

Implementation of IOT in E-governance a Concrete Bridge between People and Government in Various Sectors

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Abstract — Internet of things (IOT) is one of the most trending technologies which can be best utilized in numerous e-Governance activities. The IOT is gearing up with the facility of communication among the objects (Things) which is generating vital data. This data can be utilized in e-Governance activities for societal benefits. The governance of various sectors by government is done through e-Governance, m-Governance and now taking a new shape of incorporating IOT in e-Governance. The investigation with a case study on agriculture of Rayalaseema rural areas of Andhra Pradesh, India projected a positive result in terms of economy and comfort. This paper focuses on the IOT services to e-Governance, particularly in the field of medical and police and security for better productivity and policy making in operational, strategic and tactical levels. It facilitates rapid communication of data among various departments and establishes alliance among divisions of organizations which in turn enhances the country's economy and leads to prosperity.

Key Words — E-Governance, IOT, Medical, Police

I. INTRODUCTION

In a country like India, which has a population of over 132.6 crores (as in 2016) the main challenge is reaching the people to the grass root level and provide them with the services that they deserve. The population of India is growing rapidly this challenge looks up to become bigger. A solution to reach each person is to give e-governance a chance, but implementation of e-governance is through the internet which now days is reaching each and every person. This paper aims towards the implementation of the Internet of Things as a technology in e-governance. Internet of things popularly known as IOT is the next big revolution in the field of technology. Combining both IOT and E-governance will give us the results that are tremendous and can help in better administration. Since we aim to reach and provide benefits to the larger chunk of population we need to implement it in various sectors differently. This paper deals with the IOT implementation with e-governance in two sectors

- 1: Police and Security
- 2: Healthcare Sector

These two sectors have been always in the popularity for e-governance and also they have been explored by the IOT. These sectors can be a best option to start with. Implementation in these sectors will directly reach the

people and they will get benefits first hand. Being amongst the first layer of interaction bridging them first will be a better option.

II. E-GOVERNANCE

E-Governance basically electronic governance is the mixture Of government and the electronic devices. It can be termed as government that is on electronic devices and reaches people 24/7. It's the way of governance by which people can connect to the government better. This also allows the people to connect with the government in a better fashion. Basically making a bridge of technology between the people and government.

[3] There are many advantages of E-Governance:

- Exchange of information with citizens, businesses or other government departments
- Speedier and more efficient delivery of public services
- Improving internal efficiency
- Reducing costs and increasing revenue
- Restructuring of administrative processes
- Improving quality of services

E-governance has no special definition. It's defined differently by different organisations. Some of them are listed below.

II.I E-governance

[1] The term 'e-governance' has come into a lot of limelight in recent years but still there is no standard definition of this term. Different state governments and organizations define this term differently. Some widely used definitions are listed below:

[2] II.I.1 World Bank:

E-government refers to the use by government agencies of information technologies such as Wide Area Networks, the Internet and mobile computing that have the ability to transform relations with citizens, businesses and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information or more efficiency of government management. The result of these benefits can be less corruption, increased

transparency, greater convenience, revenue growth and cost reductions.

[2] II.I.2 UNESCO:

E-governance refers to the exercise of political, economic and administrative authority in the management of a country's affairs, including citizens' articulation of their interests and exercise of their legal rights and obligations.

[2]II.I.3 The Council of Europe:

E- *Governance* is about the use of information technology to raise the quality of the services government deliver to citizens and businesses. It is hoped that it will also reinforce the connection between public officials and communities thereby leading to a stronger, more accountable and inclusive democracy.

III. INTERNET OF THINGS

Internet of things is not a technology which is new to the world. It's basically the connection of electronic devices via internet, it's a network of all the physical things such as the vehicles, home appliances and all the electronic devices .basically it deals with the sensors, actuators and also the connectivity through which the people can exchange information and data to each other.

It aims towards lessening the human intervention in the world of technology. It allows everything to be sensed and controlled on its own that is remotely. It makes the integration of physical world of computer and gives many advantages namely efficiency, consistency and accuracy.

The online capable devices has increased by 31% in one year from 2016 to 2017. And is expected to grow two folds in next year.

Things in Internet of Things can be referred to as the devices such as heart monitoring implants or the biochip transponders on the animals in the farm, cameras that stream live feeds of wild animals in the coastal waters, automobiles with the built-in sensors, DNA analysis device for environmental, food/pathogen monitoring, or field operation devices that assist firefighters in search and rescue operations. [5]Legal scholars suggest regarding "things" as an "inextricable mixture of hardware, software, data and service

It has been successfully implemented in the navy, space research etc.it has a great scope to change the current scenario,

Anything that touches consumer industry became a buzz word. So now Internet of Things is one among. What it is - the end goals is to bring all things we use in day to day life over network and can be accessed across the world over internet. That means every objects/gadgets we use in a day to day life will have a identify over network and its information can be consumes via Laptop, Tablet and mobile and including wearable like smart watches.

IV. E-GOVERNANCE AND IOT

Internet of Things is backbone of all the networking which has many sensors, RFID chips, medical equipment's even the buildings. Basically it can be used in anything that needs to be monitored and also has unique identity on network and also has an ability to 'machine talk'. IOT is expected to bring in a revolution in economy, governance of various countries. Mainly the ones that plan around it

Indian government at this point of time thinks that there is great scope for the IOT and has foreseen the tremendous potential in it. [3]Also the government is planning a close synchronous energy between the Digital India programme and the IoT, and has already drafted it into policy. The IoT will be part of the broadband highway that will deliver a wide range of e-governance and citizen services to all corners of the country.

Clearly, we can see that IoT will play a major role in the transforming India into economy that is digital. IOT will act as a catalyst that may empower our citizens by providing them with the transparency in governance and services (education, health, legal, financial and safety) at their own fingertips. At the heart of this transformation will be a re-engineering and digitizing of government processes, using IT and supporting database and cloud infrastructure to simplify, improve and optimize the various government functions

Thus combining e-governance with IOT can be a great solution to the current problems that are faced by the people and the government while implementing the E-governance and also can be helpful for the future generations.

V. MEDICAL

E-governance and medical sector may go hand in hand and give people a better life in the terms of their health. Also we have to consider that the Internet Of Things (IoT) has been making serious impact on every industrial sector, and wherever this "technology" swept by, you can feel this Midas touch. After the "Invention" of Internet, IoT has been creating waves that not just a single business in the world can deny or resist. Those who do will be long left behind as competition is going to become strong and tenacious. In this paper, we explore the mark IoT has made in the Medical sector and how it will improve the lives of millions of people in the world.

As per the reports generated by the P&S Market Research, there is a compound annual growth rate (CAGR) of 37.6% in the medical Internet of Things industry between the years 2015 and 2020. They claim that this rise could be attributed to upper hand of remote monitoring healthcare systems that can be detect chronic life-threatening diseases in humans.

By this we can assume that IoT has taken the reins and people can enjoy personalized attention for their health requirements and related issues; they can also tune their devices to remind them of

their appointments, their calorie count, their exercise check, their blood pressure variations and so much more. Firstly let us see the current development that is done in the medical sector by E-governance. They are stated as follows:

[9]Wipro provided Hospital Information System (HIS) to six hospitals of DMC. HIS consist of 28 important modules which are essential for the hospital needs, like Patient registration, demographic details, outpatient visits, doctors' appointment scheduling, Discharge/ Transfer, Order Entry, Laboratory/ Cardiology Result Reporting, Operation Theatre Management and Pharmacy etc.

- TCS for Tamil Nadu: For the development of electronic medical records (EMR) Tamil Nadu Government has allotted 5 crore using Tata Consultancy Services (TCS).

- 21st Century's Health NET in Goa: The Government of Goa in association with 21st Century Health Management Solutions Implemented a Rs-2.5-crore Hospital Management Information System (HMIS)

called Health NET in Goa Medical College (GMC) Hospital.

- [11]Hello doctor 24X7 at MKCG Medical College: Hello doctor24x7 is a project introduced for e-health care service undertaken by 3 final yr medico of MKCG medical college using internet and mobile phones to provide health care information to rural people in form of teleconsultation, tele-medicine, specialist referral, and emergency health care information to poor patients of remote area

- SORIG: NIC proposed the a service oriented implementation for rural information grid . Berhampur is an Endeavour to meet need of rural population. This service also includes tele- medicine, e-health care, disease surveillance, epidemics prevention etc.

And there are certain proposals that can be implemented

- The appointments of the patients and the no patients checked should be online so that it can validate the law that states that the license of the GMC will be cancelled if 1000 people are not checked everyday

- The in time and out time should be made online so that there is transparency in that area

- The actually sale of medical and intake should be done online so that the corruption is minimized

E-governance mixed with the medicine sector with the IOT can do wonders. These are some applications of E-governance and IOT in medical sector

1. Hand Hygiene Compliance

[7]There are some hand hygiene monitoring systems that would detect the degree of cleanliness in a healthcare worker. According to the research of Center for Disease Control and Prevention in the United States, about one patient out of every 20 gets infections from the lack of proper hand hygiene in hospitals. Number of patients lose their lives as result of hospital acquired infections.The interactions in the hand hygiene monitoring systems are done in real time and if a clinician comes near a patient's

bed without washing his hands, the device would start buzzing. And that's not all. The complete information about the medical worker and staff, his ID, location and time will all be fed into a database and this information would be forwarded to the concerned authorities of the respected hospitals.

2. Remote Monitoring

[7]Remote health monitoring is an important application of Internet Of Things. Through monitoring, you can give adequate healthcare to people who are in dire need of help. Every day, lots of people die because they do not get timely and prompt medical attention. With IoT, devices fitted with sensors notify the concerned healthcare providers when there is any change in the vital functions of a person.

These devices are made with complex algorithms in such a way that the patient receives proper attention and medical care. The collected patient information would be stored in cloud. Through remote monitoring, patients can significantly reduce the length of hospital stay and perhaps, even hospital re-admission. This kind of intervention is a boon to people living alone, especially seniors. If there is any interruption in the daily activity of a person like if a person is living stressful life, alerts would be sent to family members and concerned health providers. These monitoring devices are also available in the form of “wearables”.

VI. POLICE

Police is the sector that is in constant contact with the population. They have to be in contact with the people all the time. They have to deal with the population all the time and also have to be alert and also manage people in the efficient manner. There are times they have to deal with the large amount of people and also with the traffic norms.

E-governance has already been implemented in this sector at various places such as:

[10] The police department already has software applications for specific functions. The details of the applications used by the department are

- Crime criminal information system (CCIS): This is a criminal records management system maintained by National Crime Records Bureau (NCRB).

- Motor vehicle coordinating system: This is used for punching and storing the data of stolen / recovered vehicles at SCRB / DCRB.

- Talash: This is used for punching and storing the data of missing persons / unidentified dead bodies.

- Portrait building: This application is used to prepare sketches of suspected criminals.

- Payroll/GPF: It is used to prepare the pay rolls/GPF statements of police personnel.

- Identity card system: This is used for preparing the identity cards of police officials / officers.
- E-FIR using e-governance FIR stands for First Information Report. It is the document that the police write out and file, when they receive a complaint that a cognizable offence has been committed.

And the certain proposals for the implementation of e-governance in police sector are

- The progress in the process should be made available online so tracking could be made easier
- The FIR’s should made online so that forgery can be lessen.
- The copy of evidences should be submitted online and kept with proper security
- The copy of statements should be recorded not written so that the change of statements can be done.

These are the places where e-governance combined with the internet of things can do wonders. There are examples where iot can be implemented.

1. To stop stampedes

In kumbhmela 2015-nashik iot was implemented where the mat was placed in the area which through the sensors they can check the density of people and when the density is increased above the safe level the text about it will go to the police who can work on betterment and also help in preventing the stampedes.

2. For controlling traffic

The sensors for speeding have been installed that check whether the speed is higher than the allowed limit and can trace the more speed thing and help in accident reduction this has been implemented in various places all over the world. Also the sensors on busy squares can help people.

VII. CURRENT HURDLES

Although we are very positive about the Internet of Things implementation in e-governance we should not overlook the fact that currently e-governance is facing a certain friction in the Indian context.

[5]It is said that e-governance creates the Digital Divide between the people. Through this person to person interaction between the people and the government is getting lost which is valued by a large no of people. Second one being that we can always blame the system for any fault.

[6] Studies have shown that there is potential for a reduction in the usability of government online due to factors such as the access to Internet technology and usability of services and the ability to access to computers Even though the level of confidence in the security offered by government web sites are high, the public are still concerned over security, fear of spam from providing email addresses, and government retention of transaction or interaction history. There has been growing concern about the privacy of data being collected as part of UID project.

The security of cyber space and misuse of data is still holding back the citizens to full adaptation of Aadhar card.

As we have already discussed that the e-governance is currently facing a lot of friction that is because it’s in the initial stage of its implementation. There are always some hurdles that are faced by the people when we introduce them to a new technology so this can be a great decision to implement IOT at this beginning level so that there is no problem for people to accept it afterwards

For example if we are making a road and after 5 year we want to make it a double lane one we will have to break it completely ad then start it from scratch. Here what we can d is making the double lane road from the start. This is what we want to say that implementing IOT at this point of time can be great decision.

The Internet of Things (IoT) is given very less attention in e-government, where the promises done by the IOT are high. The IoT describes a situation in which physical objects t coat can be connected to the Internet and are able to communicate with each other, and also identify themselves with other devices. These devices have a capacity to generate a huge amount of data. We can explore the expected benefits of IoT for e-governance by investigating case studies like the ones at the Directorate General of Public Works and Water Management of the Netherlands. The results show that the implementation of IoT has a variety of expected political, strategic, tactical and operational benefits which implies that the IoT enables effective knowledge management, sharing and collaboration between domains and divisions at all levels of the organization, as well as between government and citizens.

VIII. LITERATURE REVIEW

[8]Luigi Atzori is an assistant professor at the University of Cagliari (Italy) since 2000.He has been awarded a Fulbright Scholarship (11/2003–05/2004) to work on video at the University of Arizona. His main research topics of interest are in multimedia networking: error recovery and concealment, IP Telephony, video streaming, network QoS management. He has published more than 80 journal articles and refereed conference papers. He is editor for the ACM/Springer Wireless Networks Journal and is involved in the organization of several International Conferences on Multimedia Networking.

Antonio Iera is a Full Professor of Telecommunications at the University “Mediterranea” of Reggio Calabria, Italy. He graduated in Computer Engineering at the University of Calabria in 1991; then he received a Master Diploma in Information Technology from CEFRIEL/Politecnico di Milano and a Ph.D. degree from the University of Calabria. From 1994 to 1995 he has been with Siemens AG in Munich, Germany to participate to the RACE II ATDMA (Advanced TDMA Mobile Access) project under a CEC

Fellowship Contract. Since 1997 he has been with the University Mediterranea, Reggio Calabria, where he currently holds the positions of scientific coordinator of the local Research Units of the National Group of Telecommunications and Information Theory (GTTI) and of the National Inter-University Consortium for Telecommunications (CNIT), Director of the ARTS – Laboratory for Advanced Research into Telecommunication Systems, and Head of the Department DIMET.

Giacomo Morabito was born in Messina, Sicily (Italy) on March 16, 1972. He received the laurea degree in Electrical Engineering and the Ph.D. in Electrical, Computer and Telecommunications Engineering from the Istituto di Informatica e Telecommunication, University of Catania, Catania (Italy), in 1996 and 2000, respectively. His research interests include: new generation mobile and wireless systems, broadband satellite systems, Internet of Things. Elevated to the IEEE Senior Member status in 2007. From November 1999 to April 2001, he was with the Broadband and Wireless Networking Laboratory of the Georgia Institute of Technology as a Research Engineer. His research interests focus on analysis and solutions for wireless networks. Since April 2001 he is with the Dipartimento di Ingegneria Informatica edelleTelecomunicazioni of the University of Catania where he is currently Associate Professor.

Venuetize's Nimish Shrivastava explains how the Augmented Age is leading to new ways of experiencing and engaging with smart spaces, as well as opportunities for the people managing these spaces.

CONCLUSION

E-governance is a solution that makes exchange of information with the citizens business and the people easy and IOT is a mode by which the systems can be connected. The flavor of IOT in E-governance will ease the life of people which currently is very hectic and we all know that our country is moving towards the Digital India and IOT will serve as a master stroke to it. It will be very helpful in various sectors like medical and police as discussed in the paper and also in various other sectors like judiciary and education etc. But for the implementation of this idea we will have to overcome these hurdles no one can stop us from growing.

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REFERENCES

- [1] <http://shodhganga.inflibnet.ac.in/bitstream>
- [2] http://shodhganga.inflibnet.ac.in/bitstream/10603/5433/6/06_chapter%201.pdf
- [3] <https://www.businesstoday.in/opinion/columns/role-of-internet-of-things-in-india-digital-transformation/story/227415.html>
- [4] https://en.wikipedia.org/wiki/Internet_of_things
- [5] https://link.springer.com/chapter/10.1007/11823100_14
- [6] <http://www.insightsonindia.com/2014/11/23/e-governance-india-concept-initiatives-issues/>
- [7] <https://www.sciencedirect.com/science/article/pii/S1389128610001568?via%3Dihub>
- [8] <https://www.cabotsolutions.com/2016/02/applications-iot-healthcare-industry/>
- [9] Blobel B, Nerdborg R et al, Modelling privilege Management and access control, *International Journal of Medical Informatics*, 2006,75:597
- [10] Dainik J (2007). “GD ke din kade email se darj hogi rapat” Website of Punjab police “E-Governance in Department of Police, Punjab” ORF Discourse, Published by Observer Research Foundation, New Delhi
- [11] <https://www.government.nl/ministries/ministry-of-infrastructure-and-water-management/contact>

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