E-government, E-commerce, E-science using Internet of things and Big Data

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Abstract

This paper aims to analyze how big data and internet of things plays significant role in the government sector industries and institutions and health sector. The internet of things is upcoming technological revolution, it is the concept of everyday things which includes industrial machines to wearable devices it is the future of technology that can make lives more efficient. Innovation came slowly to Indian government. It took several years, it has been proved that expenditure for big data and analytics is shifting upwards and it will continue at a growing pace according to several researches. In this research paper the various applications of big data which are used by the different sectors have been discussed. Banking and securities industry are also using applications of Big Data. The industries also depend heavily on big data for risk analytics which includes fraud mitigation, anti money laundering, etc. The healthcare sector also access huge amounts of data but fails in utilizing the data. This is mainly due to the fact that electronic data is inadequate. In education sector the major challenge is to incorporate big data from the various sources and to utilize it on platforms that are not designed for the varying data. In today's era it is necessary for staff and students to have knowledge to learn new data tools and management tools as well. Hence the internet of things and big data has strengthened the role of participation in every sector.

Keywords: Internet of things & big data, Role, Government, Organization, Institution, Application.

Introduction

Kevin Ashton was the first person who used the term internet of things in 1999. It refers to uniquely identifiable objects and their basic representation of model in an internet like formation. The internet of things and its relevant technologies has been playing essential role since it appeared, and has been inducing the thinking of researchers from academic community, Industry and government in recent years. The most popular use of big data is in Internet of things linked devices which is connected by information security companies and hardware sensor. There is a high perception that all things can be easily restrained and supervised. It can connect with each other through internet, and can make decision by their own. In order to make internet of things smarter, lots of technologies are introduced into internet of things. Research on the effects of big data in the public sector is scarce Big data is characterized by variety, volume, veracity, velocity. It comes in large volume it is a mixture of structure and unstructured data .It challenges include sharing, transfer, storage, and visualization and information privacy. Big data accuracy leads to better decisions and result in cost reduction, operational efficiency and less risk. The existing literature usually offers prediction rather than findings.

E-science

It is in-depth science carried out in highly scattered network environment that uses large data that require grid computing, it includes technologies that enable distributed collaboration. E-science has been broadly elucidated after accessibility of materials generated by the scientific process.Application of information technology includes undertaking scientific examination, development and arrangement, analysis, data collection, result dissemination. It transforms the empirical research through digital big data. Most of the e science research activities have developed computational tools to corroborate scientific discovery.

E-commerce

It is associated with the selling and buying of information, products and services through network. Its applications are quite different. it is used for paperless exchange of business information by using E-Mail and Electronic Bulletin Boards and other related

technologies. E-commerce includes ordering, interactive marketing, and online payment on the World Wide Web. It is used for on-line approach to perform traditional functions like payment and fund transfer. Its applications are customer to business, business to business, and intra organization.

For example some of the Companies using e-commerce are

- Card service international
- Clickshop.com
- Check free corporation
- Bank of America (financial institution)

E-Commerce procedure
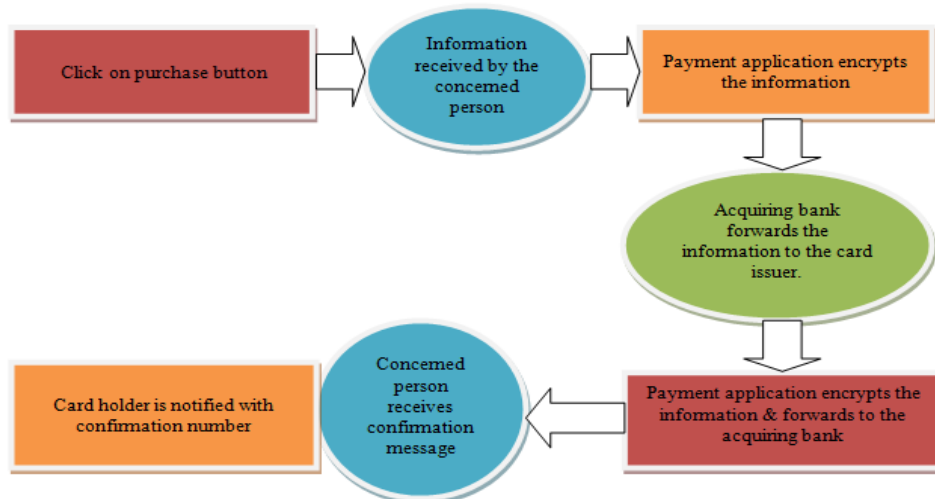
E-Government

The e-governance plan has been developed and implemented to improve the quality of government services to citizens and the other sectors. The objective is to support governance for all citizens, businesses and government. It helps to access information empower citizens. The components of e-governance are technological component, social component, service component, political component etc. it is relevant because of its simplicity efficiency, transparency, cost effective and people's participation.

Initiative till date

- Customs and excise
- Indian railways
- Postal department
- Passport
- CARD-Registration Project (State Govt. of Andhra Pradesh)
- LOKMITRA (State Govt. of Himachal Pradesh)

Different Aspects in which the Internet of Things Influence Big Data.

Data storage

First thing that comes to mind is a huge, continuous stream of data hitting company's data storage. In response to this direct impact on big data storage infrastructure, many organizations are moving toward the platform as a service model

instead of keeping their own storage infrastructure, which would involve continual development to handle the obligation of big data.

Big data technologies

While selecting the technology stack for big data processing, the influx of data that the internet of things will deliver must be kept in mind. Organizations will have to accommodate technologies to map with Internet of things data. Disk and network compute the power and will be impacted and should be planned to take care of this new type of data. The most important thing is to receive events from Internet of things connected devices. These devices can be linked to the network using Bluetooth, WI-Fi or other technology. Most popular widely used protocol is MQTT (Message Queue telemetry transport).

Big Data Analytics

Internet of things and big data are the same. Managing and extracting data from IoT data is the great challenge that companies have to face. Organization should set up suitable analytics to analyze the IoT Data. The growth of the IoT herald a new age of technology and organization that wish to participate in this new era and will accept the change and the way they do things to acquire new sources and data types . As the IoT and business grows with IoT they will have many more challenges to solve.

Some of the technologies of internet of things are:

- Radio frequency identification is an important enabling technology for the internet of things and is mainly used for tracking and tracing objects.
- Near field communication is low power shortwave way to move small amount of data within the devices.
- Machine to machine communication generally refers to the internet of things for commercial, business and industrial applications.
- Transmission sensors are different from RFID mechanization in that they use to measure features of our physical environment, such as heat, pressure and humidity.
- Actuator networks converts information from sensors into action by transmitting it to another power system.
- Artificial intelligence is the electronic environment which is sensitive to the existence of the people. Some of its characteristics involves embedded, context aware, personalized, and anticipatory.

Possible limitations of internet of things are:

1) Privacy
2) Safety
3) Compatibility
4) Complexity
5) Unemployment
6) Dependent

Gartner identifies the internet of things technologies for 2017 and 2018

Some are

✓ IoT analytics

- ✓ IoT security
- ✓ IoT processors
- ✓ IoT operating systems
- ✓ IoT platforms
- ✓ Low-power, short range Iot networks
- ✓ IoT standards
- ✓ Low-power, wide area networks
- ✓ Event stream processing

Objectives of the Study

- To determine the role of internet of things in e-government, e-commerce, e-science.
- To understand the evolution of e-government, e-commerce and e-science.
- To examine the Barriers and issues for adoption of internet of things.

Literature Review

Tarafdar and Vaidya, (2015) examined the factors that determine the organizational tendency to adopt E-commerce. The studies recommend a structure based on the qualitative data on four financial firms in India collected through case study design. Personal interview was used to collect primary data and existing database, company reports, press reports and websites are used to collect secondary data. The structure describes two broad factors leadership attribute and organizational capability to explain the significance of organizational factors on the capacity to employ E Commerce technologies. These studies establish that both leadership and organizational characteristics influence E Commerce.

Ishii, H. and Reichl (2013). This study determine that technology of wearable computing concentrate on embedded computers items and also impart various characteristics of the internet of things and also shows that investigations of innovation and internet of things are interconnected with each other

Lal, D. and Agarwal, R. (2012) studied the determinants of adoption of Information Technology in India. This study was based on 60 electrical and electronic goods manufacturing firms situated in U.P. Structured questionnaire was used to collect the primary data. The study tested the components influencing the degree of Information Technology adoption by firms. The components included are entrepreneur personality measured by consciousness, firm's international coordination factors measured by import and export intenseness, work force skill and firm area approval.

Gupta, D. and Sen (2012). This paper on e-commerce in Indian insurance industry explores the features of e-insurance in contrast with the established offline insurance service. The author establish the forth that e-insurance suggest benefits such as decline in search cost and hidden cost, price comparison for customers, and betterment for customers such as opportunity to have niche market, first mover utility and product accumulation for insurance in India. It is still at formative stage, but stands to produce more particularly from the rural markets because the vacancy of insurance agent is very less as compared to the urban markets. The study is theoretical in nature and provides insights placed on market reports and data from secondary sources.

Soren, D. (2009). Some studies recognizes the   global trends which are major in social computing as they seem to evolve under the 'web 2.0' heading, determining the possible future trends which are seen from a technology point of view as

well as from a socio- economic perspective and observe these flow to the current circumstance and requirement for e-government. Some general guidelines and ideas for e-government are discussed.

Golden et al (2008), Layne and Lee (2005). The maturity period of e-government is measured in terms of its extreme of functionality of government websites. Inappropriate technical standards, charge over citizen's privacy and absence of agency readiness to teach employees on culture change link with an absence performance guidelines are any of the factors indicate as obstacle to adoption of Information Technology in government institutions. Government websites are classified as either information or transactional. The slow moving pace of government reforms, absence of e-government champion tradition and lack of in house management are some of the factors that resist organizational change within government.

Dhillon, G. (2000). The research methodology is adopted by the large government organizations British National Health Service hospital trust and inquiry. The administration and management of information systems security was evaluated in terms of the business environment, culture, obligations and expectations of different roles, and the related pattern of behavior. The studies conclude that government requires clear financial models in order to undertake investments in their information systems and related processes

E-Governance, V.M Rao, ABD Publishers, Jaipur, India 2007

This book describes all the conceptual terms, methods and techniques regarding e-governance in detail. This shows logical idea of e-governance with e-governance practices. The author explains the real experience of various countries to enhance our knowledge. E-governance in India is described right from the observation and strategies to evolution and implementation. Modified IT Act 2000 gives scheme of activity to reach at position of leadership. E-Governance is the procedure by which community direct itself as e-governance is not only initiating technological tools but it is about a change in thoughts and work culture. In India, Department of Information Technology is accountable for IT policy and encouragement of e-Governance in the country. With its clarity in approach, facts provided with examples makes e-governance book as helpful guide as reference book to students, administrators and application developers

Data Collection

In this study only secondary data is used and it is collected from subject books, journals, case studies, internet and newspaper.

Limitation of the Study

- The study depends on pre-existing data it is not possible to access whole data.

- Lack of collecting critical data is one of the limitation.

- Suggestions and conclusion is written on the basis of other research studies.

Conclusion and Future Work

The internet of things gives a chance to access remote sensor data and to control from a distance. It allows the government to discover and improve services which cannot be provided by the other isolated systems. E-commerce is continuously proceeding forward and becoming more important in business as technologies continues to move forward and is something that should be taken benefits of and implemented. Today many of the organizations across the world are using e-commerce, e-science and became successful. Moreover e-commerce is most important factor for success of every

company .The internet of things is popular now, and there is need to label its challenges and increasing its benefits while decreasing the risk. Internet of things also represents how people and institutions are connected through the network into their personal, economic and social lives. Most of the research things into e-science have concentrate on the growth of new mechanism and developing new tools that assists scientific discovery. It can be concluded that while the internet of things makes life easier and better there are significant challenges in its use. It is clear that internet of things will have a major impact on e governance, e commerce, and e science as well and it will bring variety of benefits at every level.

Identified Issues and Barriers for adoption of internet of things

a. **Data Privacy**: The potential of the internet of things relies on various strategies that secure individual privacy across his expectations. It means that rights for privacy and respect for individual expectations are important for user to trust in the internet, related services and connected devices.

b. **Lack of standards**: If there will be inflexibility purchasers will hesitate to purchase internet of things services and products. The use of open, generic available standards for IoT devices will provide great support and benefits.

c. **Security:** IoT devices which are not secured can lead to expose of user information by leaving data unprotected. An approach is required to develop solutions to IoT challenges that are suited to complexity of the issues.

d. **Emerging Economy:** Iot has significant role for delivering economic and social benefits to developing economies. This includes healthcare, agriculture, industrialization etc. The need of implementation in less developed area need to be addressed.

e. **Business adoption cycle:** As IoT is disruptive technology to the models of businesses. Hence business are experimenting IoT by establishing prototypes and small projects to determine how it helps to business. Therefore as soon the barriers to the adoption of IoT will be removed, it will be better for all the businesses.

Further research can be done to investigate how challenges and issues identified in this study can be respond to make internet of things more secure and safer, and also to determine the feasibility of upcoming technologies.

Future of Internet of Things and Big Data

It is going to be amazing. We will able to see the framework and architecture for internet of things to develop different design principles so that different programmers can come up with new applications which will be innovative and will facilitate the communication between software and hardware devices.

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