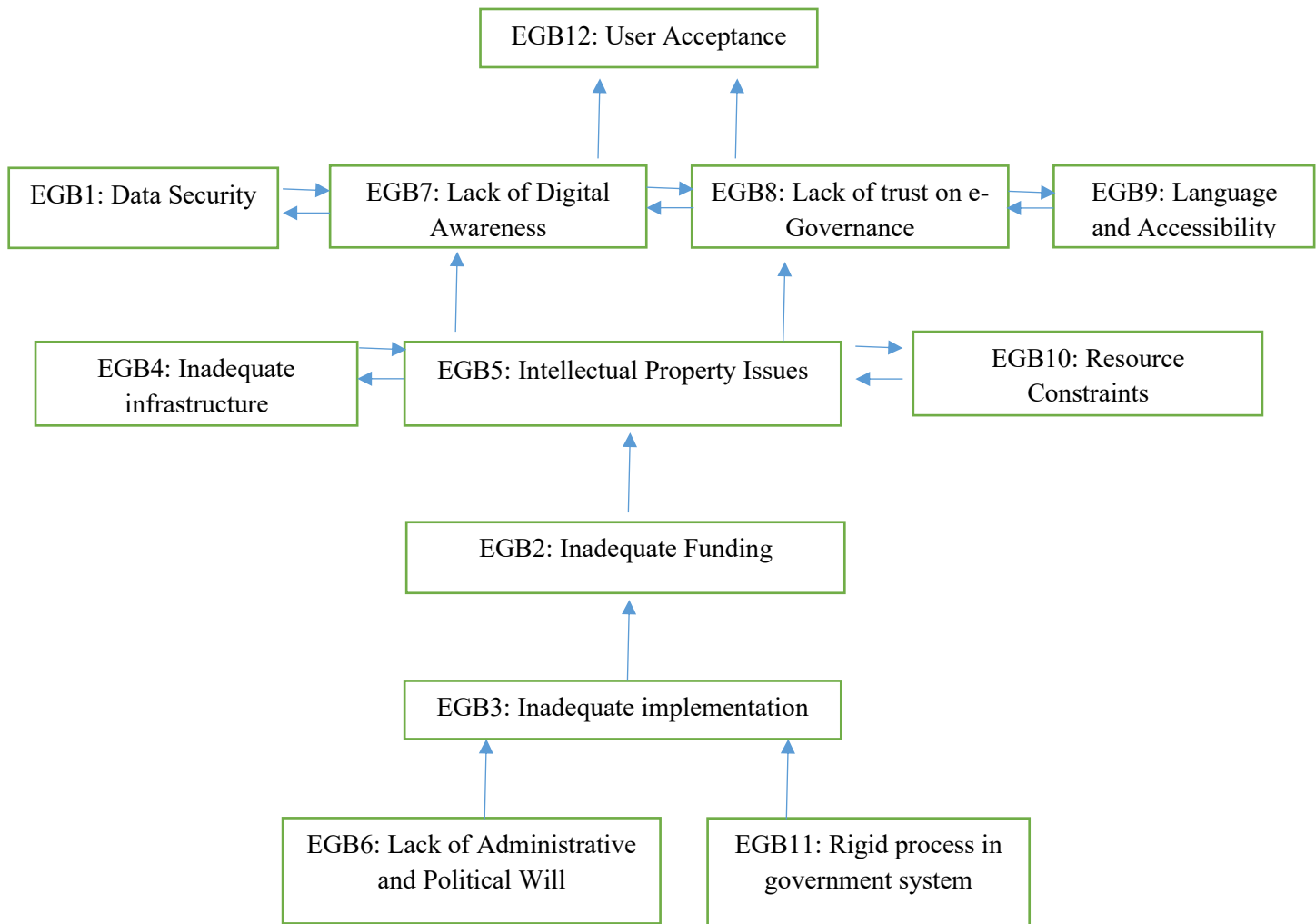


Figure-1: Final ISM Model

MICMAC:

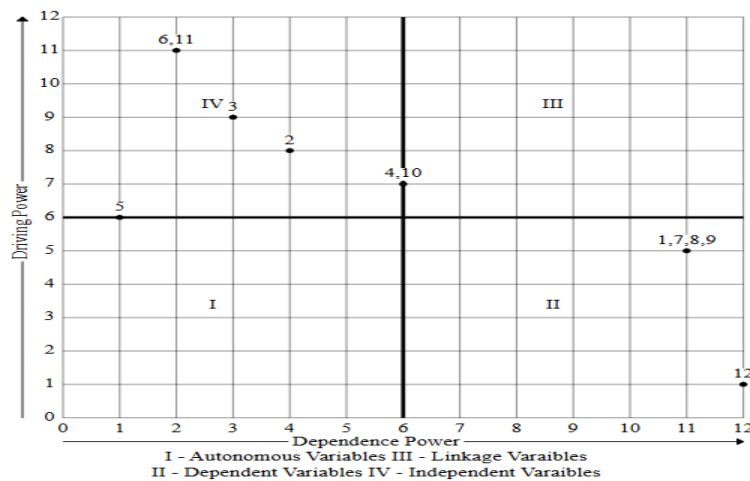


Figure 2 : CAPTION

These insights help decision-makers prioritize interventions in a logical order, starting from the most influential barriers and moving toward those that are outcomes of systemic issues.

Result and Discussion

The study of barriers is crucial in e-governance, providing insight into the challenges behind adoption of electronic governance services. Conceptual contributions in this context emphasize the significance of barriers as determinants of employee adoption. This research carries significance for both scholars and professionals.

The MICMAC investigates the dependence power and driving power. The MICMAC is analyzed to classify 12 variables into four quadrants 1. Autonomous 2. Dependent 3. Linkage 4. Independent on the basis of their driving and dependence power.

1. **Autonomous Variables:** Quadrant 1 is used to represent Autonomous variables. These variable's has low driving power and low dependence power therefore they are considered as independent.
2. **Dependent Variable:** Quadrant 2 is used to represent dependent variables. These variable's has low driving power and high dependence power therefore they are considered as dependent. The variables 1,7,8,9,12 are dependent variables.
3. **Linkage Variable:** Quadrant 3 is used to represent linkage variables. These variable's has high driving power and high dependence power therefore they are considered as linkage variables. The variables 4,10 are linkage variables.
4. **Independent variable:** Quadrant 4 is used to represent independent variables. These variable's has high driving power and low dependence power therefore they are considered as independent variables. The variables 6,11,3,2 have highest driving power and minimum dependence power.

The Haryana government ought to adopt policies and strategies that highlight the importance of usefulness, transparency in awareness, efficiency, infrastructure challenges, language and accessibility concerns, sufficient assistance and guidance, address user privacy matters, and facilitate access to e-government services. The findings of this research also emphasize that the availability of supportive conditions is among the major obstacles in the utilization and acceptance of electronic governance services. The adoption of e-governance will significantly increases by eliminating the barriers. For example, a study conducted by Smith and Johnson (2021a, b) highlights how the perceived value and user-friendliness of e-governance platforms influence user's' perceptions of them. These perceptions subsequently serve as a foundation for adoption behavior, where favorable perceptions enhance the chances of adoption.

From a management perspective, Brown and Miller (2022) highlight the significance of comprehending user sentiments to enhance the adoption rates of e-governance. The research indicates that government institutions can create user-centric e-governance platforms by applying consumer behavior theories and implementing strategic communication initiatives to promote favorable attitudes towards digital services.

Recommendations:

Lack of administrative and political will and rigid process in government system are the two high driving factors which majorly influence in adoption of e-Governance system in government academic institutions. The government and policymakers may strengthen leadership accountability.

Limitations and Future Scope:

The study concentrates on exploring the barriers in the implementation of e-Governance systems or services within the Government higher education institutions in Haryana. The study includes on Government institutions not the private institutions therefore the findings may not be applicable for them. The study is conducted in a single state (e.g., Haryana) hence is geographically limited and may not reflect the barriers in other regions with different infrastructural or socio-economic conditions. The study does not highlights enablers that can facilitate the implementations.

There is an opportunity to expend the research in multiple other directions:

A comparative analysis could be performed among various government entities—such as local bodies, public service departments, ministries and other educational institutions to explore the differences and challenges in e-governance implementation. The research could investigate employee perspectives and behaviors thoroughly, including their preparedness, attitudes, abilities, and levels of resistance by using the UTAUT model concerning the implementation of electronic governance systems. There is also an opportunity to recognize technological or policy advancements that could enhance the adoption, utilization, and service delivery.

Conclusion

This research manuscript aims to identify and develop a hierarchical model for the e-Governance Implementation barriers. E-Governance implementation in higher education in Haryana faces a multitude of barriers that are interlinked. This review using ISM highlights the need for a holistic approach, prioritizing infrastructure development, capacity building, security assurance, and administrative reforms. Policymakers must develop strategic frameworks that address foundational issues while promoting user engagement and inclusive access.

The ISM model helps to create a hierarchy among the twelve barriers of the e-Governance implementation in higher education. Inadequate Infrastructure and Resource Constraints are foundational barriers with high driving power. They influence several other barriers but are not themselves influenced by many others. Lack of Trust on E-Governance and User Acceptance exhibit high dependence and low driving power. These are symptoms rather than root causes—addressing their influencing factors (e.g., security, infrastructure) will indirectly improve them. Data Security, Inadequate Implementation Planning, and Lack of Digital Awareness act as intermediate barriers that connect root causes to dependent outcomes.

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