Architecting the World’s Largest Biometric Identity System: The Aadhaar Experience

Ref :- <https://www.mapr.com/blog/architecting-worlds-largest-biometric-identity-system-aadhaar-experience>

<http://www.forbes.com/sites/abehal/2015/11/25/mapr-and-big-data-in-the-worlds-largest-biometric-database-project/#1e577a8657be>

Summary: -

India, World Second largest populated Country after China. India’s Aadhaar project is one of the world’s most ambitious big data projects - aiming to collect, store and utilize biometric information from a population of over a billion people – so of course there are challenges, but also an incredible opportunity. Indian Aadhar Card has 12-digit number which will Uniquely Identify the People. Indian Unique Identification Authority of India (UIDAI) has commissioned the project in year 2009 which is quite very ambitious project for the developing country. Currently Indian population is going to reach 1.2 billion and as to save such huge amount of data which consists of finger prints, retina scan and personal information is a next level challenge. Also, as to complete such a huge amount of Task will require a great man power and till now UIDAI has reportedly registered about 95% of the total population which is the great achievement for the Indian Government.

As the project was commissioned as to save the Data from the various centre and identifying the wrong or forged data is also another challenge. It has taken more than 6 years to develop the platform which can tackle such a massive information. Plan of the Indian Government Is very simple as to Create a centralized system which contains all the Information of the Indian people and connect every bit of Information related to the person with UID. Its concept is like that as of the United States.

They are using [MapR](https://www.mapr.com/) to build the project’s biometric database (the largest in the world), which can verify a person’s identity within 200 milliseconds. The uniqueness of an Aadhaar identity makes it possible to eliminate fake and duplicate accounts, and the online authentication system provides a mechanism for the paperless, electronic, and instantaneous verification of a person’s identity.

Applications of the Aadhar card are very vast, heading from Digital signatures, Electronic documentation, Tax Returns, Crime Detection, Health Related Issues etc. and further this information can be Used by the Indian Government for making the policies and uses the Data for the Betterment of the Indian people.

Analysis: -

UID is very new for the Indian people and it has recently boosted its infrastructure to gain its optimum searches and other technological advancements. It has the various feature which could save the country money over the long period. It explains about why Aadhaar project was created. In India, the inability to prove one’s identity is one of the biggest barriers that prevents the poor from accessing benefits and subsidies. Every year Indian government spends about 50 billion (INR) for the direct subsidies for the food, medical, education and other stuffs. Currently for the paper economy the amount which govt has provided to the needy people are not getting to the people which leads to the growth of corruption since this will digitalize the whole process, so enable the Govt.  to transfer money related to social benefit schemes directly to beneficiary’s account. Thus, bypassing the middle men who use to eat large amounts of funds given to social benefit schemes.

Next benefit of the Aadhar project is to reduce the illegal immigration in India. Its UID will ensure that the illegal persons can be identified at the point of time. Also, it can be used by the people as the central identification point for the any given point of time.

The Aadhaar system is expected to issue more than 1.2 billion identities, and will continue to grow as the resident population expands. Since every new enrollment requires biometric de-duplication across the entire system, every component needs to scale to very large volumes. As the several people, have registered for the UID security and privacy of one’s data is a foundation of the Aadhaar system. The system uses 2048-bit PKI encryption and tamper detection using HMAC to ensure that no one can decrypt and misuse the data. Resident data and raw biometrics are always kept encrypted, even within UIDAI data centers.

For the Crime fighting also UID plays a vital role, In the next expansion of the UID can be used to identify the finger prints at the Crime scene which allows local authorities to identify the Crime related persons and whole of the life History. For this mega project UID will be linked to police Department for the crime Detection and prevention.

The amount of Data which UID is using is 3.5MB per person which cost around 10-15 peta bytes of Data. As to store such a huge amount of Data is another challenge constant hardware and software upgrades will be needed also more flexible algorithms are needed for fast processing. AS the UID will grow there will be various application that can be derived from the Data and can be used for the betterment of the people of India.