A Review of Select Innovations and Emerging Trends in E-Governance

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Abstract: **This paper reviews some of the innovations in E-governance seen across the globe. Examples have been taken from five different countries that have tried innovative ICT enabled governance programmes for deeper and purposeful engagement with citizens. These innovations are cost efficient and also energy efficient. Few emerging trends in e-governance have also been discussed in the end.**

Keywords: **E-governance, ICT, Data protection, Social networking, Artificial intelligence, RFID.**

1. Introduction

E-governance has emerged as a time tested paradigm in bringing rapid transformation in governance all across the globe. It helps governments, departments and other public agencies to carry out their operations smoothly with deeper engagement with citizens. The rapid developments in ICT have brought the governments closer to the citizens and are helping them in providing wide array of services with greater administrative efficiency, monitoring and control.

A lot of developments have taken place in the e-governance scenario. Even the hitherto less developed nations have invested money, time and efforts in creating a purposeful and scalable e-governance infrastructure to enable them better achieve their national developmental goals. The United Nations comes up with an E-government survey every two years that presents a detailed comparative analysis of country wise E-governance adoption and growth scenario.

The emerging technologies such as IoTs, cloud computing, artificial intelligence, augmented reality, bit coins etc, are bringing transformational changes in governance. One noticeable experience of developing countries in the e-governance process has been the creation of islands of MIS and e-government silos across various departments without any linkages whatsover. This has made inter-departmental coordination much more difficult and cumbersome. Countries such as Denmark, Sweden, South Korea, Singapore have brought drastic changes in their technology based governance mechanisms and have emerged as benchmarks for many developing countries.

This paper purports to explore some of the recent trends in e-governance and the best practices being followed and implemented for greater connect and engagement with the citizens.

2. Review of Literature

The Compendium of Innovative E-government Practices (2009) consists of case studies of successful e-governance implementations from several countries across the globe. Cases range from those in Angola in Africa to Peru in Latin America.

Boulton (2019) enlists and briefly describes some of the key e-governance innovations in healthcare services, agriculture, clean energy, fin tech and waste management in India.

CRS Report for Congress (2007) identifies certain critical factors that impact the state run e-government programmes. The report presents a holistic look at various facets of e-governance planning and implementation such as strategies, funding, state politics and culture, leadership and the degree of centralisation and decentralisation. Strategies are important as they provide a sense of direction to the e-governance initiatives. Funding remains a key challenge for e-governance projects as most digitisation projects required heavy initial capital outlay. A government may not have adequate resources due to more important priorities on other developmental goals and as such it may not be able to accomplish e-governance targets in time. Leadership, according to this paper, is an important aspect in successful e-governance implementation.

Rabaiah, Abdelbaset & Vandijck, Eddy (2009) discuss about the commonalities in the initiatives of different governments in achieving e-government objectives. These commonalities according to the authors arise due to best practices. One noticeable observation about e-government policies is that while they are all well developed and well understood, the problems are mostly linked to implementation. The paper focuses on the importance of having a strategic e-government framework. According to the authors there is a lot of replication in the e-governance initiatives of various countries and a proper strategic framework would help them save money, resources and time. The authors have done a detailed study on the guiding principles of different countries that influence them or that act as lampposts in their efforts to implement appropriate e-governance systems. It also discusses the various building blocks of a sound and robust e-governance framework.

PWC (2015) identifies the successful examples and case studies related with public service delivery reforms undertaken by the governments of Georgia, India, Estonia, Netherlands and Azerbaijan.

3. Research Gap

Most of the papers on best practices and innovations are old and do not have any contemporary relevance for India. The emerging new technologies such as IoTs, artificial intelligence, chatbots are increasingly being used but there are very few papers that have specifically endeavored to connect their impact on e-governance polices and systems. The current paper attempts to fill this gap and explore the ways in which new technological developments are impacting the adoption and diffusion of E-governance systems.

4. Objectives

The paper endeavors to,
1. Explore few best practices in E-governance that have helped drastic transformation or achievement of any socio developmental goal of a country.
2. Study the challenges that a progressive country like India may face.

5. Research Methodology

This paper is entirely based on secondary research. Various online research papers, portals and websites of government agencies and departments have been considered. Besides several newspaper articles, blogs and books have also been consulted in drafting the body.

6. Innovative E-Government Implementations and Best Practices

A. Australian e-Government Technology Cluster

The Australian e-Government Technology Cluster ("eGov Cluster"), is a national cluster of Government departments, industry, research and academia who have collaborated together to boost technology driven implementations in public services. The cluster has been playing very important role in acting as an intermediary between the government and the ICT innovators in providing cost-efficient, sustainable and energy-efficient services to citizens. The cluster provides and supports a number of channels such as tradeshows, conferences, collaborative projects, networking events etc. in providing linkages to service providers, innovators and common citizens.

B. Finland: Block chain enabled financial services

The refugees in Finland faced a variety of difficulties. They could not open a bank account nor could they avail even small credit for lack of identity documents. In 2015, Migri, the country's immigration service, in collaboration with a startup MONI started using block chain based digital identity service that also provided prepaid Mastercard to the beneficiaries. This has made it easier for refugees to find jobs and pay bills electronically. Hitherto, the refugees were unable to avail banking facilities as they had no credentials or proper documents. Block chain has emerged as a cost effective technology in enabling the less privileged to avail financial services resulting in check on corruption, better record keeping and accountability. The block chain enabled digital trail also permits credit scoring and increased access to other financial products. The programme has enabled refugee users find jobs, pay bills and transfer money to relatives.

C. Netherlands: SolaRoad

In Krommenie, Netherlands (north of Amsterdam) a 72-metre solar bike path was opened in 2014 as part of a pilot scheme to capture solar energy. The path produces more than 3000 kilo watt hours of energy. Sola Road has emerged as a successful model for setting up green energy infrastructure on a boarder scale.

D. Data Protection Act of Switzerland

Switzerland has very strong federal laws on data privacy and protection enabling better control of users on their personal data. The Federal Act on Data Protection that came into force in 1993 refrains all third parties from processing unauthorized personal data. Even the government authorities without appropriate legal rights cannot oversee or monitor or access user data. In 2020 the IP addresses were considered to be personal information by the topmost judiciary of the country and companies and agencies were forbidden to track Internet usage through IP addresses without explicit consent of the users. Data protection in Switzerland is also regulated by the Swiss Federal Data Protection Act (DPA) according which personal data processing must comply with the following general principles:
i) *Principle of lawfulness* – Personal data can only be processed lawfully without violation of any legal provisions.
ii) *Principle of proportionality* – the processing of personal data should only be as much as required for the intended purpose and should be just in relation to the violation of privacy.
iii) *Principle of good faith* – personal data should not be processed by misrepresentation or deception.
iv) *Principle of transparency* – The collection of personal data and the purpose of processing must be obvious to the user.
v) *Principle of data accuracy* – personal data must be accurate and kept up to date.
vi) *Principle of data security* – adequate technical and organisational security safeguards must be taken against unauthorised or unlawful processing of personal data.
vii) *Principle of appropriateness* – Personal data can only be processed for the purpose indicated at the time of collection.

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E. South Korea: Smart bins for waste management improvement

South Korea has a very innovative smart waste mechanism for waste management that has enabled it to recycle 95% of the food waste as against 2% earlier. Dumping food in landfill was banned in 2005 and it was in the year 2013 that the government introduced special kind of biodegradable bags for a fee. This has encouraged home composting and also helps meet the cost of running the scheme. The cycle food waste is used as fertiliser or as animal feed. Apart from these biodegradable bags there are thousands of smart bins that are Radio Frequency Identification (RFID) enabled. These bins charge users based on the waste deposited by residents. The pay-as-you-recycle model has ensured very high percentage of recycling of food waste as most residents try to cut down waste as much as possible.

7. The Emerging Technologies and their Impact on E-Governance

Governments all over are increasingly realizing the importance of disruptive changes and emergence of new technologies in redefining the governance landscape and providing new levels of engagement with the citizens. "The focus must now lie on the digital transformation of society as a whole. Governments are no longer only providing services to end users, whether these are citizens or businesses. They should look, instead, into enabling people and particular sectors of the economy to become digitally savvy, and to reach full ICTs adoption in those sectors," Linnar Viik, Co-Founder of E-governance Academy of Estonia comments.

Some of the key trends that are emerging in the paradigm of e-governance are mentioned below,

A. Block chain Technology

Block chain technology uses "blocks" of information in a distributed, public database or a shared, open ledger (the "chain"). It provides a secure way of business transactions without the intervention of third parties. It thus helps in reducing fraud and increasing transparency. Another benefit of block chain technology is that it provides real time information and helps in reducing operational expenses. Block chain technology is gaining immense significance in maintaining land registration records, patient treatment records, banking transactions, payment of taxes, voting etc. As the technology permits immutability, the scope of fraud and tampering of data becomes negligible. Estonia has adopted block chain in its various e-government services. Chile has been extensively using Ethereum to monitor the data and transactions of the electrical grids in the country and thus promote transparency and check corruption. Canada has also used block chain technology for effective monitoring of the government grants.

B. IoT

The Internet of Things or IoT is a concept that describes the ability of various objects and devices to communicate with one another through internet. The objects could be smart phones, smart cards, RFID chips, sensors and other such tools embedded in vehicles, building and offices – permitting all of them together to release huge amount of communicational data for productive use and analysis. IoT addresses several e-governance concerns such as smart traffic management, smart electricity, solid waste management, managing automatic lighting and ambient temperature in buildings, workplaces and residential complexes.

C. Green IT

Green IT refers to the use of recyclable, renewable and environmentally sustainable resources for use in computing and technology infrastructure. More and more governments are realising the importance of green technologies and are promoting them not only due to their low carbon foot print but are also finding them economically cost effective and sustainable in the long run. Smart buildings, solar power run traffic signalling systems, electronic receipts etc. are few of the emerging applications of IT.

Social Networking: More and more government functionaries and citizenry is resorting to social media platform for deeper engagement, feedback, monitoring and collaboration. Several Indian government departments are available on Facebook and Twitter to elicit citizen feedback and also to share important information. Even complaints and grievances are being effectively handled through social media tools.

Artificial Intelligence: Artificial intelligence refers to the capability of a digital computer or a computer controlled machine to exhibit human-like intelligence, learn from experiences, adapt to new situations, take decisions and performs tasks on its own without much of human intervention. Artificial intelligence has a range of uses in the government and can drastically improve the way government functions and can ensure better response mechanism. It can be used to further policy goals and also used as a reliable, robust mechanism for deeper interaction with citizens. Few uses of AI in e-governance are in maintaining public infrastructure, disaster response, traffic control assistance, automated surveillance to prevent crimes and acts of terrorism, robotic manufacturing, digital healthcare, predictive research, decision support, automatic picking of harvest, crop classification and monitoring etc.

Public Private Partnership: Public Private Partnership is slowly emerging as a very successful e-governance paradigm across the globe wherein the private partners bring in their business acumen while the government stays focused on socialistic and welfare concerns. PPPs are complex legal arrangements designed to share the control, risks and rewards of a set of specific investments among private partners and a government department. In most PPP models, the assets are legally owned and used by the private partner to produce a specified category of services for a specific period. Subsequently the government gains operational control and

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legal ownership of the investment, often without payment. Applying the PPP in the E-Government projects helps to achieve the objectives of e-government by effectively planning and implementing the project.

Personalisation: More and more government portals and services are using data analytics and predictive algorithms in providing highly personalised and deeper engagement levels to citizens. Biometric based unique citizen identification mechanisms have also enabled cross-platform information sharing and personalised experience across different services.

8. Conclusions and Recommendations

Thus we see that e-governance as a policy paradigm has been witnessing dramatic changes over the last more than a decade. The new age technologies have facilitated deeper citizen engagement and more personalised offering of services. Further it is also being observed that the divides between the developing and developed nations are slowly diminishing with higher development on the e-government front. If we look at the E-governance Survey reports released by the United Nations over the past few years (released biannually) we would find that most countries are improving their E-government Index. It becomes imperative for the policy makers, businesses and common citizens so embrace technologies and move towards a more inclusive society with lesser divides and higher accessibility to online services.

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