ICT Framework for Realizing Holistic CRVS Solutions
WCC Overview and Offerings

- Search and Match software solutions
- Focus on Identity and Employment markets
  - Border Management, Civil Identity, Justice & Public Safety
- In business since 1996
- Based in the Netherlands
- Deployments are organization-wide or nation-wide
### Entrenched Market - Person Identification

<table>
<thead>
<tr>
<th>Country</th>
<th>Application</th>
<th>Gallery</th>
<th>Trxs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Border Management</strong></td>
<td>NL</td>
<td>Asylum Seekers</td>
<td>1M</td>
</tr>
<tr>
<td>Netherlands Immigration</td>
<td>EU</td>
<td>Visa</td>
<td>60M</td>
</tr>
<tr>
<td>EU VIS</td>
<td>MX</td>
<td>Migrant Worker Visa</td>
<td>1M</td>
</tr>
<tr>
<td>Mexico VIS</td>
<td>UNHCR</td>
<td>Refugee Management</td>
<td>2M</td>
</tr>
<tr>
<td><strong>National ID/Credentialing</strong></td>
<td>ME</td>
<td>Batch De-duplication</td>
<td>2M+</td>
</tr>
<tr>
<td>Middle East Ministry of Finance</td>
<td>US</td>
<td>Driver’s License</td>
<td>20M+</td>
</tr>
<tr>
<td>Ohio DMV</td>
<td><strong>Police</strong></td>
<td>Law Enforcement</td>
<td>1M++</td>
</tr>
<tr>
<td>Finnish Police (incl. Border)</td>
<td><strong>Banking</strong></td>
<td>De-duplication</td>
<td>10M</td>
</tr>
<tr>
<td><strong>Healthcare</strong></td>
<td>NL</td>
<td>Healthcare Billing</td>
<td>35M</td>
</tr>
<tr>
<td>Concentra Managed Healthcare</td>
<td>US</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Sizing is based on projected project sizing or production data*  
*Sizing numbers are best estimates*
WCC Offerings

- **Services**
  - Identity expertise and Data expertise
  - Integration support
  - Configuration and Data modeling
  - Optimization
- **Technology Platform**
  - Smart Search & Match Platform
  - Biometric, Biographic, and contextual data matching in one platform
  - Flexible Architecture/Java, .Net, web services interface

**Industry Recognition**
- **MITRE** Challenge – Winner Multi Cultural Name Matching challenge
- **Frost and Sullivan** – “Biometric Emerging Multimodal Platform of the Year”
- **Gartner** Magic Quadrant for Information Access Technology
- **IDC** recognition for innovative search and match technology
Linking Foundational Identities to Civil Registries and Identity Programs
Principles of CVRS System

Per United Nations

“Principle and Recommendations for a Vital Statistics System Rev. 3”

Universal Coverage
Continuity
Confidentiality
Regular Dissemination of Information
Address functional Identity programs but **implement a Foundational Identity platform.**


Identity platform should be underpinned by a **robust Identity Resolution engine.**

As functional Identity programs are implemented, **collect civil registration and breeder document information.**

In parallel, implement comprehensive CVRS system as policy and budgets allow.
Identity resolution is:

A data management process through which an identity is searched and analyzed between disparate data sets and databases to find a match and/or resolve identities.

Identity resolution enables an organization to analyze a particular individual’s identity based on its available data records and attributes.
Data from Breeder Documents

Data usable for Fraud/De-duplication analysis

- Document Type
- Document #
- Name
- Place of Birth
- Family Tree
- Date of Birth
- Date of Registration
- Place of Registration
Core Components of a ‘Typical’ Identity Platform

- **Analysts Tool Set**: Address data anomalies and/or confirm duplications
- **Identify Internal and External Fraud**: Check for specific fraud relationships and transaction profiles of interest
- **Best of Breed Name Matching**: Per independent testing by MITRE
- **Operational Intelligence and Dashboarding**
- **Adjudication Application**
- **Rules Engine**
- **Watch-list Check**
- **De-duplication**
- **Multi-cultural Name Matching**
- **Intelligent Fusion w/ Biometrics**
- **ELISE Smart Search & Match Platform**
- **Real Time Analytics for System Identity Data**: Assess Quality Metrics, Identify Trends, Understand Operations
- **Configurable Fusion**: Optimizes accuracy, speed, cost
- **Next Generation Identity Platform**: Single platform for biometric, biographic, and other identity data for matching
Need for Multi-cultural Name Matching

- Typographic faults
- Phonetic faults
- Search for name variations with and without punctuations
- Correction for source errors
- Name variations using external name databases or own data

<table>
<thead>
<tr>
<th>Name Arabic</th>
<th>Name Latin</th>
<th>Other 1</th>
<th>Other 2</th>
<th>Other 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>دمحم</td>
<td>Mohamed</td>
<td>Magomed</td>
<td>Mamadou</td>
<td>Mahometus</td>
</tr>
<tr>
<td>دمحمأ</td>
<td>Ahmed</td>
<td>Akhmad</td>
<td>Amadou</td>
<td>Ehmet</td>
</tr>
<tr>
<td>يزع</td>
<td>Ali</td>
<td>Alikhan</td>
<td>Alisher</td>
<td>Aliy</td>
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<tr>
<td>نيماینپ</td>
<td>Benyamin</td>
<td>Benny</td>
<td>Veniamin</td>
<td>Benas</td>
</tr>
<tr>
<td>فسوپ</td>
<td>Yousef</td>
<td>Jousef</td>
<td>Jost</td>
<td>Seosamh</td>
</tr>
</tbody>
</table>
## Best of Breed – Multi-cultural Name Matching per MITRE challenge

### The MITRE Challenge Validation Set Results -MAP

<table>
<thead>
<tr>
<th>Team</th>
<th>Validation MAP</th>
<th>Challenge MAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beethoven</td>
<td>94.3</td>
<td>89.0</td>
</tr>
<tr>
<td>Riffraff</td>
<td>91.9</td>
<td>89.1</td>
</tr>
<tr>
<td>A Rose</td>
<td>91.7</td>
<td>86.2</td>
</tr>
<tr>
<td>Mean Mr Teach</td>
<td>91.6</td>
<td>89.6</td>
</tr>
<tr>
<td>Impala</td>
<td>90.7</td>
<td>82.9</td>
</tr>
<tr>
<td>0.7</td>
<td>88.9</td>
<td>82.6</td>
</tr>
<tr>
<td>JustForFun</td>
<td>88.0</td>
<td>83.8</td>
</tr>
<tr>
<td>Sunil</td>
<td>84.2</td>
<td>64.8</td>
</tr>
<tr>
<td>Phylogenetic Trees</td>
<td>81.0</td>
<td>60.9</td>
</tr>
<tr>
<td>Homebrew Magic</td>
<td>80.1</td>
<td>66.2</td>
</tr>
</tbody>
</table>

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Handle All Identity Data - Fusion

- Multi-cultural names
- Biometric information
- Biographic information
- Vital statistics
- Transactional data

CVRS Information is largely Biographic but linked to Biometric information for functional efficiencies.
Deliver Usable Information – Dashboards and Operational Analytics
Analytics: Example - Identify High Risk Groups/Dynamics

Example shows high amount of duplicates with age 25 – 35 age group.
IDENTIFY FRAUD

EXTERNAL FRAUD

Citizen Fraud
- Fraudulent Breeder Document
- Fraudulent access to service
- Multiple access to same service

INTERNAL FRAUD

Operational
- Process enables ‘fake/ghost’ enrollments
- Benefits diverted
- Shrinkage

Administrative
- Administrators comprised to enable fraud enrollments
- Administrators comprised and enable illicit distribution of services
Establish Relationships and Gather Data

Data
- Breeder Document
- Enrollment Data (Operator, Time, Location)
- Transaction Data
- Fraud History
- Fraud Patterns

Relationships
- Duplicate Enrollments
- Multiple Services
- Illicit distribution of services
- Ghost Enrollments
- Diversion of Services

Citizen

Operational Gaps and Inconsistencies

Compromised Administrators
Foundational CVRS Platform

From CVRS Digitization Guidebook
African Programme for Accelerated Improvement of Civil Registration and Vital Statistics
Start with Functional Need – Using Foundational Architecture

Identity Platform

- Breeder Document Information
- Relevant Vital Statistics at Enrollment
- Biometric Templates
- Application Specific Information

- Civil Registry Data
- Vital Statistics Data
- Biometric Image Data
- Application Specific Data

Functional Application 1: Ex... Benefits Program
Expand CVRS data as additional Functional Needs Addressed
Integrate CVRS Programmatically when Available

Programmatic CVRS enrollment when available

Civil Registry Data from CVRS System
Civil Registry Data from App 2
Civil Registry Data from App 1

Relevant Vital Statistics at Enrollment
Vital Statistics Data: From CVRS system
Vital Statistics Data: From App 2

Biometric Templates
Biometric Image Data: From App 1
Biometric Image Data: From App 2

Application Specific Information
Application Specific Data: App 2

Breeder Document Information

Functional Application 1: Ex... Benefits Program
Functional Application 2: Ex... Benefits Program

Identity Platform
Drive Information in Real Time

National Dashboard and Operational Intelligence

Identity Platform

Breeder Document Information

Relevant Vital Statistics at Enrollment

Biometric Templates

Application Specific Information

Civil Registry Data from CVRS System

Vital Statistics Data: From CVRS system

Biometric Image Data: From App 2

Application Specific Data: App 2

Civil Registry Data from App 2

Vital Statistics Data: From App 2

Biometric Image Data: From App 2

Application Specific Data: App 2

Civil Registry Data: from App 1

Vital Statistics Data: From App 1

Biometric Image Data: From App 1

Application Specific Data: App 2

Programmatic CVRS enrollment when available

Functional Application 1: Ex... Benefits Program

Functional Application 2: Ex... Benefits Program
African Programme for Accelerated Improvement of Civil Registration and Vital Statistics

From CVRS Digitization Guidebook
CVRS Vision translated to Technology Platform

National Dashboard and Operational Intelligence

Identity Platform

Operational Intelligence and Dashboarding
Adjudication Application
Rules Engine
Watch-list Check
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Multi-cultural Name Matching
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Breeder Document Information
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Application Specific Data: App 2
Application Specific Data: App 2

Functional Application 1: Ex... Benefits Program
Functional Application 2: Ex... Benefits Program

Programmatic CVRS enrollment when available

WCC Confidential
Summary – Linking Foundational Identities

Service

Operations

Technology

Know Your Citizen
Serve your Citizen

Increase Security
Increase Privacy
Reduce Costs

Functional Application – Foundational Platform
Identity Resolution
Step by Step Implementation to build CVRS system
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Questions?

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