



2nd Symposium on ICAO-Standard MRTDs, Biometrics and Security

From Basic MRTDs to Biometric ePassports

Presenter:
Malcolm Cuthbertson
De La Rue Identity Systems

MRTD Symposium
ICAO Headquarters, Montréal
6 – 7 September 2006

International standards



ICAO standards

✱ ICAO DOCUMENT 9303 (Parts 1-3), Family of MRTDs:

- Part 1: Machine Readable Passports (MRPs)
- Part 2: Machine Readable Visas (MRVs)
- Part 3: Official Travel Documents (cards)

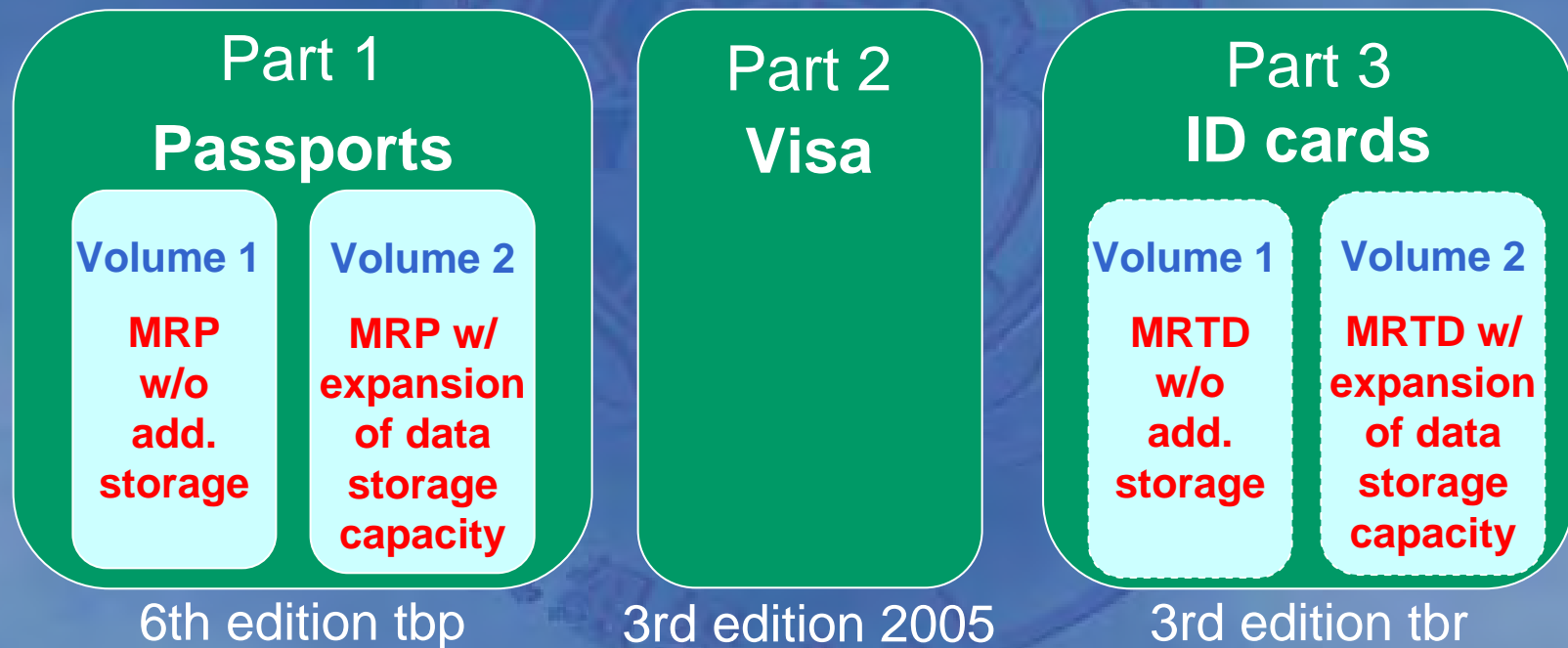
ICAO standards

✱ SECURITY STANDARDS

- Document security: Annex A
- Security of issuing process:
G8 Annex A

ICAO 9303 – status

✱ Structure of Document



What is a MRTD?

☀ Machine readable travel document (MRTD):

“Official document issued by a State or organisation which is used by the holder for international travel and which contains mandatory visual (eye readable) data and a separate mandatory data summary in a format which is capable of being read by machine.” ICAO Doc 9303, II-2

What is a MRP?

✱ Machine readable passport (MRP):

“Passport conforming with the specifications contained in Doc 9303, Part I. Normally constructed as an ID-3 size book [...].”

ICAO Doc 9303, II-2

Part 1 (6th edition) – Passports

- ☀ Review by ISO, comments integrated
- ☀ Final draft version of WG submitted to TAG Secretariat
- ☀ Draft version available from Mary McMunn mmcmunn@icao.int



Data page layout



Visual inspection zone (VIZ)

Top of the MRP data page

Code for issuing State or organization/
Code de l'État émetteur ou de l'organisation émettrice

| | | | |
|--|-------------------------------------|--|-------------------------------------|
| 01 (Name of issuing State or organization/Nom de l'État émetteur ou de l'organisation émettrice) | | | |
| 02 Passport/ Passeport | 03 Type/ Type | 04 | 05 Passport No./ N° de passeport |
| 06 Primary identifier/Nom | | | |
| 07 Secondary identifiers/Prénoms | | | |
| 08 Nationality/Nationalité | | | |
| 09 Date of birth/ Date de naissance | | 10 Personal No./ N° personnel | |
| 11 Sex/ Sexe | 12 Place of birth/Lieu de naissance | | |
| 14 Date of issue/ Date de délivrance | | 15 Issuing authority or office/ Autorité ou bureau émetteur | |
| 16 Date of expiry/ Date d'expiration | | 18 Holder's signature/ Signature du titulaire | |
| 19 (Holder's portrait/ Portrait du titulaire) | | | |
| (Machine readable zone/Zone de lecture automatique) | | | |

Zone I

Zone II

Zone III

Zone IV

Zone V

header

personal data elements

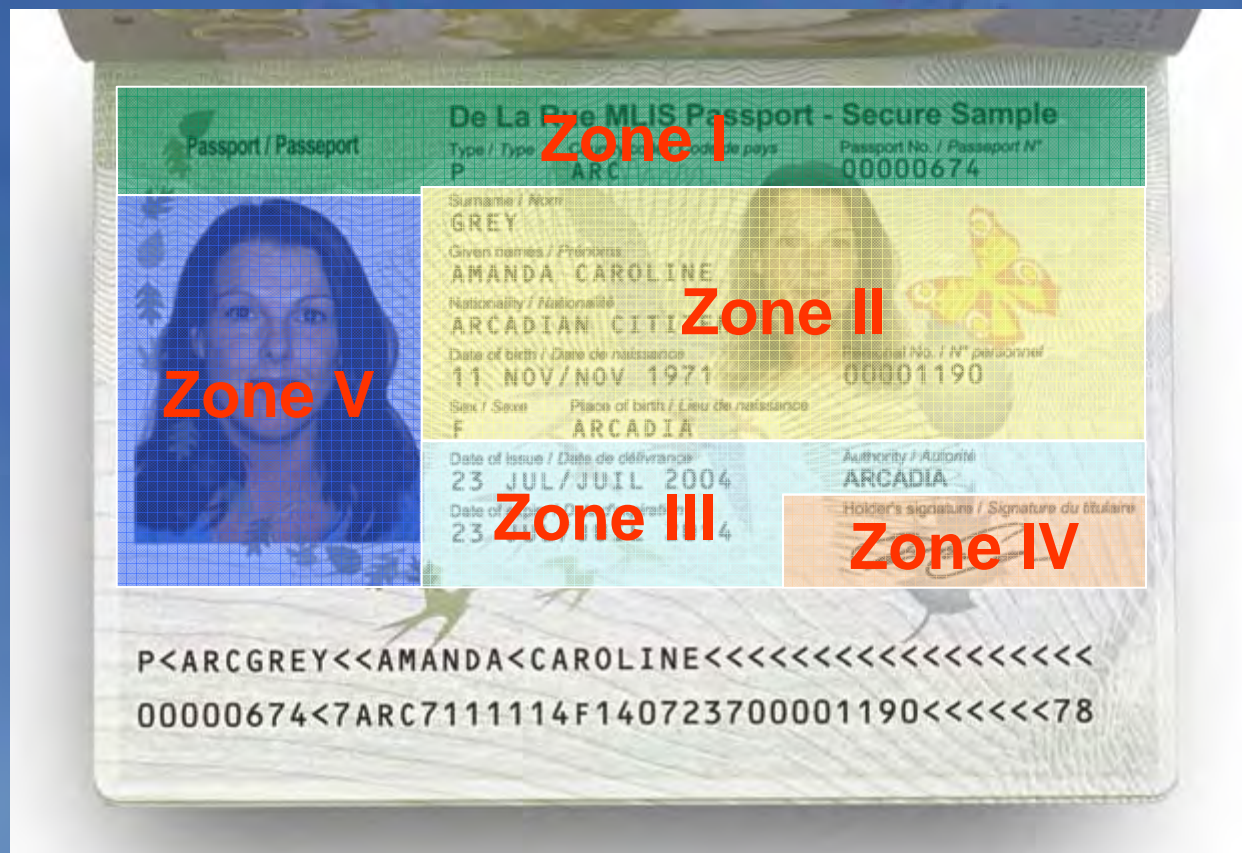
document data elements

signature

identification feature

Not to scale

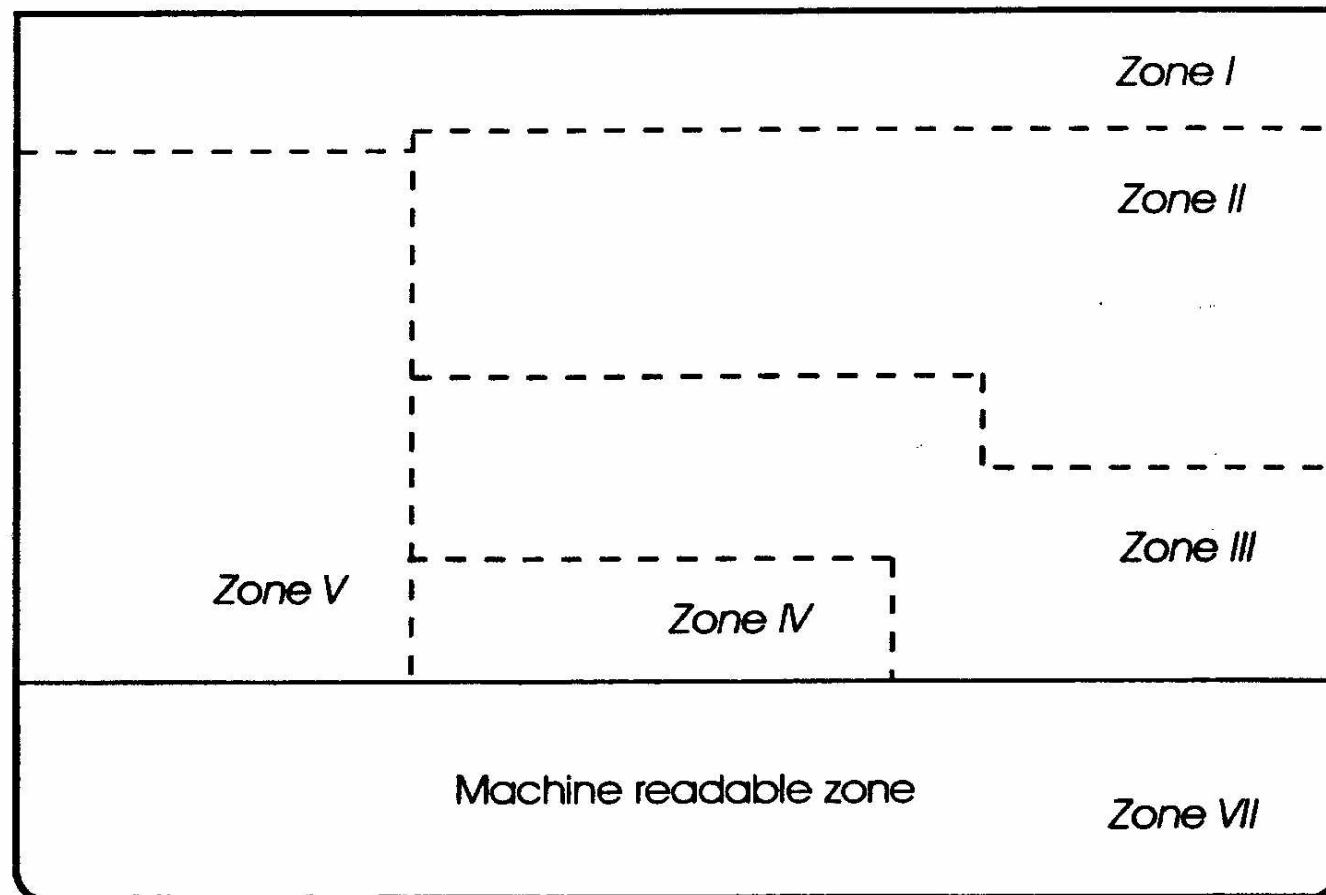
Visual inspection zone (VIZ)



VIZ – zone location options

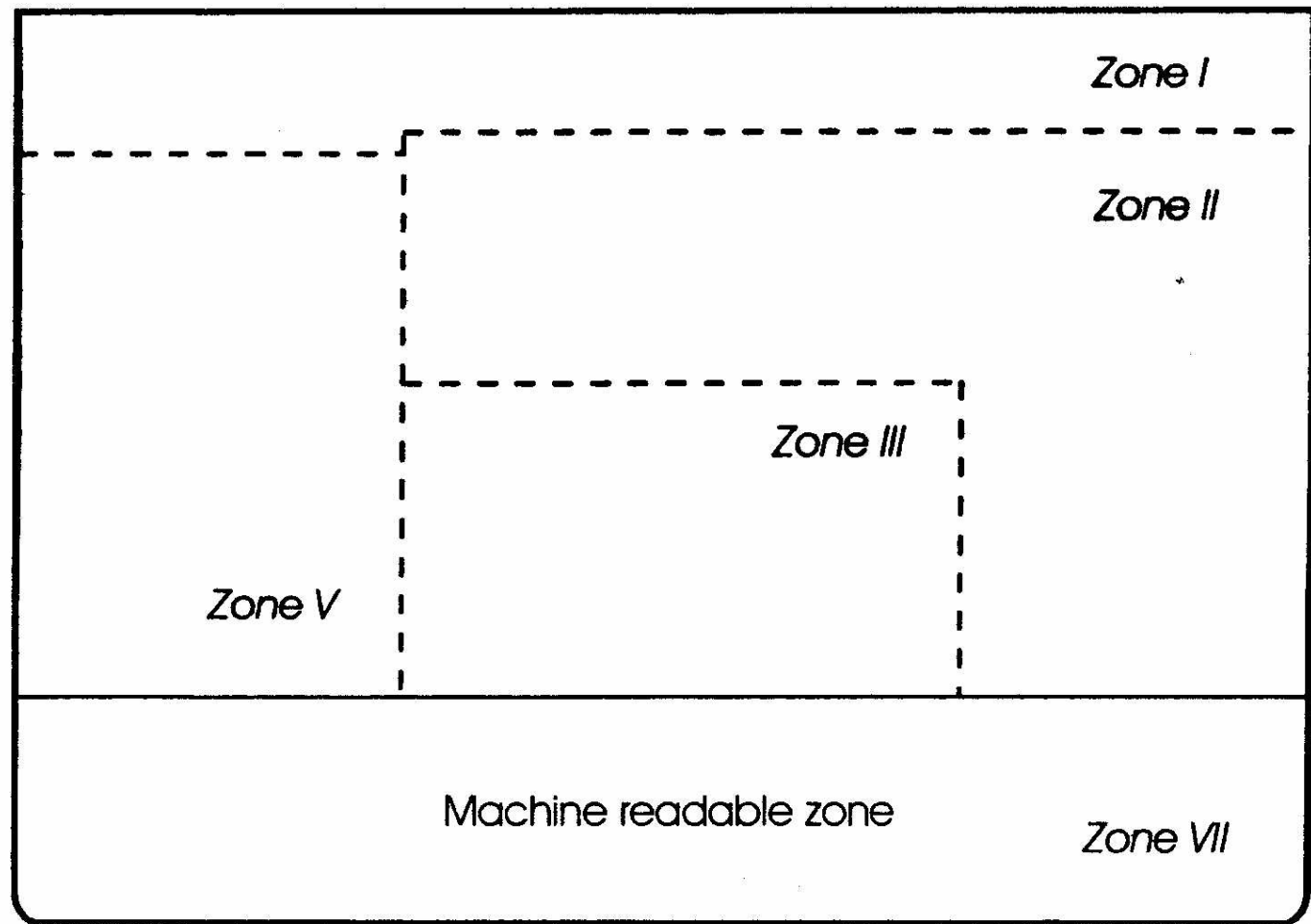
Diagram 2. Flexible positioning of Zones 1 to V

Example 1



VIZ – zone location options

Example 2



zone location o



- optional personal data (e.g. passport photo, st image, fingerprint, etc)

VIZ – zone location options



Field 18 – Holder's signature or usual mark (VR),
may be located in Zone VI (rear)

The location of



STATE OF QATAR

دولة قطر - جواز سفر

| | | | | |
|----------------------------|-------------------------------|-----------------------------------|--|--|
| Passport جواز السفر | Type النوع P | Country code QAT | Passport No رقم الجواز 00000601 | |
|----------------------------|-------------------------------|-----------------------------------|--|--|

Name
HASAN MOHAMED AHMED ALASEERI

Date of birth تاريخ الميلاد
25 11 1972

Sex نوع الجنس
M ذكر

Date of issue تاريخ الإصدار
12 08 2004

Date of expiry تاريخ الانتهاء
12 08 2014

Place of birth
QATAR

Personal Number الرقم الشخصي
27063400144

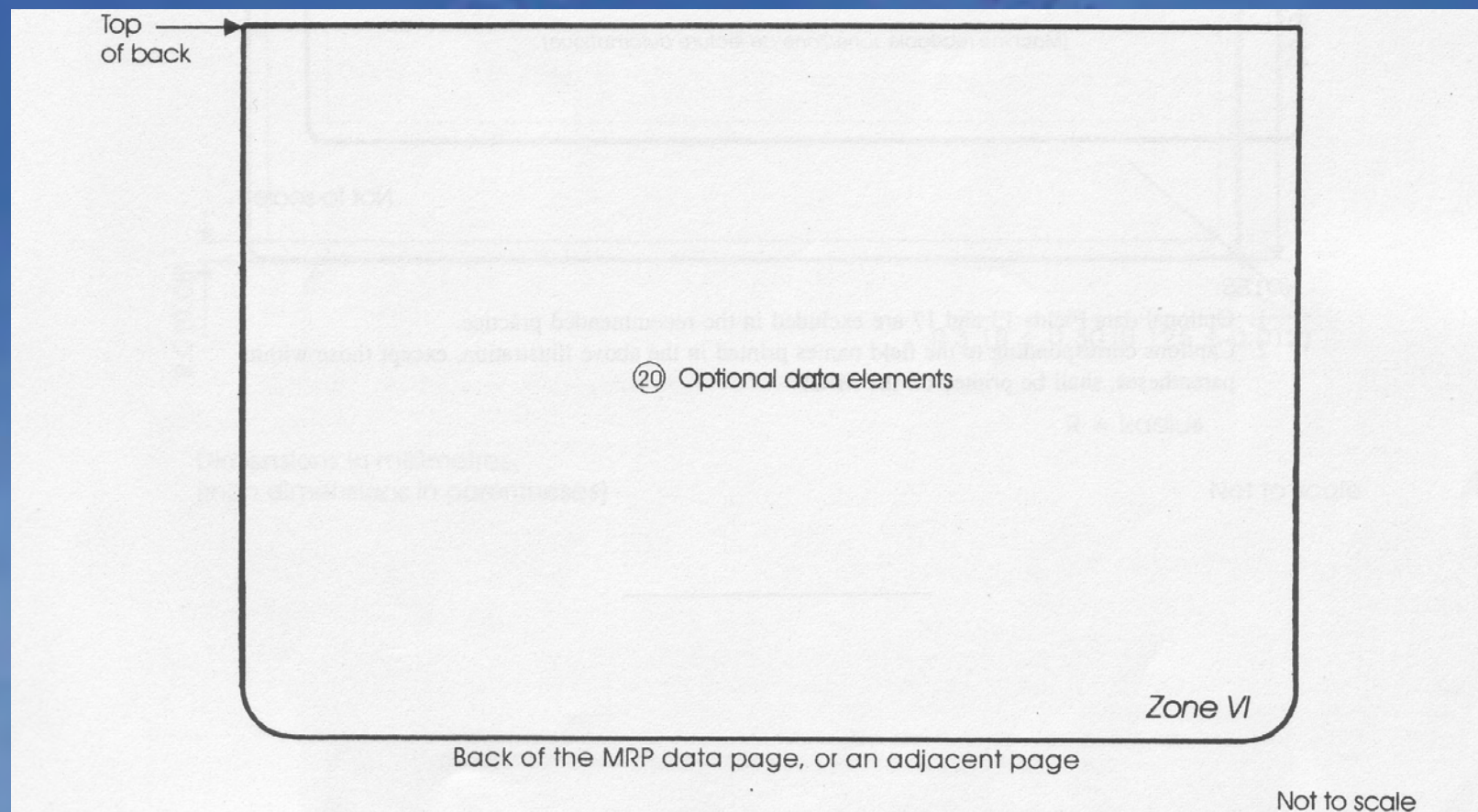
Holder's signature
[Signature]

محل الميلاد
قطر

توقيع حامل الجواز

P<QATALASEERI<<<HASAN<MOHAMED<AHMED<<<<<<<<<
00000601<9ARC7211254F140812027063400144<<<16

VIZ – zone VI



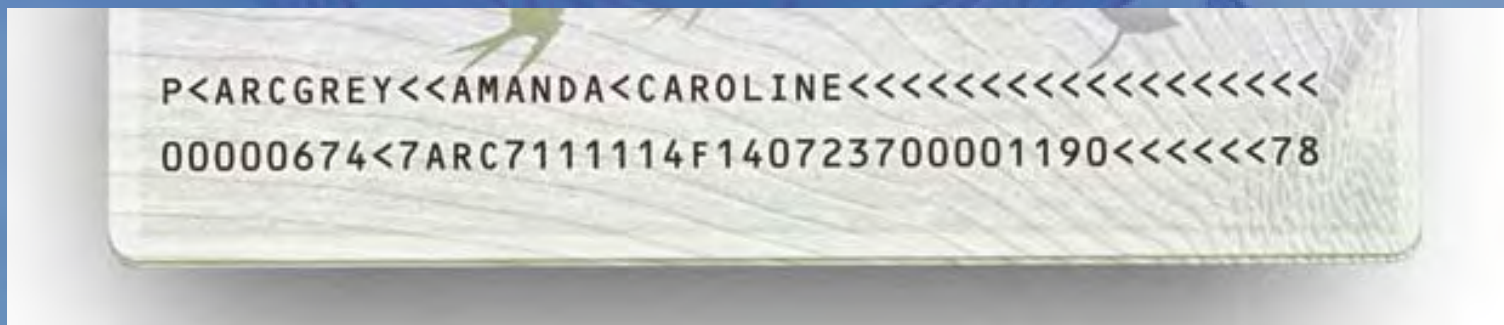
Machine readable zone (MRZ)



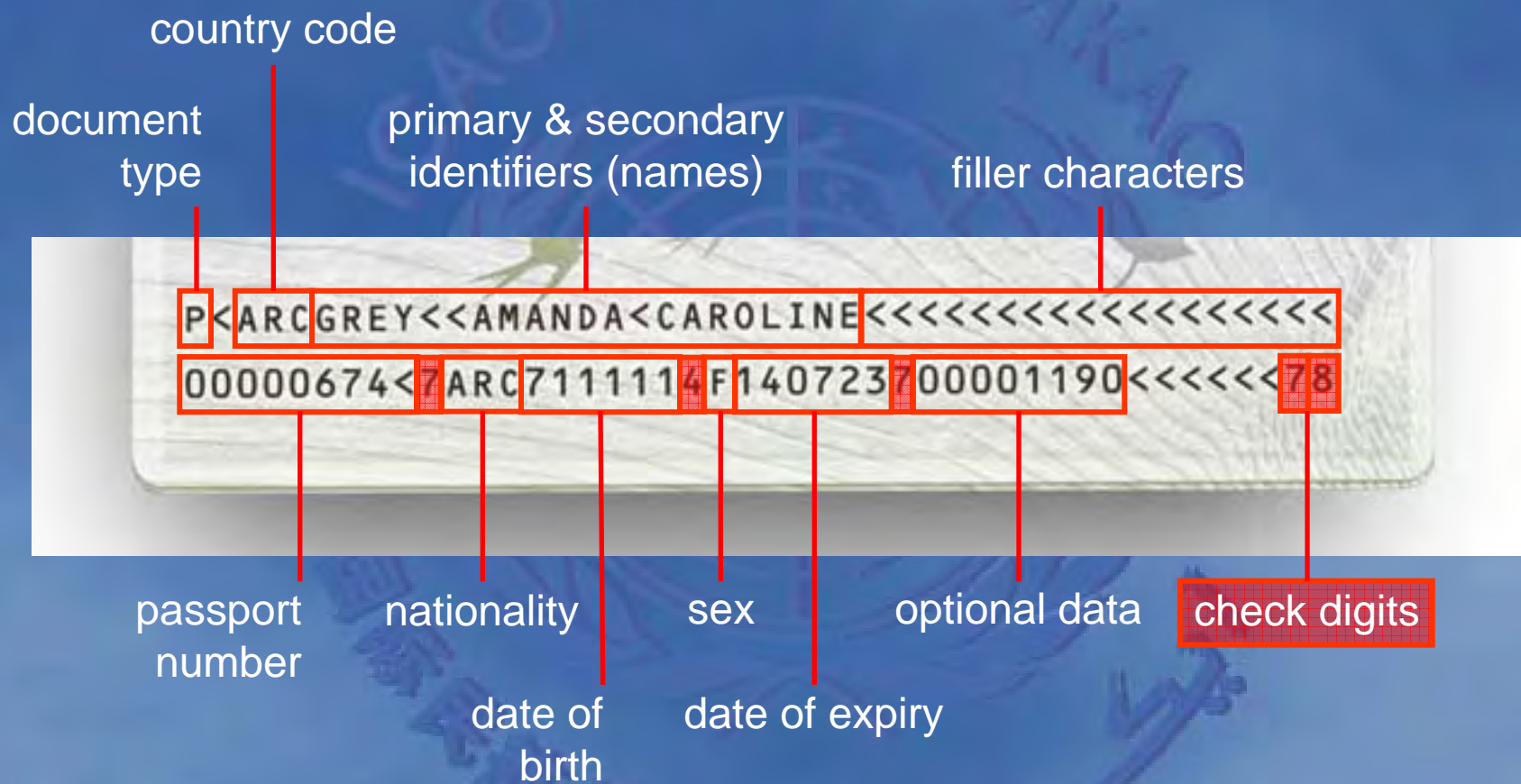
MRZ

MRZ – OCR-B

☀️ “Machine readable information is contained in two lines of OCR-B text, each with 44 characters”.
ICAO Doc 9303, II-2



MRZ – OCR-B



[illegible]

- visa label
- database (also supporting label)
- ePassport chip (future possibility)

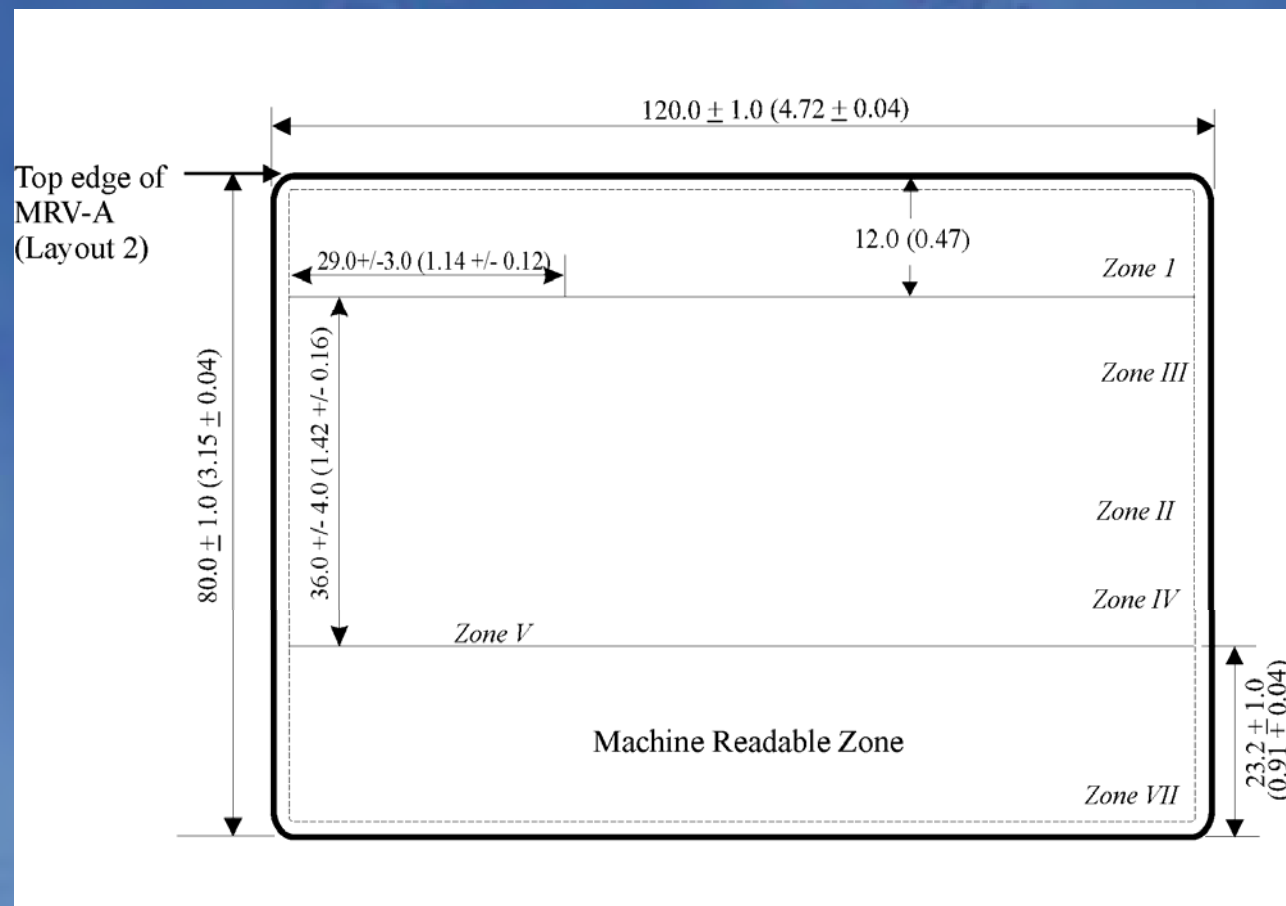
Example of MRV-A

| | | |
|---|--|--|
|  | <h1>VISA</h1> | |
| Place of Issue/Lieu de délivrance ZENITH | Valid from/Valable à partir de 10DEC 91 | Valid until/Valable jusqu'au 10DEC 96 |
| No. of Entries/Nombre d'entrées MULTIPLE | Document No./Numero de document M123889546 | |
| Type/Type BUSINESS MULTIPLE | | |
| Surname, Given names/Nom, Prénoms ERIKSSON JOHN ARTHUR | | |
| Passport Number L8988901C | Sex M /M | Date of Birth Nationality 07SEP 40 XXX |
| Signature of Issuing Officer John Doe | | |

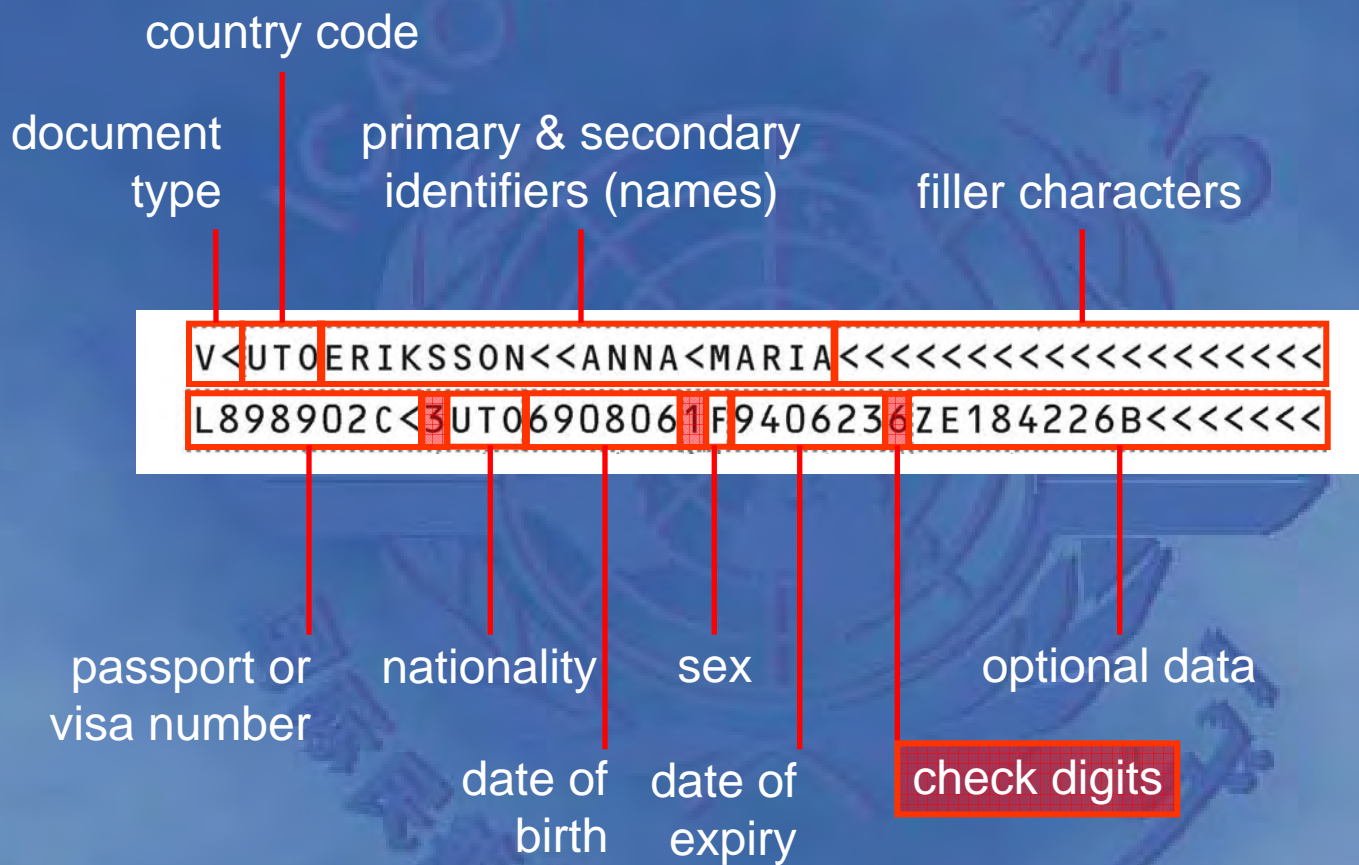
80mm

120mm

Zone boundaries: MRV-A



Machine-readable zone: MRV-A



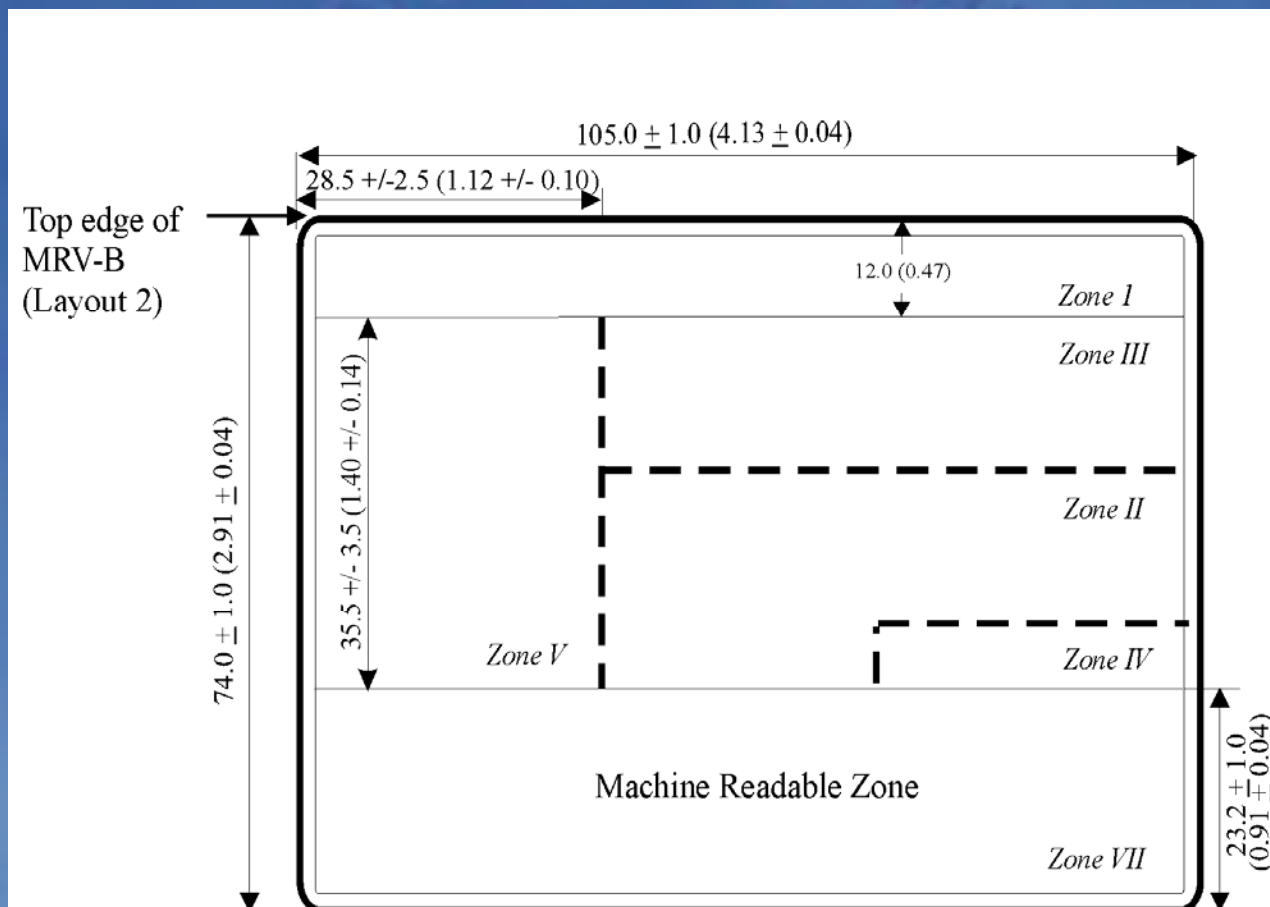
Example of MRV-B

| | | | |
|--|-------------------------------------|----------------------------------|-------------|
| UTOPIA | | VISA | |
| Place of Issue/ Lieu de délivrance | Valid from/ Valable à partir de | Valid until/ Valable jusqu'au | |
| ZENITH | 10DEC 91 | 10DEC 96 | |
| No. of Entries/ Nombre d'entrées | Document No./ Numéro de document | | |
| MULTIPLE | M123889546 | | |
| Type/Type | | | |
| BUSINESS | MULTIPLE | | |
| Surname/Nom | Given names/Prenoms | | |
| ERIKSSON | JOHN ARTHUR | | |
| Passport Number | Sex | Date of Birth | Nationality |
| L898901C | M/M | 07SEP 40 | XXX |
| Issuing Officer John Doe | | | |
| V<UTOERIKSSON<<JOHN<ARTHUR<<<<<<<<< L898901C<6XXX4009072.M9612109<<<<<<<< | | | |

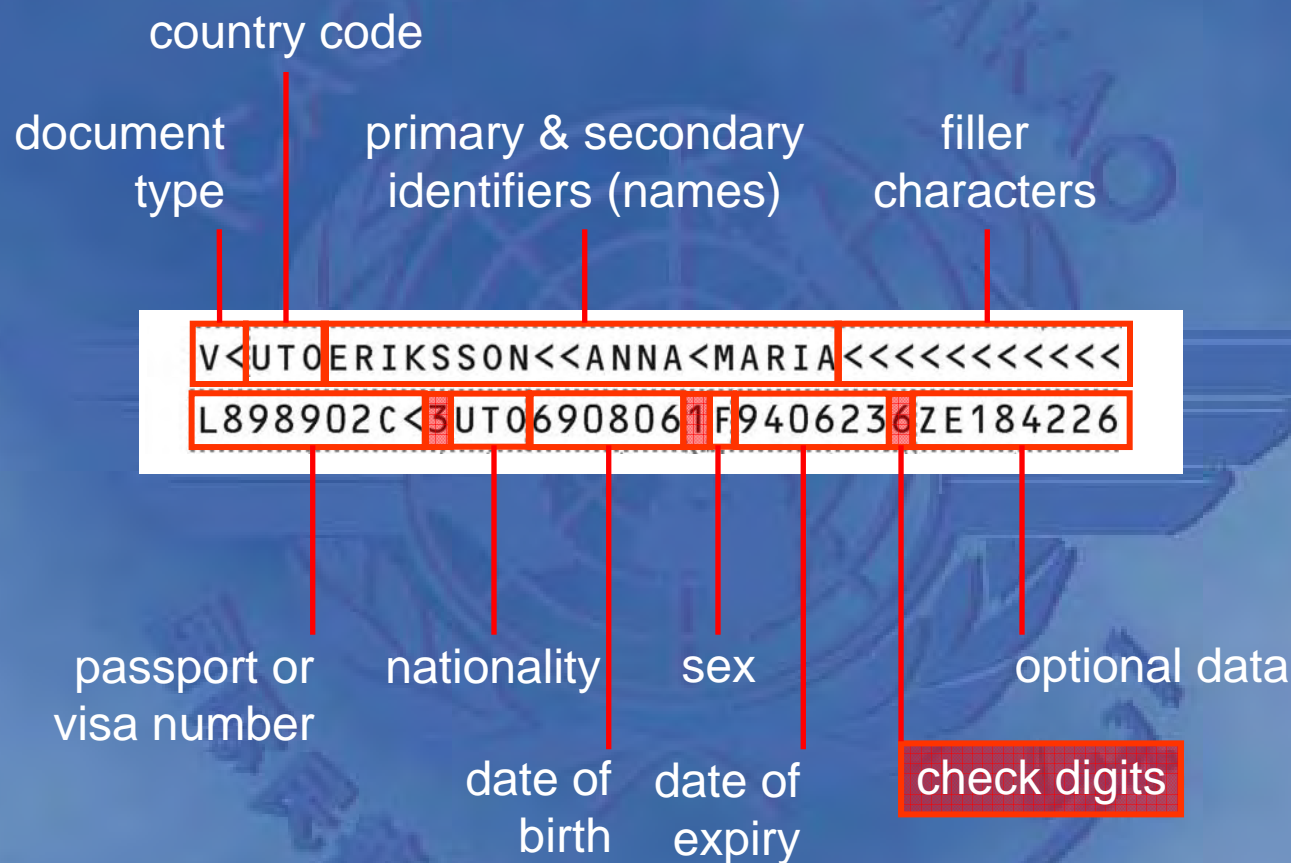
74mm

105mm

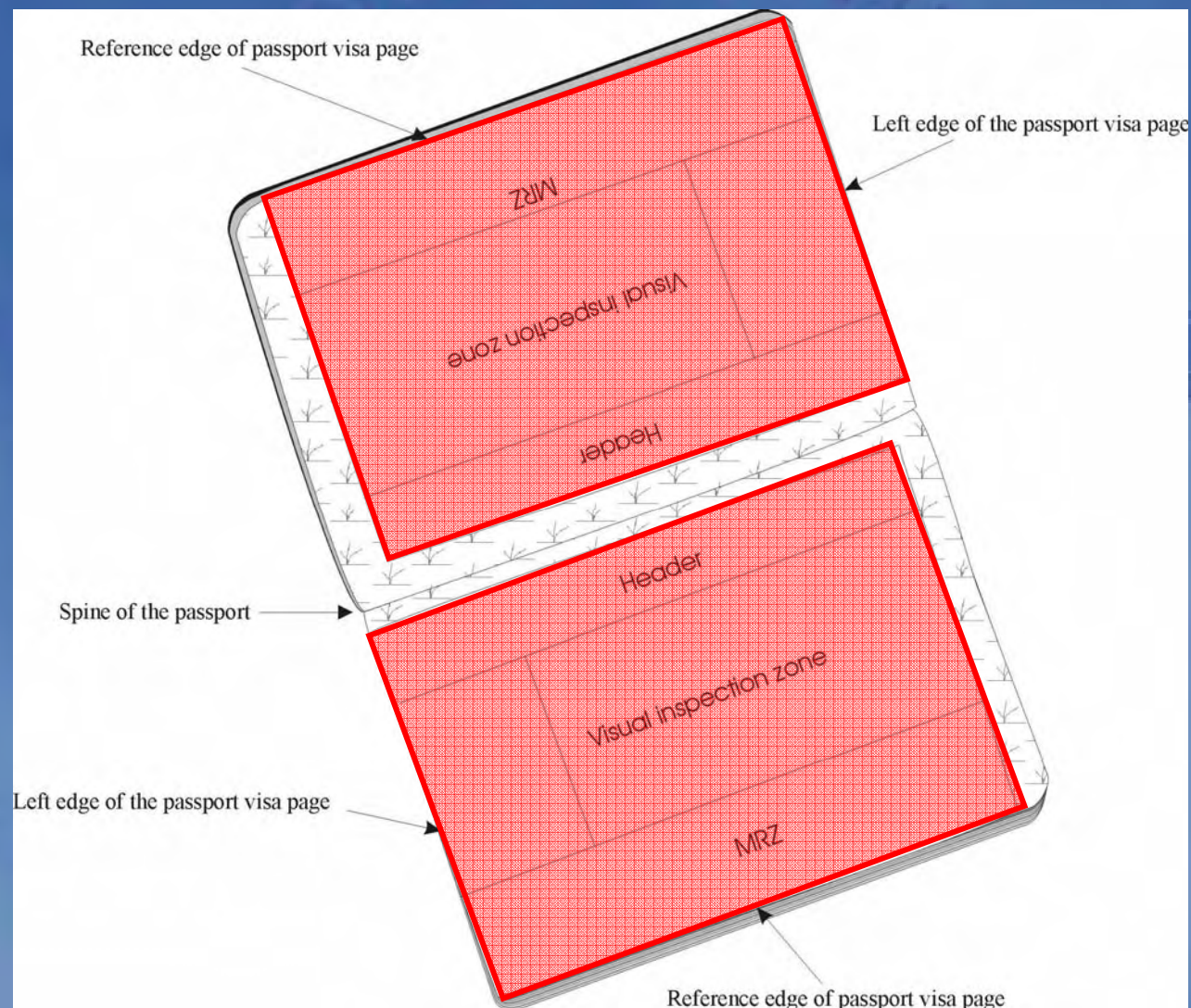
Zone boundaries: MRV-B



Machine-readable zone: MRV-B



Visa positioning in passport



European MRV

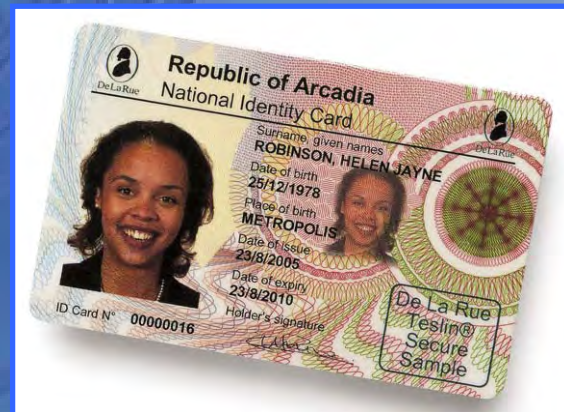


Part 3 – Official Travel Documents (cards)

- ✱ Interoperability needed
- ✱ National ID card used for travel
- ✱ Standards as for ePassports
- ✱ Part 3 currently under revision in TAG/MRTD secretariat, DCFWG finished work

Part 3 – Official Travel Documents (cards)

☀ Currently many variations

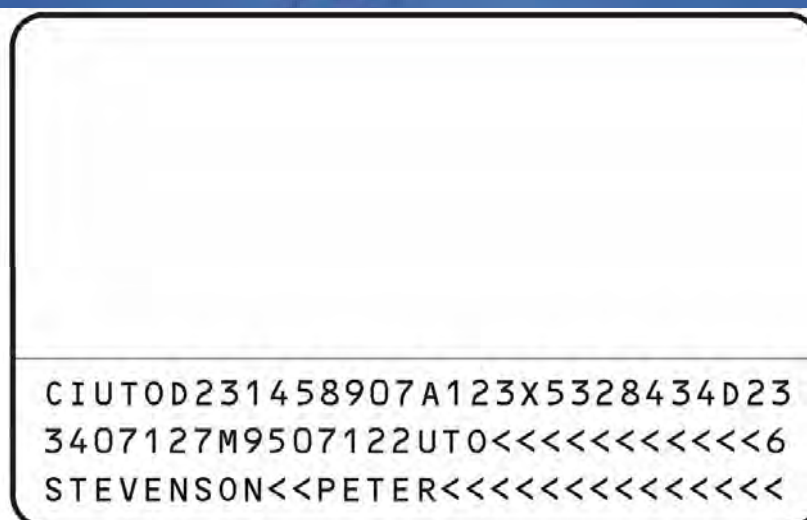
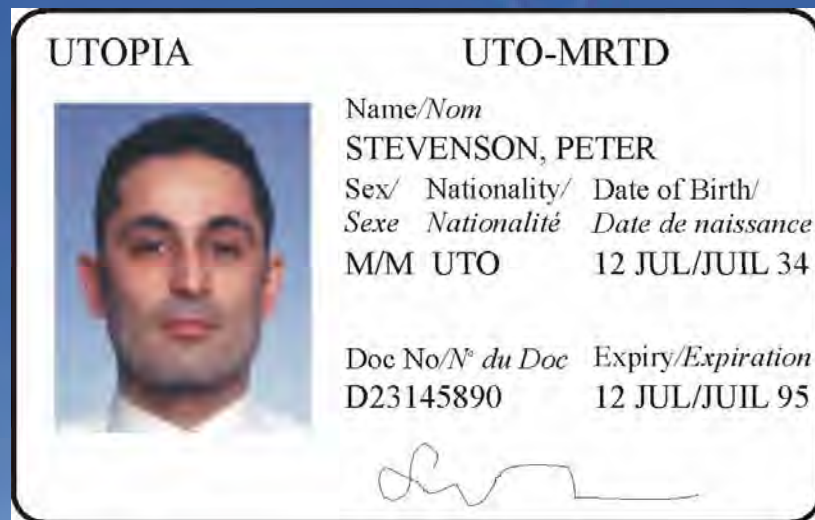


Example of td1 (ID1-sized card)

53.98mm

Front

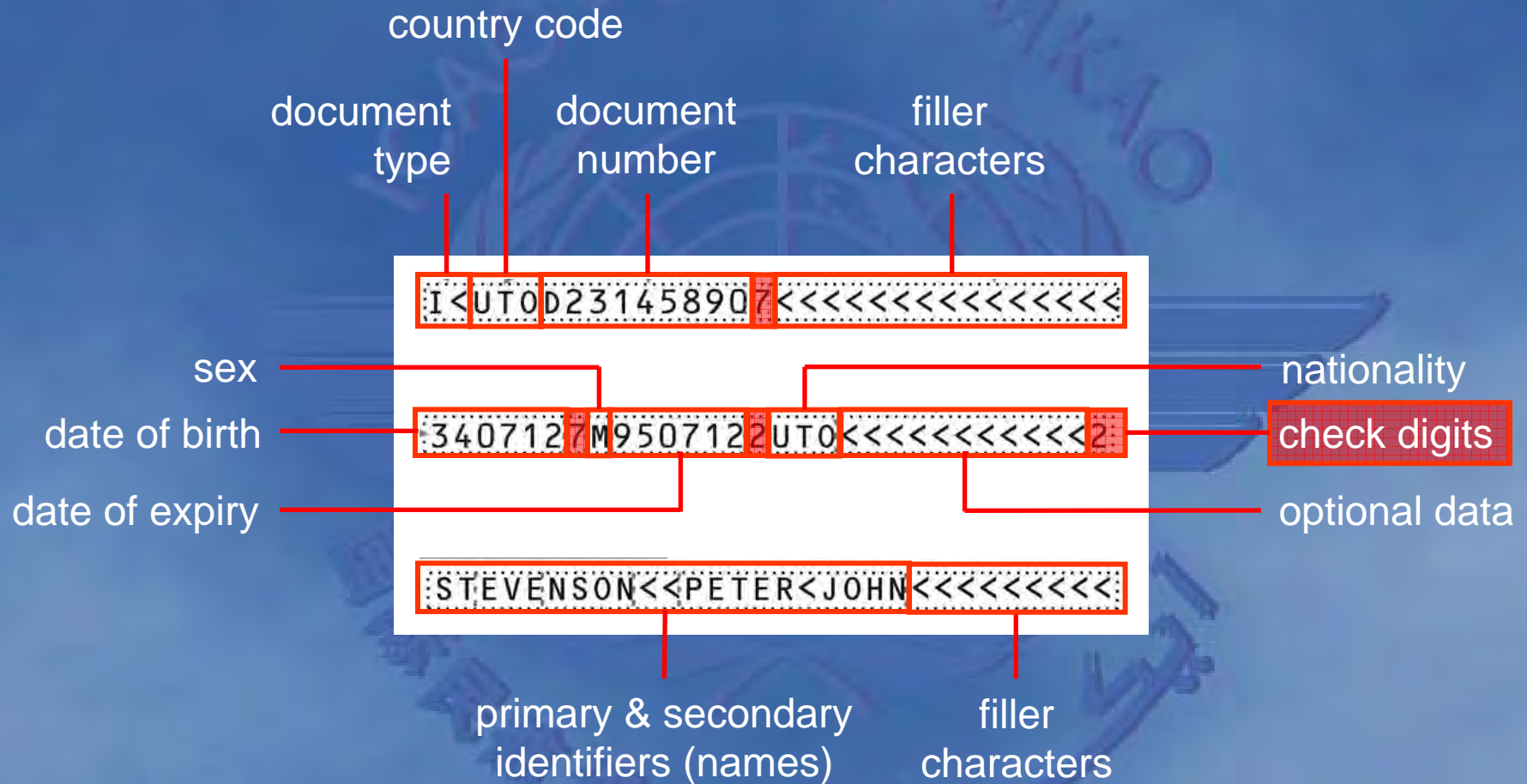
Rear



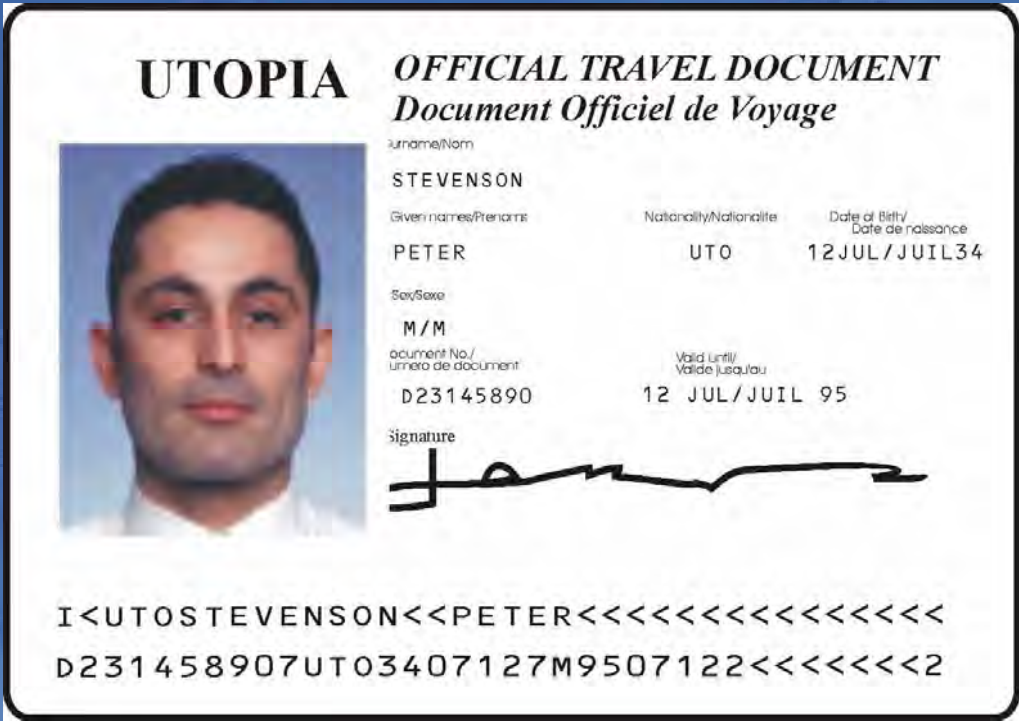
85.60mm



Machine-readable zone: td1



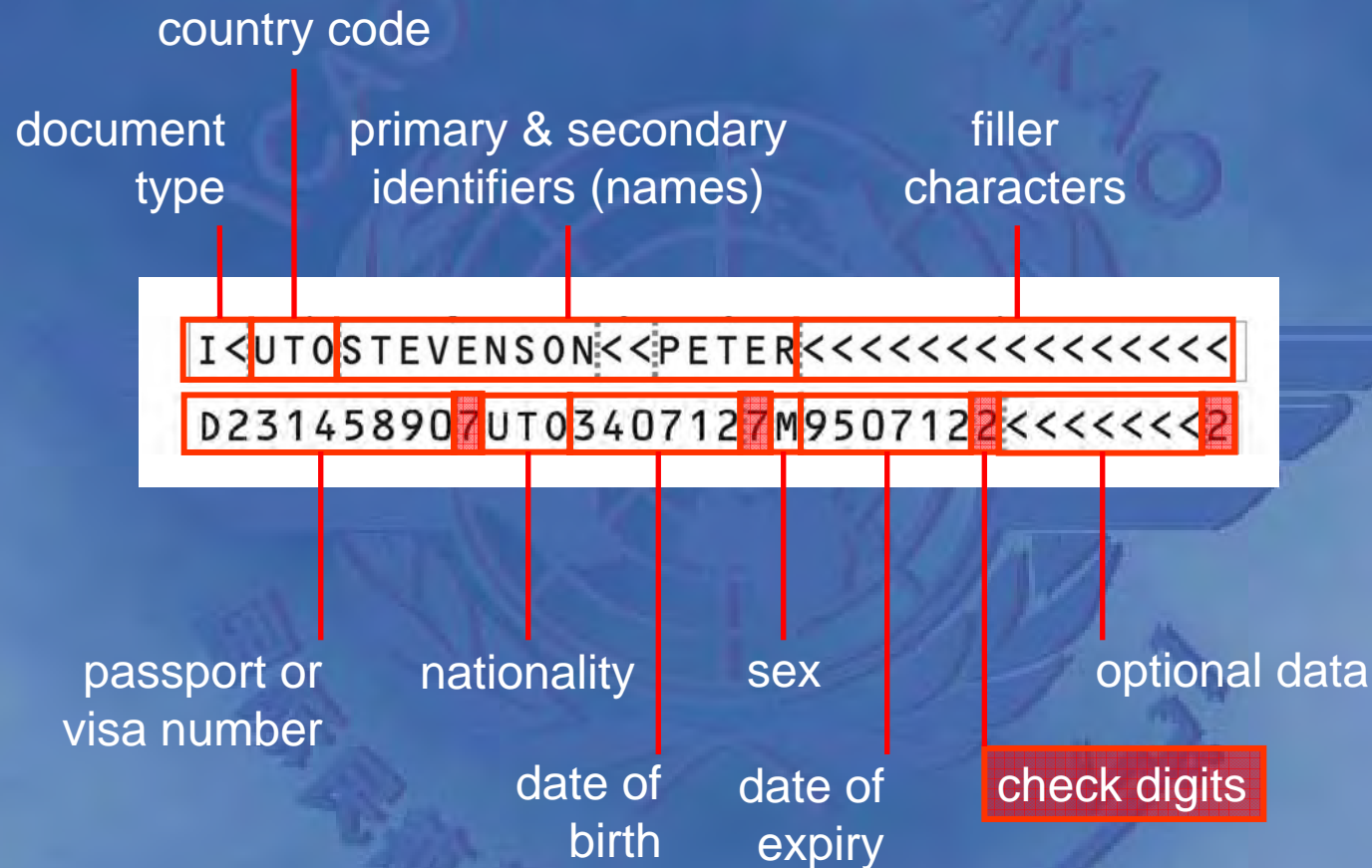
Example of td2 (ID2-sized card)



74mm

105mm

Machine-readable zone: td2



Current 9303 Part 3

✱ Options for expansion of machine-readable data storage:

- Bar codes
- Magnetic stripes
- Integrated circuit with contacts
- Contactless integrated circuits
- Optical memory

Third Edition 9303 Part 3:

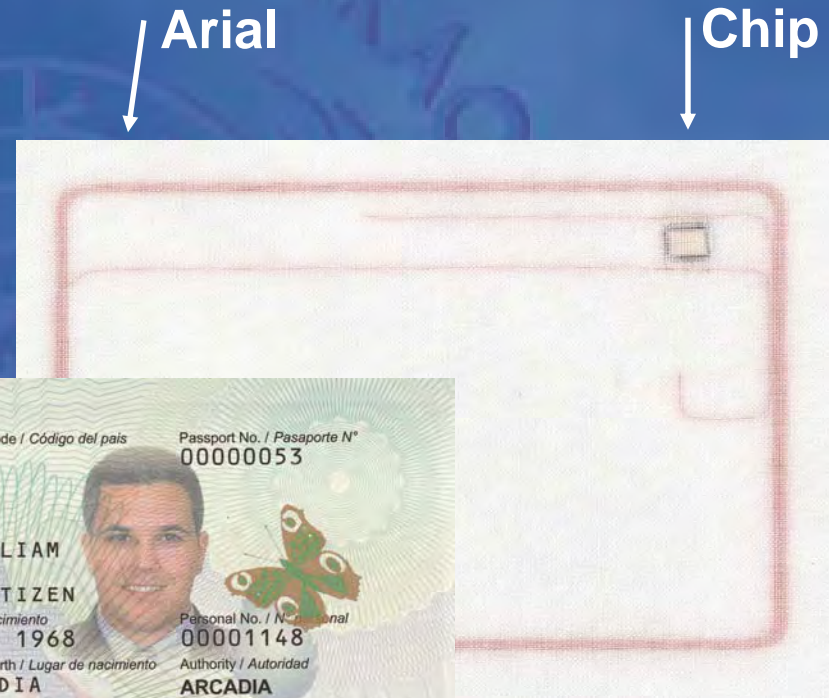
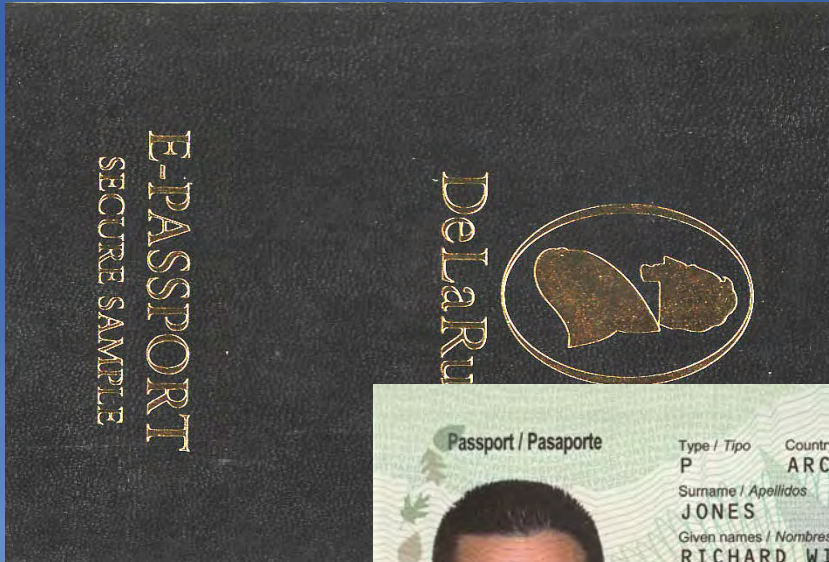
☀ Options for expansion of machine-readable data storage:

- ~~Bar codes~~
- ~~Magnetic stripes~~
- ~~Integrated circuit with contacts~~
- Contactless integrated circuits
- ~~Optical memory~~

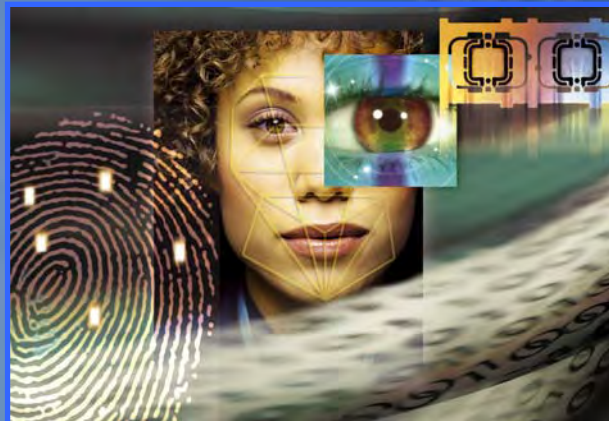
Coexistence

- ✱ OCR technology mandatory
- ✱ Coexistence of OCR with contactless integrated circuit conforming to standards in ICAO Doc 9303 Part 3 Volume 2 critical to ensure global interoperability

Next generation MRP: smart, with biometrics & chip

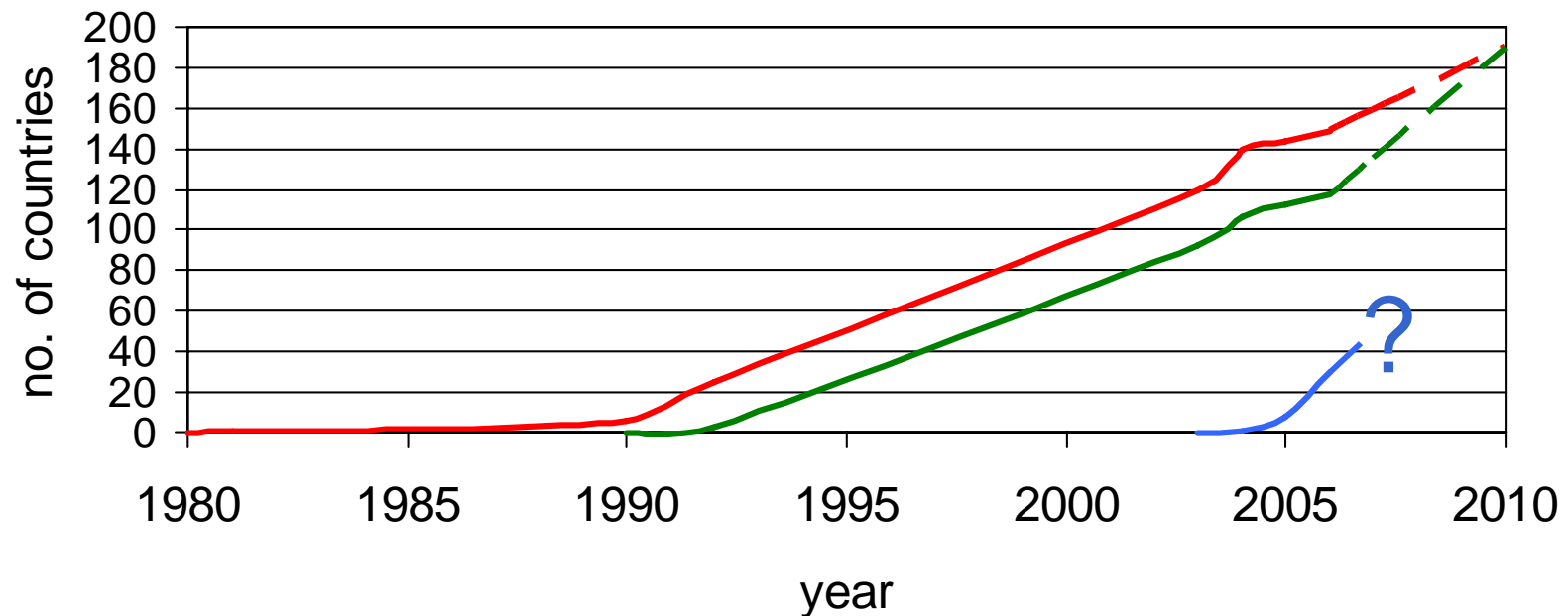


ICAO Blueprint



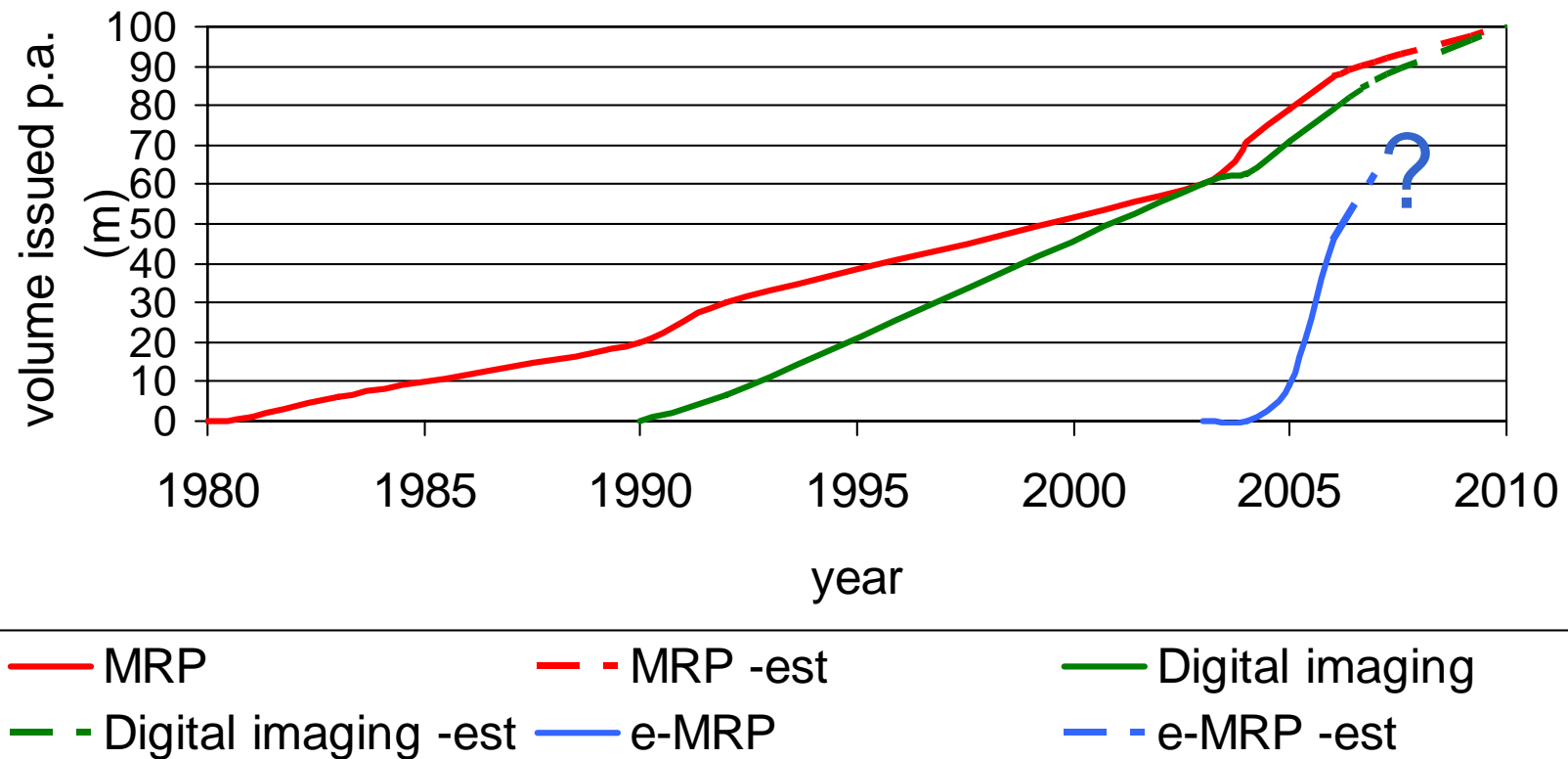
- ☀ Facial image
 - Finger Print
 - Iris
- ☀ RF Chip (min 32K)
- ☀ LDS
- ☀ PKI

Growth (no. of countries)



— MRP - - MRP -est — Digital imaging
- - Digital imaging -est — e-MRP - - e-MRP -est

Growth (volume issued p.a.(m))



900m MRTDs in circulation worldwide

Data page – importance

- ☀ Data page is the most important page in a passport
 - the most examined
 - contains all the personal data
 - requires the most protection against counterfeit and fraudulent alteration

Data page – under pressure

- ✱ It must provide protection against counterfeit and fraud, especially from desktop publishing
- ✱ It must meet the needs of immigration – easily and quickly verifying the holder
- ✱ It must be machine readable - OCR & chip



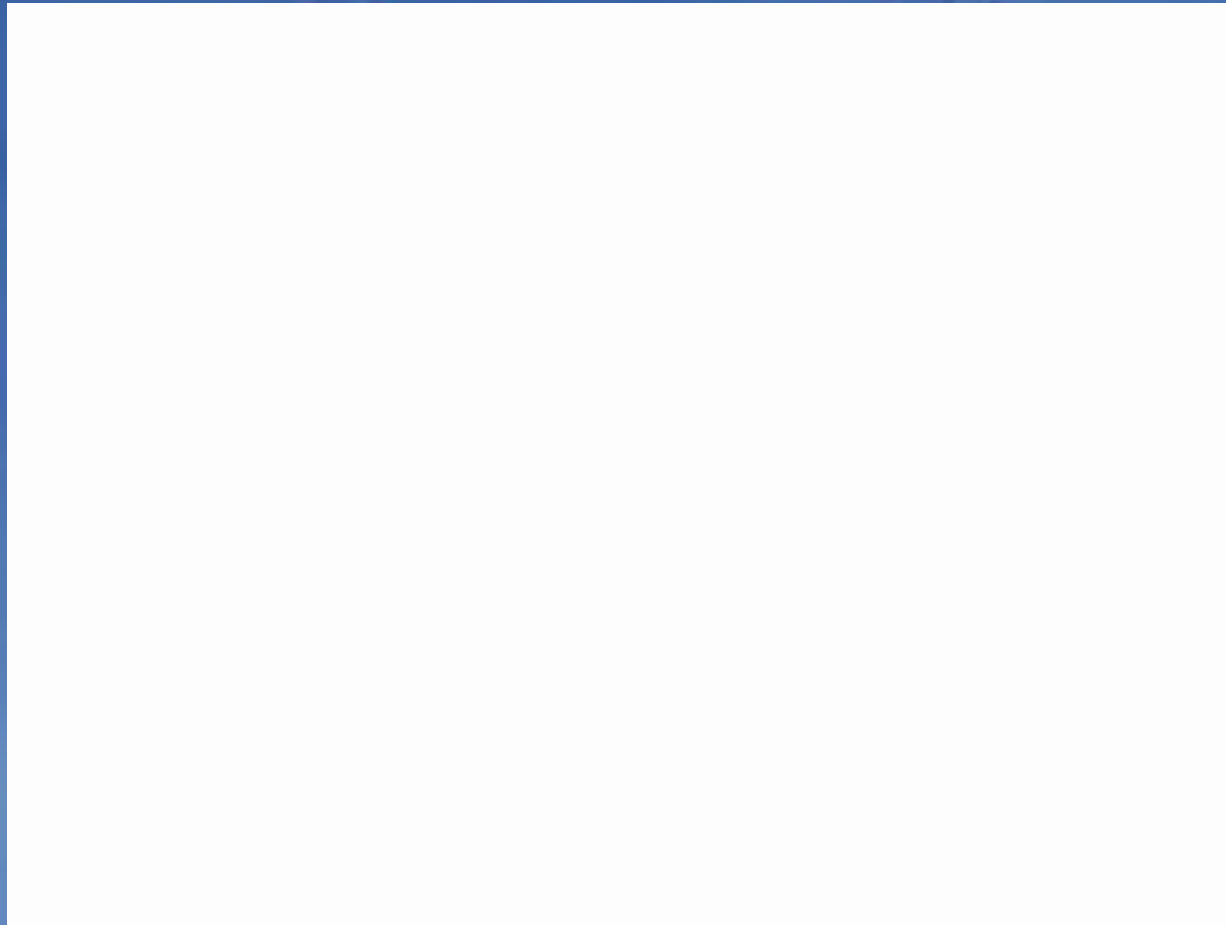
Security features

- ✱ Security must be multi-layer and the most important are the level 1 features
- ✱ The security features need to protect the holder's photograph
- ✱ Important not to obstruct the MRZ
- ✱ Security features can be included on the front and back

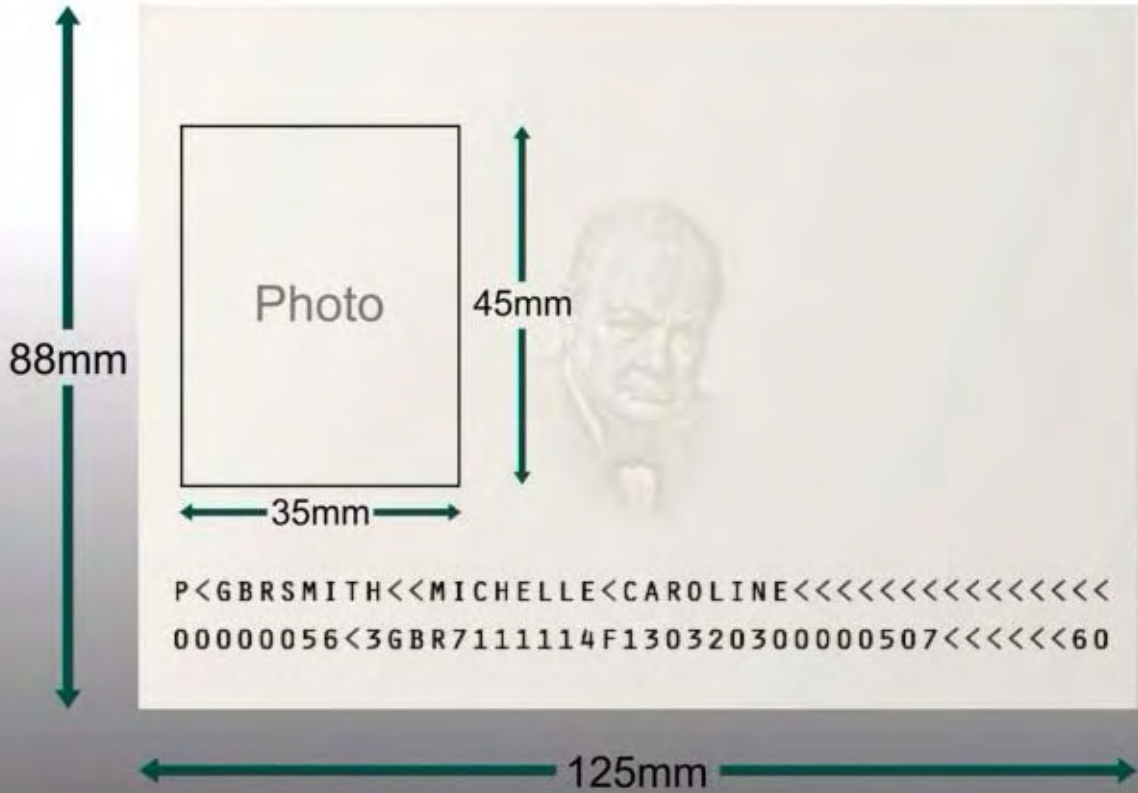
Data page – inside page



Page layout & picture outline



Layers



Elements



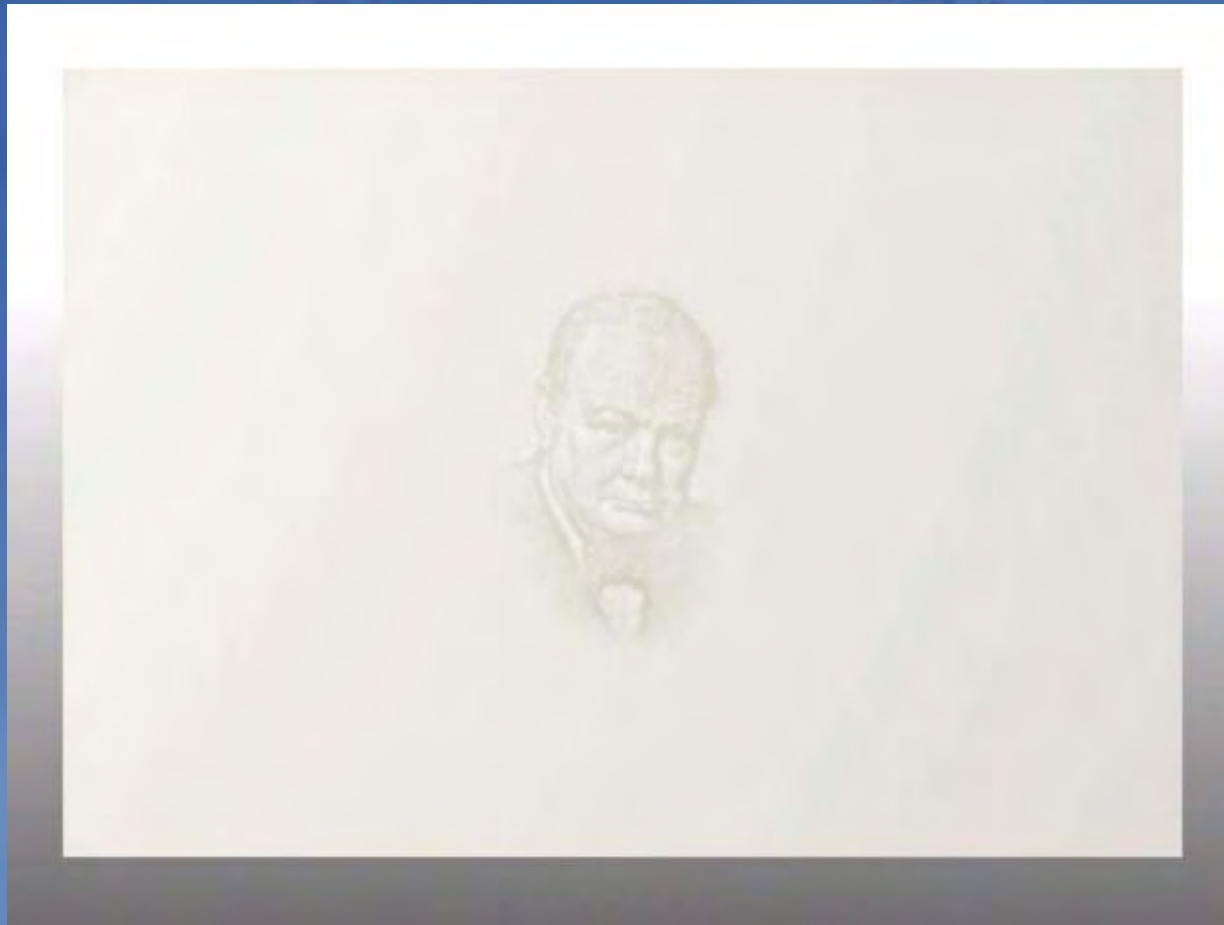
Elements



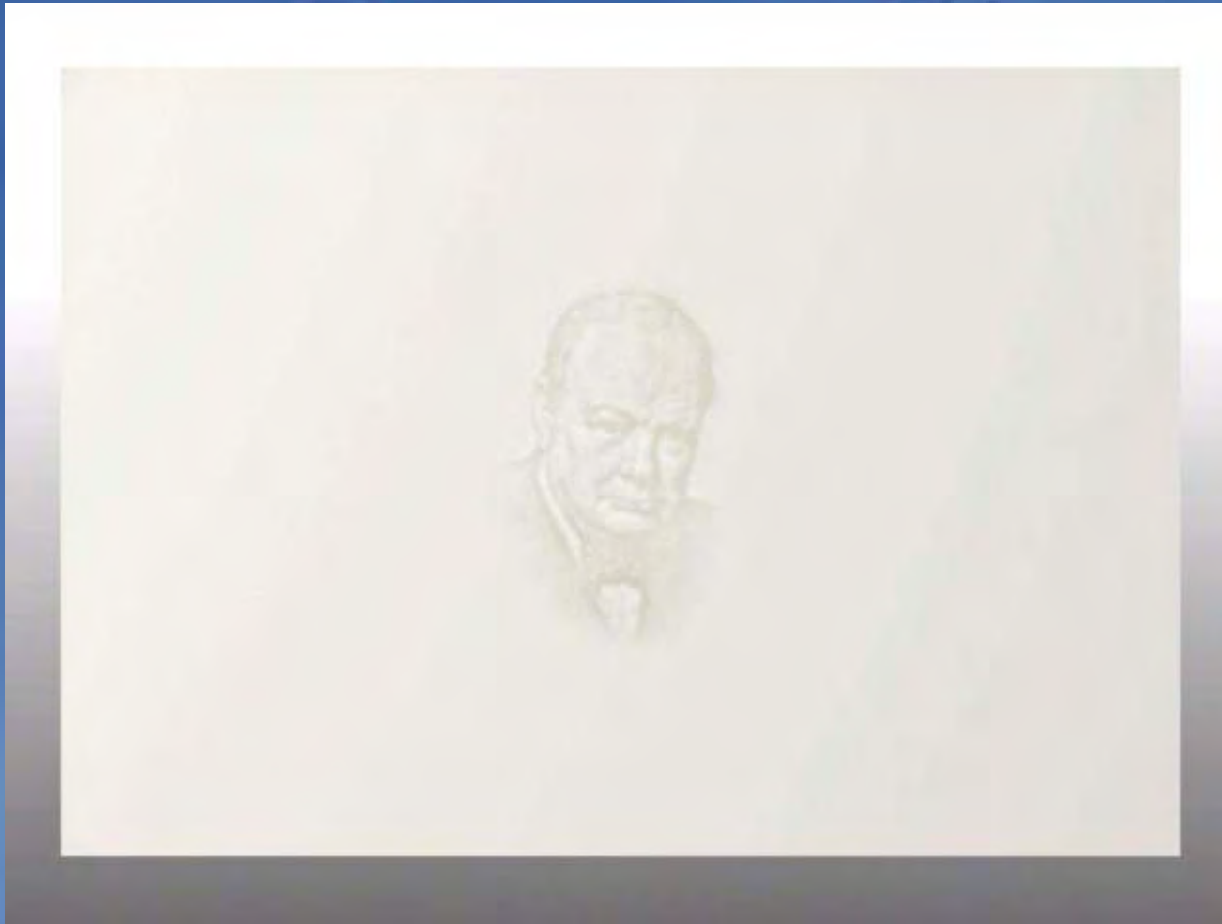
Elements



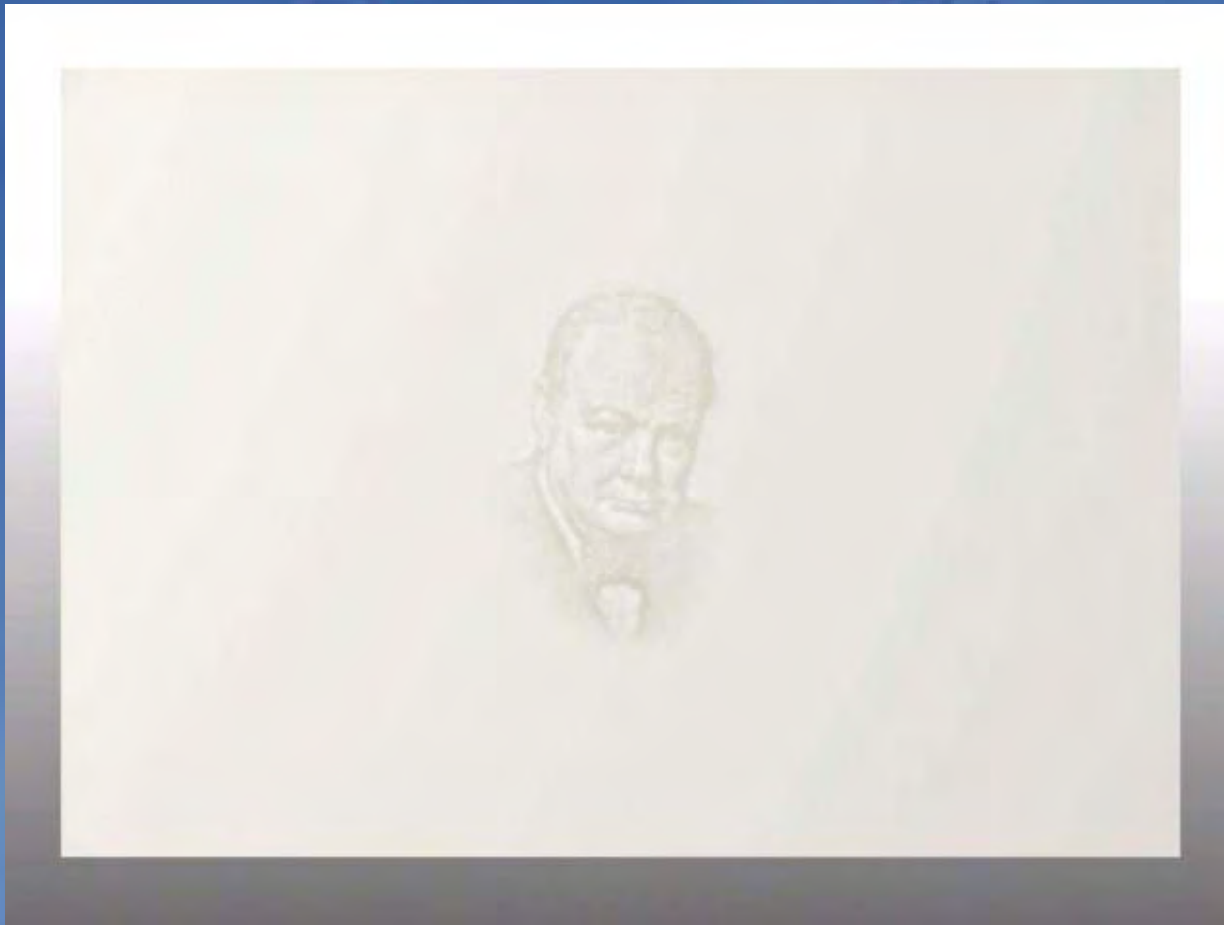
Paper substrate: UV dull



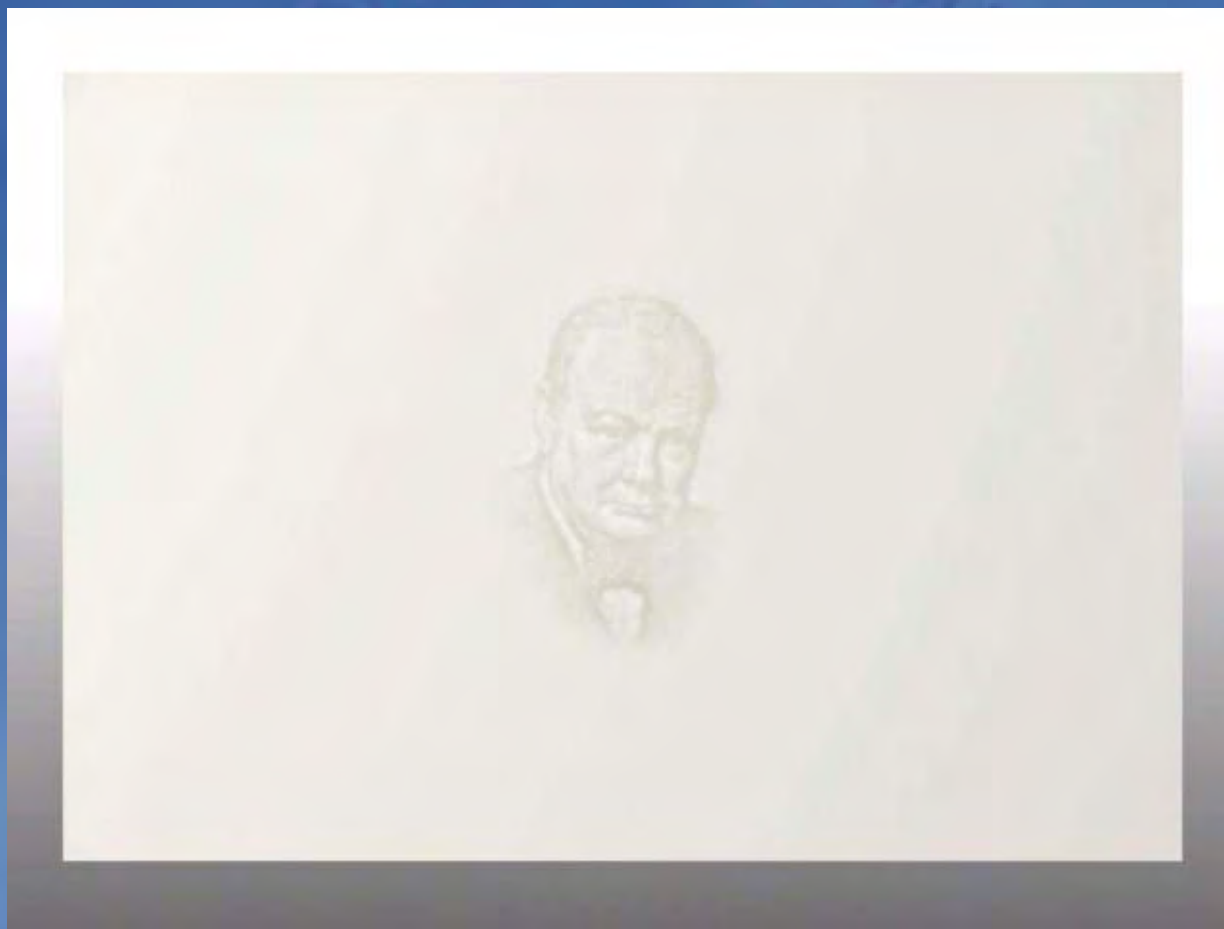
Chemical sensitisation



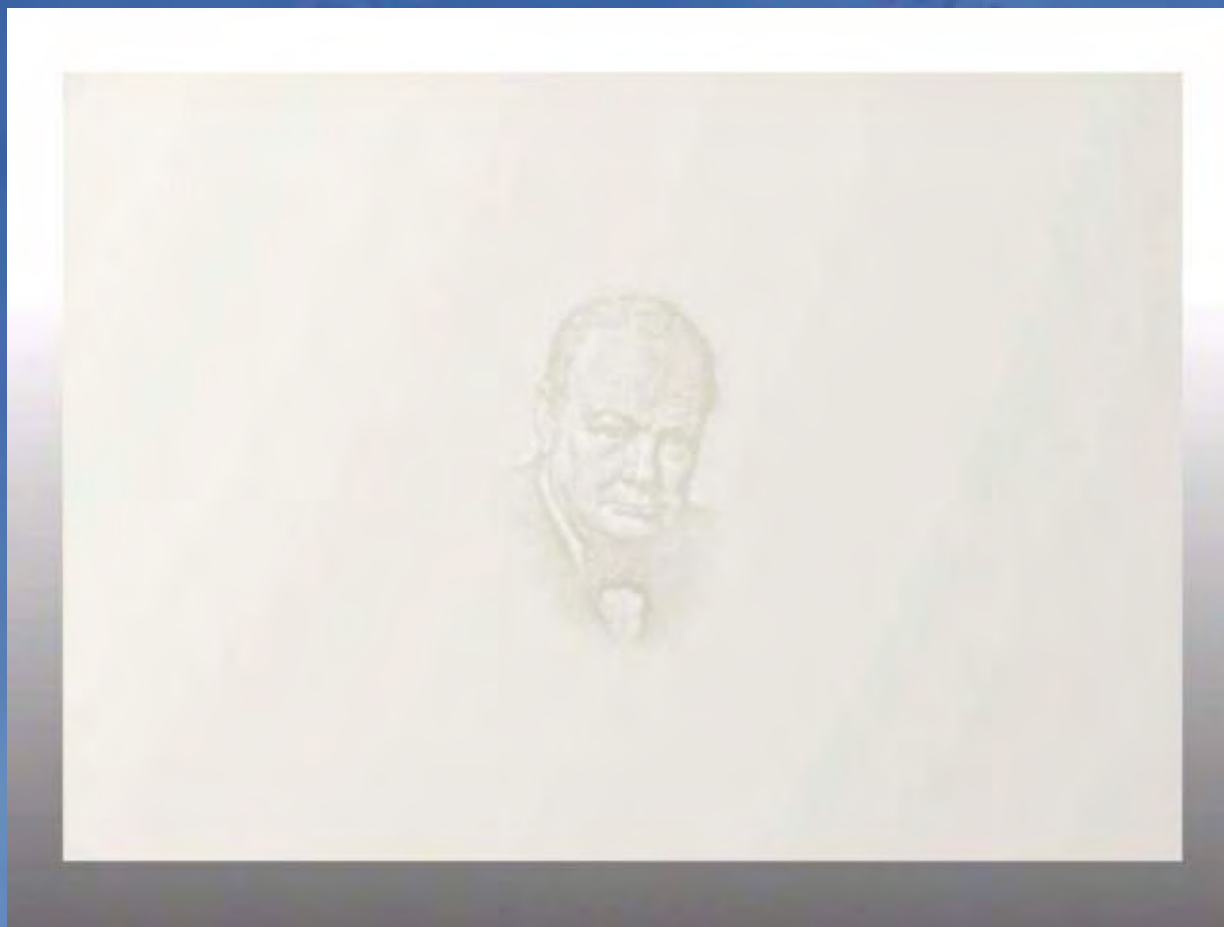
Cylinder mould watermark



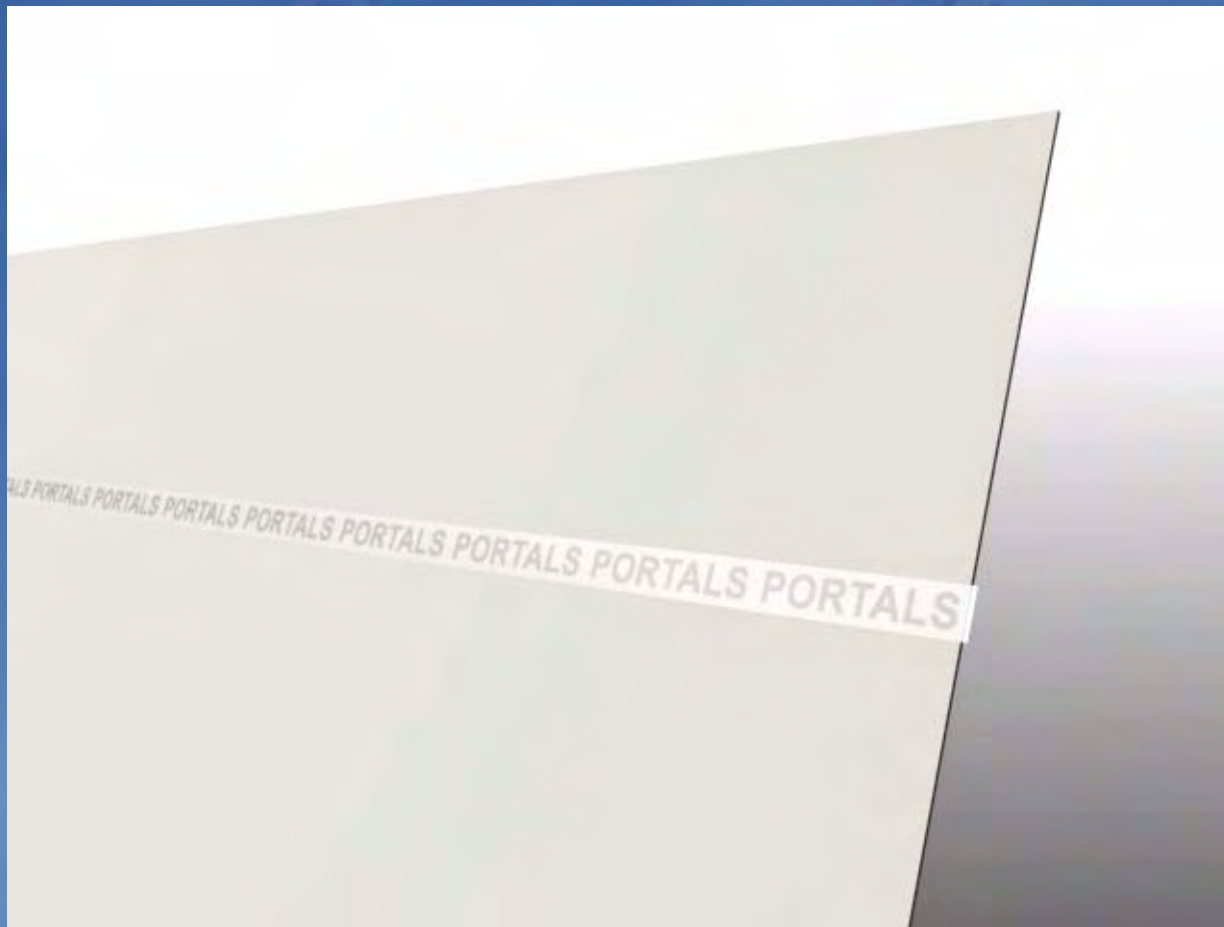
Fibres & planchettes



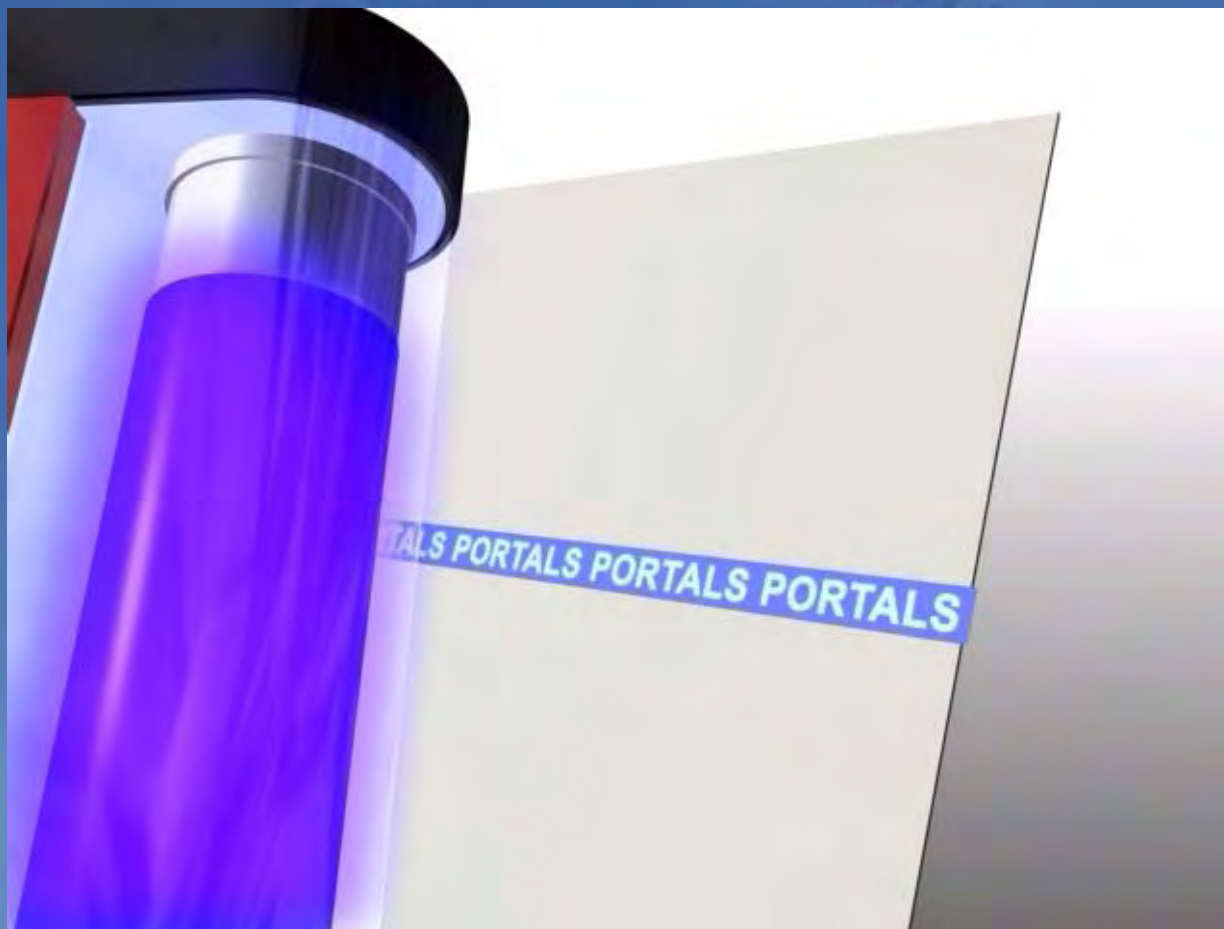
Thread



Thread

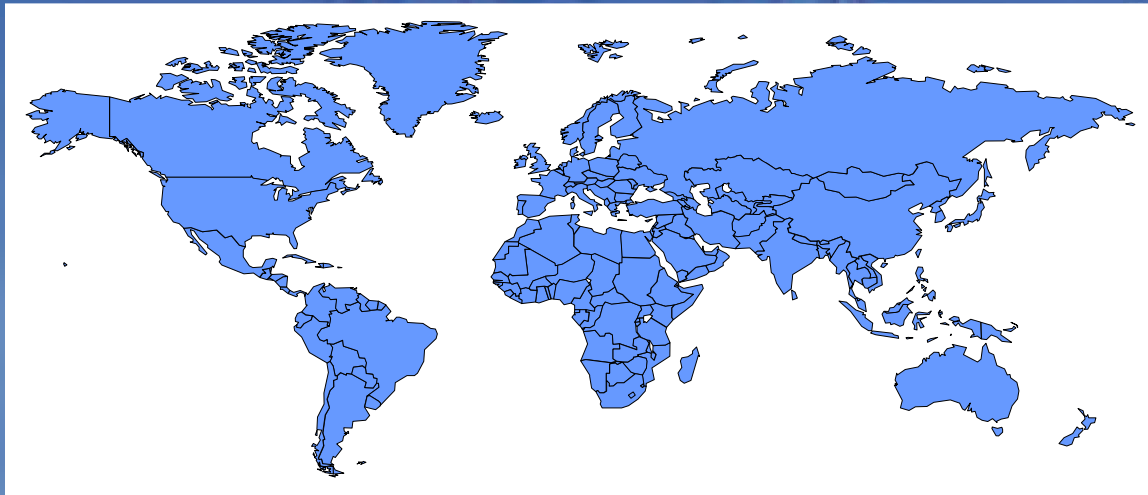


Thread



Intended benefits

- ☀ To facilitate and secure passenger processing at border control points
- ☀ To enable global interoperability



Why interoperability?

- ✱ International travel
- ✱ Border control – 189 member states
- ✱ Airlines – carriers' liability act
- ✱ Banks

MRTD interoperability

- ✱ Standards evolved over nearly 3 decades
- ✱ Balance between facilitation and security
- ✱ Interoperability includes:
 - ISO standards
 - Eye readable data
 - MR data – OCR B
 - ePassports
 - ✱ Biometrics
 - ✱ DSM
 - ✱ LDS/PKI

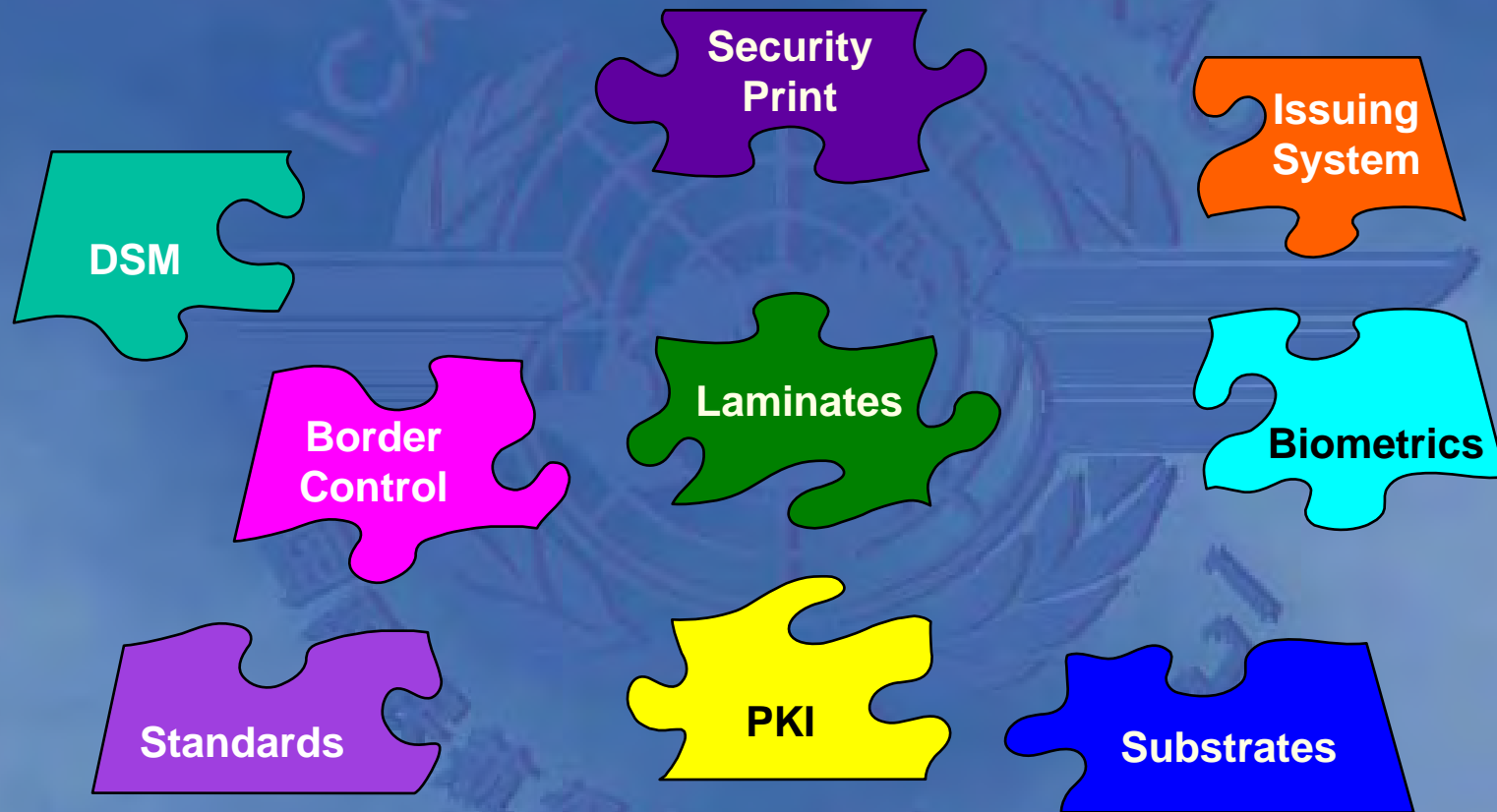
ICAO Doc 9303 Parts 1-3 interoperability

- ✱ Cultural considerations
 - Flexibility in VIZ
 - Truncation
 - Transliteration
- ✱ Reader standards – OCR & “e”
- ✱ Document specs; security features

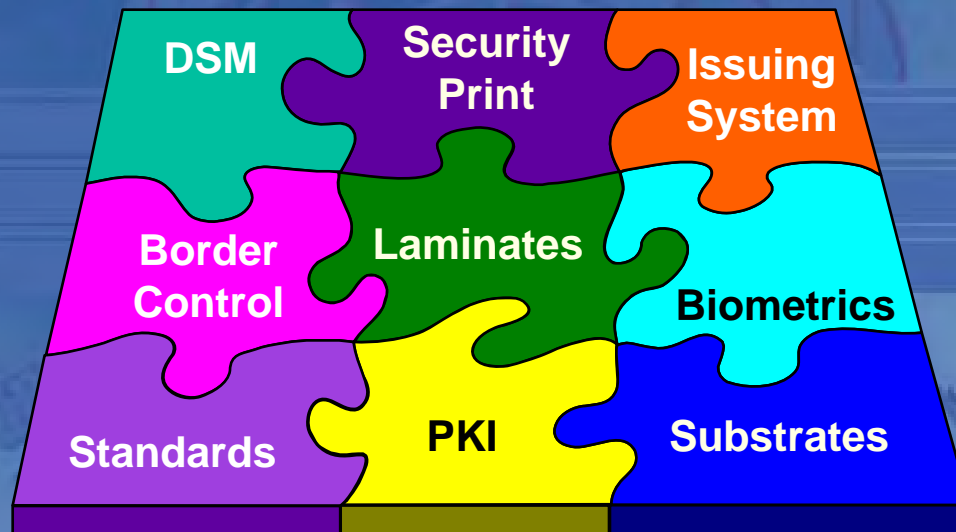
Facilitation and security

- ✱ Opposing requirements?
- ✱ 9303 recommendations on:
 - Passport security features
 - Security of issuing process

All component parts must be mutually supporting



The solution is normally a compromise



STATE OF QATAR

دولة قطر - جواز سفر

Passport جواز السفر

Type النوع P Country code

رمز البلد Passport No

رقم جواز السفر
00000601

الاسم محمد أحمد العسيري

Name
HASAN MOHAMED AHMED ALASEERI

Date of birth

تاريخ الميلاد

Personal Number

الرقم الشخصي

25 11 1972

27063400144

Sex

نوع الجنس

Place of birth

مكان الميلاد

M

ذكر

QATAR

قطر

Date of issue

تاريخ الإصدار

Holder's signature

توقيع حامل الجواز

12 08 2004

Date of expiry

تاريخ الانتهاء

12 08 2014

P<QATALASEERI<<<HASAN<MOHAMED<AHMED<<<<<<<<
00000601<9ARC7211254F140812027063400144<<<16

☀ Thank you for your attention

- Malcolm Cuthbertson
De la Rue Identity Systems
- Tel: +44 (0)1256 605047
Email:
malcolm.cuthbertson@uk.delarue.com

