Journal of Advanced Computing and Communication Technologies ***(ISSN:* 2347 - 2804*)***
Volume No.5 Issue No.5, October 2017

Usability of AADHAR in Election Process: New Paradigm

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ABSTRACT

In current scenario, lot of question is arising over the authenticity of EVM machine, even after lot of efforts put by election commission in proper implementation through different monitoring channels under strict security guidelines. Though through reports it was just that, EVM is not temper free as it's a machine and it can be tempered intentionally because handlers are human being only. So, in the global era of Internet, It seems very much possible that we can see the next election voting using AADHAAR facilities. A new IoT paradigm in which, Aadhaar seeding with the electoral role can make it possible to 'identify' and 'authenticate' the voter/ individual, which is a prime condition to identify a individual /voter uniquely to cast their vote and also individual can have liberty of location independency as well to cast their vote to particular candidate or party to their constituency. And going further, this AADHAAR service can be fruitful in designing new election process in three simple steps firstly, electoral role-Aadhaar Seeding, to map the voter to particular polling station/location and/or assembly, secondly, Aadhaar Authentication through registered devices available at pre-identified location i.e. Aadhaar Voting Centre's (AVA) followed by third step, to cast their vote through secured web service using Aadhaar OTP/Authentication PIN. With this we can also able to ensure the CIA constraint of Information Security as well which is necessary for any critical process.

Keywords
Internet of Things, AADHAAR, Online Voting, Information Security, Registered Biometric Devices, NPR

1. INTRODUCTION

As lot of discussion is going on over the validity of EVM machine based current voting system. This lead to confusions in the mind of many people's that what is wrong and what is right. As there is lot of statistics regarding the same, and the counter measure is again are costly affair, as suggested in reports in term of VVPAT (Voter-verifiable paper audit trail). So, if we can able to give some new paradigm for this issue by using some other resources can give a chance to re-design the current running process. For this purpose, some jargons are need to be discussed, i.e.

I) Biometric

II) AADHAAR Ecosystem

III) AADHAAR Seeding

Biometric: Biometric is the metrics of physical particulars of single person through which individual can be identified as him. These can be fingerprint, hand, eye or voice. Major advantage of using physical particular for verification is that it reduces the administrative efforts to made identification as it is based on the concept, who the person is by what they are i.e. fingerprint, eye etc.

Primarily, Biometric is used as an access control mechanism but as the industry is growing biometric is in use into many other ways. As 'Identification' and 'Authentication' are only two things which is very important anywhere and biometric identification has advantage over it as it involve with physical particular's for identification overrule the condition 'who is carrying the identity' as in cases of early system of identifications i.e. through card alone or along with pin. As, we have to consider the cost as well, so the parameters should be chosen accordingly for the devices which actually have to access the record for matching and for this purpose AADHAAR number can be used as one unique AADHAR number is generated for one person's ten fingerprints, two Iris and facial photo along with the verified demographic details provided by the individual.

But, One more issue is needed to be addressed is about the 'Registered Biometric Devices' to match with the CIA Constraint i.e. confidentiality, Integrity and Availability. Currently, Scanning of fingerprint, etc is done through non-registered biometric devices means those devices which don't have any legal binding (as computer system have MAC addresses and have private-public key concepts for data authentication) which can cause the security breach. So, Registered Biometric Devices are needed to be introduced so that activities can be traced, analyzed and also useful for any kind of misconduct or fraud management related to biometric apart of record matching and modification.

AADHAAR Eco System: AADHAR (UIDAI: Unique Identification Authority of India), is a statutory authority established on 12th July'16 by GoI, Miety, under the provisions of Aadhaar Act'16, which is further amended time to time. AADHAR has potential to uniform and unified the belongings of people's together viz. linking of PAN, DL, and Ration Card etc with 12 digit AADHAR unique number. As, UIDAI provide online authentication ecosystem using biometric and demographic data as a service through AUA i.e. Authentication User agency and ASA i.e. Authentication Service Agency. Here if any agency seeking for AADHAAR Authentication for his costumer/associate for service delivery, he should contact to AUA and it can be called as sub-AUA, which is needed to be registered through UIDAI, as AUA's is required to be registered with UIDAI for providing services through establishing authentication channel to CIDR [Central Identities Data Repository is GoI agency, unit of UIDAI for managing and storing AADHAAR data] through ASA. (For

Government Departments CDAC plays the role of AUA and ASA). We need these agencies to act in between because of the provisions of AADHAAR ACT'16, which we are not aware of and without knowing its legality, we are using it. Few points are listed as below:

1) It is not a valid address proof – As AADHAAR is designed to allow anyone to get it without any document, but it is in use by banks and other's for this purpose and even many homeless people made their AADHAAR for bank accounts and for other facilities.

2) Not even a proof of Citizenship – As per Section 9 of Aadhar Act'16, it is not a proof of citizenship, but for passport services it is valid POA and POI.

9. The Aadhaar number or the authentication thereof shall not, by itself, confer any right of, or be proof of, citizenship or domicile in respect of an Aadhaar number holder.

3) It is not even an Identity Proof, if produced alone – we were using it as valid ID everywhere but it is not so, section 4 of Act states in nutshell it need to be verified every time through CIDR whenever produced anywhere.

Clause 4.—This clause deals with the properties of Aadhaar number. It provides that any Aadhaar number issued to an individual shall not be re-assigned to any other individual; it shall be a random number and bear no relation to the attributes or identity data relating to the Aadhaar number holder. It further provides that the Aadhaar number may be accepted as proof of identity of its holder but subject to authentication.

4) AADHAAR number should not made public – It is somewhat we are not taking it seriously, we should not share or anyone should not store anyone details, as it can cause serious fraud or identity misuse.

(4) No Aadhaar number or core biometric information collected or created under this Act in respect of an Aadhaar number holder shall be published, displayed or posted publicly, except for the purposes as may be specified by regulations.

5)Use of Registered Biometric Devices – Till now no one is using Registered Biometric Devices as per norms, though it is also required as per IT ACT to make sure to ensure the responsibility for any kind of compromise while encrypting biometric data through the providers key and returning to host applications.

However, AADHAR Ecosystem's are more or less as the concept of IoT, where at user end action is initiate [Biometric capture through biometric registered devices], which is routed through node or gateway to connect it with cloud solution for conducting analysis [captured data is routed through AUA and ASA to the CIDR for analysis] and desired action is performed on database to fetch result to perform action [result in the form of 'yes' or 'no' is generated to perform authentication to initiate desired action in various applications/scheme] [fig-1]

S.No	IOT	AAdhaar Ecosystem
1	User Interface + Request Biometric Device	Capture of Biometric Information in PDI Form
2	Node(Gateway) Connected Through Cloud Solution for Analysis	PDI Is Routed Through AVA/ASA Agency Through CIDR for Analysis
3	Desired Action is Performed for Result	'yes' or 'no' is returned as result for action performed

Fig 1

AADHAAR Seeding: It is a process of adding AADHAAR number of individual along with any kind of record i.e. Bank Account, LPG Connection, Ration Card, Pension scheme etc. This AADHAAR UID seeding is becoming very powerful tool now days for effective e-governance, as it is in use for DBT (Direct Benefit Transfer) under social welfare entitlements like Pensions, subsidy, scholarship, MNREGA Wages etc directly to the AADHAAR attached account, and on the other side remove the issues of de-duplications and illegal immigrations, which ensure the benefits to beneficiary by cutoff the problem of middleman and corruption.

As AADHAAR UID is not mandatory to be used as ID and AADHAAR Act'16 also support this, but due to its usability it is adopted by many governments for social welfare entitlements, AADHAAR and its seeding is becoming mandatory by default.

2. PROPOSED SYSTEM

In proposed system, AADHAAR is usable at every step in order to strengthen the identity and authenticity of the individual and are mainly divided into three steps:

2.1 AADHAAR Seeding with Electoral Role

Basic requirement for casting vote is identification of individual as the voter of particular booth which is supported by electoral role and election ID cards. And, it is ironical that even after lot of efforts, electoral role still not able to be claimed as authentic as still there are issues of de-duplications, missing of name/ wrong removal or addition of name by B.L.O's and because of which his integrity is also questioned many time. Erroneous or wrong particulars or picture on Voter ID Card etc. But on non availability of alternative we are making efforts to make it correct as much as possible.

And, on other hand there is multiple electoral role exist one with the Election Commission of India who is responsible for Lok Sabha and Vidhan Sabha Elections and other with State Election Commission who is responsible for Local Bodies and Panchayat Elections within state. So, there may be question that 'Are we need Double Voter List or Single List'?

Apart of it, under the section 14A of Citizenship Act'55, National Population Register (NPR) program is started, which is first step in order of preparation of National Register of Indian Citizens (NRIC), and under which it is compulsory for every citizen to get registered within NRP. It is more or less similar to UIDIA Biometric AADHAAR Program but have few viable differences as –

-Voluntary vs. Mandatory: UIDAI is not mandatory in nature but NPR registration is must for every citizen

-Online vs. Offline: UIDAI is valid after online verification but NPR can be verified offline as well

-Authentication vs. Identification: NRP signifies the resident status and citizenship and UIDAI act a well established for identification

-Census vs. documentation: NPR is based on census data on the other side UIDAI is based on self filled form

-Enrollment centre vs. door to door approach: UIDAI centre's were open for individual's to get register for UID and on the other side NPR is based on door to door approach to collect data which further displayed at local level for social audit which provide transparency and equity.

Though NPR also require Biometric details as of AADHAAR/UIDAI i.e. ten fingerprints, two iris and photo, as second step for which AADHAAR seeding and its verification through UIDAI is done for the purpose of Identification and Authorization.

So, in preview of above we have two illustration, to fulfill the requirement of unified and uniform voter list, as individual can be a part of voter list at one place only.

Illustration-1

We can go for AADHAAR seeding with current voter list which de-duplication the voter list around the country and unified voter list with individual detail at one place only can be formed as per the rule with the help of UIDAI verification and can be used by both ECI and SEC. And, those whose name is needed to be included can be verified and modified easily and added to the voter list, eliminating the problem of disgruntle B.L.O and bogus voters.

Illustration-II

As, NPR work is under process and completed up to UID mapping verification, so the house hold list of enumeration block under wards for urban areas and gram sabha for rural area can be used as fresh voter list, marking these smallest area division code under NPR as area specified for B.L.O, which reduces the repetition of work and in case of discrepancy both list can be corrected simultaneously and will be fit as per norms of authentication and identification, and also support the national cause.

2.2 Registered Biometric Devices

In case of non-registered devices, although security measures are present, but still there is possibility of data theft between sensor device and host machine, if machine is compromised. In such cases it will be very much required to know 'device provider' to ensure the responsibility. UIDAI doesn't specifies any hardware design but it mandates the security features must fall into prevention and traceability in the manner that registered devices should securely sign biometric data to form the encrypted personal identity data (PDI) block within device driver and give it back to application for use. It basically ensures that-

1)Biometric data is signed within the device using providers keys to ensure live capture, such that there is no mechanism through which external program can get stored biometric for signing and encryption i.e. eliminating use of stored biometric.

2)Certified device drivers should be provided by device provider for encapsulating the biometric capture, signing and encryption of biometric within it such that no external program can have the private key used for this.

3) Unique identifier for each device registered with UIDAI allows tracing, analyze and fraud management.

With this, Permanent Registration Centre's can be formed where the biometric authentication through registered biometric devices can be done for identification and authentication of individual, and It is also fruitful as later on NPR also require these kind of centre's to carry with their activities under NRIC. And, in preview of above alike AADHAAR Voting centers (AVA) i.e. Temporary Registration Centre/pooling booth can be formed where individual can cast their vote for their registered location after being verified through UIDAI and application attached with result from CIDR for identification of individual as him and location/assembly associated with UIDAI.

So, in this paradigm, as the result received through UIDAI can return two values through application i.e. 'yes' or 'no' for identification and 'area code'/'assembly code' to trigger the user interface i.e. third phase for casting vote. As, it triggers the location associated with UIDAI, give an edge for making voting location independent and it also can be effective voting solution for NRI peoples. [Fig- step-ii]

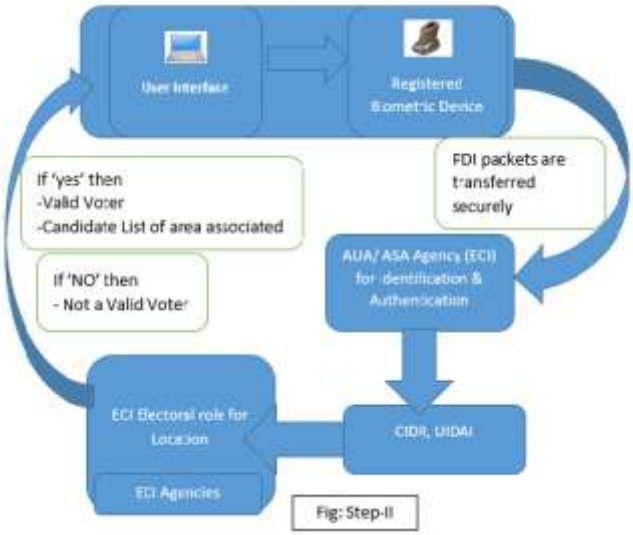

Fig: Step-II

Moreover, this also can be a part of discussion that mobile phone's having biometric capture feature can also be used as registered biometric device, and can also be an effective medium for online voting with the check measure like 'one mobile one vote'.

2.3 Vote Casting Through Web Service

As a result of validation individual is provided the access to the list of candidates with name and party symbol along with assembly name and part number through secure web service, where individual can cast its vote to desired candidate by clicking the particular button, and it can be doubly sure by providing authentication through AADHAAR OTP or through unique PIN series allotted to that particular centre, which can be given to individual after aadhaar verification to enter to the web portal after casing of vote for confirming the cast of vote. 5G Network Technology can have the key for this.

In this way, casting of vote can be recorded smoothly and results can be declared as soon as voting is ended in one go through the service portal.

Note: the result of step-2.2 can only be used to trigger the step-2.3, and there should be no recording of 'who casted whom' should be maintained, as it violates the right of privacy.

3. CONCLUSION

With the time, size of current voting system is increasing day by day and also questions were arising on the EVM machine as well, lead to issues listed as:

-There is increase of demand for polling personals as voting booth were increasing day by day due to population

-Need of vehicles were also increasing with the demand of polling personals, and monitoring teams at different level.

-VVPAT is costly affair and needed to be attached with EVM machines increasing the labour cost, consumes space for keeping it and security cost as well.

-Correctness of Voter list

In order to match voting system with the crowd, new solution is needed to be explored, which can counter the issues listed above like bulkiness, correctness, authenticity and multi tear system. This AADHAAR based voting paradigm can be explored and discussed for the desired robust system with the reduced manual intervention in preparation and need of man force at many levels. But, along with this system we also need to address some issues like availability of network at AVA's for conducting these online tasks from biometric authentication up to web service portal.

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