Secure digital identity management in Estonia (ID card and m-ID)

Mari Pedak
Senior Consultant
+372 515 6761
mari.pedak@ega.ee

ega.ee

1990 - Deputy Governor,
Harju County Government

1993 - Head of Municipal Property Board,
Tallinn City Government;
Member of City Council

1996 - Head of Department of Local
Government and Regional Development,
Deputy Secretary General for
Eurointegration, Ministry of Interior

2000 - Director General,
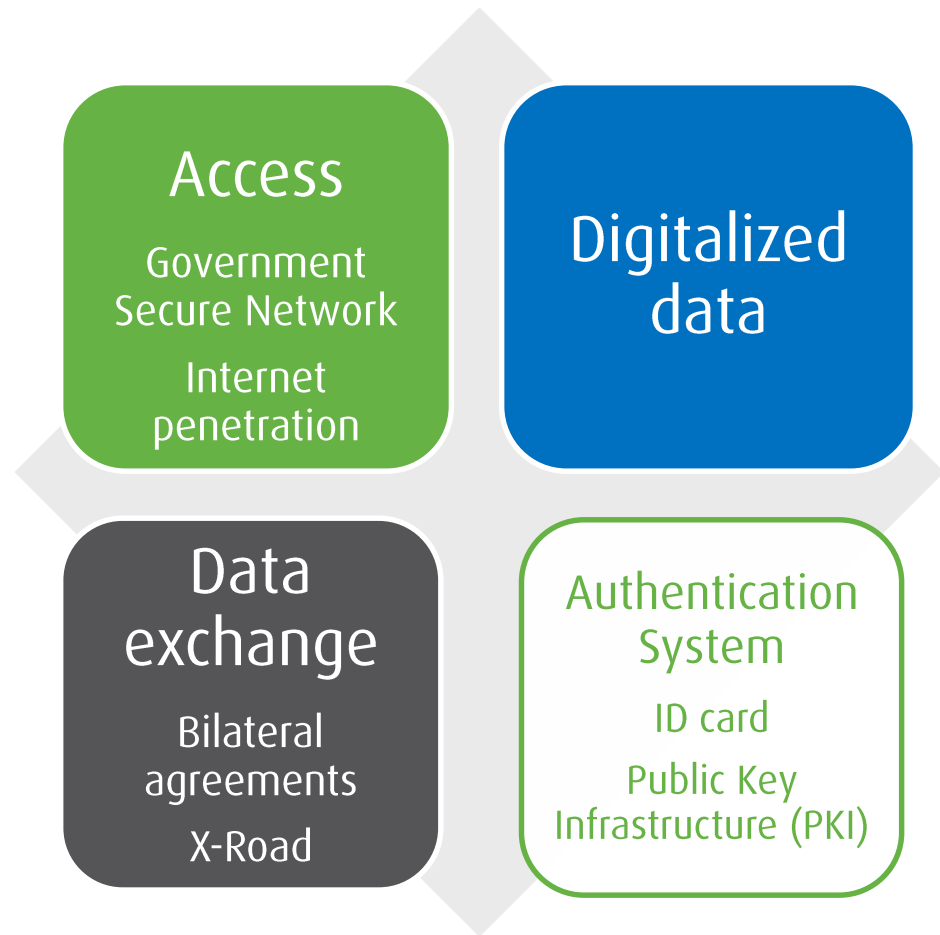Citizenship and Migration Board

2008 - Director,
IT and Development Centre, MoI

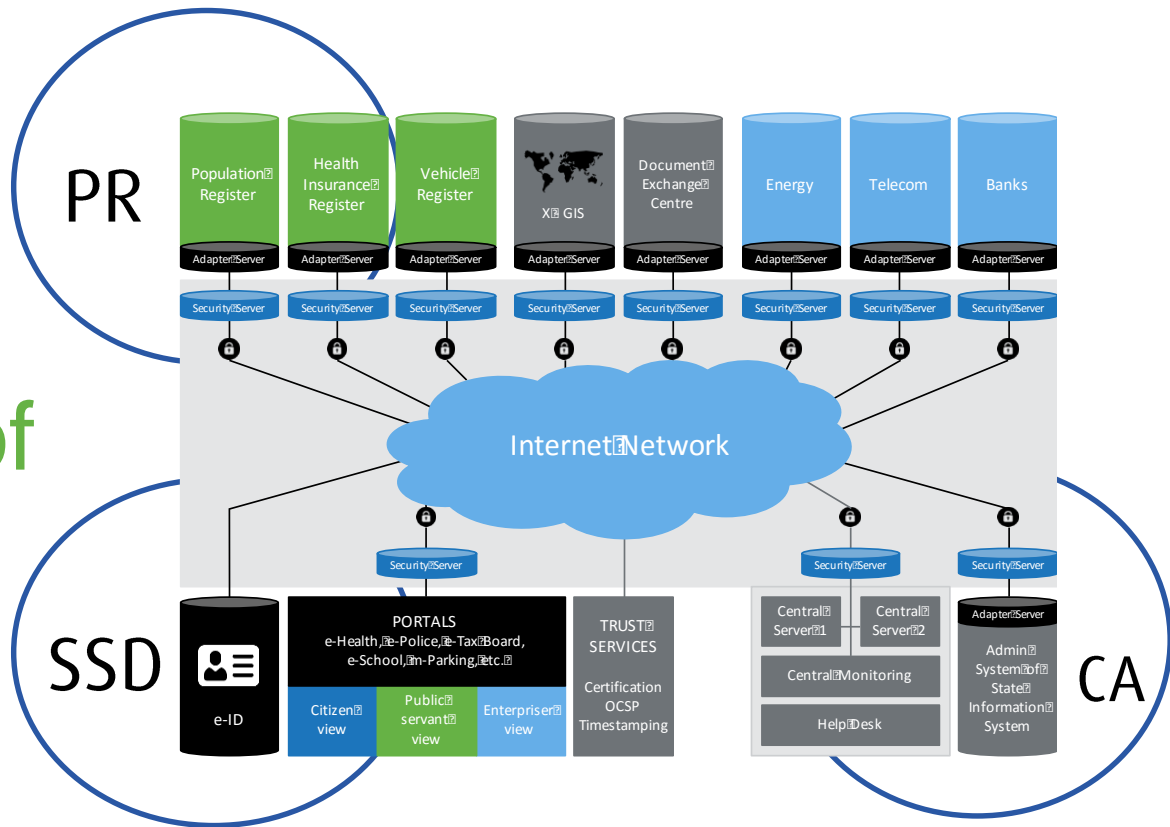**2012** – Senior Expert, e-Governance
Academy

Digital Identity Management as a Cornerstone of e-Estonia

4 Pillars of e-Government Infrastructure

Access

Government Secure Network

Internet penetration

Digitalized data

Data exchange

Bilateral agreements

X-Road

Authentication System

ID card

Public Key Infrastructure (PKI)

ega.ee

Population Register of Estonia

- provides a main set of personal data to all government authorities and to public and private sector
  - generates personal identification codes
  - is data presentation layer for all users
- registers place of residence
  - issues certificates about place of residence
- provides working environment for proceeding of civil status acts:
  - registers birth etc.
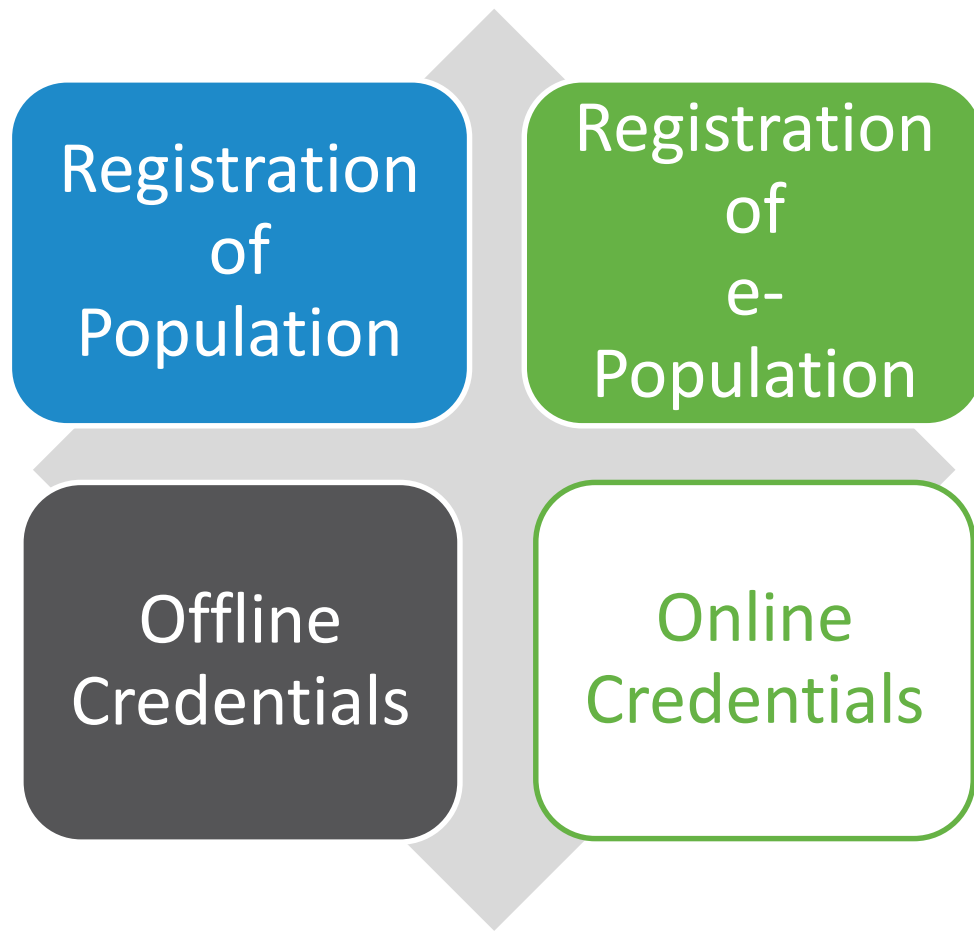
Hierarchy of Registers
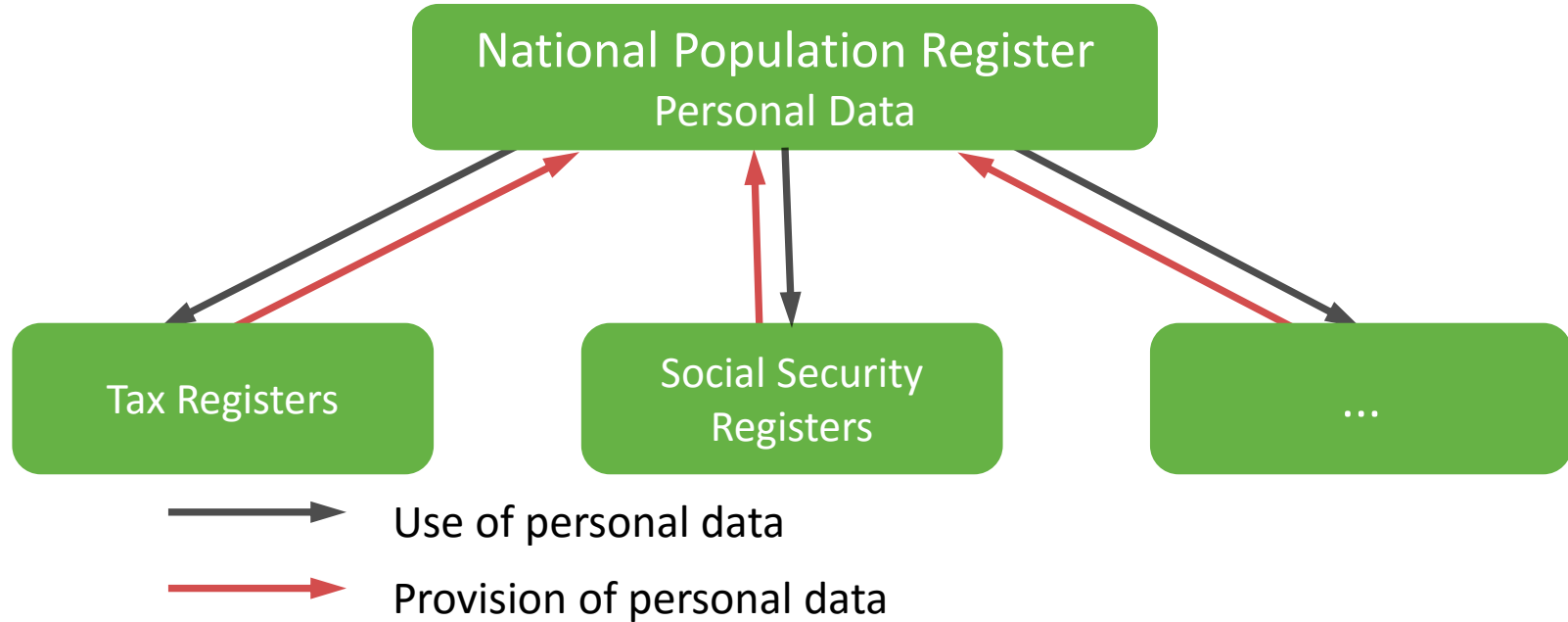
Physical vs Digital World

The digital revolution needs a strong analog foundation

World Bank World Development Report 2016

ega.ee

Identity Management Offline and Online

Registration of Population

Registration of e-Population

Offline Credentials

Online Credentials

ega.ee

EESTI.ee
Gateway to eEstonia

More than 4,5 million visits ↑13%
401 316 different users, 33% new users

46% men

255 669
@eesti.ee users
↑21%

86 976
numbers saved
↑51%

54% women

815 e-Services More than 6,9 million views

Most visited

🧰 Services for entrepreneurs
★ 01.07.2014 changed to viewing data

701 395
My data

670 054
Admission into educational institution (SAIS)

279 474
Adding data on the certificate of temporary incapacity for work

209 934
Prescriptions

187 885
Benefits for incapacity for work

134 528
★ Submitting insurance data to the Estonian Health Insurance Fund

One-stop-shop

The key to the digital world

3 user categories:

- for a citizen
- for an entrepreneur
- for an official

Personal „Office"

Digital ID and Signature since 2002

Digital signatures: 220+ M
Active cards: 1,3 M
Online authentications: 350+ M

ega.ee

(Digital) Identity Documents and Related Services

Identity Documents

```
                    Identity
                    Document
                   /        \
                  /          \
         Physical            Digital
         Document            Document
```

Physical Document

passport
ID card
residence permit card

Digital Document

ID card
digi ID/e-resident's card
residence permit card
mobile ID

ega.ee
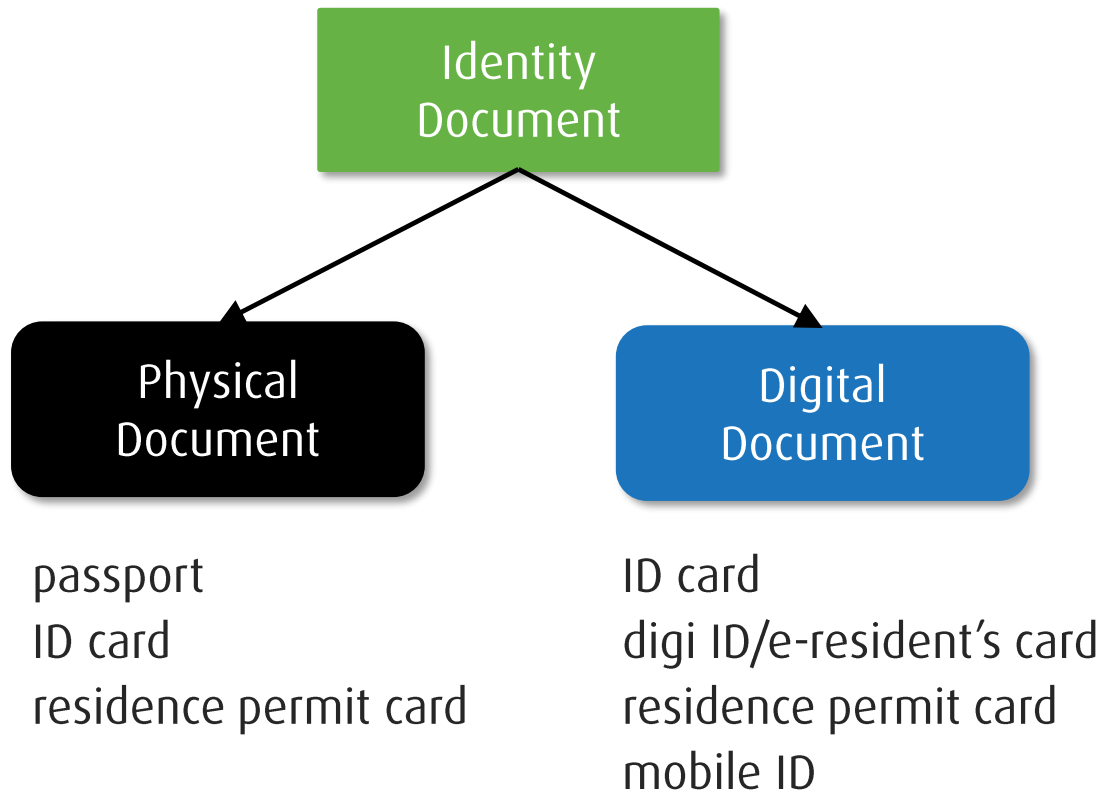
Digital Document

- Identity Documents Act §3:

A document which is prescribed for digital identification of a person (hereinafter a digital document) is a document prescribed for identification of a person and verification of identity in an electronic environment.

Entry into force 30.07.2009

ega.ee

Estonian Identity Card

- valid max 5 years
- compulsory ID document from 15 years age

IDcard = Medium of Digital Identity

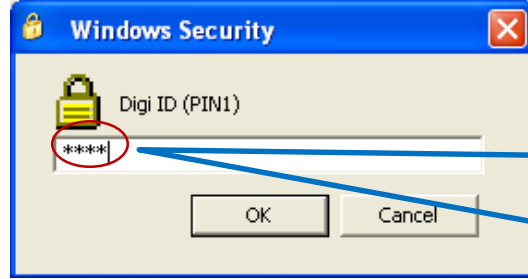visual identification of a person

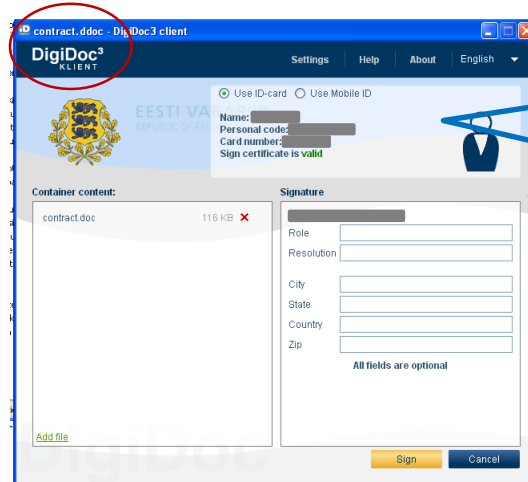digital identification of a person

personal unified e-mail address

IDcard as a travel document

IDcard as a "key": opens up different data banks

digital signature

secure messaging: encrypting and decrypting

ega.ee

ID Card Issuance Process

Police and Border Guard Board service offices

1. Application in person, by post or by e-mail

6. Personalised ID card with certificates and PIN envelope handed over in office

2. Request for personalisation

5. ID card with certificates and PIN envelopes sent by courier

Trüb Baltic AS

3. Request for certificates

4. Generated certificates

SK

Certification Centre AS Sertifitseerimiskeskus

ega.ee

Digital Identity Card as of Oct 01, 2010
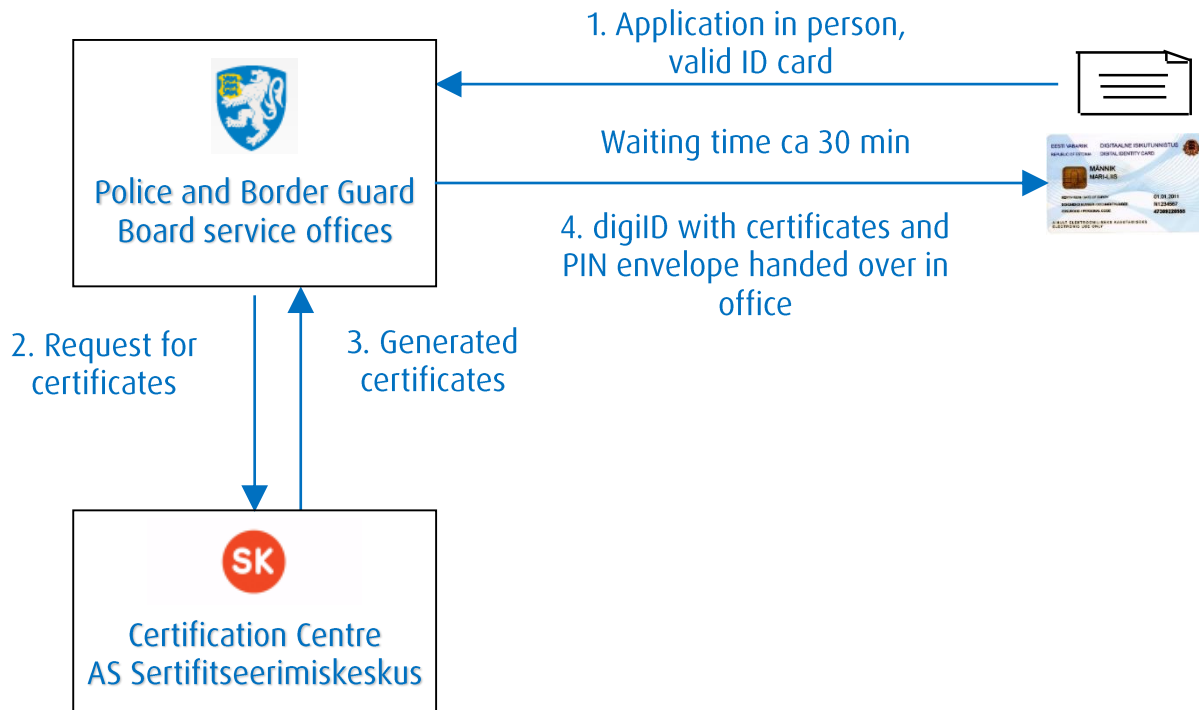
- digi-ID - 1ˢᵗ "pure" digital identity document
- personalisation takes place in service offices
- visual data is printed by thermoprinter

ega.ee

EESTI VABARIIK   DIGITAALNE ISIKUTUNNISTUS
REPUBLIC OF ESTONIA   DIGITAL IDENTITY CARD

MÄNNIK
MARI-LIIS

KEHTIV KUNI / DATE OF EXPIRY   01.01.2011
DOKUMENDI NUMBER / DOCUMENT NUMBER   N1234567
ISIKUKOOD / PERSONAL CODE   47309220555

AINULT ELEKTROONILISEKS KASUTAMISEKS
ELECTRONIC USE ONLY

Digi-ID Issuance Process

1. Application in person, valid ID card

Waiting time ca 30 min

4. digiID with certificates and PIN envelope handed over in office

Police and Border Guard Board service offices

2. Request for certificates

3. Generated certificates

Certification Centre AS Sertifitseerimiskeskus

ega.ee

What Is Inside the Chip?

- Cryptoprocessor
- Personal data file
- Certificate for authentification along with e-mail address Forename.Surname@eesti.ee
- Certificate for digital signature

ega.ee

Uniform Platform - DigiDoc

- Full-scale architecture for digital documents, signatures and encrypting
- Includes real-time validity confirmation of a certificate (OCSP)

Mobile ID

- Usable as a digital document for authenticaton and digital signing

- Requires replacement of SIM card with PKI-capable SIM card
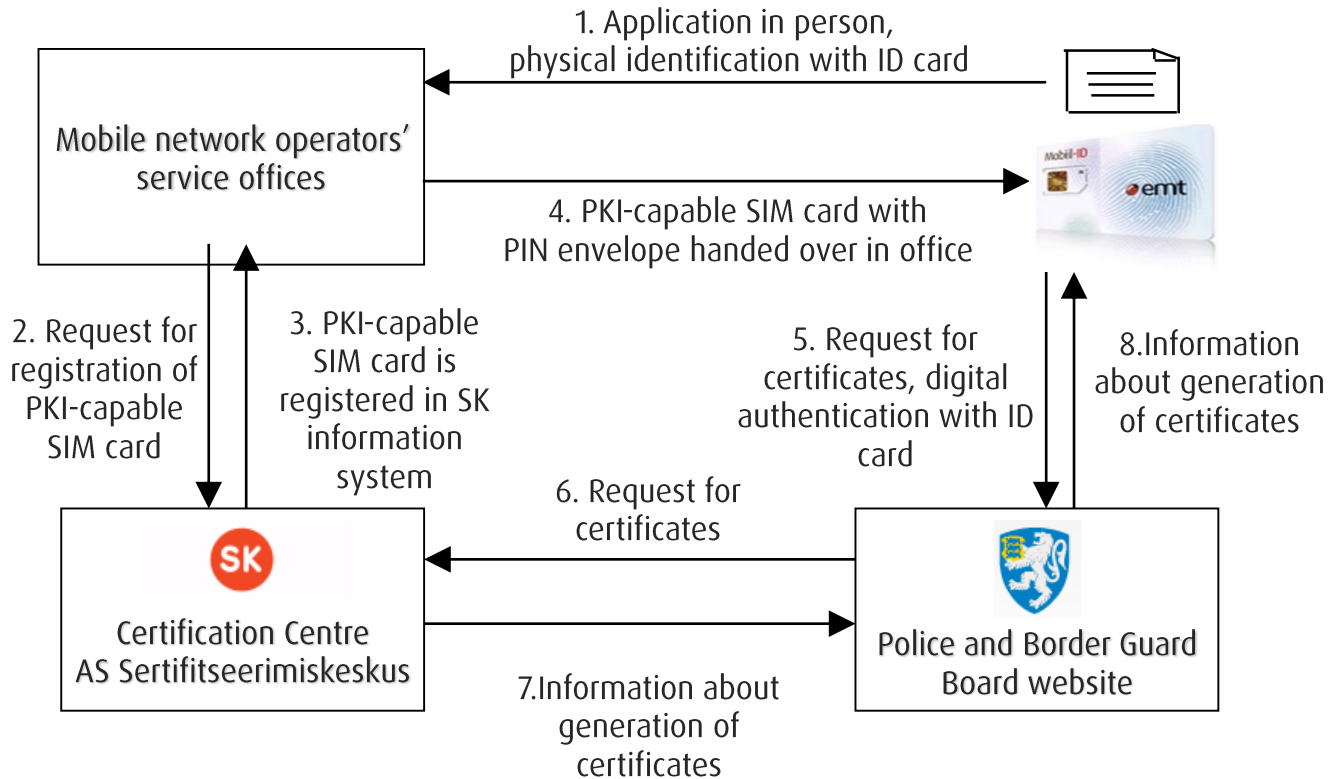
- No specific software required

ID card

Interneti-pank

- PC (with ID card reader)
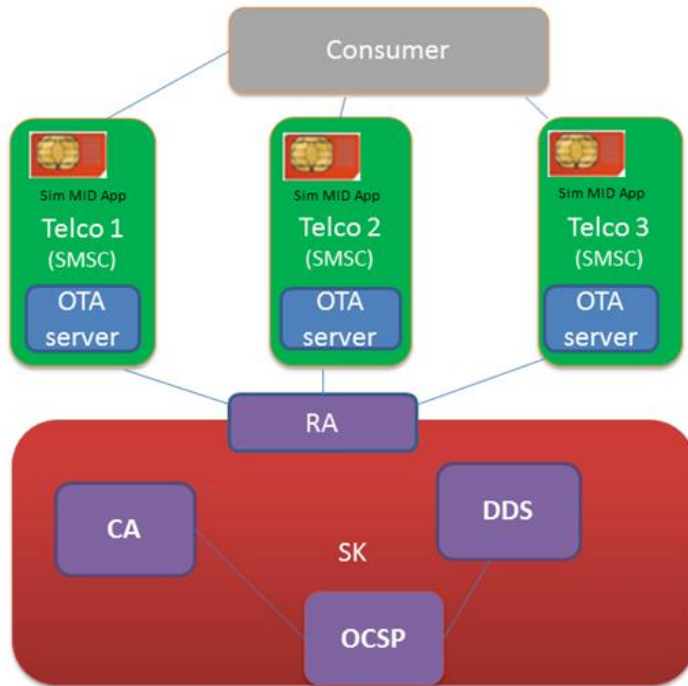- ID card reader
- ID card (PIN 1,2)

Mobile ID

Interneti-pank

- PC connected to public Internet
- Mobile phone PKI-capable SIM card
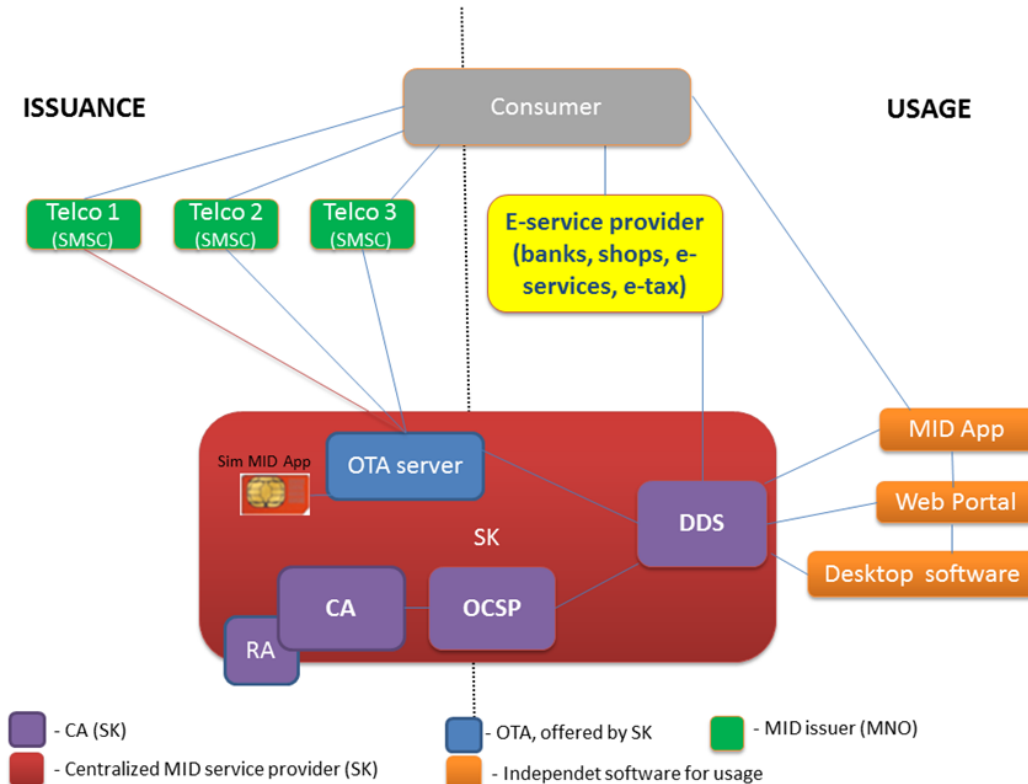- Mobile ID (PIN 1,2)

Mobile ID Issuance Process

1. Application in person, physical identification with ID card

Mobile network operators' service offices

4. PKI-capable SIM card with PIN envelope handed over in office

2. Request for registration of PKI-capable SIM card

3. PKI-capable SIM card is registered in SK information system

5. Request for certificates, digital authentication with ID card

8. Information about generation of certificates

6. Request for certificates

Certification Centre
AS Sertifitseerimiskeskus

Police and Border Guard Board website

7. Information about generation of certificates

ega.ee

Old mID Infrastructure

New mID Infrastructure

ISSUANCE

Consumer

USAGE

Telco 1 (SMSC)

Telco 2 (SMSC)

Telco 3 (SMSC)

E-service provider (banks, shops, e-services, e-tax)

Sim MID App

OTA server

SK

DDS

MID App

Web Portal

CA

OCSP

Desktop software

RA

- CA (SK)

- OTA, offered by SK

- MID issuer (MNO)

- Centralized MID service provider (SK)

- Independet software for usage

ega.ee

M-ID Prices

emt

Valid from 01.01.2014	excl.vat	incl.vat
State fee handling	7,00	-
Monthly fee	0,83	1,00
User fee*	0,00	0,00

ega.ee

Validity confirmation Services - Prices

- On concluding the contract, the service is free of charge:
    - office packet - free until the end of the first month
    - mini packet - free for 3 months
    - from standard packet - free for 6 months

Service Package	Minimum Number of Queries	Price per Query €	Minimum price per Month €
Base package	0	0,10	0
Office package	400	0,048	19,30
Mini-package	2000	0,038	76
Standard package	10 000	0,026	260
Bronze package	30 000	0,020	600
Silver package	80 000	0,014	1 120
Gold package	150 000	0,010	1 500
Platinum package	250 000	0,009	2 250
Diamond package	400 000	0,008	3 200
Brilliant package	750 000	0,007	5 250
Personal package	>750 000	under agreement	under agreement

ega.ee

Residence Permit Card as of Jan 01, 2011

- EU uniform residence permit card for third-country nationals (incl. fingerprint biometrics).

- Carries the same e-functionality as identity card.

ega.ee

eID Tokens

National ID-card

E-ID Card

Mobile Phone

ega.ee

eID Facts

- eID is part of national identity document
- Population ca. 1.3 M
- Valid eID tokens ca 1.2 M
  - eID since 2002
  - mID since 2007
- Online authentications: 350+ M
- Digital signatures given: 220+ M
  - today approximately 5,6 M per month
- E-residency since Dec, 2014

ega.ee

i-Voting 2005

8 elections
30% votes in 2015

i-Voting Development /i-voting statistics

ega.ee

I-voters among participating voters
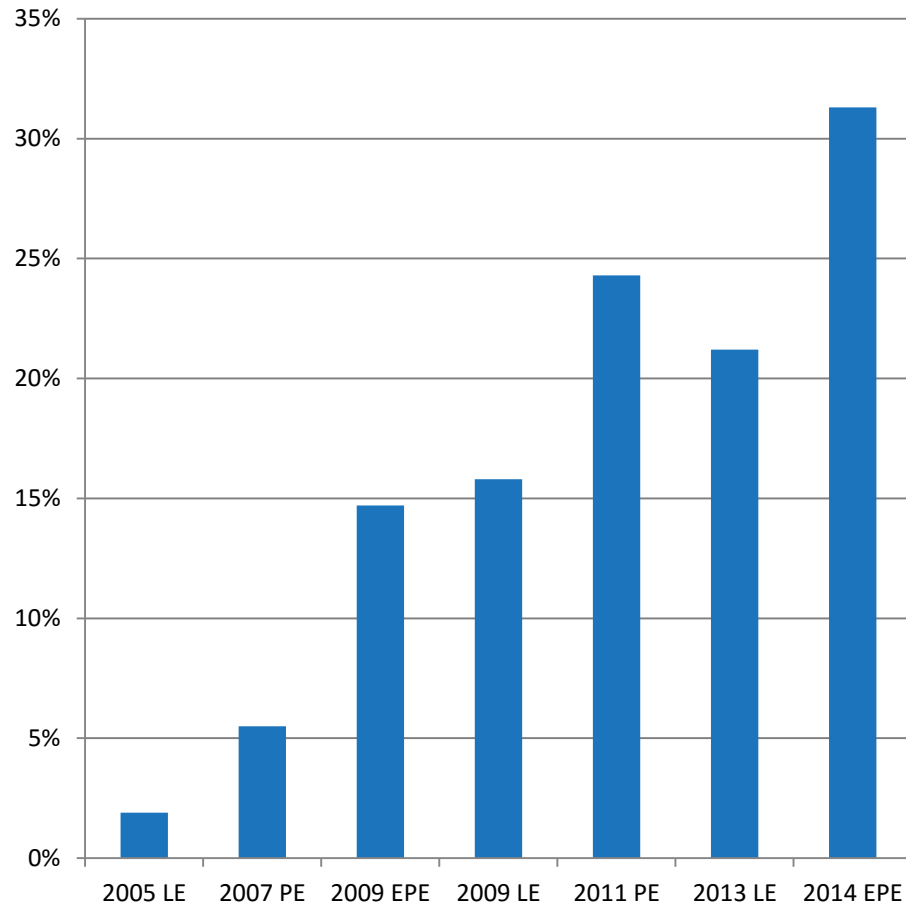
I-Voters by Age, 2005-2013
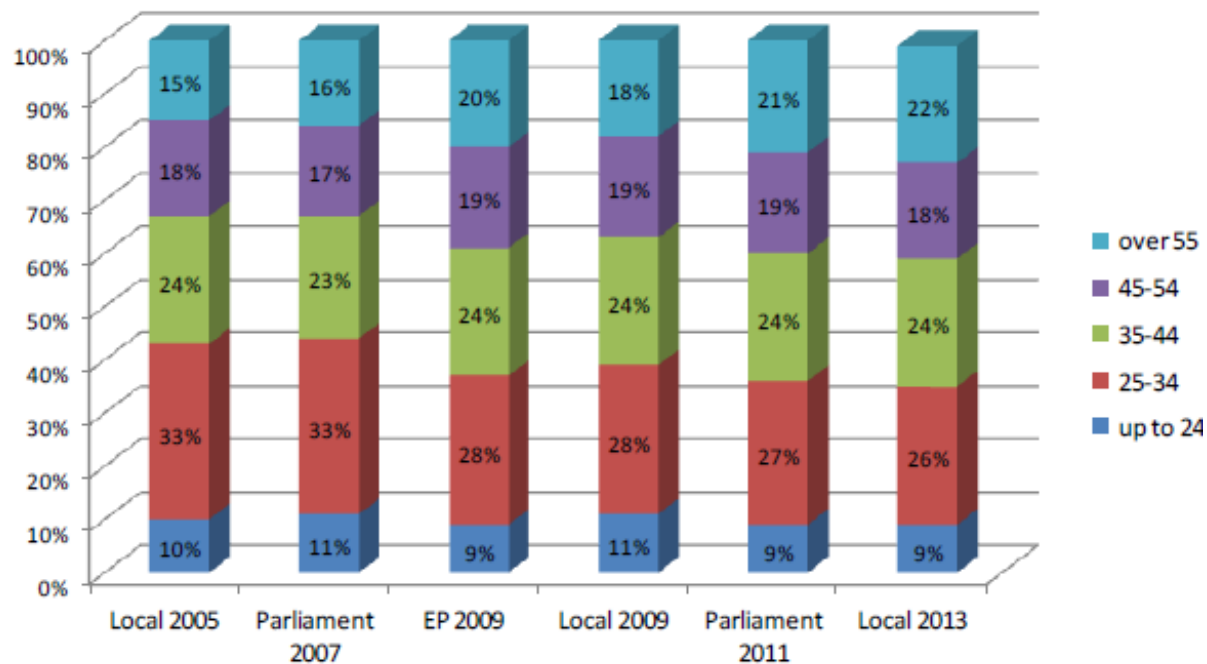
I Voters by Gender, 2005-2013

ega.ee
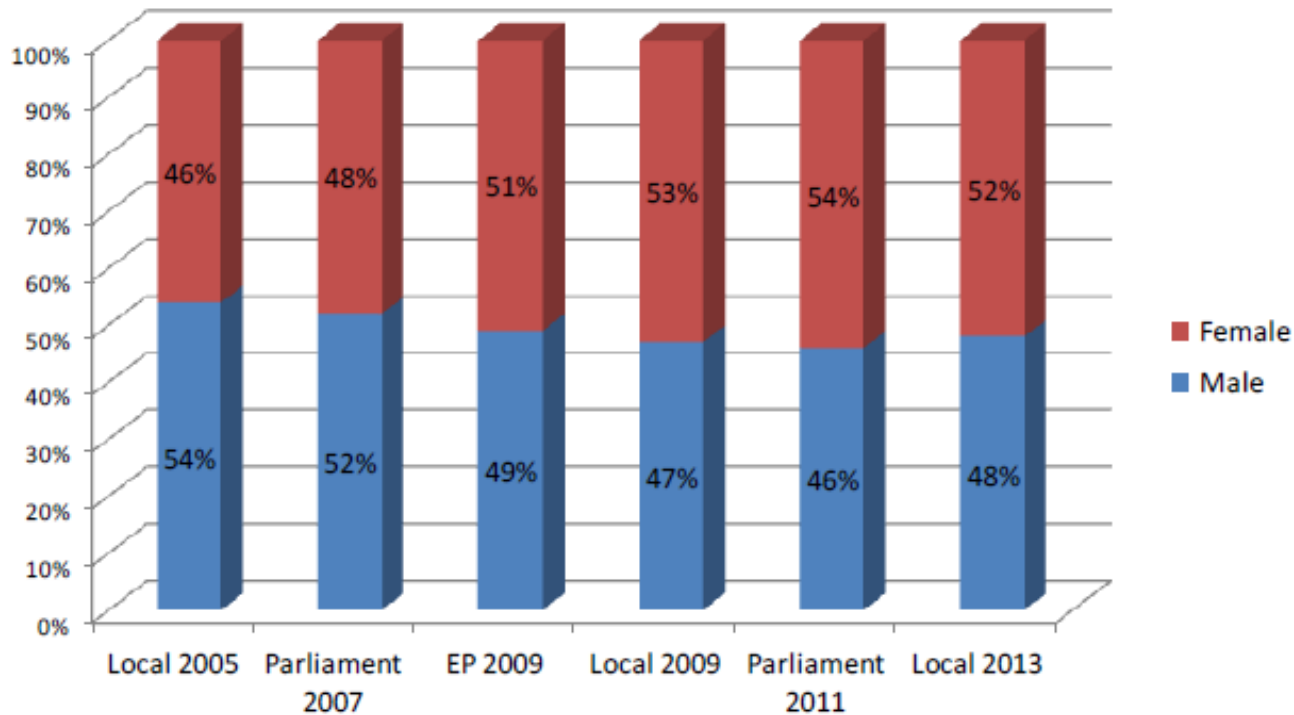
Envelope scheme
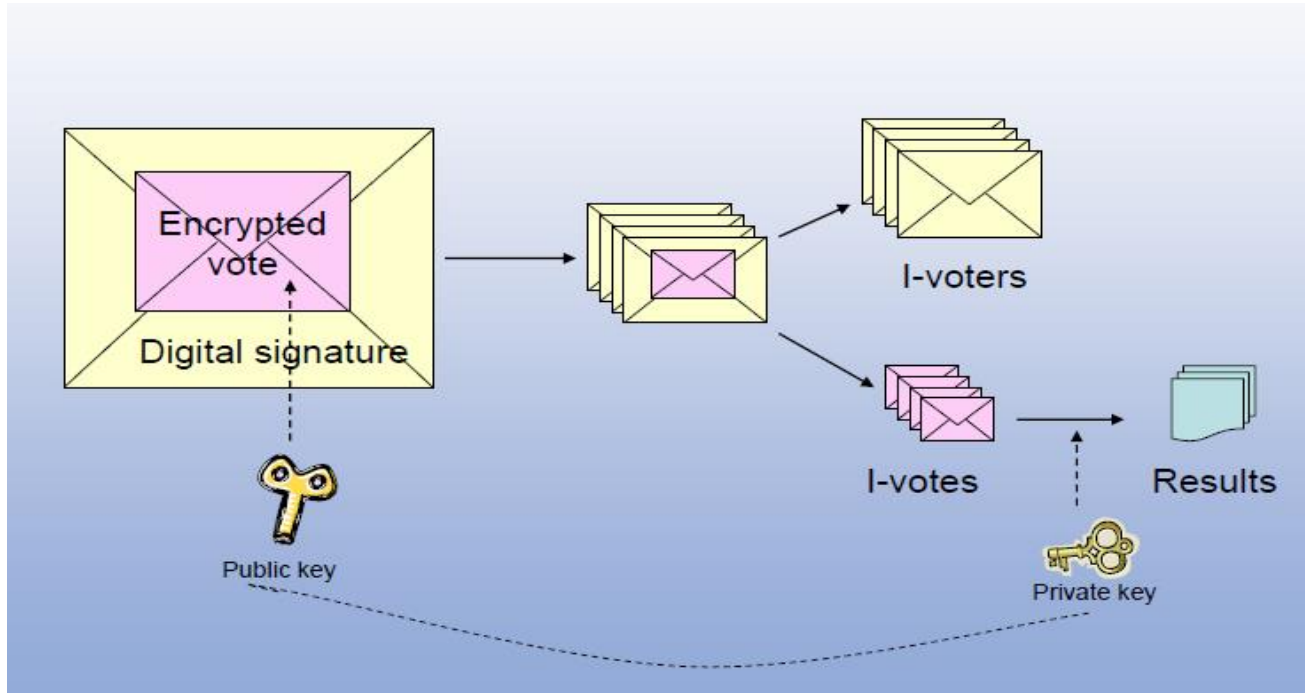
e-Residency Card since December, 2014

EESTI VABARIIK
REPUBLIC OF ESTONIA

DIGITAALNE ISIKUTUNNISTUS
DIGITAL IDENTITY CARD

MÄNNIK
MARI-LIIS

KEHTIV KUNI / DATE OF EXPIRY — 01.01.2011

DOKUMENDI NUMBER / DOCUMENT NUMBER — N1234567

ISIKUKOOD / PERSONAL CODE — **47309220555**

AINULT ELEKTROONILISEKS KASUTAMISEKS
ELECTRONIC USE ONLY

- The first in the world to offer e-residency (since Dec 2014)
- Provided by the Estonian Government.
- For internationally active companies and people, who want to run their business and life in the digital way.
- 10000 applicants (march 2016)
- e-resident.gov.ee

ega.ee

The first e-resident of Estonia Edward Luc

e-Residency Use Cases

1. **Visitors of Estonia**
Academia, tourists
While visiting Estonia enjoy the same online benefits as locals

Clare Sullivan
Australia

Stanislav Yurin
Ukraine

2. **Virtual business environment**
Freelancers, entrepreneurs
Run location-independent international business online.

3. **Community of e-Residents**
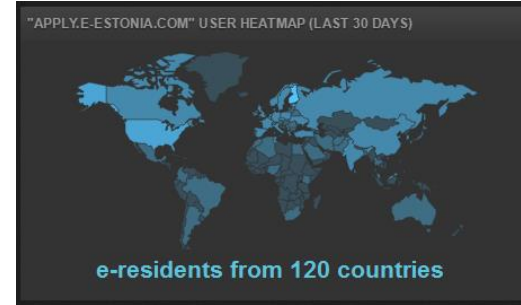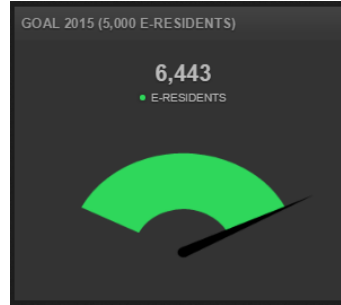**Global citizens**
Join us to create a country without borders.

Carlos Miceli
Argentina

Developers

4. **Open digital identity platform**
Developers
Use e-Residency as a platform to scale your own services.

Statistics of e-Residency
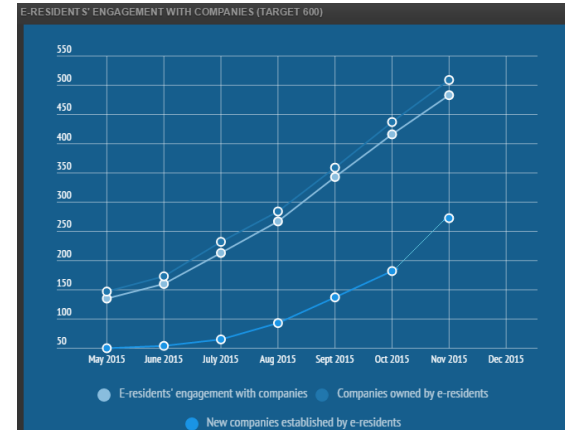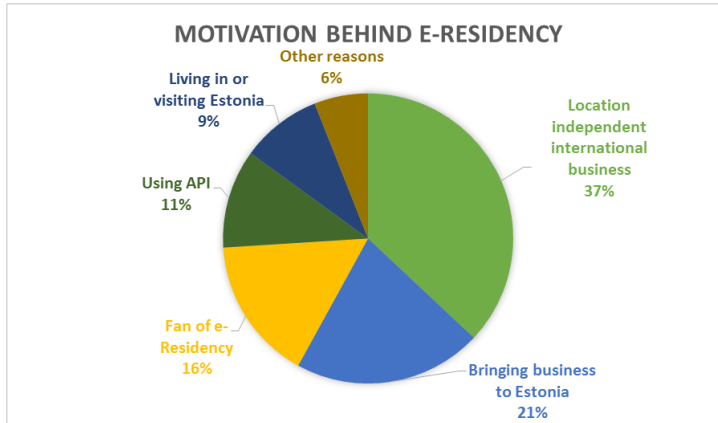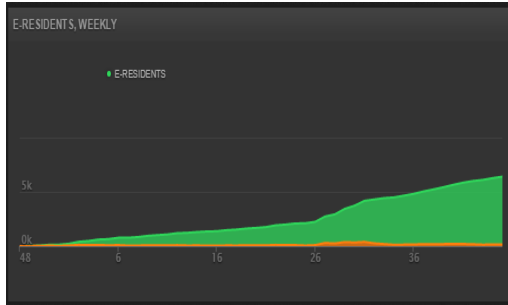
Digital Identity Management as a Cornerstone of Trust Building

eIDAS

- Directive 1999/93/EC of the European Parliament and of the Council of 13/12/1999 on a Community framework for electronic signatures.

- Regulation (EU) no 910/2014 of the European Parliament and of the Council of 23/07/2014 on electronic identification and trust services for electronic transactions in the internal market and repealing directive 1999/93/EC.
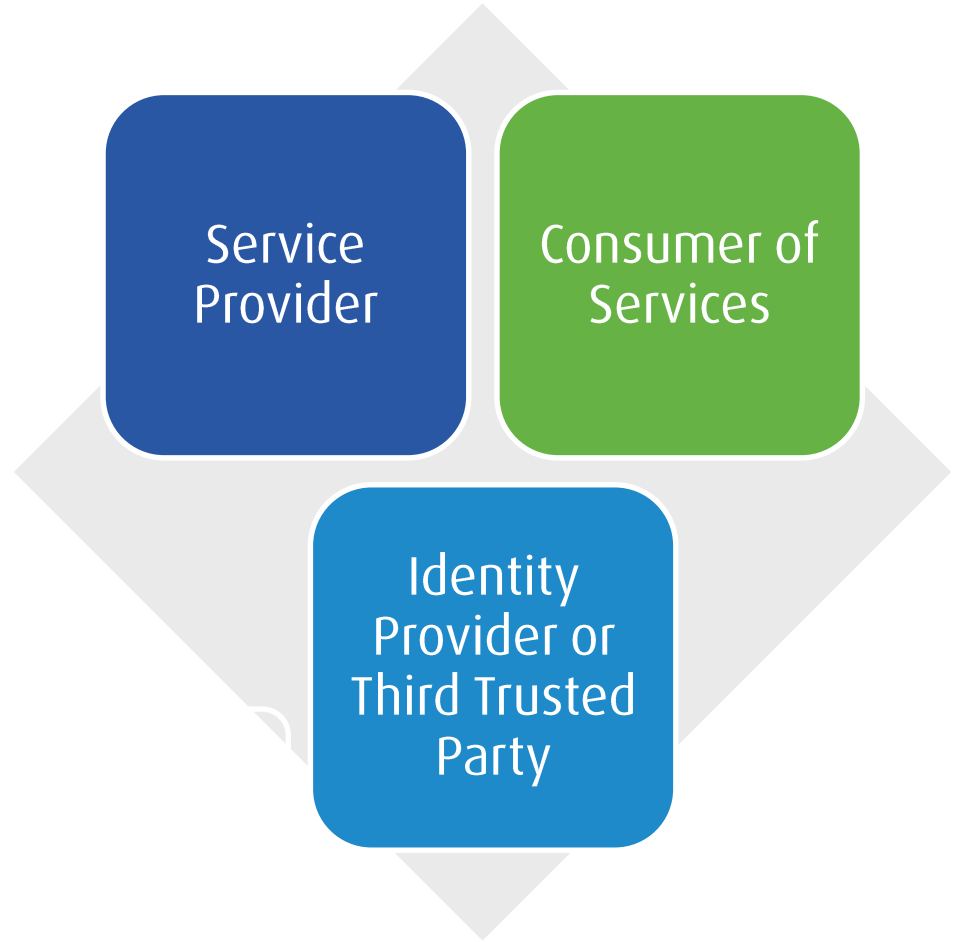
- Digital Agenda eIDAS

ega.ee

Mutual Recognition of eIDs

- Member States must recognise eID means issued under „notified" eID schemes from other Member States for cross-border access to its public services requiring e-identification based on the reciprocity principle (art. 6)

ega.ee

Electronic Trust Services

- mutual recognition of e-identification means
- electronic trust services:
    - electronic signatures
    - electronic seals
    - time stamping
    - electronic registered delivery service
    - website authentication
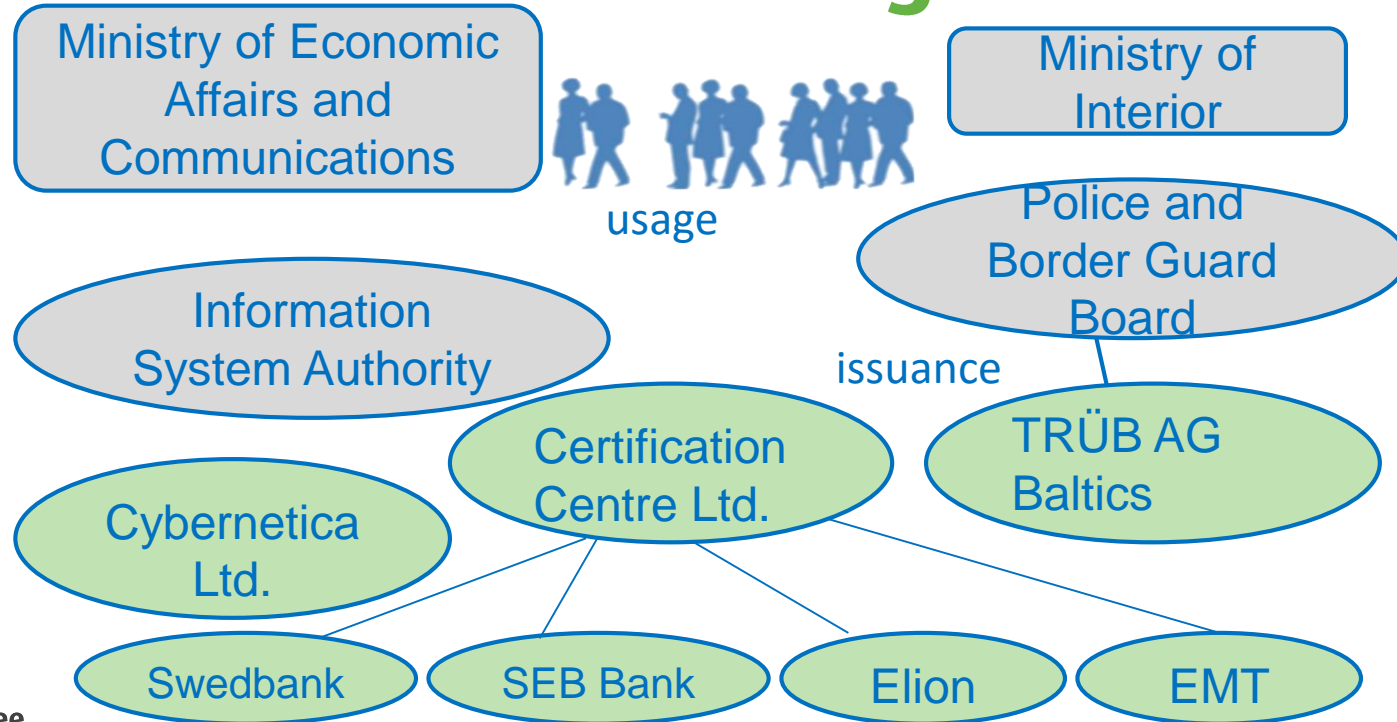- electronic documents

ega.ee

Trust Building

Service Provider

Consumer of Services

Identity Provider or Third Trusted Party

Building Trust and Confidence towards e-Government

"On the Internet, nobody knows you're a dog."

On the Internet, nobody knows you're a dog...
Peter Steiner, The New Yorker, 1995

ega.ee

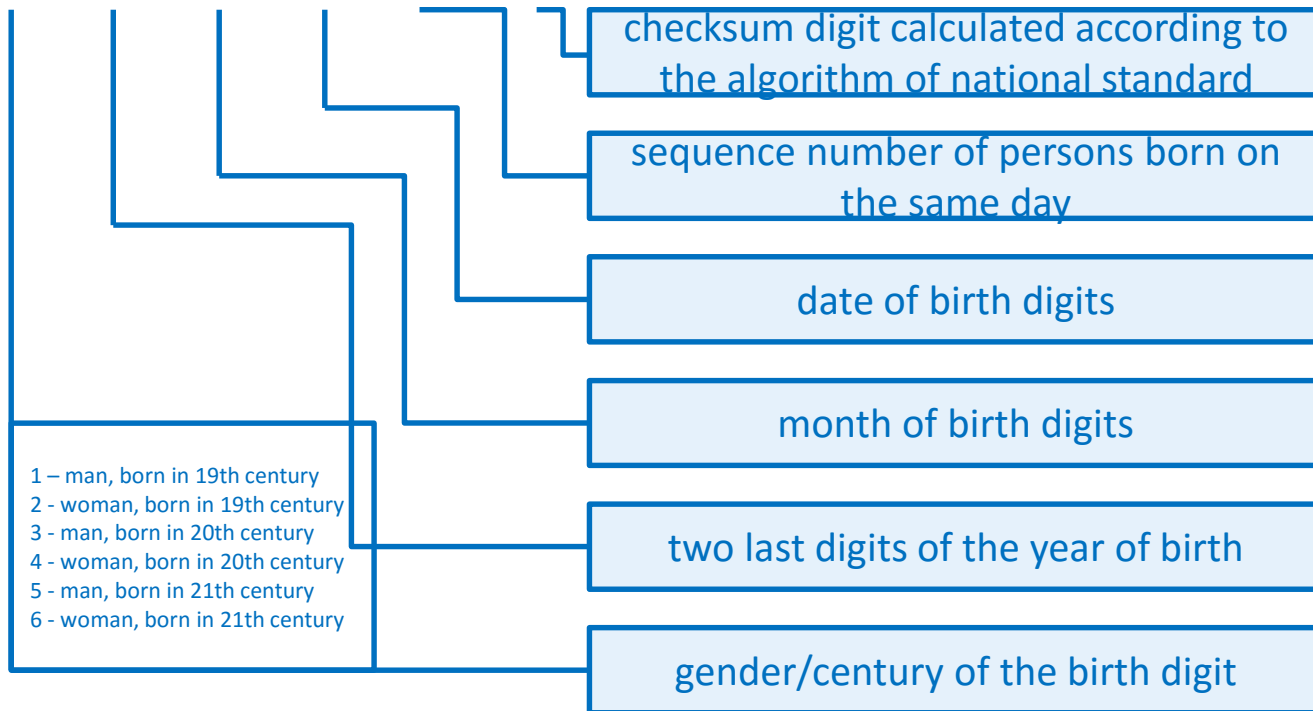(Electronic) Identity and (Digital) Identity Management

Estonian National Identitity Framework

- The identity system is established around the persistent life-long ID called Personal Identification Code (PIC), which links all identities together, declaring them as belonging to the same person

  - Formation of PIC is based on the Estonian Standard EVS 585:2007 „Personal Code. Structure" and the Population Register Act

  - All certificates of widely accepted electronic identities (ID card, digiID and Mobile ID) contain PIC

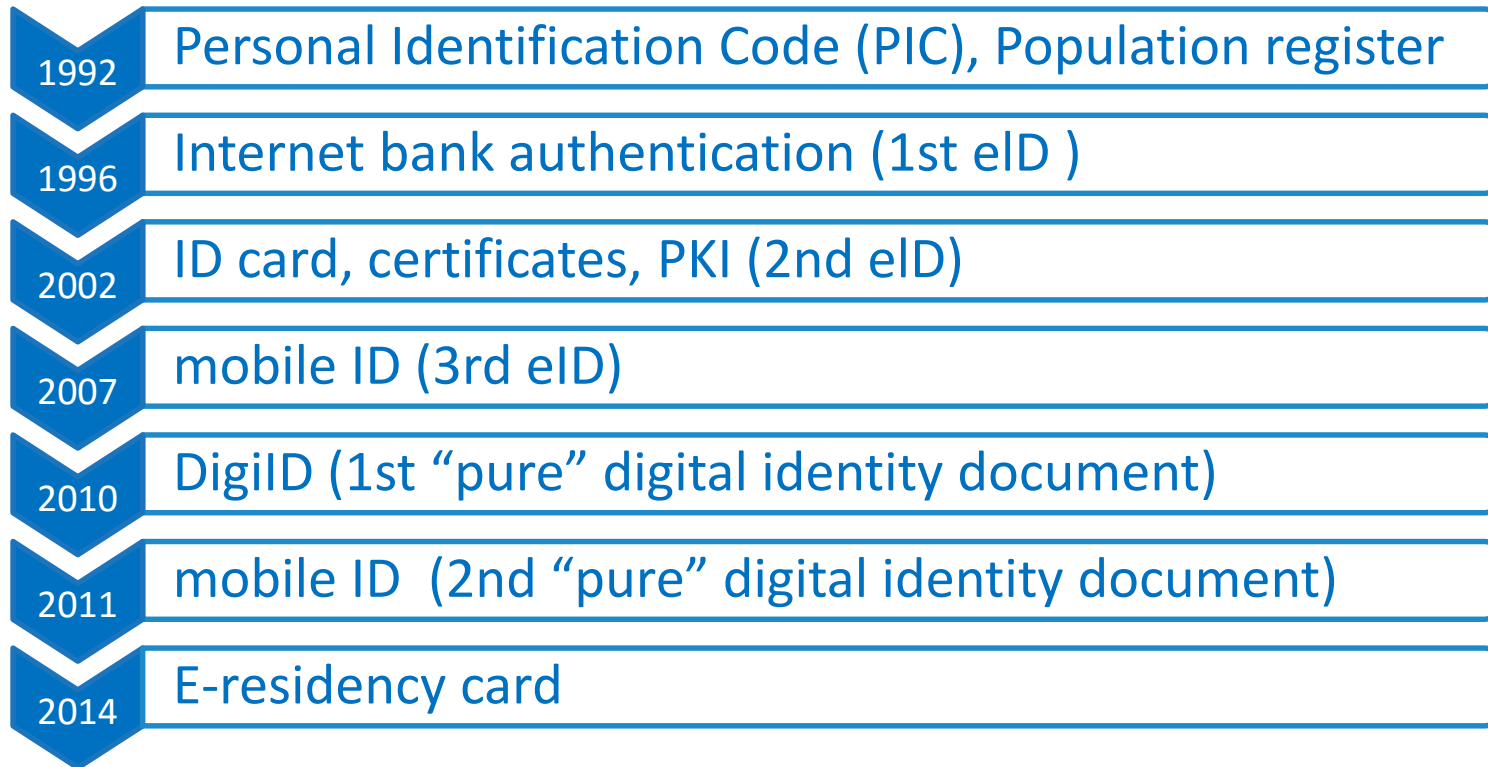- The identity management policy is closely related to identity documents policy

ega.ee

Personal Identification Code

The 11-digit PIC consists of:

X XX XX XX XXX X

checksum digit calculated according to the algorithm of national standard

sequence number of persons born on the same day

date of birth digits

month of birth digits

two last digits of the year of birth

1 – man, born in 19th century
2 - woman, born in 19th century
3 - man, born in 20th century
4 - woman, born in 20th century
5 - man, born in 21th century
6 - woman, born in 21th century

gender/century of the birth digit

eID Development

1992	Personal Identification Code (PIC), Population register
1996	Internet bank authentication (1st eID)
2002	ID card, certificates, PKI (2nd eID)
2007	mobile ID (3rd eID)
2010	DigiID (1st "pure" digital identity document)
2011	mobile ID (2nd "pure" digital identity document)
2014	E-residency card

ega.ee

Electronic Identity Types

- Internet bank authentication
  - Password cards
  - PIN calculators
  - ID-cards
- ID-card – based on PKI technology
- mID – PKI capable SIM-cards

ega.ee

Digital Identity Management Principles

- State monopoly and responsibility to identify a person, confirm the identity and issue certificates on identity documents

- Centralized identity management

- Principle of "one person = one identity"

ega.ee

Digital Identity Management Principles

- One-to-one relationship of certificates with the user of the digital document

- Public verification of certificates via the personal identification code

Digital Signature

Digital Signature - Concept

- Legally binding

- Equivalent to what we are doing on paper

- Public sector is obliged to accept digitally signed documents

- Any relation: G2G, G2B, G2C, B2C

TEST 3.bdoc

DigiDoc³
KLIENT

Settings   Help   About   English ▼

○ Use ID-card   ● Use Mobile ID

EESTI VABARIIK
REPUBLIC OF ESTONIA

Mobile number: 3725156761

Personal code:

☑ Remember me

Container: C:\Users\mari\Desktop\TEST 3.bdoc   Save

This container is signed by you

Container content: **Signature**

TEST 3.docx   196 KB 🖫   🔒 **Mari Pedak**
                                                  Signed on 02. November 2015 time 12:44
                                                  Signature is valid   Show details
                                                                              Remove

Save files to disk

Send container to email   Print summary

Browse container location   Encrypt document

                                          Add signature   Close

DigiDoc3 client 3.11.1.1426

Digital Signature Cost-Profit Calculator

- 100 million digital signatures

→

- People and companies have saved more than 82 000 000 €

SK

Using the digital signature effectively we save 1 working week per year

2 % of **GDP**

Economic Effect

ega.ee

Lessons Learned

Best Practices

- Simple solution
- Compulsory ID card
- Low state fee
- Public-private partnership
- Interoperable ICT architecture
- Usable in any relation: G2G, G2B, G2C, B2C, B2B, C2C

ega.ee

EstEID with NFC – How it works #1

ega.ee

Legal Acts

- Identity Documents Act
- Digital Signature Act
- Population Register Act
- The Minister's of Regional Affairs 07.01.2005 Act no 4 "The formation and grant of personal identification codes"
- Personal Data Protection Act
- Public Information Act

  https://www.riigiteataja.ee/tutvustus.html?m=3

ega.ee

References

- **e-Estonia**: www.e-estonia.com
- ID-card overview: www.e-estonia.com/component/electronic-id-card/
- E-residency: https://e-estonia.com/e-residents/about/
- **Certification Centre**: www.sk.ee
- Digital signature concept: www.id.ee/public/The_Estonian_ID_Card_and_Digital_Signature_Concept.pdf
- ID Card Support Centre: id.ee/?lang=en&id=30466

ega.ee

References

- Digital signature cost-profit calculator: eturundus.eu/digital-signature/
- **Information System Authority**: www.ria.ee
- Gateway to e-Estonia: https://www.eesti.ee/eng
- **Police and Border Guard Board**: www.politsei.ee/en
- ID-card application process: www.politsei.ee/en/teenused/isikut-toendavad-dokumendid/

ega.ee

Thank you for your attention!

Mari Pedak
mari.pedak@ega.ee
+372 5156 761

Follow us in Twitter and FB eGovAcademy

ega.ee