

Anchoring Aadhaar for Technology Framework of Digital India

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ABSTRACT

The Government of India (GoI) has envisioned Digital India program to usher India in to a digitally empowered economy. The objective of Digital India program has been centered on the delivery of the governance in an electronic mode to the citizens of India. The advancement in the Information and Communication Technology (ICT) has changed the way the people and government carry out their works and interact with each other, from manual system to digital system. This paradigm shift has forced the government for deliberation over inventing some ICT based, novel ways for the delivery of the governance to the citizens in an electronic mode. The Digital India program is an initiative in this direction to cater to the requirements of the government to deliver the governance, electronically to the citizens through internet using applications of ICT. While extending governance in the form of welfare services by the government in an electronic mode to the citizens of the country, it is prerequisite to have captured some citizen centric data that establishes unique identity of the citizens over the network in order to avoid the errors of inclusion and errors of exclusion. The twelve digit unique identity number known as Aadhaar serves the purpose of identification of the individuals by establishing the unique identity of the citizens over the network. The data generated during the process of communication between the government agencies, Aadhaar Database and the citizens give rise to the development of the Federated Database Systems. The present paper discuss the advent, evolution and the technology framework of Digital India.

Keywords: Aadhaar, Central Identity Data Repository (CIDR), Digital Identity, Federated Database, Governance.

1. INTRODUCTION

In Social Development Commission Debate of United Nations (UN) on February 5, 2004, the speakers have emphasized that the vulnerable people especially in the developing countries face a number of socio-economic struggles. It is the prime responsibility of the government to ensure the effective delivery of the essential public services such as education, health care and access to food to all people [1]. India is a developing country having high proportion of vulnerable segment of population i.e. poor and socially weaker sections of society [2, 3, 4]. It is specifically mentioned in the Directive Principles of the State Policy in the Constitution of India in Article 38 under Section IV that India is a welfare state. A welfare state is based upon the principles of equal opportunity to the citizens and significantly equal distribution of wealth across them. The Government of India spend a substantial amount of budget for up-lifting the lives of the poor and deprived sections of the society [5]. The boom in ICT has led the Government of India to derive some novel ways for the delivery of the welfare services to the citizens by making use of the ICT. The Digital India initiative is an attempt towards achieving the goal of delivery of welfare services and governance to the citizens in an electronic mode. The digital India has encompassed three key areas: i) to provide access to digital infrastructure to every citizen, ii) governance and services on demand and iii) to digitally empower the citizens [6].

2. EMERGENCE OF DIGITAL INDIA

The history of civilization has witnessed drastic changes from the stone-age to information age. In the starting age of the civilization, hunting was the medium of living. The history of civilization reveals that people procured the things of daily

needs by way of bartering. With the advancement in the civilization, the bartering was replaced by money as the medium of exchange. Later, with the advancement in ICT, the medium of exchange has took a complete different scenario with the introduction of smart cards, online banking and more recently crypto-currency such as Bitcoins. The following figure illustrates the change in the medium of exchange/ trade/ business over the passage of time.

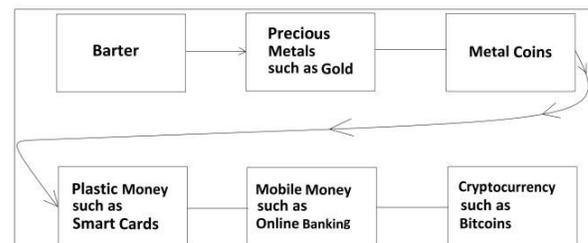


Figure 1. The Journey of Money from the Stone Age to the Information Age. (Source: Compiled by Authors)

In the past, India is ruled by various kingdoms. India has remained the Dominion of Britain for about two centuries and this was the worst time in respect of the governance. Post- Independence, being welfare state, it had been the primary duty and responsibility of the government (whether it is central government or the state government) to ensure governance to be accountable and transparent. From time to time, various means have been adopted by the government to deliver welfare services to the citizens. However, there were many cases that the intended beneficiaries were deprived of the benefits delivered by the government due to the Errors of Inclusion and Errors of Exclusion [7, 8]. In the delivery of the welfare services by the government organizations, the Error of Inclusion arises when an ineligible individual gets registered himself/ herself illegally to the list of actual beneficiaries and the Error of Exclusion arises when an eligible individual fails to register

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himself/ herself to the list of beneficiaries. One of the former prime minister of India has said in one of his addressing to the public that only 15 paise of every rupee meant for the welfare of downtrodden reaches them [9]. The thought was based on the fact that the remaining money disappears when it passes through the hands of middleman. In order to remove the middleman in the delivery of the welfare services, the Government of India has envisioned the idea of digital India with the help of Information and Communication Technology, so that people may get what they are entitled for, in the same spirit and form, as it is delivered by the government.

3. TECHNOLOGY BEHIND DIGITAL INDIA

Digital India is an endeavor towards transforming the entire ecosystem of delivering government services to the citizens of the country as well as changing the functioning of the government. Broadly speaking, it is a mixture of technology and functions of government, to extend governance to the citizens in an electronic mode. It is aimed at the welfare of the individuals as well as the masses of the society. Figure 2 portrays the technological setup of Digital India.

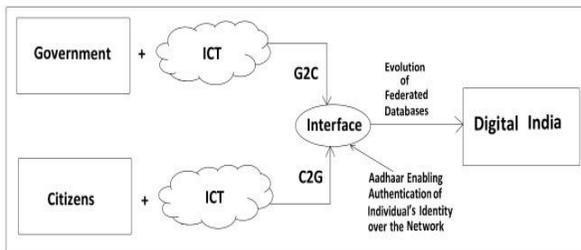


Figure 2: The Technological set up of Digital India (Source: Compiled by Authors)

The basic components of Digital India are defined as follows:

3.1 UNIQUE IDENTITY, AADHAAR

In order to gain access to a computer/ remote site/ physical premises or to receive the benefits of the welfare services of the government, it requires first to establish the identity of the intended person/ beneficiary [10]. In case of the manual systems, the identification can be established through a piece of paper. However, when it comes for an individual to be identified over the internet in order to provide him/her the services offered by the government or to provide access to the remote computer/site, the physical piece of paper establishing identity becomes futile. In such a case, it requires to have some kind of digital identity and digital authentication mechanisms to prove one's claim "Am I who I say I am?" to be true over the network [11]. In order to provide unique digital identity to the citizens of the country, the Government of India has envisioned twelve digit unique identity number commonly known as Aadhaar [12]. Aadhaar is an application of ICT and Biometric Technology that aims to provide unique identity to every resident of the country, who has enrolled himself/ herself to the identity database of Aadhaar, known as Central Identity Data Repository (CIDR). Aadhaar is a flagship program launched by

the Government of India in the year 2009 under the Ministry of Electronics and Information Technology to strengthen e- governance in the country.

3.2 FEDERATED DATABASE SYSTEMS

The Government of India extends welfare services to the citizens of the country through various organizations such as Public Distribution System (PDS), LPG gas subsidy, subsidy to farmers and scholarships to students. Other organizations such as Income Tax Department, Telecom Companies and banks also require to communicate electronically with the residents of the country. Prior to extending the welfare services to the citizens or during communication with the citizens, the primary duty of every organization is to identify the intended beneficiaries with high degree of certainty in order to avoid the errors of inclusion and errors of exclusion. In order to establish the identity of the intended individuals, the organizations set up a communication with CIDR of Aadhaar and seek answer in yes or no for the question "Am I who I say I am?" with high degree of accuracy. During the process of authentication of the identity of the individuals, as requested by the service provider agencies with the Aadhaar identity database i.e. CIDR, the CIDR collects only that basic data about the individuals, as it was shared at the time of the enrolment of the individuals with CIDR. The CIDR does not hold other specific data about the individuals such as his/her account number, purpose of authentication, no. of welfare services received and the place from where the authentication has been sought. Such transactional data regarding the individuals reside only with the respective database systems of the requesting service provider agencies and it give rise to the development of Federated Database Systems [13]. It eliminates the risk of keeping whole citizen centric data and authentication history at a single centralized place i.e. with CIDR and facilitates to keep the citizen centric transactional data in a distributed manner with different service provider agencies, using federated database systems [14]. The Figure 3 portrays the development of the federated database systems in the process of extending services to the citizens of the country by various service provider organizations in an online mode.

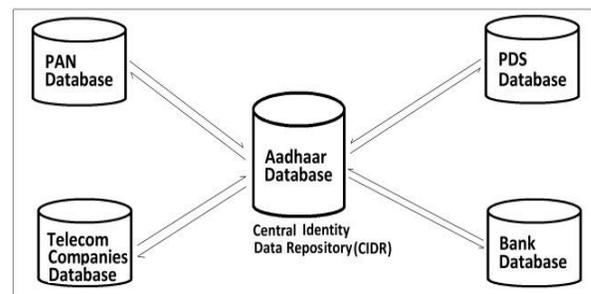


Figure 3. The service provider agencies seek out answer from the Central Identity Data Repository (CIDR) of Aadhaar, for the question 'Am I who I say I am?' in Yes/no, over the network and give rise to the development of the Federated Database Systems [13]

3.3 INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

ICT is an umbrella term that encompasses the following but not limited to i) Computing Devices such as computers, laptops, mobile phones and peripheral devices; ii) Data and Information; iii) Telecommunication Devices; iv) Internet and v) Software etc. ICT has heavily influenced the way the organizations and people have interacted with one another before its advent. Information and Communication Technology is a prerequisite to realize Digital India. Till date, there is a huge digital divide in the Urban and Rural India [16]. The major reasons for digital divide are digital illiteracy, lack of telecommunication infrastructure, lack of quality internet bandwidth and irregular supply of electricity. The Government of India has vowed to strengthen the state of the art of the ICT in the country. The GoI in the annual budget 2018-19, has sanctioned to install a total number of 500,000 wi-fi hotspots in the rural India to strengthen the internet connectivity. It has allocated Rs. 10000 Crore for establishing telecom infrastructure in the country and a budget of Rs. 3073 crore has been allocated for the Digital India Program [17].

4. CONCLUSION

The radical advancements in Information and Communication Technology has changed the entire ecosystem of delivery of government services to the citizens. Digital India is an initiative of the Government of India to fulfil the requirements of this new ecosystem. Aadhaar, the twelve digit unique identity number is anchoring the Digital India program by establishing the unique identity of the intended beneficiaries over the network in order to extend the welfare services of the government to the residents of the country. In Public Distribution System (PDS), which is the oldest welfare scheme of the GoI, it has been observed that due to the involvement of the bogus identity card holders in the PDS system, the fake individuals have been included in to the list of beneficiaries and have illegally enjoyed the welfare services of the government and genuine beneficiaries have been excluded from the delivery of the welfare services of the government, and thereby, such malaise activities have diluted the purpose of the welfare schemes of the GoI. Digital India is fully equipped with the state of the art technology and has potential to deal with the errors of inclusion and errors of exclusion. As a future scope, the citizen centric data accumulated in the federated database systems can be used to assess quantitatively and qualitatively, the overall effect of Digital India and the underlying technology in the digital empowerment of the residents of India.

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