Robust Identification As the Foundation
For the Efficient Administration of SP Programs

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Identity Matters
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Today’s Agenda

I. Identity Matters

II. Principles of Identity Management

III. eID-Transformation: Beyond Registers
Section One

IDENTITY MATTERS
The Importance of Formal Identification

- **Formal Identity has become an important component in human-human interactions in a structured society**
- **It is now recognized as essential for the proper conduct of government & commercial activities**
Identity Improves Security

- Oldest application of identification systems
- Continues to be a significant driver

**Public Safety**
- Criminal identification & Justice systems
- Law enforcement

**National Security**
- Counter-terrorism
- Intelligence
- Border control
- Visa issuance systems

**Commercial**
- Access Management (doors, computers, accounts. replacement for passwords)
- Securing payment systems (e.g. Apple Pay)
- Driven by Identity-centric vs. perimeter-centric security needs
  - Authenticate & authorize person based on their identity
  - Provisioning
  - Delivering convenience
Identity Improves Administration

**Improve Efficiency, Effectiveness**

*Know-your-people: central to ability to deliver services*

- Identification = administrative tool
- Improved access to public services: education, healthcare, social protection programs, financial inclusion etc.
- Lower administration costs
- Considered “very essential for the realization of effective, efficient and good quality public services”

**Prevent Fraud & Improve Governance**

*Impacts social protection/benefits programs as well as civil service payroll:*

- Ghosts (fictitious): Huge problem across the world for civil servant rosters
- Duplicates: 1 person enrolling as multiple beneficiaries
- Deceased beneficiaries kept on
- Ineligible individuals
- Wrong or redundant targeting
- Collusion (lack of accountability & transparency)

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Indonesia 2015 Study of 32 “Population database using” institutions showed 23.8% across board improvement in the 5 service quality dimensions (Tangibles, Reliability, Responsiveness, Assurances & Empathy)

Recent estimates by ID4Africa: 10-20% of civil servant rosters are ghosts in Africa (Nigeria, Ghana, Kenya, Tanzania, Zimbabwe, Uganda…)
Identity Drives Development

- Relationship between development-related indicators & formal identity
  - Socio-economic inclusion
  - Education, gender equality, health, etc.

- Accelerates economic development by enabling innovation. New economic exchange & interactions
  - E-Government & e-commerce
  - Payment systems, & mobile money
  - Targeted cash transfers instead of subsidy
  - Innovative Identity based apps (e.g. Karnataka has 4600 new apps based on e-ID)
  - E-Voting & verified voting

Case Study: Credit Bureaus

- Lack of robust identity: prevents their emergence in many countries
- Stifles finance: limits loans to consumers & businesses (micro only)
- Significant impact on economic development

Banking Associations & Central Banks in several countries made this point clear in several WB mission interviews
Regional initiatives to establish identity-based credit bureaus
Conferring Legal Rights

**Without Formal Identity an Individual Today**

- Cannot cross a border
- Cannot vote
- Cannot access many public services
- Cannot claim entitlement & benefits
- Cannot own property
- Cannot open a bank account
- Cannot...
- Cannot...

*Cannot assert many legal rights in a modern society... Situation will get worse as more interactions become electronic (human-machine replaces human-human)*
With broad-based identification becoming this important, a strategy for identity management is becoming priority on the national policy agendas of many countries.

1. Engagement of all identity stakeholders (*identity concerns all*)
2. Assessment of their existing identity assets & legitimate needs
3. Establishment of roadmaps & Enterprise Architecture
4. Building development plans to rectify gaps
5. Recognition of a central identity authority
6. Plans should include:
   - Modernization of existing assets
   - Institutional arrangements among stakeholders (MOUs)
   - Legal framework for protection (privacy, data protection, grievance)
   - System integration (investing in building interfaces across registers)

*In order to formulate informed policies a deeper understanding of identity management is required*
Section Two

PRINCIPLES OF IDENTITY MANAGEMENT
Identity = A set of human attributes or characteristics (identifiers) that, once specified, narrow down all possible entities to one and no other

Identity = \{X, Y, Z, \ldots\}

To be is to be the value of a set of variables—W.V. Quine

Biographic Regime

- Foundation of all legal identity
- **Attestable** identifiers (name, DoB, address, profession, etc.)
- Considered less robust
- Can be hijacked or faked

Biometric Regime

- Relies on immutable & indisputable attributes called biometrics
- Characteristics of the human body (patterns) that can be imaged & used as attributes for identity
Identity Register

- A register is a collection of identities (database), that meet certain requirements

<table>
<thead>
<tr>
<th>Exist</th>
<th>• The person exists &amp; alive as validated by a (face-to-face) or other enrollment procedure (community attestation). <strong>No ghosts.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique</td>
<td>• The person can only be present ONCE in the register. <strong>No duplicates.</strong></td>
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</tbody>
</table>
| Fixed or Traceable                         | • Identity **fixed for life**  
• Being able to change identity in an untraceable way undermines the legal constructs of society or effectiveness of programs |
| Linkable                                   | • Identity **linked to a notoriety**, social or recognized legal name  
• Legacy identity (social, communal, tribal references) is the foundation to which we still need to link to |

- A register is considered a good database if it is inclusive & assures that each identity it contains meets the above conditions
# Establishing Uniqueness: Four Ways

| The Birth Register (Civil Register) | Tracing identity to its origin
<table>
<thead>
<tr>
<th></th>
<th>Assumes robust birth registration practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biometrics</td>
<td>With large enough attribute set uniqueness can be achieved</td>
</tr>
<tr>
<td></td>
<td>Most reliable</td>
</tr>
<tr>
<td>Know-Your-Citizen</td>
<td>Robust administrative procedures</td>
</tr>
<tr>
<td></td>
<td>Example: use of community attestation</td>
</tr>
<tr>
<td></td>
<td>Crowd sourcing (published election lists)</td>
</tr>
<tr>
<td>Social Footprint</td>
<td>Big data analytics, mostly in developed countries</td>
</tr>
</tbody>
</table>
The Civil Register

- Most fundamental ID database
  - Uniqueness + Linkage
- Unfortunately, in many developing countries:
  - Information is not reliable
  - Many individuals missing from register
  - Insertions through legal judgments susceptible to fraud
  - Often in paper form only (difficult to search)

Modernization

Involves at least two elements:

1. Implementation of CRVS distributed information systems (CRVS-MIS) to record ALL new births as well as a centralized data-store for consolidation & identity knowledge recovery
2. Digitization of historic records

Digitization Experience: Difficult & Expensive

- UNICEF & Plan: Guide for Digitizing Civil Register (Sept 2015)
- Cost expectation: ~$0.25 (indexing) - $0.5 (single)/record or $0.9/record double capture
- Challenges: no. of volumes, decentralization of information
- Example: Morocco has ~300K bound volumes scattered in 2200 locations. Nepal 250K vols in 4000 locations
- Indonesia spent $100 M ten yrs ago to digitize its identity records
**Perfect Together**

**Civil Register**  
**Biometrics**

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**Good Policy**

1. Improve civil registration coverage for the new born (technology & campaign)

2. Historic civil register is digitized at least in part, accessible online & searchable (but not a priority, lower cost by treating it as preservation of heritage. There are alternatives)

3. Integrate with biometric identity regime for added robustness & in order to support *authentication* at time of use
The Biometrics Regime

1. Scanners
2. Images
3. Algorithms
4. Storage
5. Capabilities

**Images**

**Templates**

```
0100010
0100010
0100010
```

```
00011111
00011111
00011111
```

```
00010111
00010111
00010111
```

```
00111010
00111010
00111010
```

**Register**

**Capabilities**

- **1:1 Authentication**
  - Is person who he claims to be?

- **1:N Identification**
  - Who is this person?

- **Deduplication (AFIS/ABIS)**
  - Is person unique in register?
## Identity Registers: Assets

<table>
<thead>
<tr>
<th>Program</th>
<th>Asset Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundational</strong></td>
<td></td>
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</tbody>
</table>
| Civil Register                 | – Points of contact with the population  
|                                |   – Procedures for registration & control  
|                                |   – Birth & Death register                                                        | Legal Permanent                           |
| **National Population Registers** | – With or Without Biometrics  
|                                |   – **Database**: Repository of all legal identities recognized in the country (see below).  
|                                |   – **Service**: Online identity services to authenticate or identify             | Administrative Permanent                   |
| **Functional**                 |                                                                                 |                                            |
| Program Specific Registers     | – Identity databases representing Know-Your-Client or your beneficiaries.  
|                                |   – Could be individual or household.  
|                                |   – Examples include voters lists, social security, social protection, education beneficiaries, passport register, health care, etc. | Transient  
|                                |                                                                                      | Data value drops with time (e.g. 3 year SP program, one day election, etc.)  
|                                |                                                                                      | Updates based on cyclical refresh (e.g. once every 3 years)            |
| Credential(s)                  | – Proof of identity in the form of secure ID Card or other official identity certificates |                                            |
Registers In Republic of Utopia

- Foundational Registers
  - Everyone is registered at birth
  - Everyone receives a Unique Identity Number (UIN)
  - Enroll once & use for life

- Functional registers can be built on foundational registers to support any applications as needed
National Population Register (NPR)

- Exhaustive list or a national level database where each entry:
  - Corresponds to one individual that has the right to be in the country (citizen, foreigner resident, diaspora)
  - The person is represented only once in database
  - The person is associated with a unique identity number (UIN)
  - Covers 100% of population, no age restrictions & no exclusions
  - Each entry is a collection of Identifiers according to the Identity Data Model adopted by the country

NPR:
Database that contains basic identifying information about the entire population
NPR: In Its Purest Form

- Contains ONLY identifiers that are stable data for life

- Identity Data Model:
  i. Full name
  ii. The UIN
  iii. The parental link
  iv. Place of Birth
  v. Date of Birth
  vi. Gender
  vii. Biometric identifiers or other mechanisms for attestation of uniqueness of person to whom the UIN is assigned

Non changeable except to correct errors or legal proceedings (through court judgment, example changing name, etc.)
Updating the NPR

- Only TWO operations affect the pure NPR

- Birth
- Immigration
- Refugees

- Death
- Emigration

Entry → NPR (data stored and updated)
Exit → Archive (data archived and removed)
Intimate Link with Civil Register

Entry Trigger Event

Exit Trigger Events

Civil Register

Civil Register Bureaus

Contact Points wt the Population

Immigration

NPR

Archive
NPR: Extended Form → NPR+

- Rarely do we find NPR in its purest form

- Often data structure is extended in many ways. Most common is the addition of residence information (identity with residence:
  - Current Legal Address
  - Permanent address
  - Phone number
  - Email address
  - Other contact mechanisms

- While these are important from administrative point of view, they introduce *dynamic* data into the NPR which creates challenges to keep the register up to date
• On its own an NPR in purest form does NOT group people into households
• For many reasons, including planning and Social Protection targeting, etc. it is desirable to group people into households
• The grouping can be for the TOTAL population or a segment of it

**Household:**
A group of people living in the same house, sharing the food and has one of them as head of household.
Family versus Household?

- Household is NOT necessarily a family

- With an NPR that contains parental links {UIN, UIN-f, UIN-m, …} a nuclear family can be reconstructed dynamically (family number may be assigned as well)

- Even an extended family can be reconstructed to some extent
  - An example of a good implementation of that is the NADRA system in Pakistan, where family trees are automatically reconstructed across multiple generations using UIN triangulations

- Population authorities around the world are evenly split in using family versus household as the basic unit
Building a Household Register (HHR)

- Additional information that groups people into households must be added to the basic NPR in order to produce a HHR

- **HHN is a grouping of UINs localized to a residence or address**
  - HHN-XYZ={UIN1, UIN2, UIN3, Address…}

- There are several mechanisms for collecting this information

- The experience in the world is varied in this regard, because of legacy, and mainly can be summarized into the next category:
### Mechanisms for Collecting HHR Data

<table>
<thead>
<tr>
<th>Type</th>
<th>Explanation</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social Surveys (Go-2-People)</strong></td>
<td>House to house general or partial census of the population for collecting household data &amp; socioeconomic information</td>
<td>Colombia (SISBEN), Costa Rica (SIPO), Rwanda (Ubudehe), Bangladesh, India (certain parts), Indonesia (2011, 2015) Survey</td>
</tr>
<tr>
<td><strong>On-demand (People-come-2-You)</strong></td>
<td>People are required to come to declare each addition to their family &amp; update their status OR Incentivize people to come declare because of social programs</td>
<td>Chile (Ficha CAS), USA Welfare, Indonesia (Family Card), Morocco RAMED, TAYSSIR? Jordan</td>
</tr>
<tr>
<td><strong>Hybrid</strong></td>
<td>A mix between the two</td>
<td>Mexico (rural census, on demand urban), Brazil (Cad Unico): quota based survey</td>
</tr>
<tr>
<td><strong>Institutional</strong></td>
<td>Dedicated administrative body embedded inside the population as means of control (ministry of public security)</td>
<td>China Hukou (Reform of 2014), Taiwan, Vietnam</td>
</tr>
</tbody>
</table>
In Reality: Social Registers (SR)

Head of Household

Household Composition & Socio-economic Indicators

Classification (e.g. PMT)
Flavors of Social Registers

Program Specific Registers

- P1
- R1
- P2
- R2

Single/Unique Social Register

- P1
- P2
- R

Interoperable Registers

- P1
- P2
- UIN
- R1
- R2
The UIN is a strong identifier.
- Allows programs to have a holistic view of services delivered to each individual
- Lowers the burden on individuals demanding service
- Better Know-Your-Customer as it improves coherence of data

Absence impacts effectiveness of programs & coordination among them.

To succeed it cannot be optional, ALL programs need to use it. The UIN enables public service institutions to become users of the population database.
Since in real-world registers contains dynamic data, it raises complex & costly issues related to keeping data up to date

- Sometimes a campaign is used to establish a baseline register then targeted programs are tasked with maintaining the data concerning the population served up to date
  - Program MIS are critical

- More reason for having a reliable & unique UIN

Citizen engagement is critical to keeping registers up to date: this means the links must go both ways
Trending: Integrated Population Register Systems (IPRS)

Super Registers: collection of registers that are harmonized, integrated & synchronized

- Civil register
- Population/HHR register
- National ID card register
- Aliens register
- Passport Register
- Tax register
- Driver’s license register
- Social Security register
- Health insurance register
- Bureau of statistics register

March 10, 2015 Kenya officially launched its IPRS after > 5 years of integration work. Key enablers

- Use of Personal Identification Number or UIN
- Use of entity resolution to disambiguate people where UIN is absent
Section Three

E-ID TRANSFORMATION
Robust Identity Registers: Proven Value

- Improves efficiency of public spending.
  Effective tool against fraud

- Accelerates economic development

- Important interface between government & people to improve & simplify service delivery.
  Essential for effective, efficient, & good quality service

- Improves fairness, cooperation & targeting of social programs

- Could provide dynamic census of the population

- Capacity to react rapidly in case of a choc

Important interface between government & people to improve & simplify service delivery.
Essential for effective, efficient, & good quality service.
To Realize the Promise

- Need to create not just a set of databases
- But an entire identity ecosystem or platform that relies on these databases (100%) for universal service delivery
- This is the e-ID Transformation

Reforming the way a government transacts with its citizens and the way it delivers what they need (social protection, education, health, other services) and in the way it empowers the people to conduct their daily lives.

Successful e-ID Transformations

- RealMe • New Zealand
- Dutch e-ID • Netherlands
- Aadhaar • India e-transformation
- Fedict e-ID • Belgian
### Ingredients for e-ID Transformation

1. Robust National Identity Registers
2. Online identification & verification services (as web service to those authorized access)
3. A universally used UIN
4. Digital certificates (digital signature framework for encrypting & signing)
5. Recognition of e-ID as a legal category
6. Secure credential that allows holder to assert their identity **offline**
7. Mobile credential that allows holder to assert identity on mobile device
8. Credential readers at points of service
9. A political will that requires services to pass through this platform
10. A legal protection framework

Digital Identity (eID)

Is the totality of *processes & assets required for establishing a person’s unique identity & credentialing it so that it can be securely & unambiguously asserted & verified through electronic means*
Legal Protection Framework?

- The sum is certainly larger than its individual parts.
- Raises concerns about privacy & free will
- Need to ensure appropriate legal framework is in place to protect the rights (data protection and privacy) of those who consent to providing data about themselves
- Notice, Consent, & proper security measures

Best Practices Exist

- FIPPs Fair Information Practice Principles
- OECD Guidelines
Thank You

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- Thank you for your attention
- A lot to think about

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