

Trajectories of India's Experiments With Digitisation: From Computerisation to Digitisation, Governance Shaped by Evolving Technology

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Abstract

This paper analyses the evolution of e-Governance and examines its features with reference to India. It examines the impact of evolving technology on e-governance and evaluates the challenges posed in the governance of Digital Space, offers solutions to current problems and forecasts the global e-Governance framework of the future. The key objective of this paper is benchmarking various agencies of the government of India on their e-Governance-Service delivery performance. This paper attempts to ensure that the developing country perspective is clearly articulated

Keywords

e-Governance in India, Digital Government Stage Analysis Framework, Benchmarking e-services, Assessment Survey

1. Introduction

India ranks third among the most attractive investment destinations for technology transactions in the world.

1. In September 2020, India moved four places up to reach the 48th rank and made to the top 50 countries in the Global Innovation Index (GII) for the first time.

2. India ranks in the top 15 for indicators such as ICT (Information and Communication Technology) services exports, graduates in science and engineering, government online services and R&D-intensive global companies.

3. India ranked 52 in Global Innovation Index (GII)-2019. It moved up to fifth rank in Global R&D Funding Forecast 2020.

India's gross expenditure in R&D was forecast to reach US\$ 96.50 billion in 2020. By 2022, R&D expenditure is targeted to reach at least 2 per cent of the country's GDP [2].

- Considerable investment and development have been incurred in different sectors such as agriculture, healthcare, space research, and nuclear power through scientific research.

- India is among the topmost countries in the world in the field of scientific research, positioned as one of the top five nations in the field for space exploration.

- The country has regularly undertaken space missions, including missions to the moon and the famed Polar Satellite Launch Vehicle (PSLV) [2].

India is likely to take a leading role in launching satellites for the SAARC (South Asian Association for Regional Co-operation) nations, generating revenue by offering its space facilities for use to other countries [2]. <https://www.natureindex.com> > indian-science-ascending

- Using PPP (Purchasing Power Parity) exchange rates, India already is the fourth largest economy in the world. India's key strengths are its large domestic market, its young and growing population, a strong private sector with experience in market institutions, and a well-developed legal and financial system [18,19,20].

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- In addition, from the perspective of the knowledge economy, another source of strength is a large critical mass of highly trained English-speaking engineers, businesspeople, scientists, and other professionals, who have been the dynamo behind the growth of the high-value service sector [18,19,20].

The United Nations Department of Economic and Social Affairs (UNDESA) conducts e-Government Survey across the globe every two years and comes out with its benchmark reports. India has made significant improvement in its e-Government Development Index from 118 in 2014. 107 in 2016 to 96 in 2018 [12]. <https://www.un.org> > desa > dpad > publication

Therefore, an analysis of the impact of evolving technology on e-governance in India provides a critical understanding of the implications of the digital revolution for developing countries and countries in transition.

2. Research Question/Problem Statement

Globally, e-Governance Developments (EGDs) are still progressing. Developing countries like India with a large population and distributed administrative structure, face many challenges towards this progression [9].

The key objective of this paper is benchmarking various agencies of the government of India on their e-Governance-Service delivery performance. This paper explores the EGD scenario in India and benchmarks it as per national standards using the UNDESA survey framework carried out by the United Nations. India faces many constraints like other developing countries and shows low indices on certain parameters [5]. The paper analyses the grounds for this tardy growth. The paper locates the lacunae in the e-Governance system of India. The results of this study can help strategize EGDs especially towards interoperability and integration issues. It is this perspective, plus the fact that the paper sets out to consider the implications of the Digital revolution for developing countries and countries in transition, which provides its unique approach. This paper attempts to ensure that the developing country perspective is clearly articulated.

3. Research Methodology

This paper presents a four-stage Digital Government Evolution Model comprising Digitization (Technology in Government), Transformation (Electronic Government), Engagement (Electronic Governance) and Contextualization (Policy-Driven Electronic Governance) stages; provides evidence in support of this model drawing upon the study of Indian Digital Government literature in published between 1990 and 2020.

The paper uses the Digital Government Stage Analysis Framework to explain the evolution, implementation, impediments, and forecasts for the future. The framework is based on the Online Service Index (OSI) of UNDESA e-Government Survey and further customized for the Indian federal structure and e-Governance landscape of the States and Union Territories of India. The parameters identified for assessment are from the service recipient perspective and therefore focused on citizen centric approach.

This assessment framework is applied as a benchmarking tool to evaluate common services provided to citizens (G2C), business users (G2B) and government departments (G2G). These services under the identified focus sectors of Finance, Health, Social Welfare, Education, Labour & Employment and Environment which are considered core departments and are provided by all States and Union Territories and respective Central Ministries.

As the paper consolidates a representative body of the Digital Government literature in India, it could be also used for defining and integrating future research in the area.

4. e-Governance in India

e-Governance comprises the use of information and communication technologies (ICTs) to support public services, government administration, democratic processes, and relationships among citizens, civil society, the private sector, and the state [31, 28].

4.1. Stage-1: Digitisation

Electronic governance or e-Governance is adopted by countries across the world. In a fast-growing and demanding economy like India, e-governance has become essential [24].

<http://www.mit.gov.in/content/informationtechnology-act>

The rapid growth of digitalization has led to governments the world over introducing and incorporating technology into governmental processes. Electronic governance or e-governance can be defined as the usage of Information and Communication Technology (ICT) by the government to provide and facilitate government services, exchange of information, communication transactions and integration of various stand-alone systems and services [2]. In other words, it is the use of technology to perform government activities and achieve the objectives of governance. e-Governance can take place in four major types of interactions: **Government to Government (G2G)** **Government to Citizen (G2C)**. **Government to Businesses (G2B)** **Government to Employees (G2E)**

The launch of National Satellite-Based Computer Network (NICENET) in 1987 and subsequent launch of District Information System of the National Informatics Centre (DISNIC) programme to computerize all district offices in the country for which free hardware and software was offered to the State Governments to provide the requisite impetus for e-governance, may be considered as the first phase. e-Governance thereafter developed with the growth of technology [13] http://arc.gov.in/11threp/ARC_11th_report.htm

4.1.1. Stage 2: Transformation

The Transformation Stage is in principle internal to government organizations and how they interact with each other. The main mechanism to carry out such improvement is technological and organizational innovation, including a fundamental rethink of what a technology-enabled government, organization or sector does or should do in digital terms and how to align its business and technological developments. The main enabler to carry out such improvement is the digital and technological environment, including related capabilities and structures, established as part of the Digitization Stage [8].

Through e-governance, government services are made available to citizens and businesses in a convenient, efficient, and transparent manner. Examples of e-governance include Digital India Initiative, National Portal of India, Prime Minister of India portal, Aadhar (Unique Identity Number), Filing and payment of taxes online, Digital land management systems, Common Entrance Test etc [13]. <http://planningcommission.nic.in/plans/planrel/fiveyr/welcome.html>

The National e-Governance Plan approved in 2006 has made progress through Mission Mode Projects and Core ICT Infrastructure [13] http://mit.gov.in/sites/upload_files/dit/files/Compendium_FINAL_Version_220211. Today, there are a large number of e-Governance initiatives, both at the Union and State levels [13]. <https://www.scribd.com/document/44296404/E-Readiness-Report-202008> The second phase of the e-Governance programme to transform India into a digitally empowered society and knowledge economy is transformational in nature and meant to ensure that all government services are available to citizens electronically [24]. http://www.mit.gov.in/sites/upload_files/dit/files/DraftEDSBill_11042011.pdf. It also brought in public accountability through mandated delivery of government's services electronically [13]. <http://planningcommission.nic.in/plans/planrel/fiveyr/welcome.html>

4.1.2. Stage 3: Engagement

In 2006, the **National e-Governance Plan (NeGP)** was formulated by the Department of Electronics and Information Technology and Department of Administrative Reforms and Public Grievances that aimed at making all government services accessible to the common man, ensure efficiency, transparency, and reliability of such services at affordable costs to realise the basic needs of the common man [12]. http://www.mit.gov.in/sites/upload_files/dit/files/documents/12th_Nov_NAG_261110.pdf

The NeGP has enabled many e-governance initiatives like: **Digital India** was launched in 2015 to empower the country digitally. Its main components are:

1. Developing a secure and stable digital infrastructure
2. Delivering government services digitally
3. Achieving universal digital literacy.

As on 31st May 2021 there are a total of 3,836 integrated e-services that the Government of India offers. However, a significant achievement is imparting sensitization on the importance of service delivery effectiveness and promoting participation of all Departments and Ministries at state, and Central Level to adopt the e- Government framework in their day-to-day functioning to reinforce the vision Of MINIMUM GOVERNMENT AND MAXIMUM GOVERNANCE.

4.1.3. Stage 4: Contextualisation

The Contextualization Stage includes responding to the changing needs and aspirations of the society, supporting self-governance for local communities to be able to govern themselves with no or little interference from government. Digital Government innovations employed at the Contextualization Stage include – emergency assistance and community response grids, usually through mobile apps, during disasters. For instance, the 112 India has buttons for 4 major Emergency Alert Options- Fire, Medical, Police & Other with a google map to pinpoint the location of the user. ‘MyGov Corona News desk’ and ‘Arogya Setu App’ provides all statistical updates on COVID. Mobile collaborative transport and social transport apps, for example ‘m-Indicator’ App provides live train & bus tracking in select Indian cities. There are public services for vulnerable groups, digital social innovation and outcome-based funding, remote and self-health monitoring apps. For crime mapping and crime hotspot monitoring, GIS (Geographic Information System) helps to identify such spots and analyse crime incidence patterns [12]. <http://mit.gov.in/content/framework-mobile-governance>

Developed over more than two decades of technology innovation and policy response, an assessment of e -governance in India shows that the greatest investment and progress have been made in enhanced public services and improved government operations [5]. http://www.nisg.org/knowledgecenter_docs/A01000001.pdf

Policy development has moved forward on several fronts, but new policy issues continually add to an increasingly complex set of concerns. The least progress appears to have occurred in enhancing democracy and exploring the implications of e-governance for administrative and institutional reform. ICT-enabled governance will continue to evolve for the foreseeable future providing a dynamic environment for ongoing learning and action [8]. <http://www.scopus.com/inward/record.url?eid=2-s2.0-70349160519&partnerID=tZOtx3y1>

4.1.4. Limitations of the 4-stage Digital Government Evolution Model

First, is the tension between the sharp logical characterization of different stages of the Digital Government Evolution Model and the fuzzy and complex nature of some Digital Government initiatives.

Second, the subjectivity of the classification into stages; as some borderline cases may cover more than one stage, the classification only demonstrates generic developments.

Third, unlike the stages of growth models, the Digital Government Evolution Model is not aimed at leading organizations toward higher stages of Digital Government maturity, but capturing their factual evolution at the macro level, often with different stages of their evolution co-existing in time.

5. Benchmarking / Qualitative Assessment of Digital services: An Analysis

The quality of state portals has been assessed on four parameters, viz., **Accessibility, Content Availability, Ease of Use, and Information Security and Privacy**. Based on the information provided by the states, to the NeSDA portal of Government of India, assessment scores for each the four parameters were calculated. Further, based on the overall score – average across all the four parameters, the States have been ranked accordingly [2].

Sectors covered in Assessment of state portals

1. Finance 2. Education 3. Labour & Employment 4. Social Welfare (including Health and Agriculture) 5. Local Governance and Utility Services 6. Environment

Criteria for evaluating Accessibility. The criteria that were assessed are whether the website supports: • People with various disabilities (Auditory, Physical, Speech, Visual, Temporary Disabilities, People with Limited Bandwidth, etc.) • Multi-Lingual support • Compatibility with multiple devices • Compatibility of website with various search engines and resolutions, etc. • Compliance standards of the website • Multi-Media compatibility (Videos, Audio, Images and Animations, etc.) • Creation of personal Login profiles to avail the service • Provision to upload documents with online/offline support.

Criteria for evaluating Content Availability. The criteria that were assessed are whether the website has: • Presence of Reliable content • Availability of updated and relevant information • Presence of Timestamps and Sitemaps • Presence of Help and FAQ sections • In line with the various policies (Copyright policy, Open data policy, etc.) • Availability of statistics and factual data on the website.

Criteria for evaluating Ease of use. The criteria that were assessed are whether the website has: • Availability of essential, enhanced, and advanced features • Presence of user manuals, ‘how-to’ guides to avail the services • Efficiency and effectiveness of the website • Availability of internal workflow mechanism and service delivery charters • Presence of What’s New sections • Complaints resolution mechanism • Comfort and acceptability level of users

Criteria for evaluating Information security & privacy. The criteria that were assessed are whether the website has: • Been hosted on HTTPS protocol • Security policy to safeguard the user data • Mobile and email alerts during unauthorized changes to user profiles • Compliance with GIGW and W3C • Carried out TPA (Third Party Audit) for online security • Presence of copyright Statements and disclaimers.

5.1. Assessment Methodology

The assessment was done in 4 stages.

- Stage 1 - Basic Data Entry

In this stage, the uploaded URLs for the mandatory services from 6 identified sectors was examined. The services considered for this stage of data entry were in the Government to Citizens (G2C) (Citizen Services) and Government to Business (G2B) (Small Business Services) categories.

- Stage 2 – Review of Basic Data Entry

In this stage, the URLs uploaded were examined to verify whether the service links were functional.

- Stage 3 - Detailed Portal/ Service Questionnaire

In this stage, assessment questionnaires for the approved portals and services were given to the SPOCs (Single Point of Contact) of the Departments. They had the option to choose ‘Yes’, ‘No’ or ‘Not Applicable’ for each of the questions in the assessment questionnaire.

- Stage 4 - Review of Detailed Portal/Service Questionnaire Responses

In this stage, the responses to questions submitted by the SPOCs in Stage 3 were reviewed.

5.2. Calculation Methodology

Binary Evaluation method. Each parameter had specific numbers of questions. The responses submitted (Yes, No, Not Applicable) were evaluated in the binary mode (Accept / Reject). **The number of questions in each parameter for Services** were Accessibility (19), Content Availability (12), Ease of Use (11), Information Security and Privacy (8) **The number of questions for the portal**, was Accessibility (11), Content Availability (9), Ease of Use (13), and Information Security and Privacy (9)

The table below indicates the scores when a particular response is accepted or rejected. When a 'Not Applicable' is accepted, the total count (base) gets reduced by one. The scores for a particular service, across all parameters, were calculated in this manner.

Table 1

#	Response	Accept	Reject
1	Yes	1	0
2	No	0	-
3	Not Applicable	C-1	0

C indicates the total number of questions for the respective parameter.

Step 1: Calculation of Score of an Assessment Parameter 'P' across all service portals of a sector.

$$SP = \frac{RPY}{(QP - RP-NA)}$$

Where

- SP = Score of Parameter 'P' of a sector
- QP = No. of Questions under Parameter 'P' across all service portals of that sector
- RP-Y = Sum of Responses with Yes (Yes = 1) under Parameter 'P' across all service portals of that sector
- RP-NA = Total number of Responses with 'Not Applicable' under Parameter 'P' across all service portals of that sector

Step 2: Calculation of Overall Score of a Department for a Sector.

$$\text{Overall Score (OS)} = S1 + S2 + S3 + S4 + S5 + S6 + S7$$

Where

- S1 = Score of Accessibility Parameter of that sector
- S2 = Score of Content Availability Parameter of that sector
- S3 = Score of Ease-of-Use Parameter of that sector of that sector
- S4 = Score of Information Security & Privacy Parameter of that sector
- S5 = Score of End Service Delivery Parameter of that sector
- S6 = Score of Integrated Service Delivery Parameter of that sector
- S7 = Score of State and Request Tracking Parameter of that sector

Step 3: Ranking of States within a sector:

- a) Calculate the Overall Score of each State
- b) Sort the States in descending order of the Overall Score with highest overall score ranked as '1', and so on.

5.3. Assessment of states across all parameters

The overall assessment score of the state portals is depicted graphically below:

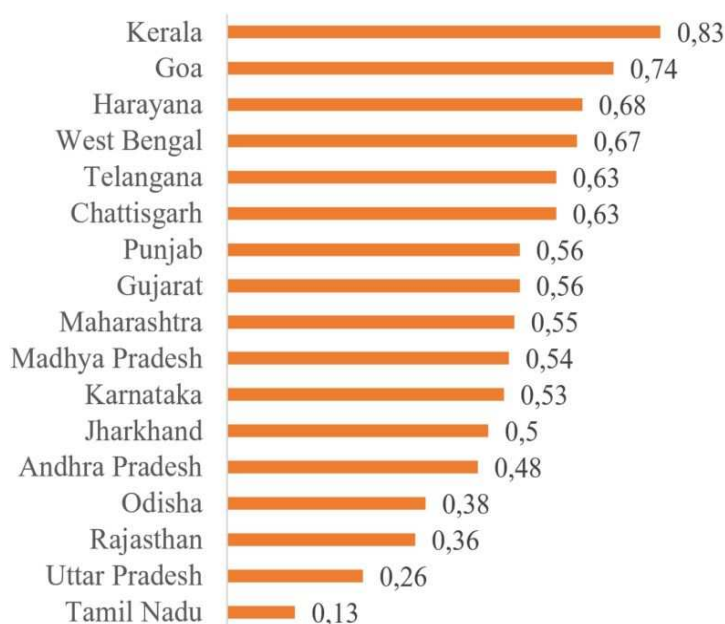


Figure 1: Assessment of Select states (India)

Kerala, Goa, Haryana, and West Bengal are leading state portals with more than 65% compliance to the criteria assessed across all the assessment parameters • States have higher compliance to the criteria assessed in Ease-of-Use parameter compared to other parameters

Note: India has 29 states (federating units) & 8 Union Territories (Union Territory is a small administrative unit that is governed by the central government). 8 North Eastern states and Himachal Pradesh (Northern state) and the 8 UTs have not been included in this list. 2 states had not provided adequate data. However, this is a representative study meant to analyse the efficacy of e-Governance in India in a brief and concise Research Paper.

5.3.1. The analysis of the state portals on the four assessment parameters is mentioned below:

Key Observations

Accessibility • Gujarat, Kerala and Rajasthan are the leading state portals with more than 60% compliance to the criteria assessed under this parameter.

Amongst the other States in this category, four States have their portals with compliance between 50% to 60%, nine States have compliance between 25% to 50% to the criteria assessed under this parameter.

Content Availability

Kerala, Chhattisgarh, Goa, Punjab, and West Bengal are the leading state portals with more than 75% compliance to the criteria assessed under this parameter • Five States have their portals with compliance between 50% to 75%, while six States have their portals with compliance of 25% and lower to the criteria assessed under this parameter.

Ease of Use

Haryana, Kerala, and West Bengal are the leading state portals with more than 90% compliance to the criteria assessed under this parameter • State portals of ten states have compliance between 50% to 90% to the criteria assessed

Information Security & Privacy

Goa, Gujarat, and Kerala are the leading state portals with more than 75% compliance to the criteria assessed under this parameter • State portals of seven states have compliance between 50% and 75% and four states have compliance between 25% to 50% to the criteria assessed.

5.4. Citizen Survey Assessment

The Citizen Survey was conducted to determine the satisfaction levels of respondents based on their experience in availing e-services in **one state**, the state of Maharashtra, which has a population of **126.2 million**.

5.4.1. Parameters

The respondents were requested to rate the following criteria for the assessment of e-services:

- a. Ability of the portal to support multiple languages
- b. Updated information on the portal
- c. Search feature on the portal
- d. Online payment facility of the portal
- e. Tracking of eService applications and grievances logged
- f. Alerts due to unauthorized changes in user profile
- g. Availability of e-Services within specified timelines on the portal
- h. Access to the portal through multiple devices
- i. User feedback facility on the portal
- j. e-Services User Manual on the portal
- k. Social media integration of the portal
- l. Status updates and alerts for e-Services
- m. Password recovery and reset facility on the portal
- n. Availability of end service online without manually visiting a government office/Kiosk

5.4.2. Methodology

The survey was launched on 25th April 2021 and closed on 25th May 2021. The sample size of the survey covering online service users and non-users was **3229 respondents**.

5.4.3. Key Inferences

1. A vast majority of the respondents were aware of the e-services available and 86% of the respondents had availed at least one e-service, highlighting the success of awareness efforts undertaken by the Government in this regard.

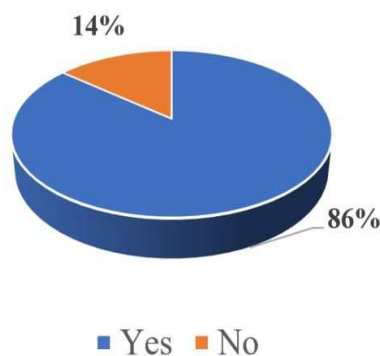


Figure 2

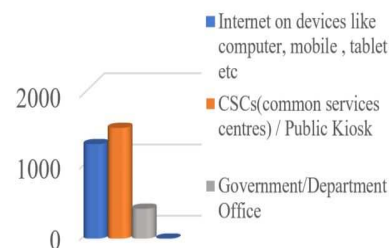


Figure 3

2. CSCs/Public Kiosks emerged as the most preferred choice of availing e-services, closely followed by access through computer/mobiles etc., clearly underlining the importance of focus on both physical and digital availability. Respondents preferred e-services over manual services owing to a more favourable experience with respect to all three factors of Cost, Time, and Effort.

3. Finance, Local Governance & Utilities were the sectors in which citizens availed e-services the most.

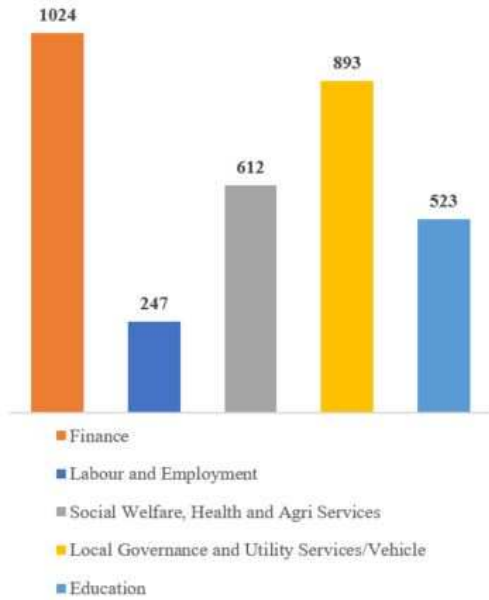


Figure 4: Sectors in which. citizens availed e-services the most

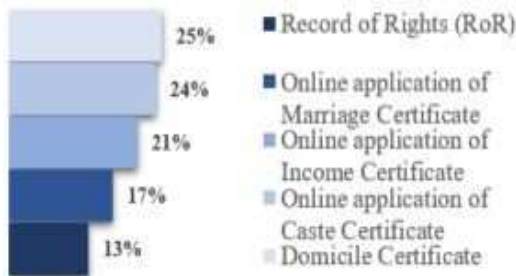


Figure 5: Finance

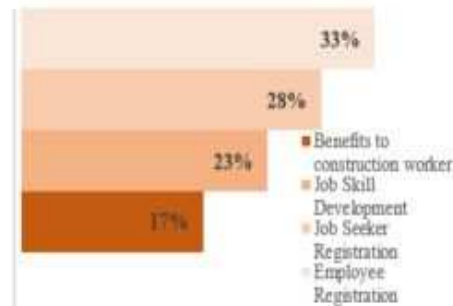


Figure 6: Labour & Employements

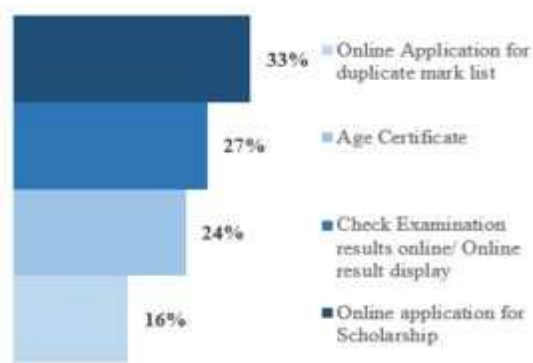


Figure 7: Social welfare, health and agriculture

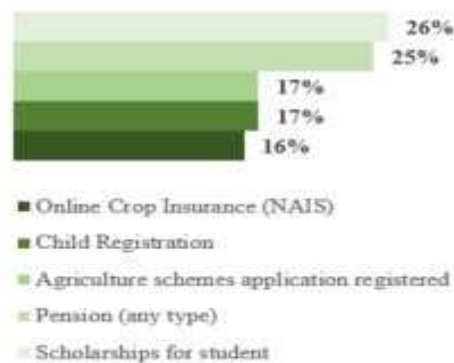


Figure 8: Education

4. In the Finance sector, the services availed are Record of Rights (RoR), Online application of Marriage Certificate, Online application of Income Certificate, Online application of Caste Certificate, Domicile Certificate. Domicile Certificate tops the list of most availed e-service followed closely by Online application of Caste Certificate.

5. In the Labour and Employment sector, the services availed are Benefits to construction worker, Job Skill Development, Job Seeker Registration, and Employee Registration. Employee Registration tops the list of most availed e-services followed closely by Job Seeker Registration.

6. In the Social Welfare Health & Agriculture Sector, Scholarships for students and all types of pensions emerged as the most opted for e-services.

7. In the Education sector, the most availed e-services included online application for scholarships and checking of examination results.



Figure 9: Environment including Fire Management



Figure 10: Local Governance & Utility

8. In the Environment sector including Fire Management, the most availed e-service was application for initial NOC or plan approval for building permit.

9. The most availed e-service in Local Governance & Utility Services category, was application for birth certificate followed by e-payment of electricity bills.

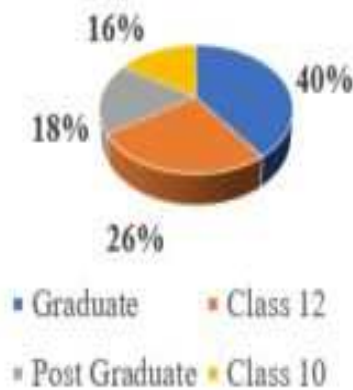


Figure 11: Gender Based Usage

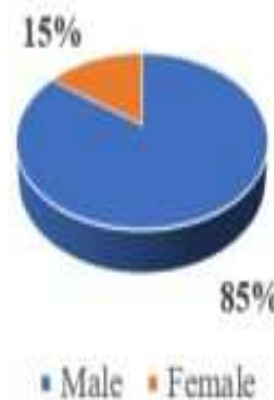


Figure 12: Educational Background

10. Of the total respondents who had availed at least one e-service offered, 85% respondents were male and 15% were female, which indicates a need to increase focus on awareness and engagement of female citizens.

11. Of the total respondents who had availed at least one e-service, 40% of them were graduates followed by the number of citizens who had studied up to Class 12: 25%, up to Post Graduation: 18%, and up to Class 10: 16%.

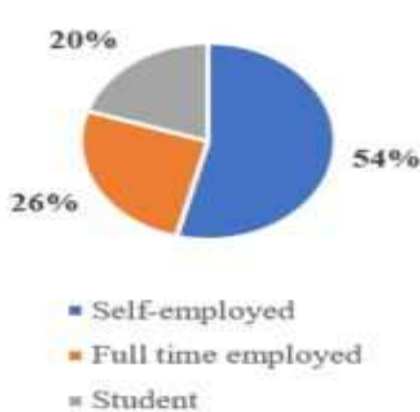


Figure 13: Age Based Usage

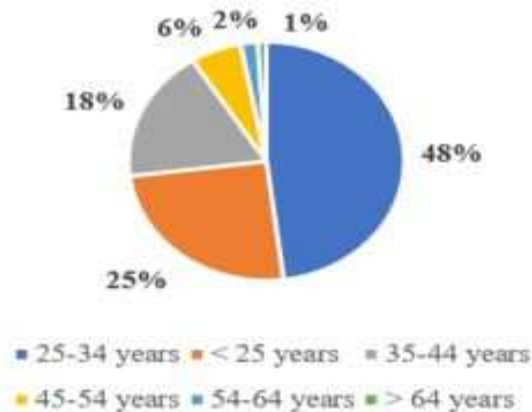


Figure 14: Occupation and Annual Income Range

12. The survey findings highlight that a younger citizen base (25-34 years) was the most willing to opt for e-services. Youth <25 years also showed a preference for e-services. However, with increasing age, fewer citizens opted for these services.

13. Of the total respondents who had availed at least one e-service as per the occupation and annual income range, most citizens were either self-employed or employed full-time, with an annual income range of more than INR 2,50,000 (\$3431.47). The income range was factored into the questionnaire.

6. Problems, Issues that remain unresolved in e-Governance in India

1. E-Governance in E-Governance: e-governance is not merely about technology; it is about reform. In a country with a huge digital divide, no culture of participatory governance and high rates of digital illiteracy, it was unrealistic to design programmes without these considerations and expect a positive response. Poor work culture and lax supervision resulted in web sites that were not regularly updated, slow response to online queries and clarifications, and online transactions that were plagued by delays and errors, causing dissatisfaction among the public [5]. For example, more than 6000 e-mail complaints pertaining to income and caste certificates, pending pension amounts, and drinking water shortages were lodged through these kiosks. However, on an average only 10% of these applications were being resolved. This happened because government began engaging with their constituents in a big way without actually looking at other aspects in the value chain simply because web-based technologies could enable them to do so [4].

2. The Silo Effect: Merely putting up a Web-enabled front office to existing back-offices without re-engineering the internal functions and networking of the back-offices can be a recipe for disaster. While citizens could come to a centre and apply online for a pension or a caste certificate, the back-office operations in these departments were still paper based and processing of an application would take the same amount of time as before. This severely affected the quality and speed of service delivery.

3. Vendor Driven e-Governance: Most Project consultants or Vendors who were hired by the government fell short on quality assurance. For instance, multiple copies of Voice to Text software were bought by the government as an e-governance application and to bridge the digital divide. These copies were bought on the premise that this will ease the workload of tele centre owners. However, these copies did not reach the tele centre level. Firstly, given their limited capacity, they could reach out to only 20% of the total number of kiosks [7].

Secondly, in case of any technical difficulties, government was contract bound to approach assigned vendors only. With their limited reach, vendors took a lot of time to fix the errors in the telecentres which kept telecentres out of work for days, resulting in losses and further disenchantment.

7. The Way Forward

The ‘Way Forward’ is to enhance the usability and utility of the portals, which would increase the acceptance and usage of portals among citizens. The parameters chosen to create a user friendly and glitch free e-Governance system for the future would be:

1. Accessibility: As this parameter is important to improve user perception and participation, Web portals should be usable, accessible, well coded, and mobile-device-ready. Availability of information related to key services like state holidays, online polls, call centre numbers to enhance usability of a portal. **Adherence to W3C** (W3C: World Wide Web Consortium) & **GIGW** (GIGW: Guidelines for Indian Government Websites) compliance displayed clearly on the portal homepage is a leading international practice. Portals should be multi device compatible to adjust to various mobile devices such as Tablet, iPad, mobile phones etc.

2. Content Availability:

To address multi ethnicity of India, at least one regional language should be provided along with English and Hindi.

The website should be easy to find in top search engines. Hence, it should be optimized by “key words” so that its visibility increases, and people know about the services provided.

To enhance user satisfaction, provision may be made for calling feedback regarding e-services & share results of user feedback.

There should be sitemaps in every portal along with information manual and help desk number to access the services easily.

3. Ease of Use: 1.e-Government service delivery portals should have facilities to log Grievances & Complaints on the portal itself. 2.Innovative processes and mechanisms for service delivery, and citizen engagement as well as empowerment are essential, to make services inclusive and accessible to all groups in society.

4. End Service Delivery: The following improvements are suggested.

- 1) Improve End Service Delivery.
- 2) Enactment of Right to Services Act in all states thereby ensuring the service delivery timelines and standards.
- 3) Introducing convenient channels of service delivery to all citizens.
- 4) Use of Digital tools like Digi-Locker to deliver services like certificates, RC book (Registration Certificate for vehicles), etc. which may not be provided manually.
- 5) Use of Government cloud account by officers to verify the documents of citizens for all services. [3]

5. Integrated Service Delivery: Some improvements suggested are: 1) Availability of multiple portal navigation routes for services and information enhances accessibility and ease of use for citizens to leverage e-Government services. 2) Service delivery portals should have features to enable access to people with visual/audio/motor disabilities. 3)Multilingual support for e-Governance portal will increase ease of use for citizens as well as help in reducing digital divide in India.

6. Information Security and Privacy: The following improvements are suggested. 1)e-Government service delivery portals should be secured through incorporation of HTTPS (Hyper Text Transfer Protocol Secure) and/or third-party security alliances. This would increase citizens’ trust in the service delivery portal. 2) STQC compliance (Standardisation Testing and Quality Certification) displayed clearly on the portal homepage is an international practice of security assurance. 3)Disclaimer and Privacy policy must be clearly stated on all government portals to make citizens aware of the purpose of collection and usage of their data and to maintain integrity of data transactions. 4.To improve user friendliness and to assure citizens of the safety of their data, password status alerts and password reset facility must be enabled for citizens.

Fostering active citizen participation:

Eventually, e-government should be directed to achieve citizen-centric and most importantly the involvement of citizens in the government affairs (participatory governance) to help the citizens improve their lives and to embrace them in decision making process that affect their future well-being [7].

The following improvements are suggested.

1. A single window which enables automatic tracking of service requests is recommended. 2. The facility should be accessible from anywhere across the web, easy to use, and reduce the issue / request resolution time which increases overall productivity. 3. Offer best-in-class experience to all citizens by providing multilingual national level call centres operating 24x7 4. e-mail based helpdesks and mobile based applications to ensure that citizens can access the services in a cost-effective manner [15].

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2. The Citizen Survey Assessment was conducted by online questionnaires forwarded to citizens in Maharashtra state. 3229 citizens filled in questionnaires were found valid. The Research Team of The Mumbai School of Public Policy, of which the author is a member, were instrumental in the distribution of the questionnaires, collation, and analysis of the data.

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