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IFPC 2020: Biometric Processes of the Entry Exit System

Federal Office for Information Security (BSI, Germany)
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Agenda

1. Introduction: New Systems, New Challenges
2. Workflow Engine: Make Things Easier
3. Interoperability: See the Bigger Picture
4. Summary: Challenges Solved?

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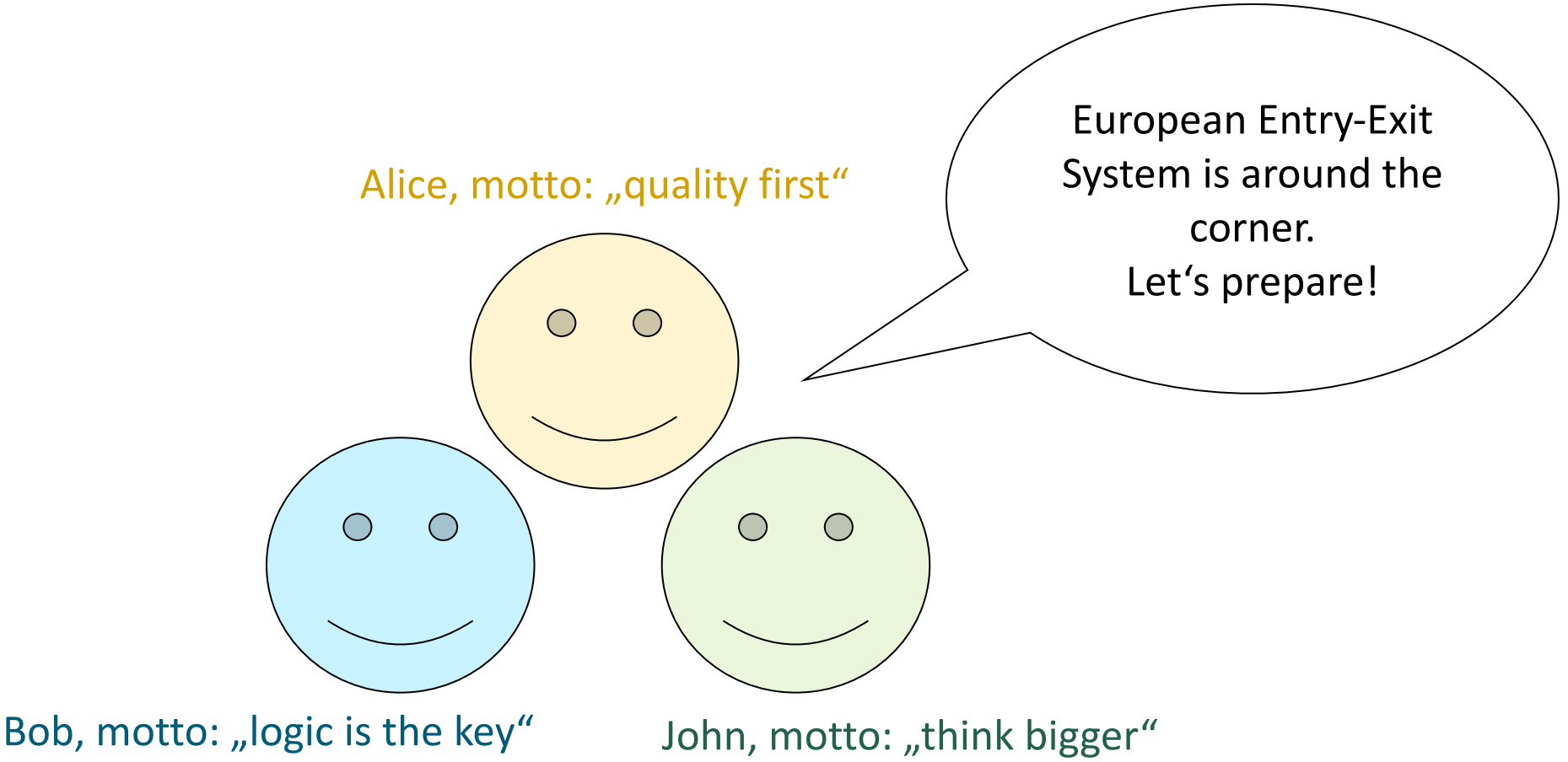
Introduction

New Systems, New Challenges

Team Biometrics BSI



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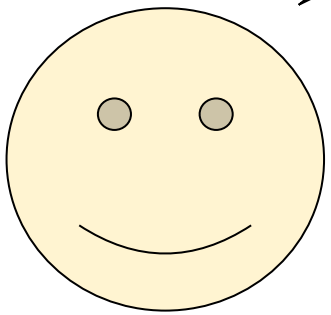
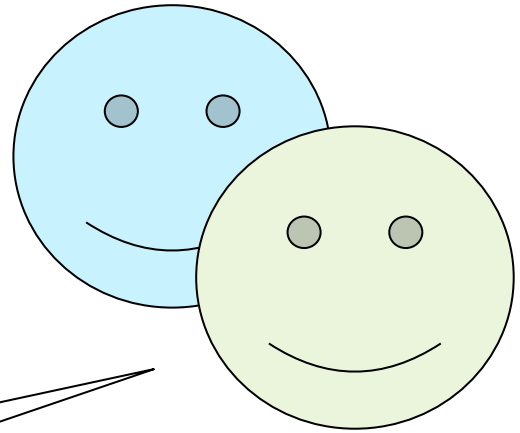
Team Biometrics BSI: Biometric Quality

Guys, biometric quality during enrolment is essential. Did you know that the EES will contain 200-300 million identities in the end?



We won‘t be able to find someone if the biometric data is not good enough!



What do you mean by „good enough“?

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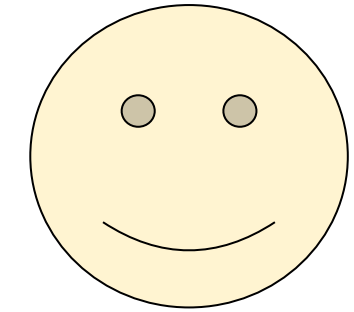
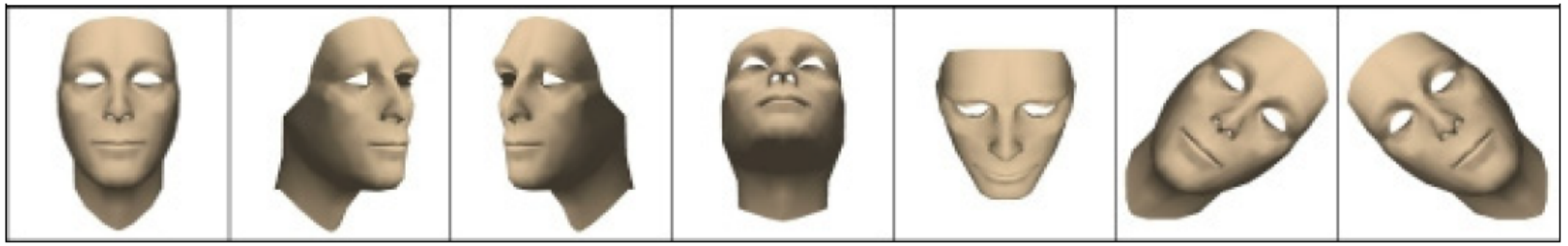
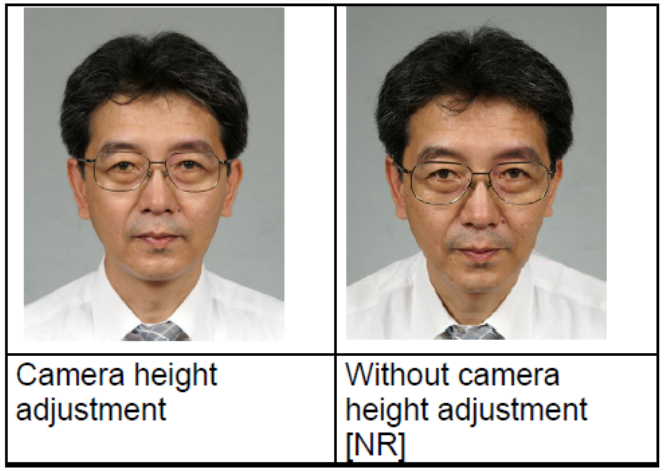
Team Biometrics BSI: Biometric Quality

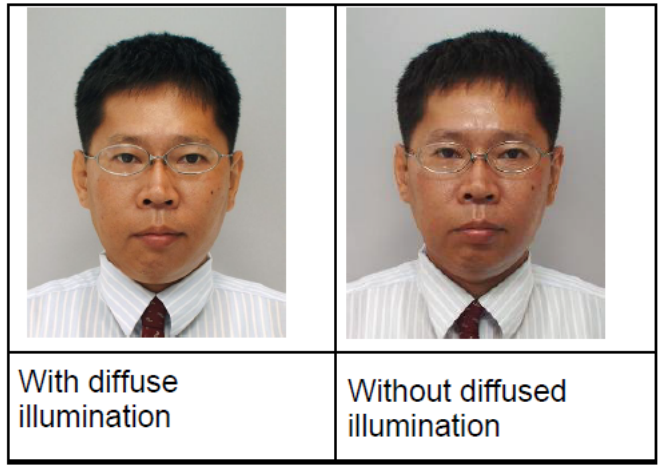


It‘s not that easy to get „good“ pictures…

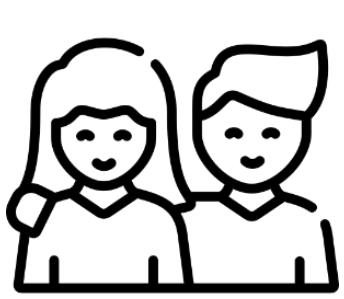


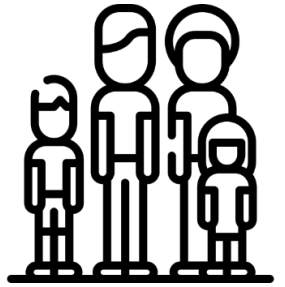


Camera height adjustment	Without camera height adjustment [NR]



With diffuse illumination	Without diffused illumination





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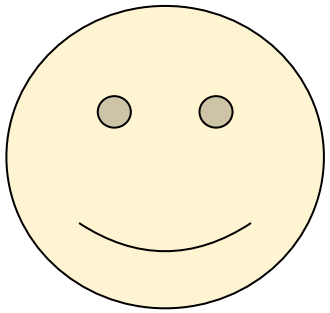
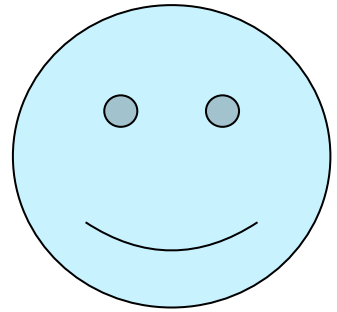
Team Biometrics BSI: Further Issues…

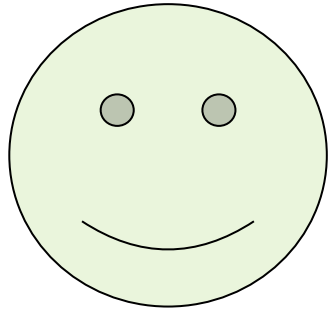
Okay, it‘s difficult to get good biometric pictures. We have to tackle that. But is there anything else we should look into?



Absolutely! I was designing processes the other day and I think we really should combine things in a **Workflow Engine**.



Also, EES is not the only system in the EU. I think we should have a close look on the **Interoperability** between these systems!



I never heard about Workflow Engine or Interoperability to be honest.
Can you guys elaborate on this?

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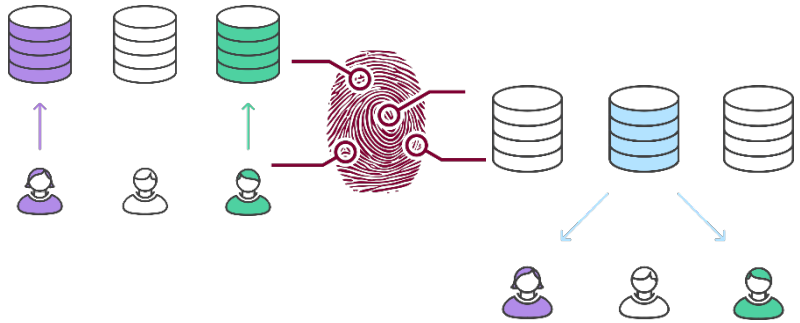
EES-Workflow Engine

Automating EES-Processes at Central Level

EU-Identity Registers with biometrics (EES)

Large-scale identity registers (such as the EES) require harmonised and sound *access, verification, and enrollment processes* that must be respected by all users (for EES: authorities in EU member states)



The development of common EES-processes and their integration into national IT-infrarchitecture is non-trivial:

- Legal requirements
- Biometric quality and acquisition
- Unambiguity, completeness, soundness of EU-identities
- Interplay between alphanumeric and biometric identity data
- Efficiency and security
- Technical aspects
- ....

The **EES-Workflow Engine** is a central implementation of such common EES processes and EES business rules at EU level.

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SMART BORDERS

National implementation of EES-process logic

- All business workflows with the EES are reduced to a set of atomic computational steps

SearchByTravelDocument | VerificationInEESwithFI | IdentificationInVISwithFP | ...

- Workflows need to be composed from the given atomic operations by national systems

Disadvantages

- High redundancy (communication, implementation, domain knowledge, ...)
- Non-uniform processes and potentital lack of data quality
- Once implemented, logic hardly adjustable to upcoming changes

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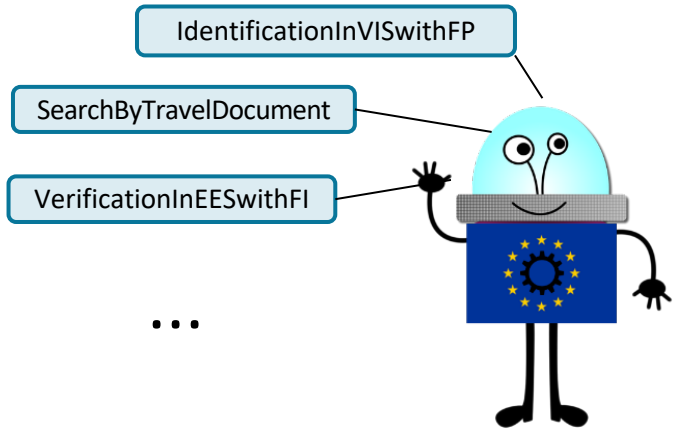
SMART BORDERS

EES-Workflow Engine: a smart EES-API



1. Automatisation of EES processes via concise interface
2. Central (=EU) implementation of EES-process logic
3. Transactions (maintain progress and data, guide clients/requesting necessary data)

StartBorderControl

- Start transaction
- Alphanumeric search

AddDataToBorderControl

- Submit biometrics
- Biometric searches

IdentificationResult

- Selecting true matches

End/AbortBorderControl

- Complete transaction
- Register border crossing

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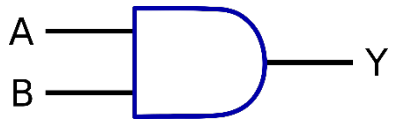
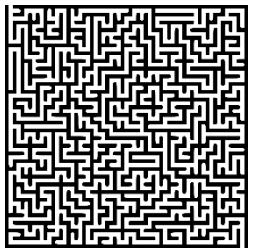
EES-Process Logic and the Future

With more and more use cases to consider, it becomes non-trivial to specify the internal process logic (= EES business logic) of the EES-Workflow Engine.





- Search results from different sources (biometric & alphanumeric)
- Requesting data (e.g. biometrics)
- Updating an existing identity file (e.g. outdated biometric samples)
- Calculating the allowed duration of stay
- ....

Significant conceptual and technical changes ahead

ETIAS, Interoperability, ...

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EU Interoperability of Information Systems

A National View on Linking Data with Biometrics

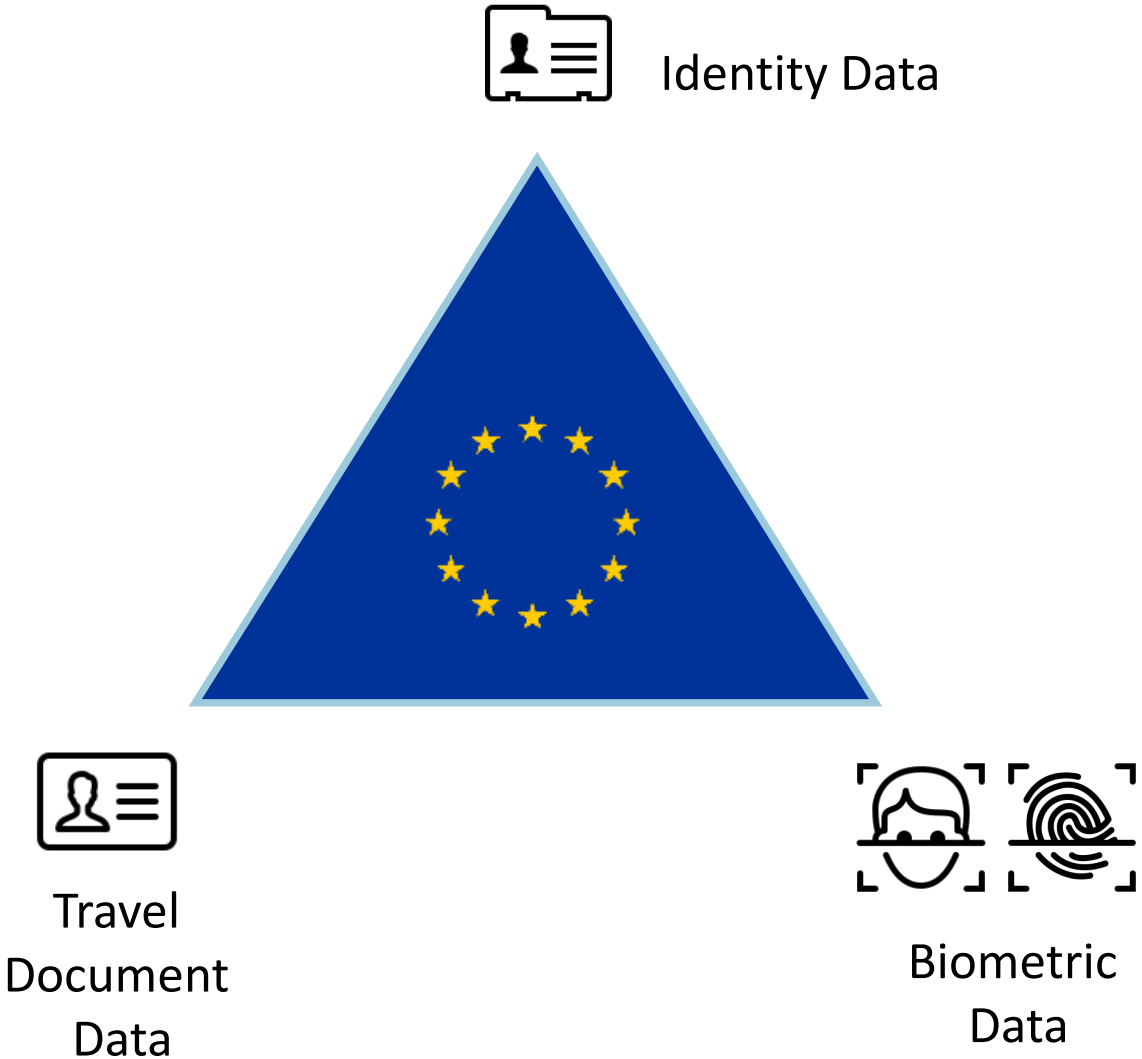
Agenda

- EU Information System Interoperability in a Nutshell
- Operational Challenge: Links
- Open Questions: Links

EU Identity Triangle

1. An **identity** is a set of alphanumeric travel document data, other alphanumeric identity data and biometric data captured from a person.

2. A **person** is only known to the EU information system through his identities, which were captured when he interacted with an EU information system.



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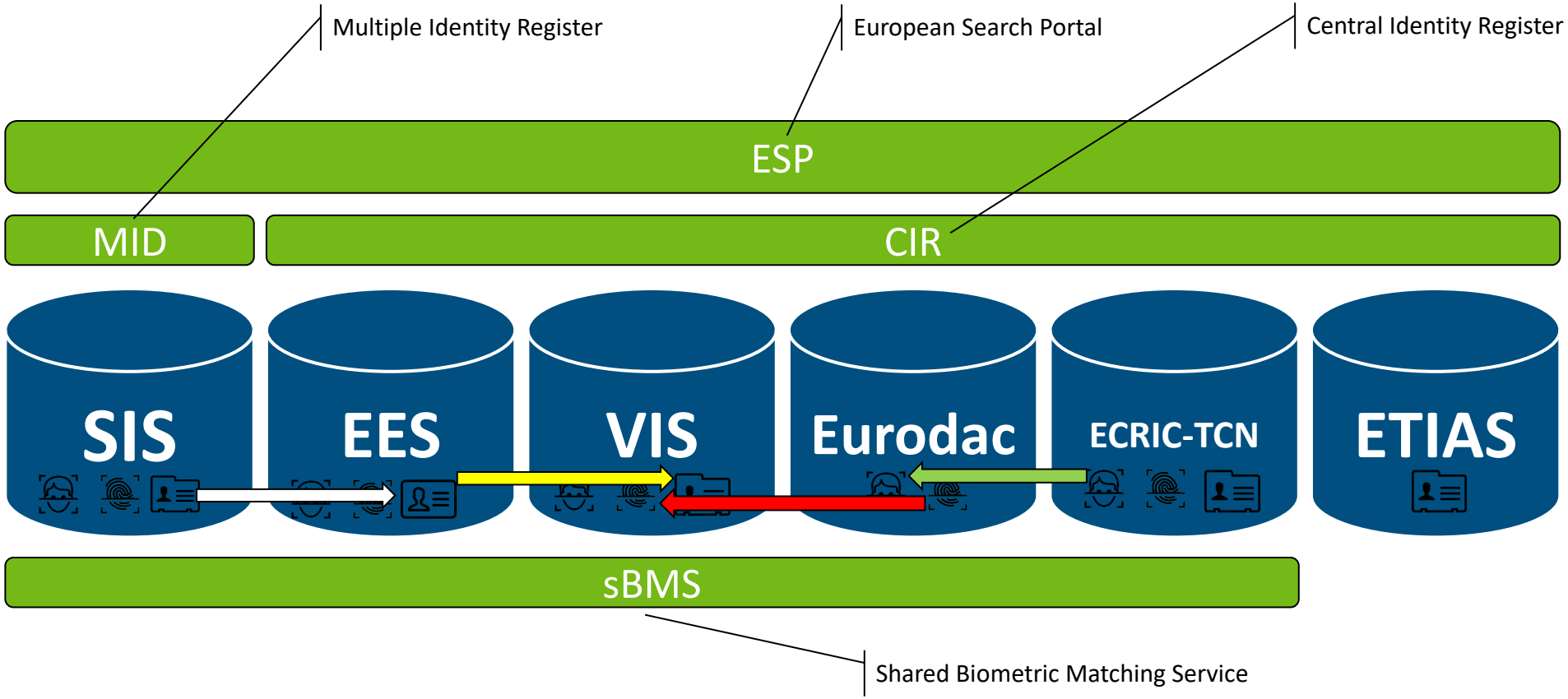
EU Regulation on Interoperability of EU Information System [1]

Interoperability virtually merges the EU information systems from a business point of view while maintaining their legal separation by providing a horizontal software integration framework.



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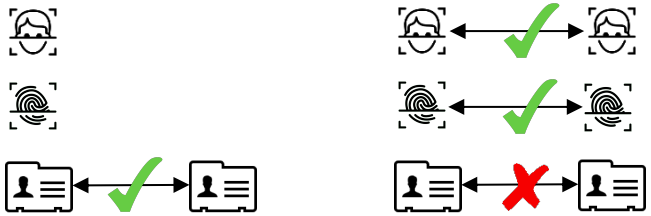
[1] Regulation (EU) 2019/817 and 2019/818

Link Colours

Yellow

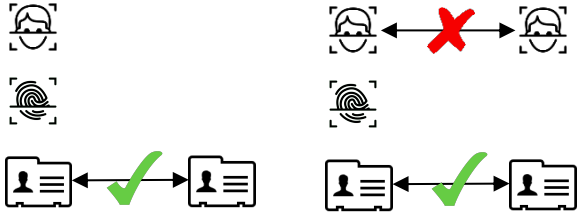
Manual verification required: The linked identities share the same data but also have similar or different data.

White



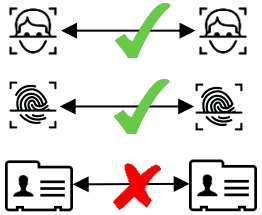
Same person (no identity fraud): The linked identities are the same persons with (partly) the same data. Different data is no identity fraud.

Green



Different person: The linked identities share (partly) the same data but are different persons.

Red



Same person (identity fraud): The linked identities are the same persons with partly the same data. Different data is identity fraud.

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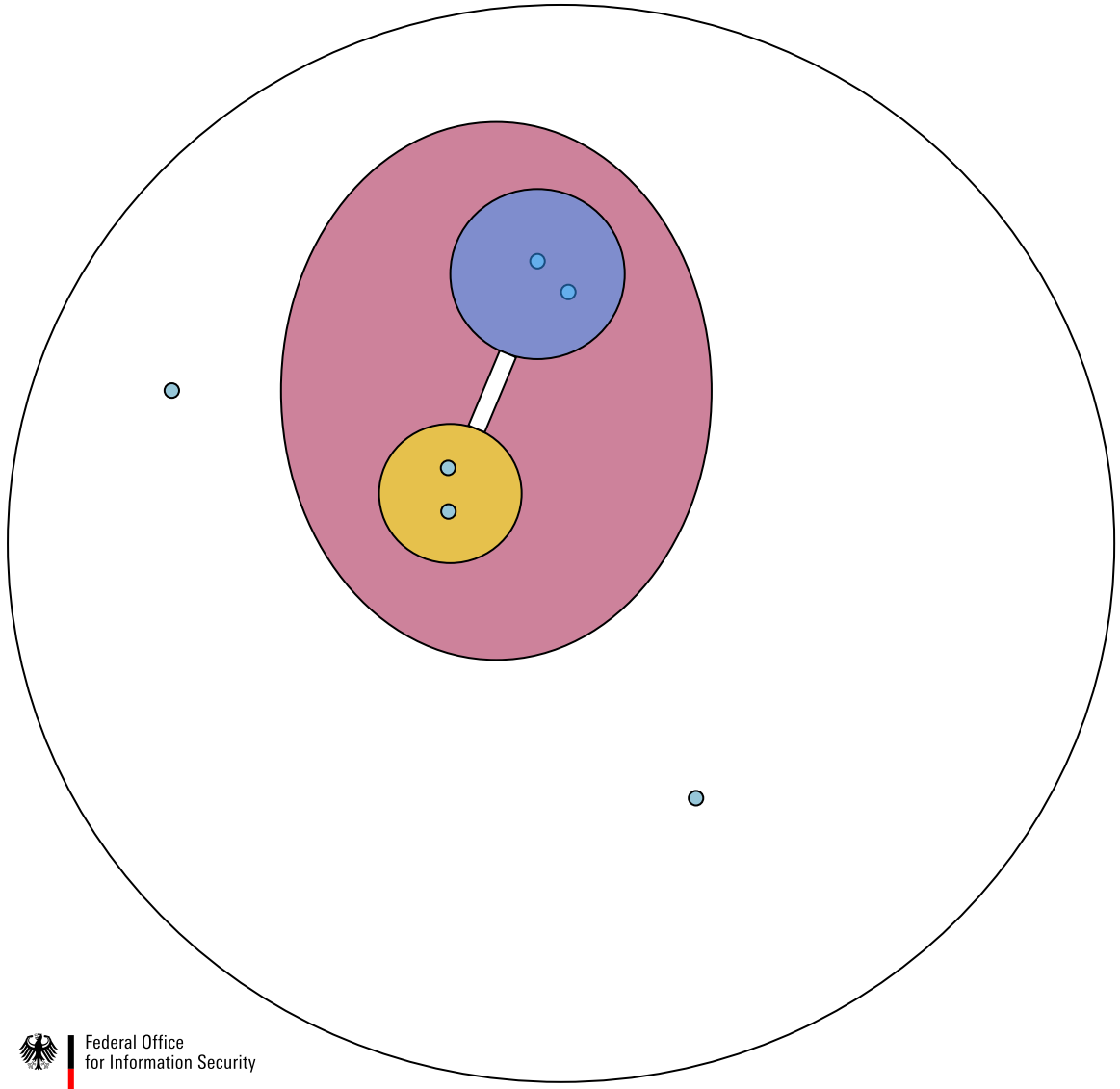
The Identity Continuum of the Interoperability Framework



Identity Continuum

Identity

Identity Group in System A

Identity Group in System B

White Link: Same Person

Individual File

The systems participating all group together identities in **identity groups** belonging to the same person.

The **individual file** is a set of identity groups belonging to the same person in different systems.

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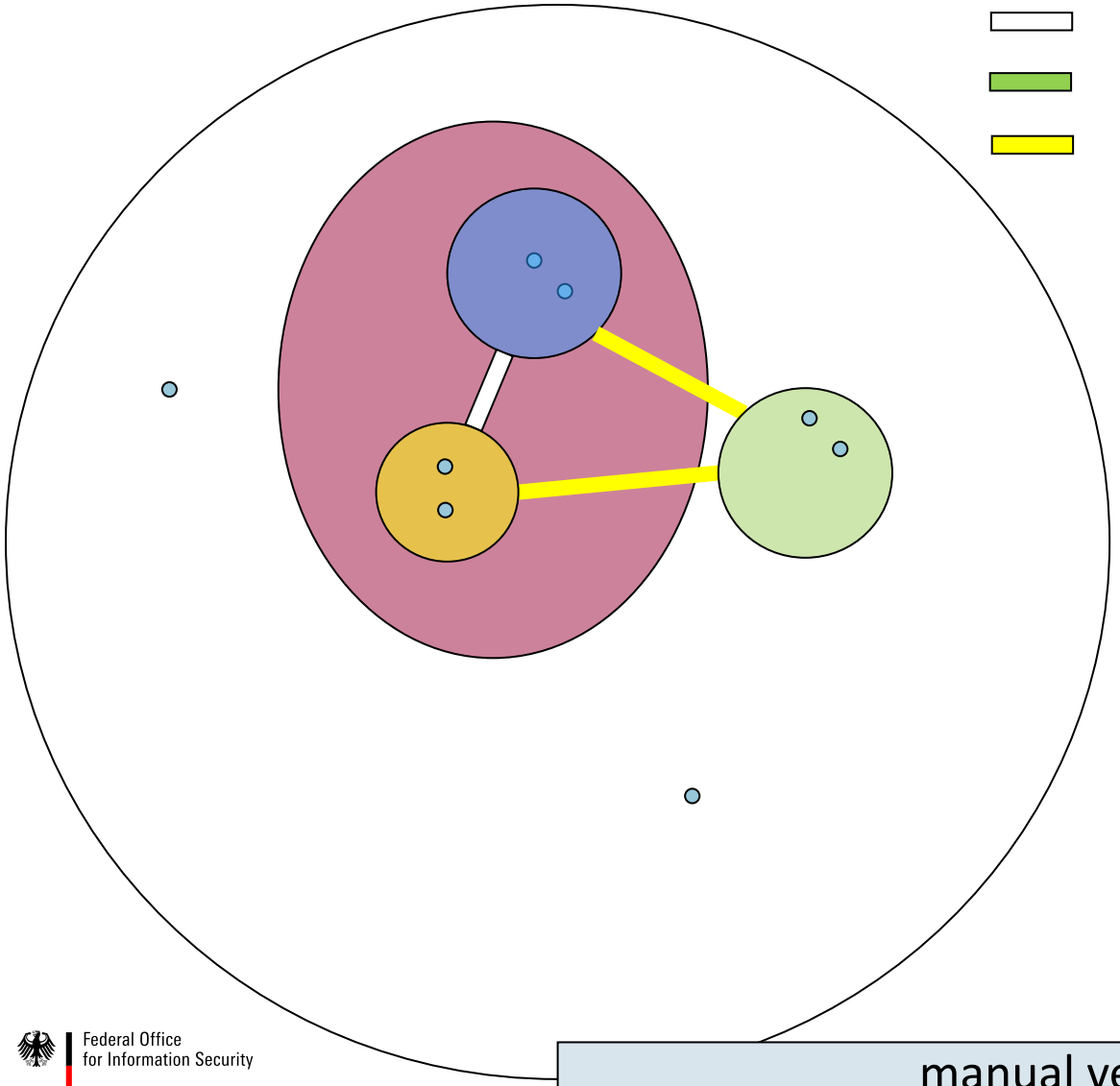
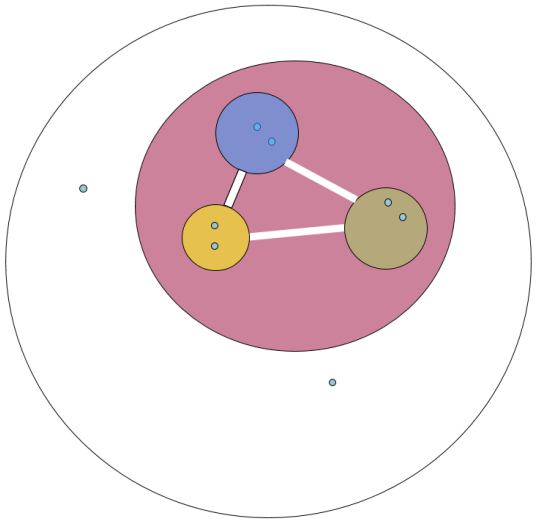
Yellow Links – Enforcing Choices

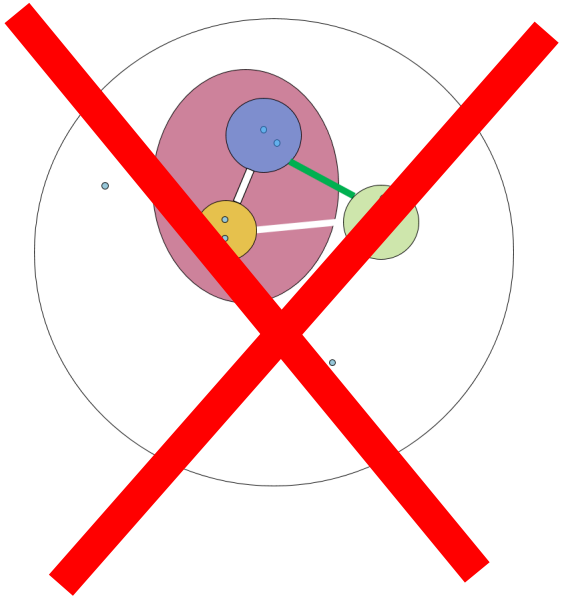
White Link: Same Person

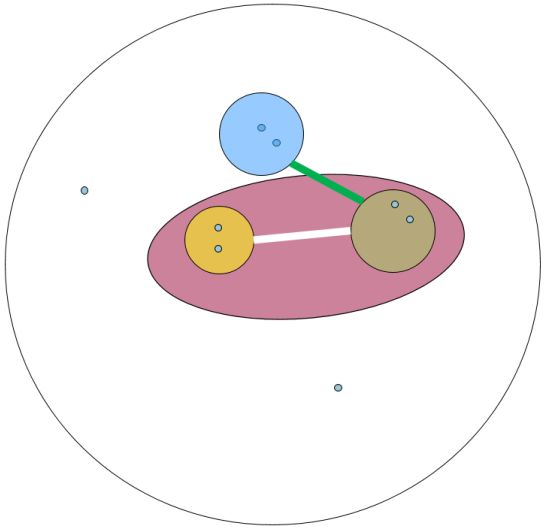
Green Link: Different Persons

Yellow Link: To be Assessed









manual verification

Current Challenges Link Management / Yellow Link Clearing

- Central/decentralized entities or a mixed approach?
- What workload will these entities have and thus what staffing is needed?
- Is there cross entity communication (national/european) necessary, if yes how?
- What skills and training do the entities need?
- Is any national legislation needed or adoption of existing legislation?
- Impact of to be defined transitive rules enforced by the framework on workflows?
- ….

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Summary

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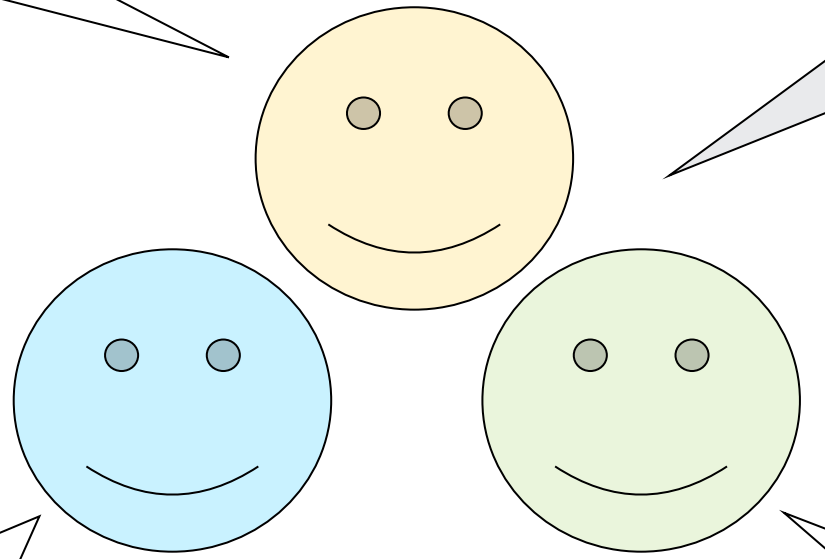
Quality of Biometric Data is essential

EES comes with a lot of challenges but we‘ll manage if we prepare carefully!



Combine processes in Workflow Engine

Think about Interoperability early

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Thank you!

Contact

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Further Reading

- Schengen Borders Code (SBC) EU 2016/399, 9 March 2016
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32016R0399
- EES amendments to SBC EU 2017/2225, 30 November 2017
  https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ:L:2017:327:TOC&uri=uriserv:OJ.L_.2017.327.01.0001.01.ENG
- EES Regulation EU 2017/2226, 30 November 2017
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R2226
- EES Regulation EU 2019/818(7), 20 May 2019
  https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32019R0818
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32019R0817
- BSI TR-03121, Biometrics for Public Sector Applications http://www.bsi.bund.de/EN/publications/TechnicalGuidelines/TR03121/BSITR03121.html