

Golden Strategies For TotEx Planning

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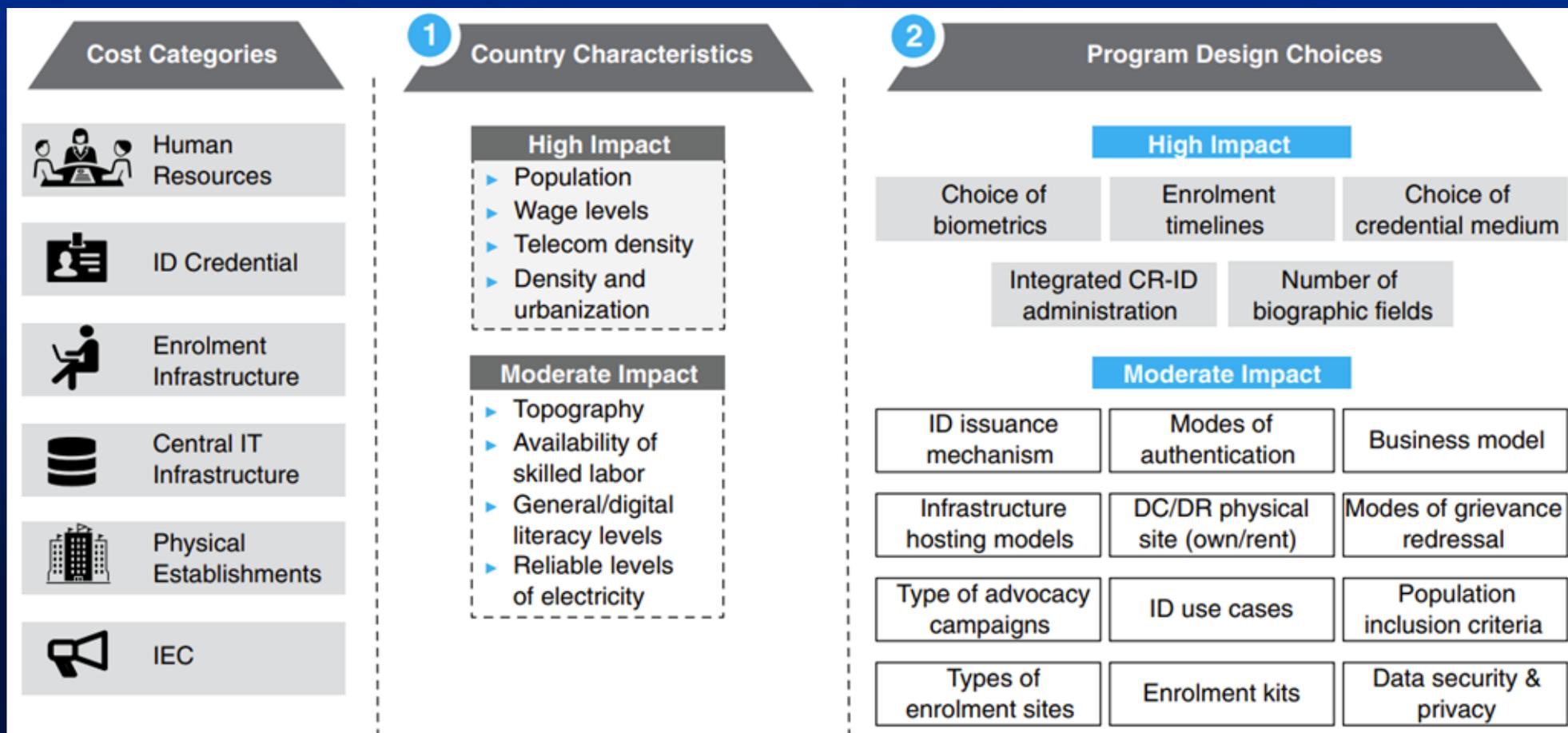
Credentials: Anshul Pachouri (MicroSave Consulting)



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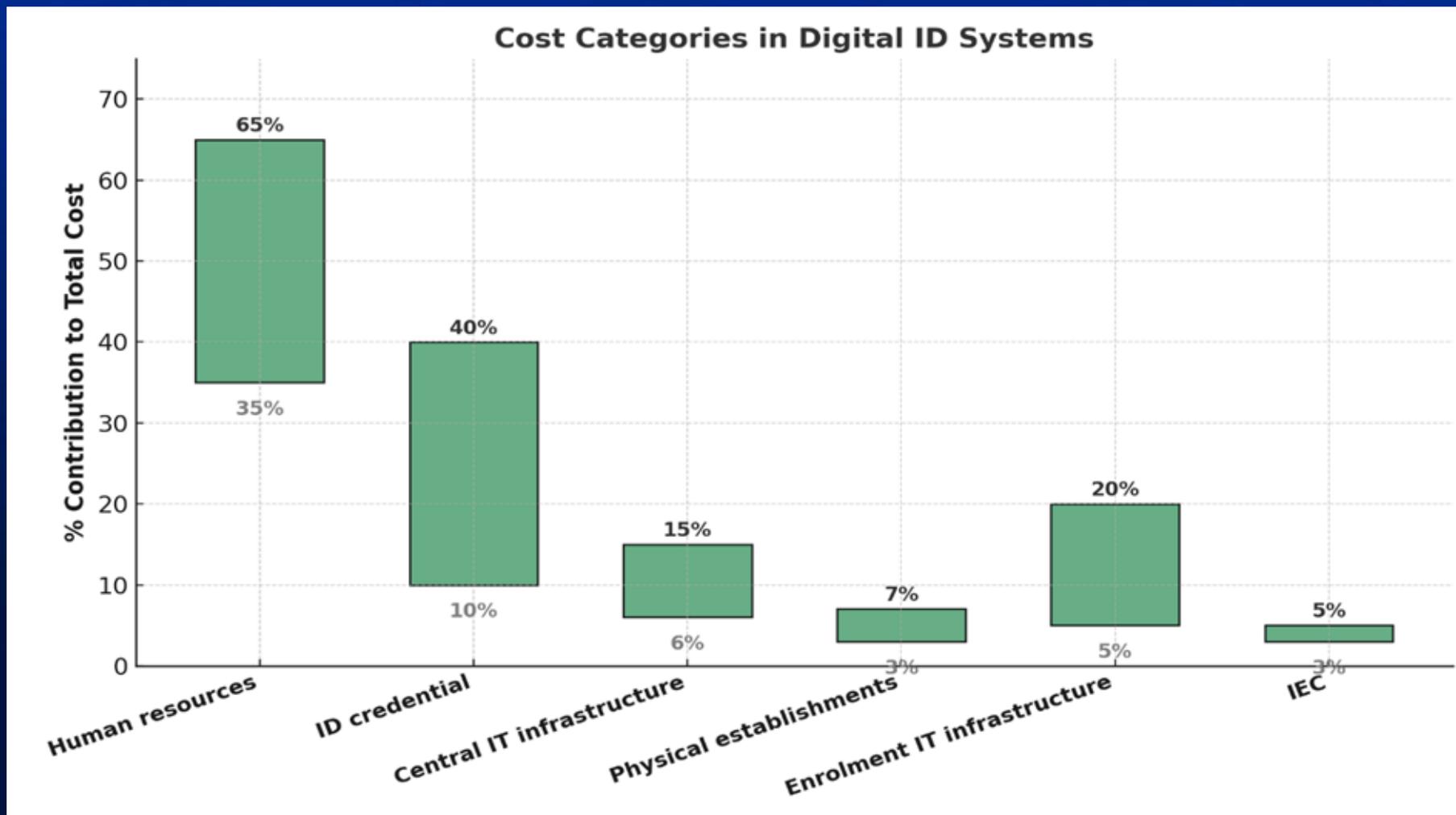


Cost Categories – Country Characteristics and Design Choices





Cost Categories – Contribution



Golden Strategies for TotEx Planning



Presented by: Arnd Langguth
CEO - BioRugged

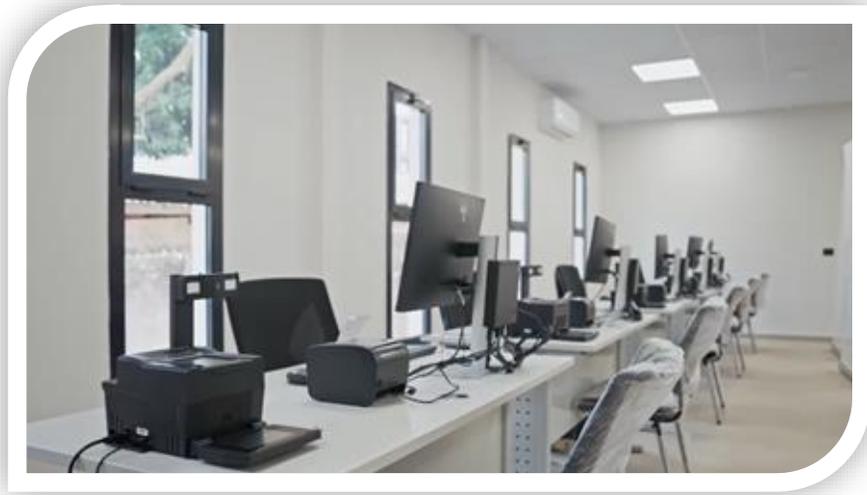
Hardware requirements – what we often see



MOSIP



- MOSIP recommendations = Law = Tender requirements
=> MOSIP can not cover all scenarios
- Enrollment = Biometric kit = we need kits
=> A kit is not the one size fits all solution
- Population (age 16 and up) / planned enrollments / days = No. of kits - or -
Available budget / assumed kit price = No. of kits (<= Vendors love this!)
=> Phase the approach and save, adjust the country
- Some parts of the country don't have power = all kits need a solar panel
=> Kit with solar = Kit without solar + a solar panel + extra battery
=> Check the distribution



A Desktop device setup:

- ✓ Many enrollment stations
- ✓ Small footprint
- ✓ The officers seated for long shifts



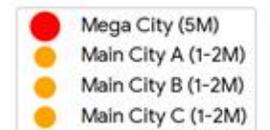
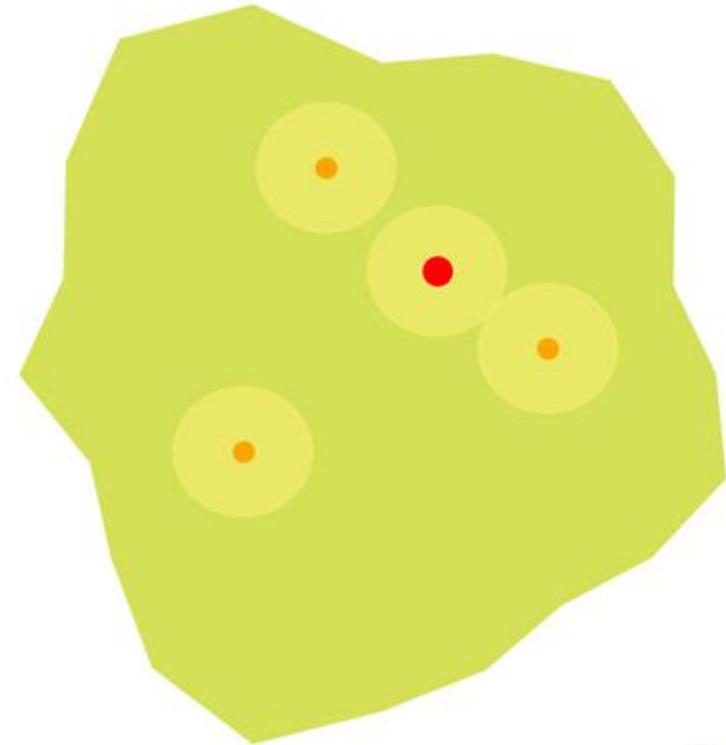
A Kit example in office:

- ✓ Large footprint
- ✓ Inconvenient for all day use

Avenia, the average African country

- Total population is 29M people; 15.95M are 16+
- Land mass is 519,000 km²
- Urban land with grid is 10%, rural land without grid is 90%
- Population with grid access is 48%, Energy Poverty 52%
- Avenia has one Mega City (5M) and 3 Main Cities (1,2 – 2M)

Theoretical Land Map of Avenia
(The 'Average' African Nation)





Planning – A conscious approach (I)

Enrollment period over 36 months.
Strong start to create momentum and drive the project.

We assume 45 people / kit / per day in a city office and
15 people / kit / per day in rural Avenia

We have 1 megacity and 3 main cities
=> High population density, quick win

We already have the “post initial enrollment” phase in
mind



Planning – A conscious approach (II)

Phase 1, Year 1 – The quick win:

Urban hubs, 6.38M people (45 people / kit) =
568 Stations

=> 40% of the Nation enrolled with 568 Stations

=> After Phase 1, smaller enrollment offices remain,
other stations move to Government offices for future
enrollments



Planning – A conscious approach (III)

Phase 2, Year 2 & 3 – the grunt work:

- 4.78M people (15 people / kit) = 1.276 kits (40 – 60% with solar)

=> 1/2 of these kits remain in circulation.

=> 1/2 of these kits can convert into CSRs or similar.



MegaMatcher ABIS and SDK

Golden Strategies for TotEx Planning: Deduplication

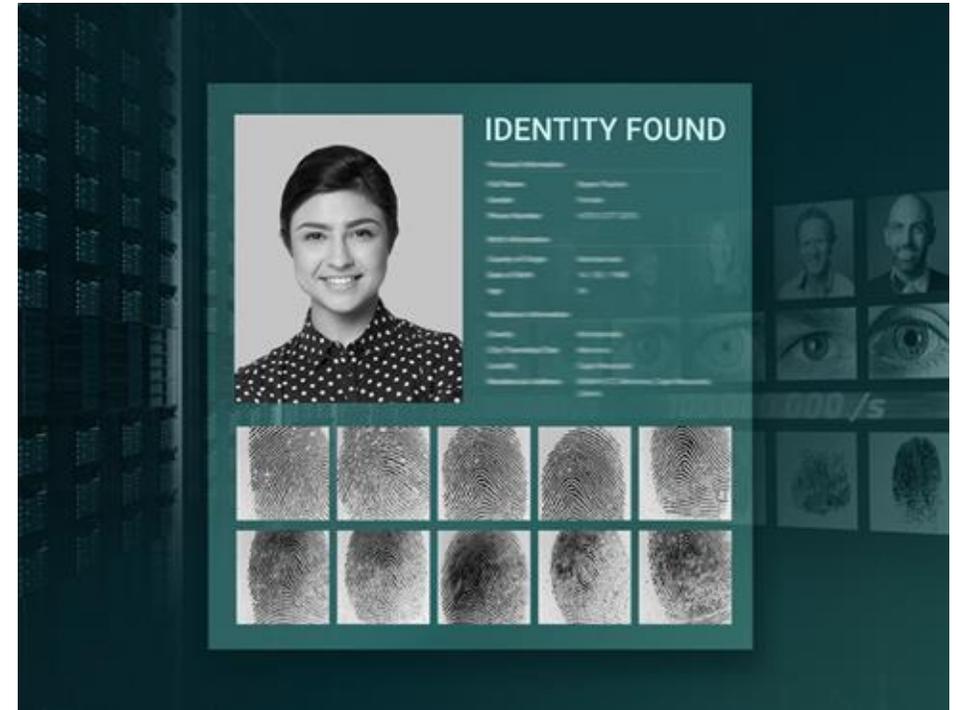
Antonello Mincone
Business Development Director



What is deduplication?



- Deduplication is the process of finding and removing duplicates identities in the DB through biometric traits comparison
- It can happen during each enrollment for a new system with empty DB and it can be done for an existing legacy database
- Typically deduplication is performed through an ABIS system
- Deduplication can be an online or an offline process



Understanding the value of Biometric Deduplication

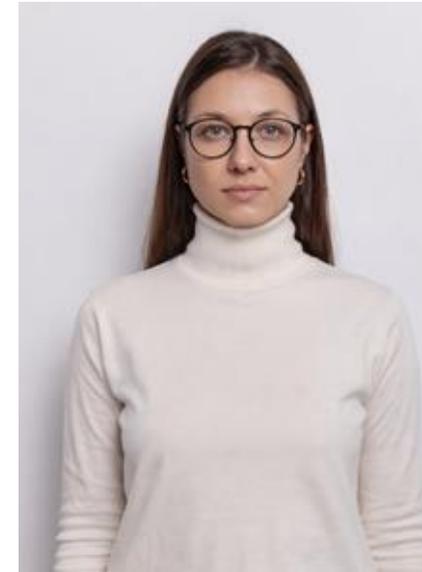


Which are cost implications of having duplicate identities in the database?



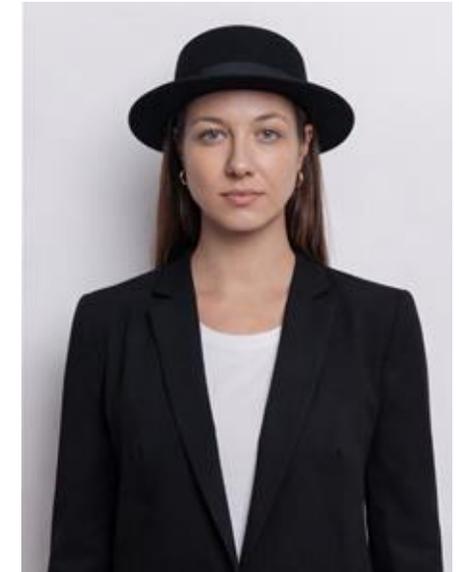
PERSONAL INFORMATION

Full First Name *Marta*
Full Last Name *Anderson*
Date of Birth *01/02/1990*



PERSONAL INFORMATION

Full First Name *Emily*
Full Last Name *Brown*
Date of Birth *25/09/1994*



PERSONAL INFORMATION

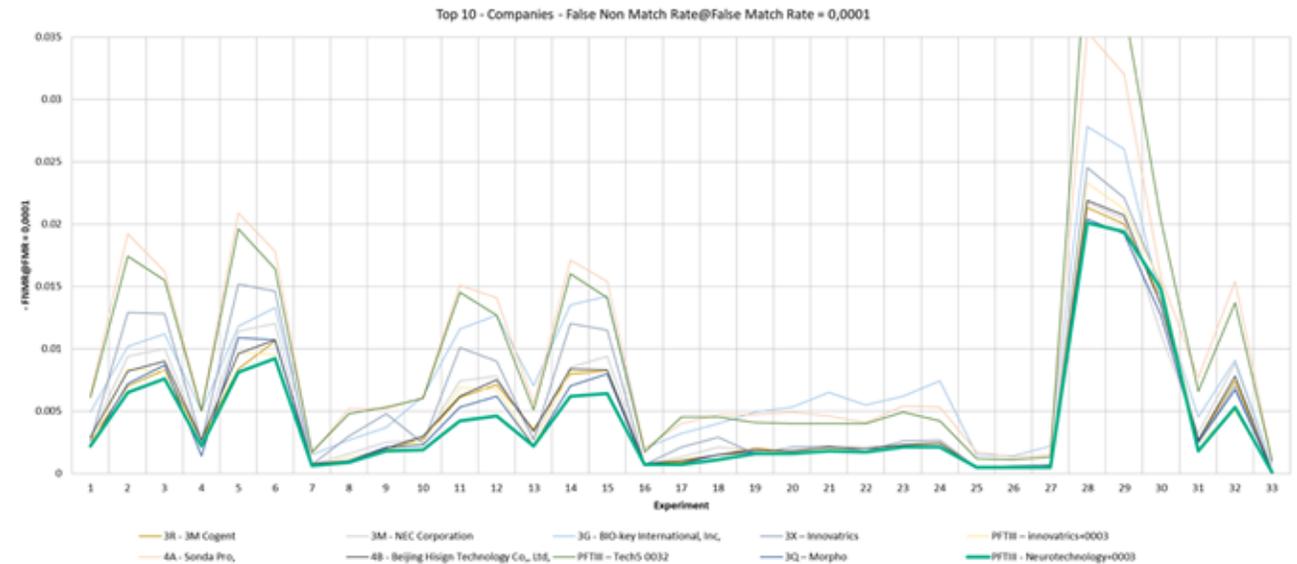
Full First Name *Monica*
Full Last Name *Smith*
Date of Birth *18/04/1985*

Optimizing the system cost by choosing biometric modalities and number of instances



Each biometric modality and related algorithm have their own accuracy (probability to miss a duplicate).

The more accurate are the algorithms and the bigger is the number of biometric instances for person, the lower is the probability of missing a duplicate when comparing biometric traits of two person.



Optimizing the system cost by choosing biometric modalities and number of instances



- Which is the project database size?
- How the database size is expected to scale up in the future?
- Which are the demographic characteristics of the involved project population?



Optimizing the system cost by choosing biometric modalities and number of instances



The choice of biometric instances to capture shouldn't depend only on population size but also from:

1. Average biometric quality in the population
2. Cost of methods alternative to biometrics
3. Ability of operators to make a proper quality enrollment
4. Biometrics modalities intended to be used later for credentials authentication
5. Intrinsic limits of certain biometric traits



Are 10 fingerprints enough?



Table 5.2: FNIR values from the DET plotted in Figure 5.1.

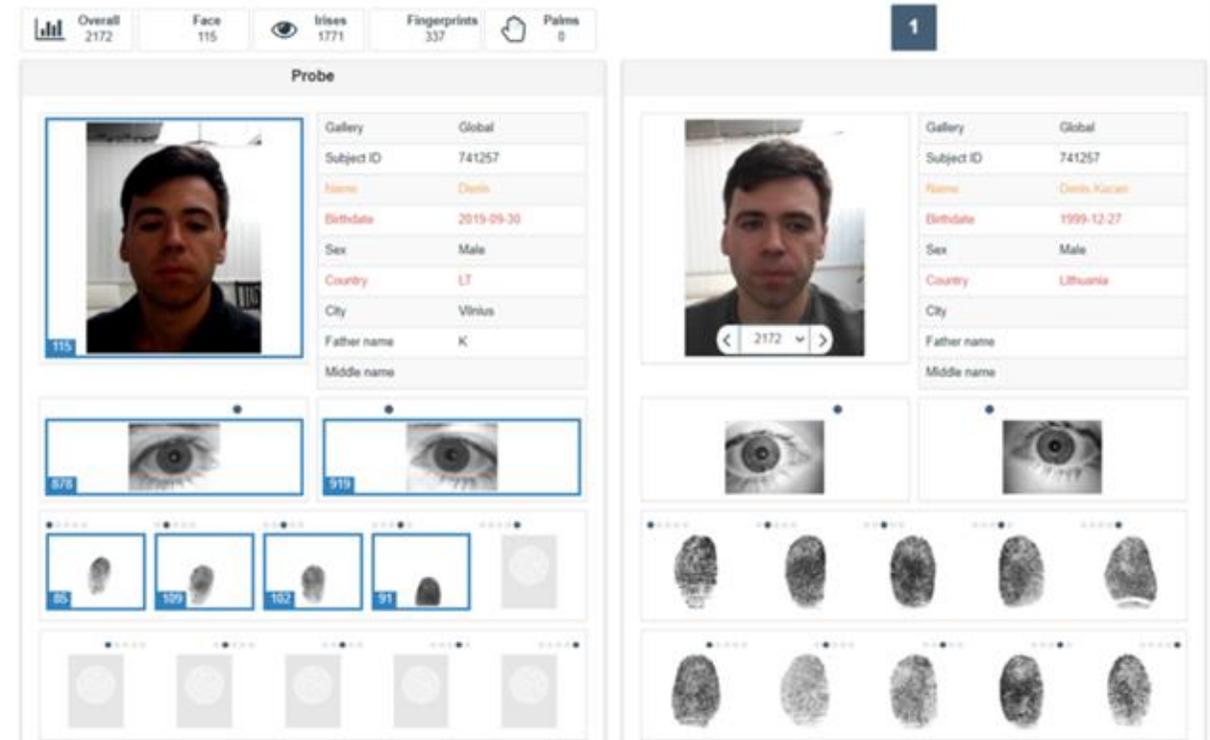
Probe Content	FPIR ≤ 0.001	FPIR ≤ 0.005	FPIR ≤ 0.01
Left Slap	0.0001	0.0000	0.0000
Right Slap	0.0002	0.0001	0.0001
Left + Right Slap	0.0000	0.0000	0.0000
Identification Flats	0.0000	0.0000	0.0000

Source: NIST FRIF TE (Neurotechnology submission results)

Manual Adjudication



- Not all matching cases can be solved automatically by the ABIS, especially when there are anomalies.
- Which are the cost for employee and training the operators?
- How many operators are needed?



Algorithms accuracy and speed



- A more accurate algorithm find more duplicates automatically and reduces the number of people required in the manual adjudication process
- A faster algorithm uses a lower amount of hardware resources to find duplicates
- The ability of the ABIS to be tuned or to tune itself automatically can be used to adapt to the number of available hardware resources

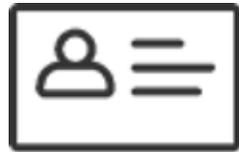


Migrating identity platforms to new systems



PHASE 1

**EXISTING
IDENTITIES
MIGRATION**



MIDDLEWARE



**IDENTITIES
DEDUPLICATION
THROUGH ABIS**



PHASE 2

**IDENTITY REGISTRATION
OR IDENTITY RENEWAL**



MIDDLEWARE



ABIS



1 to many

Cost of data migration from legacy system

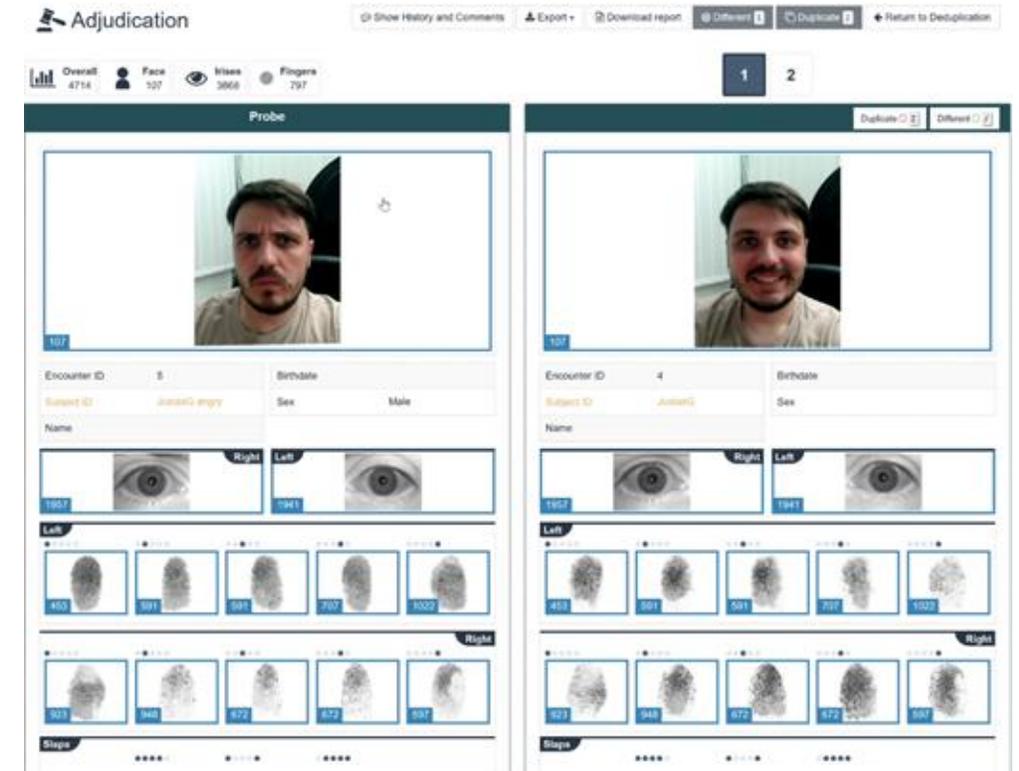


Deduplication of data from legacy system may require dedicated hardware or use the same hardware that later on will be used in production, depending from the system speed.

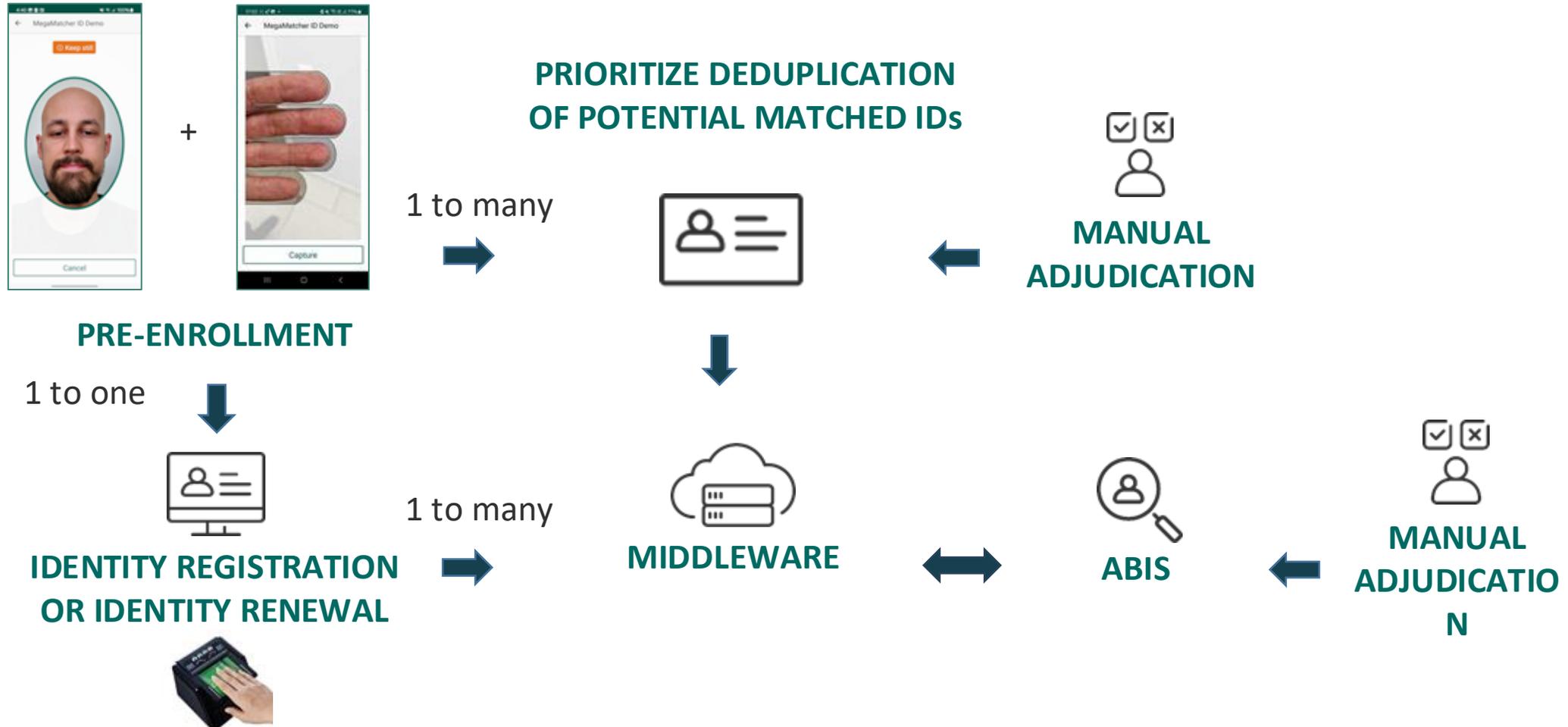
Which is the cost of delaying production phase of the new system?

Are legacy data usable (quality?) by the selected system and may legacy data be ignored in the new system?

Deduplication of legacy data and new data may be required to happen at the same time through dedicated adjudication logic
=> **It requires advanced adjudication solving methods.**



Leveraging pre-enrollment for costs optimizations





National ID Credentials

Credentials are no longer just proof of identity; they are the key linkage between individuals, state, and services

What are Credentials?



A credential can be defined as any document, object, or data structure that vouches for the identity of a person through some method of trust and authentication. (As per ID4D, World Bank)

Types of Credentials



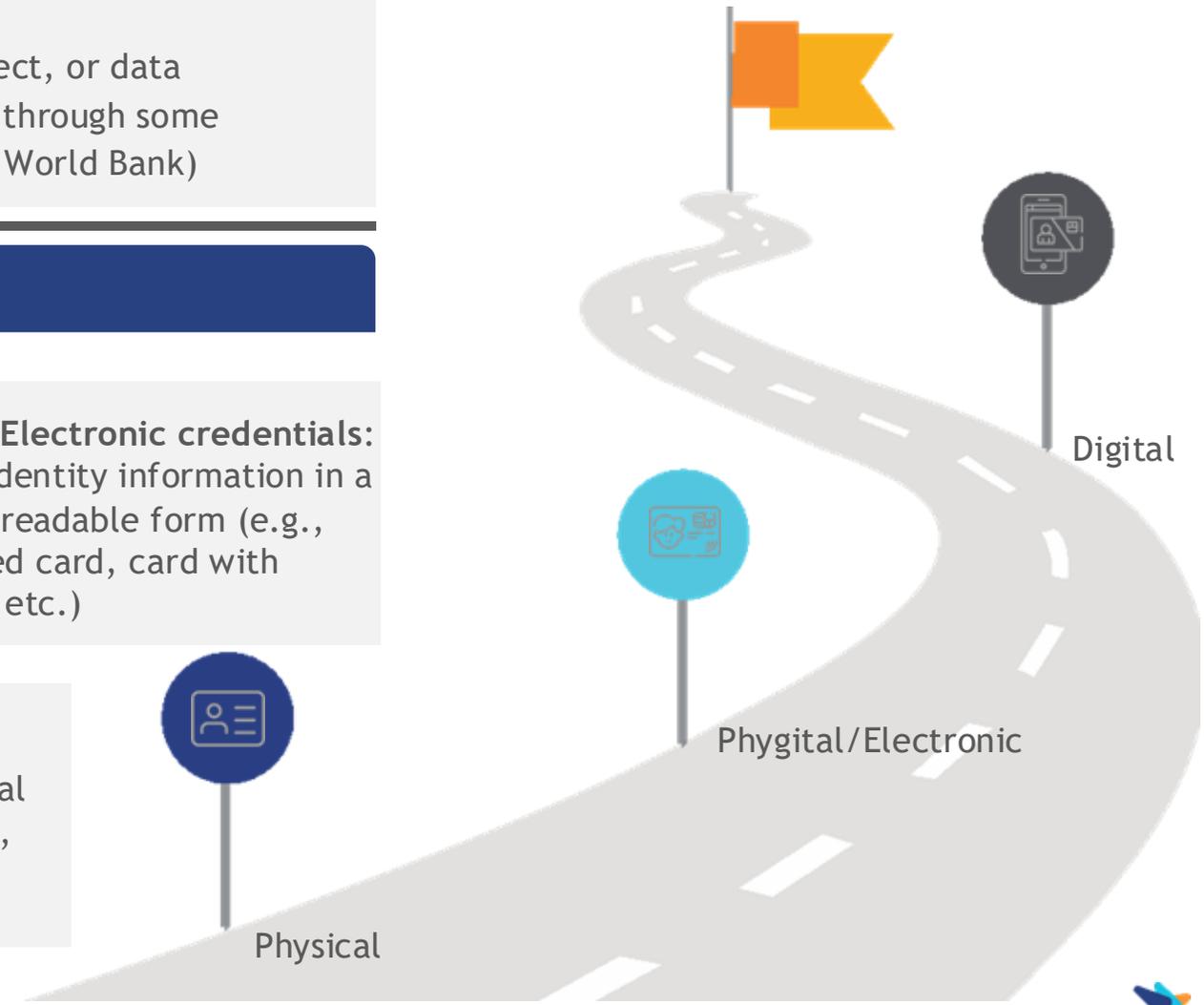
Physical credentials: Present identity information in a human-readable form (e.g., physical card/letter)



Phygital/Electronic credentials: Present identity information in a machine-readable form (e.g., chip-based card, card with barcode, etc.)



Digital Credentials: Present identity information in a digital environment (e.g., ID number, digital certificate, etc.)



National ID credentials can be categorised as physical, phygital (electronic), and digital

Examples of physical, phygital and digital credentials

Credentials	Examples				
Physical	 <p>Physical card</p>	 <p>Letter/ slip</p>			
Phygital/Electronic	 <p>Chip-based card</p>	 <p>NFC card</p>	 <p>Physical card/letter with QR code</p>	 <p>Physical card/letter with bar code</p>	 <p>SIM-based Mobile ID</p>
Digital	 <p>ID number</p>	 <p>Digital ID app</p>	 <p>Digital wallets</p>	 <p>Digital certificate</p>	 <p>XML</p>

The credential journey of National IDs across countries can broadly be classified into three approaches

Digital-First Leapfroggers



- The system is designed digital-first. Online authentication and verification are the core features
- Physical ID cards, if issued, are optional or secondary
- Systems are built to work across multiple platforms and services. Enables large-scale digital service delivery
- Example - India, Ethiopia

Phased Evolution (Electronic to Digital)



- Countries already have a foundational national ID with wide coverage
- Identity systems started with physical or electronic ID cards
- Over time, digital credentials are added to the system
- Digital IDs enable online services and mobile access
- Example- Singapore, Estonia, Thailand

Physical or Electronic Credentials



- Countries mainly use physical ID cards or electronic IDs
- Identity verification is largely offline and in-person
- Digital interoperability is minimal or absent
- Transition to digital identity is slow and gradual
- Example- Sudan, Ivory Coast

There is no "one-size-fits-all" journey; choices of credentials should be context-driven

Key Considerations in designing the digital credential ecosystem



Existing Digital Infrastructure



Internet connectivity



Mobile penetration



Electricity distribution and connection



Budget (Funds/grants)



Population



Digital Literacy



Potential use cases



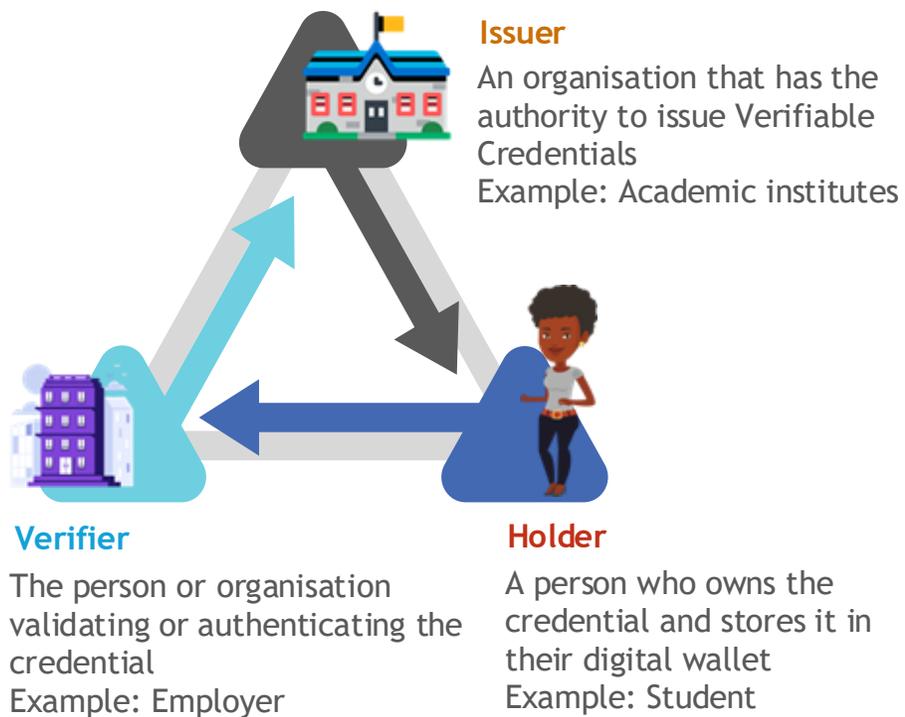
Private sector ecosystem



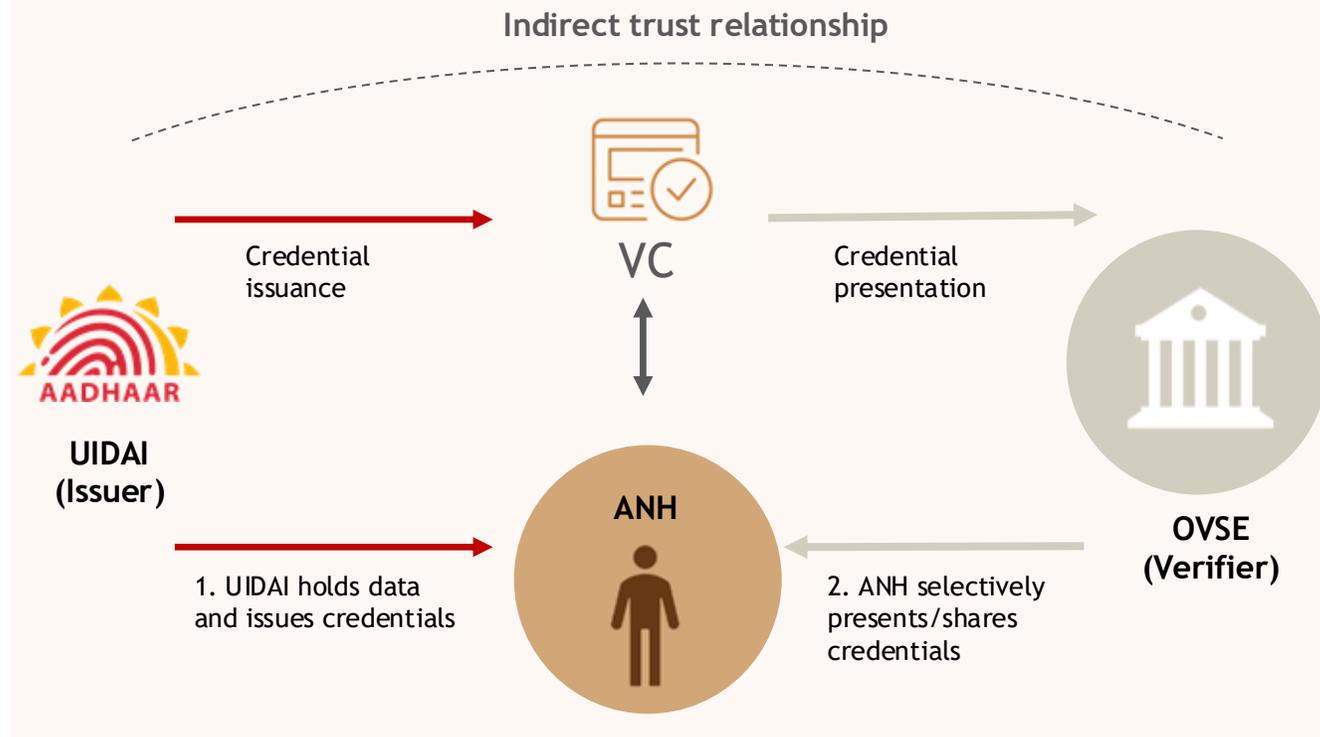
Human and technical capability

Verifiable credentials (VCs) are increasingly used for sharing personal data, offering cryptographic assurance of authenticity and integrity

A VC is a digital, cryptographically secured record of claims made by an issuer about a subject (i.e., a user). It is tamper-evident, independently verifiable, and proves who issued it.



An example of Aadhaar Verifiable Credentials



ANH: Aadhaar Number Holder | **OVSE:** Offline Verification Seeking Entity

Aadhaar VCs are digitally issued by UIDAI, securely stored in an Aadhaar App, and selectively presented to a verifier, who cryptographically confirms the issuer, holder, and validity of the credential

