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AN EFFECTIVENESS STUDY OF INCLUSION OF EMERGING TECHNIQUES OF INFORMATION TECHNOLOGY E-GOVERNANCE

[1]Ashutosh Kumar choudhary, [2]Suniti Purbey

[1]Assistant Professor, [2]Assistant Professor
[1]Computer Science & Engineering,
[1]ASET, Amity University, Chhattisgarh Raipur, India

Abstract: Good research practice suggests that we should begin by defining our terms. The Oxford Concise dictionary defines research as a, the systematic investigation into and study of materials, sources, etc, in order to establish facts and reach new conclusions and an endeavor to discover new or collate old facts etc. by the scientific study of a subject or by a course of critical investigation. This definition is useful because it immediately focuses upon the systematic nature of research. In other words, the very meaning of the term implies a research method. Computing science is an immature discipline. This has brought startling advances in both hardware and software engineering. Unfortunately the development of computing technology has not been matched by a similar development in academic research techniques.

Index Terms - *E-Governance, Emerging Technique, Big Data, Computing Science*

I. INTRODUCTION

Information technology (IT) strategies are organized and long-term approaches to connect government with citizens. Federal, state, and local governments are investing in the development of IT strategies to promote their e-government goals. E-government improves and enhances the infrastructures and services provided to the citizens. The purpose of this paper is to investigate the strategic role of IT in e government. The findings of this study indicate that better configuration of IT strategies with different projects, clear legislation, implementation guidelines and standards are required. A detail analysis of citizen participation can be performed from literature, general practice, incentives and organization to highlight, investigate, and discuss major issues regarding the public participation challenges in e-government. This is an important IT implication in this paper that provides contribution to theory and practice of e-government. The major findings of this study are useful for decision makers, policy makers and also valuable for actual understanding of the needs of the citizens.

2. Review of Literature:-

Information quality was found to be a major variable during information retrieval from the state website. Moreover, service quality, perceived ease of use and transaction security is important variables which influence the public intention to execute transactions with the government (Rehman and Esichaikul, 2011). The introduction of IT is undergoing a period of eight to 10-year growth when technology investments are growing twice faster than the economy, followed by a similarly long period when technology investments are growing at the same pace as the economy (Loesch, 2012). Global IT development has belief over local economies influence because information sharing on new products in internet is highly significant and rapid delivery as well. The key problem relating to the high failure rate of e-government projects is the lack of awareness about the potential factors that may assist citizens to adopt e-government services (Sang and Lee, 2009). The eagerness of the citizens to adopt e-government is the most important issue for successful e-government implementation

of (Shareef et al., 2009). Bwalya (2009) developed a model combining existing models with ICT infrastructure and culture awareness. Grant and Chau (2006) proposed an e-government framework to categorize, classify and evaluate e-government system. An effective definition of e-government was started to find out the building blocks of e-government. Some important drives of e-government strategies are political and economic factors, vision, and requirements of each nation. Political spirit is vital to initiate any e-government projects, and strategic vision facilitates for planning and proper implementation of e-government (Heeks, 2006; Rabaiah and Vandijck, 2009). E-government development is disrupted by lack of resources and infrastructure in developing countries (Heeks, 2003; Mofleh and Wanous, 2008; United Nations, 2013). Some components such as inequality and poverty cause digital divide in diffusion of e-government (Heeks, 2006; Heeks and Bailur, 2007; United Nations, 2013). Another key issues are e-democracy, e-politics and cyber laws (Mofleh and Recent studies in e-government implication indicate a strong impact of optimism, publicity and lack of balance in e-government functioning (Heeks and Bailur, 2007). The use of digital infrastructure for governance is accepted worldwide (Jaeger, 2003; Riley, 2007). Adoption of web-based technologies to deliver government services has become a universal trend in public administration. IT, thus, is the reinforcement driver of e-government (Lee and Kim, 2007).The studies of information use in government focuses on the design and use of ICTs in the public sector as well as on the implication of IT in inter-governmental collaboration. An exhaustive understanding of the design and use of IT requires the study of institutional strength and composition. The purpose of this paper is to investigate the strategic role of IT in e-government. Jaeger (2003) believes that e-government include the use of other ICT, such as database, networking, discussion support, multimedia, automation, tracking and tracing and personal identification technologies. E-government is not about the use of technology, it is the relationship among technology, policy and various stakeholders, which come together to construct and offer improved services to citizens. Technologies by themselves do not define what e-government is and what it will be (Yildiz, 2007). However, unpredictable IT infrastructure in government organizations will minimize the e-government performance. The shortage of IT skills is also a barrier, which contends a number of challenges regarding the efficiency of a public administration to provide modern e government services (Heeks, 2006; Ho, 2002)

3. Objectives:-

The major aim of this study is to investigate the strategic role of IT in e government. Based on widespread literature review the conceptual model was developed. The first part of the block is pre-requisiting factors for e-government adoption. The variables are trust, website design, service quality and satisfaction. In this case these variables act as independent variables towards e-government adoption. In addition, IT standards and e-government strategy act as independent variable on e-government adoption. The contribution of mediating variable is to link motivating constructs and influencing constructs in e-government. All these variables were developed from literature review.

3.1. Trust -The importance of trust in e-government adoption is vital based on previous studies (Be´langer and Carter, 2008; Carter and Be´langer, 2005; Welch et al., 2005). Belanger and Carter (2008) provided confirmation empirically by evaluating the influence of trust in government over e-government adoption. They found that trust in government is a significant factor influencing public intention to use e-government. Prior research has comprehensively recognized trust in the internet as a significant predictor of e-government services adoption (Carter and Be´langer, 2005; Chang et al., 2005) and this study recognizes its importance. Based upon the above arguments we propose the first hypothesis as: H1: Trust is positively and directly associated with e-government adoption in online platform.

3.2. Website design -E-government website was investigated to be a strong predictor of actual systems usage in the information systems study (Chau and Hu, 2001; Venkatesh et al., 2003). User-centered websites are important for governments as e-government websites are becoming the significant medium for electronic transaction between citizens and government (Becker, 2004). Bertot and Jaeger (2006) mention that user acceptance is critical factor in establishing user focused e-government services. Different studies show that well-designed and attractive contents on government websites play critical role to provide citizen satisfaction (Smith, 2001; Wang et al., 2005; Gajendra et al., 2012). Thus, we propose following hypothesis: H2: Website design is positively related to e-government adoption in online environment.

3.3. Service quality- Service quality is important variable to perform transactions with the government (Rehman and Esichaikul, 2012). The government should pay more attention on how information will be delivered and organized to the people (Stiftung, 2002). Parasuraman et al. (1988) developed a scale to measure quality which is called 'SERVQUAL'. The components of the scale are responsiveness, assurance, tangibles, reliability and empathy. A complete service quality impacts satisfaction and adoption (Reichheld et al., 2000). The quality of service plays a vital role in e-business. Sures chander et al. (2002) found five critical factors that are essential in measuring service quality: human element of service delivery, tangibles of service, core service or service product, system inaction of service delivery and social responsibility. Thus, higher quality of service will provide greater customer satisfaction. H3: Service quality positively influences e-government adoption

3.4. Satisfaction -Online services will lead to increase satisfaction among citizens and acceptance of the public services (Stiftung, 2002). Technology facilitates to identify a website where delivery of services could be monitored to meet the individual needs to enhance the satisfaction of citizens from government services (Gilber and Balestrini, 2004; Gajendra et al., 2012). E-government adoption is measured by the level in which the government can provide trouble free services, rich and engaging support for public satisfaction. Thus the customer satisfaction is measured by transactional satisfaction and overall satisfaction (Shanker et al., 2003). H4: Public satisfaction in online platform positively effects e-government adoption.

3.5. E-Government adoption -The successful adoption of e-government services is important for governments. Warkentin et al. (2002) define adoption as the intention of people to involve in e-government services in order to collect information and request services from the government. Carter and Belanger (2005) evaluate it as intent to implement, while Gilbert and Balestrini (2004) examine as intention to use e-government services. Both willingness and intention is considered as uni-dimensional measures of e-government adoption. However, e-government adoption is a multi-dimensional variable. Adoption is a simple decision of using, or not using, electronic services. Akman et al. (2005) explained that the success of e-government adoption depends on public efficiency. E-government services offer public precision in the process of governance, such as prompt and efficient services, simplification of procedures, and friendly attitudes of an individual (Gajendra et al., 2012).

3.6. IT strategy -IT strategy includes competencies, IT scope and IT governance. Some of the challenges in developing countries are lack of ICT infrastructure, public awareness on e-government services and citizens' trust in the government which are basis for e-government project failure (Heeks, 2006). Bwalya (2009) proposed a model that combines existing models with ICT infrastructure and culture awareness. The findings of this study were focused on the creation of an ICT enabled environment for the adoption of e-government. Hence, following hypothesis was developed: H5: IT is directly and positively related to e-government adoption.

3.7**. E-Government strategy -**Strategy-focused governments seek to formulate a plan which integrates government and e-government strategies (Irani et al., 2005). Strategic fit in government is defined as the configuration between external and internal domains that is represented by either government transformation or e-government transformation (Gilber and Balestrini, 2004). A complete framework for the evaluation of e-government projects was outlined by Esteves and Joseph (2008). Based on above argument we propose following hypothesis: H6: E-government strategy directly influences e-government adoption in online platform

4. Methodology:-

Big data will become one of the most powerful investment sectors for government. E-Government can use big data to discover the trends and patterns of peoples' behaviour on the social networking so that the government can provide better, effective, efficient service .The term of Big Data offers a new opportunities for value creation, discovery , prediction and empower the business intelligence for decision support in e-government . Since the public sector starts their online transactions and activities, the e-government initiatives adopt the big data strategies in their next implementation. Big data provides the government with the better understanding of their people's habits and interests with the aid of applications in their mobile and social networking based on their browsing, clicks, search engines, purchase histories, booking, etc. With these capabilities, the government can understand its people's habits, tastes, personalities, and preferences, which can help predict what their people want and offer appropriate advertise and programs that would satisfy their needs and concerns. Big data helps government to structure smart government by providing faster, effective, and reliable services to their citizens. In public

sectors the big data is a new concept and powerful technology used to define the growth and availability of various data. E-government can try to brief service delivery and offer higher speed, transparency, effectiveness, efficiency, and certainty. Big data has the power to transform e-government practices in generating added value for public services and has ability to motivate and support the digital innovation for e-government. Toward enhancing the e-government services and the increasing of effectiveness and efficiency, the added values of big data are explored in business analysis. In addition, the big data is discussed in identical administration structures about the issues of integration of various information sources, security risk and digital confidentiality. The viewpoint research directions are specified in big data issue for public sector. E-government not need a big data, it need the right big data ,where big data is delivering meaningful value to e-government as a new revolution that leading the entire ICT agency , where the new activities and valued data are being generated faster than ever before. Where these big data hold the key to unlock a new race of activities that will make both the government and the public have a better understanding of business that will make it more effective and efficient. Many leaders defined Big Data as the next edge for innovation, productivity, competition, and quality. The main principle of big data is valuing predictions, and it optimizes abilities and rules that create value to support data management. Big data is available in various structures and formats, and it can be used for different objectives, such as predicting a search keyword or social networking activities. The e-government initiative needs to recognize the importance of big data management, benefits, analysis, and technologies into their e-government strategic plan.

5. Expected outcomes of the Work

The concepts behind the big data allow the governments, organizations, and citizens to achieve a variety of aims and objectives in a special way. The investment in e-government to enhance the services delivery of the public sector and engaging with internal and external entities will enhance the public service transparency, collaboration, e-participation, and efficiency. The massive amount of available data right now has difficulties to hand and analyse in the organization. One of the main challenges that faced these governments is the implementation of the big data. Nevertheless, the governments need to make an effective plan and strategies before taking initiatives and adopt projects to build a big data analytic and ensure that the investment of the projects is worth (profit) to the nation. This paper aimed to show the definition of big data and e-government and analyses the initiatives of the big data in the government in many situations including the Big data features, Big data challenges, Big data initiatives, Big data and e-government issues.Moreover, this paper combined information about initiatives and more published research works in the area of the Big Data and e-government to lead researchers to find some comprehensive information, which helps to extend further in that area. Also, this paper proposed a possible solution for challenges that facing e-government through implementing of big data. In addition, this paper offered benchmarking requirements which aimed to facilitate Big Data initiatives in e-government.

6. Details of research work -

The preliminary research idea came during the implementation of e-Governance in the topic of **"**Inclusion of Emerging Technologies of Data Science in E-Governance Systems**".** The e-Governance projects like : e-Hospital-One Stop Solution for Hospital Management Information System, Public Financial Management System-Facilitating Transparency and Accountability in the use of Public Funds, Public Distribution System-Automation for Targeted Public Distribution System, Service Plus- A Framework for rapid roll out of e-Services, e-Transport- Moving Towards Smart Transport Vehicle Registration, Driving License online, e-Prisons- Digital Innovation in Prison Reformation, Immigration, Visa and Foreigner's Registration and Tracking-Technological Transformation of Immigration & VISA Process, e-Courts-Redefining the Justice Delivery System using ICT across Districts, Service Plus- Service Plus is a metadata-based, single, integrated framework that can be configured swiftly for facilitating government departments rollout services to citizens and businesses, Assembly and Parliamentary Election Management system and many more. All the above mentioned products and platforms are different and which are not being implemented in time by the use of ICT with the Government. As a result Government of India uses Information and Communication Technology to provide public services in a more effective way but not reaching up to last people in time. With the immerging technology of Data Science, the e-Governance society will be benefitted in future in a manner that the last person standing in queue will get the accurate service with all together in same time. Data Science and engineering technology viz., Artificial Intelligence, Machine Learning, Big Data and Cloud computing can contribute to many of the aforementioned issues that can extend e-Governance expansion, but has some limitation and risks too. This has been a driving source behind initiating proposed research in the related topic. We belief that the scholars and government organizations will try to determine ways to assure the successful adoption of proposed research work.

Since Data Science is a relatively new concept, the research with IoT, AI, ML, Big Data adoption in e-Government will be very useful for farmer and weaker section of society. Many NIC's product of e-Government (say e-hospital, Land Record, e-Court, Election, e-District services etc.) are going to be digitization. In other words central and state governments are digitizing all the government departments, scheme and services. With the help of NIC's internet facility NICNET in government offices the use of e-Governance application has increased. Hence size of these data is increasing in rapid day after day. Processing and sharing of these data records are difficult by traditional approach. It is not new to gather and process of big data. Open source big data technology like NoSQL and Hadoop are used to handle. Here we will do some research work that how big data will provide solution in the transformation of the government processes (e-Governance) by increased efficiency and effectiveness with citizen engagement in decision making too. Accurate analysis carried out based on big data which helps to increase and optimizes operational efficiencies, enable cost reductions, and reduce risks. In order to capitalize on big data one should require infrastructure that manages and processes huge volumes of structured and unstructured data in real-time and can ensure data privacy and security.

For Operational Big Data No SQL Big Data systems are designed in such a way it capitalizes on new cloud computing architectures, to permit access on massive computations to be run reasonably and efficiently. Hence this builds operation on big data workloads much easier to manage, cheaper and faster to implement. Whereas Map Reduce which provides the analytical capabilities for re -collective and complex analysis. Map Reduce provides a new method for analysing the data that flaunts its capabilities provided by SQL, and based on a system called Map Reduce that can be scaled up from single servers to thousands of high and low end machines. When government agencies are harnessing and applying analytics to their big data, they have improvised a lot in terms of managing utilities, running agencies, dealing with traffic congestion or preventing the affects crime. But apart from its advantages in Big Data, governments also address issues of transparency and privacy. Educator regarding Big Data provides a significant impact on education systems, students and curriculums. By analysing big data, they can identify at-risk students, ensuring student's progress, and can implement an improvised system for evaluation and support of teachers and principals in their teachings. When it comes to health care in terms of Patient records. Treatment plans. Prescription information etc., everything needs to be done quickly and accurately and some aspects enough transparency to satisfy stringent industry regulations. Effective management results in good health care to uncover hidden insights that improve patient care.

Our research work will establish a conceptual framework that will map the current research with the new expectation and enable the easy identification of research gaps. In addition to this, the theoretical stage model for Data Science adoption in e-government presented in this study may be one promising stage model in the related literature studied so far. We shall propose a stage model that will rank the different uses of Data Science in e-Government and will be used to evaluate the progress of government processes. The study will be focused exclusively on the use of Data Science in e-Government by retrieving complete information from e-governance data for making the best policies and mining e-governance data that how poverty is associated with free schemes which is being provided by Government to poor people.

In nut shell the proposed research work will be focused (But not limited) on following topics with special reference to e-governance services being provided by NIC in Indian Scenario:

1. To conduct survey among various stockholders of the society on satisfaction of existing e-governance services and to identify their need and expectation.
2. To compare traditional e-governance model against an improved e-governance model with emerging technologies like Cloud computing, Artificial Intelligence and Machine Learning (AI and ML), Internet of Thing (IoT), Information and Communication Technology (ICT), Big Data etc.
3. To identify pros and cons of traditional e-governance and e-governance with emerging technologies.
4. To study e-governance models based on emerging technologies of world wide.
5. To study Feasibility of proposed e-governance models based on emerging technologies in terms of quick delivery of services to the citizens, Service management, Security etc.
6. To study Effectiveness of Emerging technologies for inclusion of e-governance.
7. To propose conceptual framework of e-governance with emerging technologies.

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