



The Innovatrics Automated Biometric Identification System is a reliable multimodal biometric software utilizing fingerprint, face, and iris recognition technology.

E-Book

8 Rules for a Successful Biometric Voter Registration



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To organize trustworthy democratic elections, having a credible, up-to-date, and secure voter registry is paramount. In countries that want to prevent ID fraud, rigged voting and disenfranchising citizens due to poor infrastructure or illiteracy, biometrics is an ideal solution.

Around 35% of over 130 electoral management bodies surveyed by the International Institute for Democracy and Electoral Assistance have already introduced some form of biometric voter registration to improve the different stages of the electoral process.

With Innovatrics onboard, the electoral committee has an experienced technology partner capable of adapting to varied conditions and infrastructure for a successful election. From pre-enrollment, to registration and data consolidation, and down to voter list printing, the electoral body has our top-ranking technologies and our pioneering expertise at their disposal



Matúš Kapusta Head of Government Solutions

Matúš has spent a lot of time on site in several African countries preparing and overseeing the deployment of Innovatrics technology for biometric voter registration and enrollment officer training.

"To win the trust of the election committee, it is important to display a constructive and transparent approach. The main objective in our line of work is to make sure every eligible citizen observes the right to vote. At the same time, we must ensure that each voter can cast only one vote," he explains.

Define, check, and communicate your needs with as much precision as possible.



Make the procurement transparent while clearly defining the rights of the parties.

The needs of electoral commissions or governments for biometric elections may vary depending on the specifics of the local laws and regulations. The more precise the specification of the need is, the quicker and more functional the implementation can be. Make sure the technical demands are double checked by technicians and experts of the electoral law so that the respective processes, which the system operator will perform on the citizens' records, are in accordance with the regulations. If proper protocols are not carried out, there could be a snowball effect leading to the eventual postponement of the elections.

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You can go even further and divide the whole operation among several different vendors: technology provider, hardware provider, and elections operator. Generally speaking, it's a good measure to split the operations and let the specialists focus on their jobs. In these situations, it's critical to clearly and precisely define the scope and responsibilities of each provider. Election committees often set deadlines before they define the scope properly, which can lead to the delay of the elections in a worst-case scenario. It's important to prepare with the vendor(s), set a realistic timeline, and define the scope beforehand.

In Guinea, we successfully cooperated with two external companies: Korean MIRU Systems which supplied the enrollment kits and ETI S.A. which is a local company in charge of the field operations that has the capacity to provide manpower and logistics for the actual enrollment deployment. Innovatrics provided regional and central support for the operations.



Protect citizen data at all costs.



Maximize the completeness and the quality of the biometric data.

While the collected citizen data is the basis for any electoral register, the register is only as good as the data. In order to protect it, you have to consider all possible risks and mitigate them.

For the enrollment kits used in the field, we have developed a system of double backups. All data is kept both in the kit's internal storage and on memory cards. If an enrollment kit crashes, the data on the card can still be used and restored in a new kit. so the enrollment data isn't lost. To further limit the risk of data loss, the new enrollments are exported from the kits on a daily basis to an external USB drive. Even if the kit is completely damaged or lost, only one day's worth of data will be missing. USB drives should never get lost, but if this happens, the data can be re-exported and sent again. At the end of the whole enrollment cycle, all the kits are transferred to the central site, where their content is backed up and checked for consistency against the previously exported data.

The other aspect of data security is making sure the data cannot be misused if an export gets into the wrong hands. This is the reason why we encrypt all data. As such, biometric data goes through asymmetrical encryption, and any output of our enrollment software can only be viewed in our central site. For high quality data, focus on high quality hardware and software. We recommend the use of slap fingerprint scanners to ensure that hands cannot be swapped during the enrollment.

Our enrollment software checks the condition of the fingerprints and photographs to maximize the quality of the biometric data. If the fingerprints or the photo are of less than satisfactory quality, the software warns the operator to recapture them. If good quality is not achievable, or the biometric data is incomplete (e.g., missing fingers or a deformed face not allowing software face recognition), a record giving the reason of the insufficiency must be made by the operator. ICAO facial quality assessment is adjusted to local conditions, rendering the enrollment process conducive for both voters and operators and ensuring high photo quality. For cases with missing hands or unusable fingerprints, we provide face identification. 5

Make no compromise in excluding the ineligible.



Ensure full transparency and traceability.

If a correct enrollment operation is there to make sure that everyone who is eligible to vote gets the opportunity to do so, the main aim of the data processing at the central site is to ensure no one who isn't eligible to vote gets the chance to trick the system. The core function of any biometric election system is deduplication. Make sure you choose the correct provider with a deduplication engine up to the task and well suited to your needs. In this field, Innovatrics has the most reliable deduplication -it ranks at the top of both the fastest and the most accurate algorithms based on NIST results.

Although being in the voters' list more than once is not the only way of cheating, a proper deduplication can't solve all the problems. It is not uncommon for underage citizens to be fraudulently enrolled in order to produce voter cards allowing irregular votes.

Nevertheless, even these situations can be solved. For instance, in Guinea we were able to identify and remove almost 60,000 minors using an Al-based age analysis tool.

Fraud is not the only reason why some registers are inaccurate or get challenged. The demography evolves constantly, and the register must reflect this evolution. For example, the deceased should be removed from the voters' list. In Guinea, this operation was done based on death certificates provided by local authorities and was carried out by a team of about 30 operators trained by our staff. They removed almost 170 thousand people within less than 10 days.

Other people without voting rights had to be removed as well, such as convicts or foreigners.

For any elections to be credible and their results to be accepted by all parties, full transparency and traceability of all actions are a must. The basic principle of our solutions is that of 'no-deletion'. Every record imported within the system stays inside the system forever. All performed actions are tracked and the old records archived so that the complete history of any citizen record can be accessed any time.

This no-deletion policy has the double benefit of transparency and reversibility. The system can be audited at any moment, and thus makes for a credible system acceptable by every party involved. At the same time, any changes made by mistake can be reverted in case of necessity, e.g., a citizen with a death certificate who is removed from the pool of eligible voters but is later discovered to be alive (clerk error, person declared dead and then found etc.) can be reinstated, and his/her voting right given back

The flexibility and transparency of our approach was put to good use during the Guinea project, where two separate international audits took place: the technical audit of Organisation internationale de la Francophonie(OIF) was taking place as we progressed while the ECOWAS audit was performed just after the completion of work and was completed within a few days. The concluding recommendations were enforced within 48 hours. 7

Retrieve vote's records and correct data quickly and efficiently.



Do not underestimate the generation of voters' documents.

After the preliminary voters' lists are printed and displayed, citizens can file a request for corrections in their records, or demand the revocation of their removal from the lists. This can lead to a great volume of corrections which must be carried out in a very short time by a relatively limited number of people. In Guinea, for example, the staff working on the corrections and adjudications never exceeded 54 operators trained by our team. We used a system of 2D barcodes and barcode scanners to retrieve the citizens' records for correction within a second (instead of typing and searching by ID). In practice, this means that we cut the complaint resolution from months to days while lowering the probability of mistake (correction of wrong record) to close to zero.

In most cases, the final result of our involvement is the generation of the necessary legal documents such as voters' lists and voters' cards. Since the elections are time critical, we have anticipated this phase of the project by developing very fast, high-volume reporting tools. In Guinea, the matching servers were reused to produce hundreds of thousands of voter cards at a very high rate. Under this setup, matching is still available during the document generation although in a smaller capacity. Thus, no extra hardware is needed. Hundreds of thousands of pages can be generated overnight, which also allows for a quick and efficient regeneration should a need for correctionsarise.

Scalable architecture is important. The same powerful servers, which are used for biometric deduplication, are also used for generation of voter lists and cards. Millions of pages that an ordinary computer would take a month to generate on its two or four processor cores, the servers with their 150 cores can do overnight. The system scales well, able to run parallel distributed lists. This is important for elections because they are always time critical. Even if you make a mistake, it's quick to repair and recreate the reports.

About us

We are an independent EU-based provider of multimodal biometric solutions. Our algorithms consistently rank among the fastest and most accurate in fingerprint and face recognition. For over 15 years, we have partnered with all types of organizations to build trusted and flexible biometric identification solutions. Our products are being used in more than 80 countries, benefiting more than a billion people worldwide.

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