Next Generation Border Crossing

ePassports and their Impact on Border Control

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Contents

- Trends
- Status quo ePassports
- Impact on border control
- Future border control requirements and processes
- Conclusion
Trends with high impact on border control

**Mega trends**
- Globalization and growth in international travel
- Terrorism, illegal migration, organized crime

**Subtrends**
- Integrated border management
- New technologies
- Integration of upstream processes
- Risk profiling
- Large-scale IT systems
- Automation, self-service, and mobile control
Status quo ePassports

Electronic passports
- Until 2010 approx. 43 countries will introduce ePassports
- Most travellers will then have an electronic passport
- ID cards with RFID and biometrics will be issued soon

Others:
- Visa Information System – VIS
- Schengen Information System II – SIS II
Interoperability

Technical issues
- MRTDs, chips and contactless interfaces are specified
- Functional range and quality of the reading devices vary
- Chip position and reader layout define reading process
- Few initiatives regarding end devices
- ePassport interoperability tests
- Technical report on test standards for ePassports

No interoperability tests in future?

Privacy issues
- Privacy/security applications are not mandatory
- BAC - Keys generated from MRZ
- EAC – Key management and PKI structure required
Extended Access Control (EAC) and PKI

Country Verifying Certification Authority

- Supreme CA of the PKI
  - Issues document verifying certificates
  - Typically a sovereign task

- Manages doc reader certificates
  - Restricts access rights and the validity period
  - Issues inspection system certificates

Document Verifying CA

- Documents verifying certificates
- Manages doc reader certificates
- Restrictions access rights and access period

Document Readers

- Access rights and access period defined by the IS certificates
Challenges facing border control

- Examination of people and TD at checkpoints, green and blue border
- Authentication, verification, identification
Example: Automated forgery detection

Automated MRZ detection
- Basis for database queries

Automated forgery detection
- Embedded security features
- Verification with reference database
Example: Biometric verification

**Biometric verification**
- Fingerprint
- Facial image
- Appropriate environment conditions
- SW, HW and integration
- Maximum assistance for border control officers

Border control point

![Diagram of border control point with biometric verification process, involving fingerprint and facial image comparison with databases.]
Example: Integration of upstream governmental processes

Visa issuance
- Pre-processing of data
- All data available and accessible at the border control point
- Biometric verification possible

Potential
- Speed up border clearing process
- Close and secure chain between visa issuance and border control
## The primary inspection point

<table>
<thead>
<tr>
<th>Ongoing procedures</th>
<th>Authentication</th>
<th>Verification</th>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data page</td>
<td>MRZ reading, rarely forgery detection</td>
<td>Visual</td>
<td>Matching of MRZ data with database</td>
</tr>
<tr>
<td>Chip data</td>
<td>Automated forgery detection</td>
<td>ePassport vs. live data</td>
<td>Matches of MRZ data with database</td>
</tr>
<tr>
<td>Data page matching chip</td>
<td>Different document databases</td>
<td>ePassport vs. database</td>
<td>Biometric identification at secondary control</td>
</tr>
<tr>
<td>Additional documents</td>
<td>Validation of signatures</td>
<td>Visa vs. live characteristics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Integrity of data</td>
<td>Visa</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Facial image match</td>
<td>Registered traveller cards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biographic data match</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Future procedures (2 – 5 years)

- Automated forgery detection
- Different document databases
- Validation of signatures
- Integrity of data
- Facial image match
- Biographic data match
- Visa
- Registered traveller cards

- Chip image vs. live image
- Chip finger vs. live finger
- Chip iris vs. live iris
- Chip image vs. database image
- Chip finger vs. database finger
- Database finger vs. live finger
Staffed process

Traveller with document presents documents

Officer checks document, conducts verification and sends request to various databases.

PKI Network

DB DB DB
Separated process

- Traveller with electronic document puts documents on self service system.
- System sends data to various databases and collects answers in a local database.
- Officer checks document, sends request to local database and conducts final inspection.
- Presents documents.
Automated process

Traveller with MRTD puts documents on self service system.

System sends data to various databases and collects answers in a local database.

Traveller allowed to use automatic clearance conducts biometric verification.

Traveller not allowed to use automatic clearance is sent directly to the officer.

Officer reads document, conducts inspection.
Conclusion

- Future border control will be based on ePassports
- Interoperability depends on the capability of the supplier
- Data collection and control will be moved upstream
- Risk profiling and clustering of travellers for efficient allocation of resources
- Data sharing, inter-agency cooperation, Integrated Border Management
- Automation changes border control but does not substitute human work
- New technologies enable secure and convenient border crossing
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