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European
Commission

Stronger and Smarter
Borders for the European Union
The Entry-Exit System

Smart Borders Pilot German Experiences

IBPC 2016
NIST, Gaithersburg
05.05.2016



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Proposal: EU ENTRY / EXIT SYSTEM (EES)

How will the system work?

EES will collect:



EES will record:



EES will replace:



To whom will it apply?

to non-EU nationals, visa-required and visa-exempt travellers in the Schengen area.





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Proposal: EU ENTRY / EXIT SYSTEM (EES)

Who is using EES data?

The **competent Member State authorities**



Border guards



Consular officers dealing
with visas

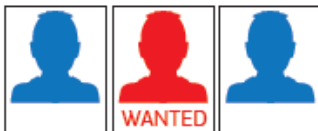
Who will be able to access data in the EES?

Member States

Law enforcement
authorities

Europol

will have access for criminal identification
and criminal intelligence



Border crossing facilitation

for all non-EU nationals



Traveller self-
service kiosk



Checks against
security databases
(SIS, Interpol SLTD)

Border control
lane

Border guard





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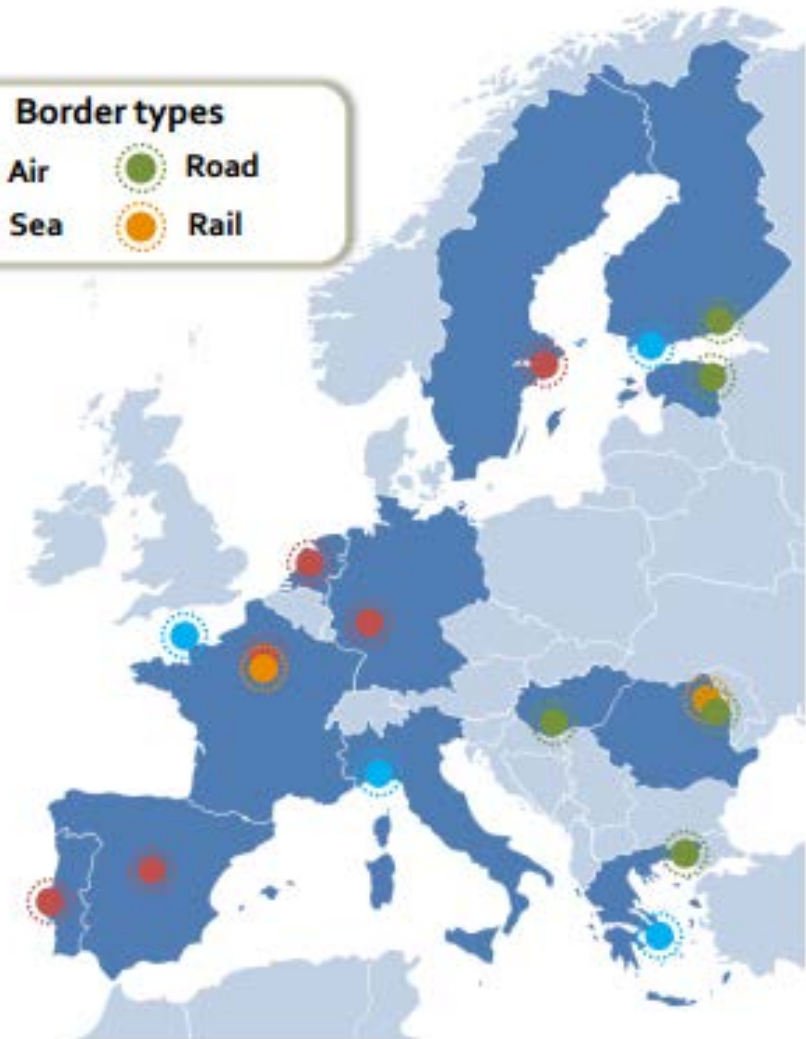


Smart Borders Pilot in 2015

Smart Borders Pilot in a nutshell

Scope	Air, sea and land borders crossing points (BCPs)
Member States	12 (DE, EE, EL, ES, FI, FR, HU, IT, NL, PT, RO, SE)
Border crossing points	18
Test cases	78 test variations
TCN travellers	58.000
Border guards involved	About 350
Biometrics	Fingerprints (FP), facial image (FI) and iris
Process accelerators	ABC gates, kiosks
Desk research	Spoofing, VIS and travel document number, we service

Border types



Focus on

- Technology state of play
- Which & “how many” biometrics?
- ABC & Self-Service Kiosks
- Operational & end user experiences



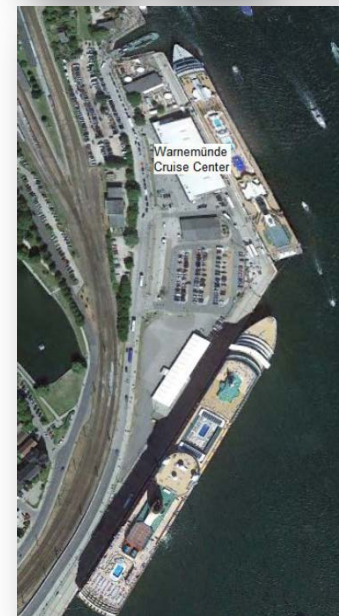
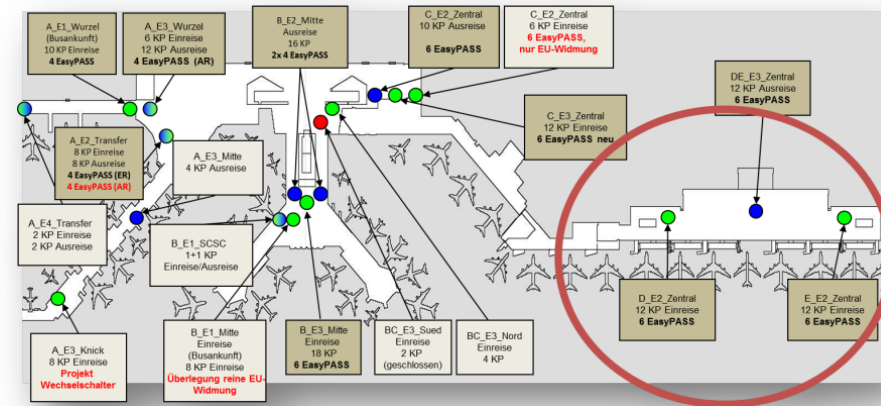
German Participation

EU Pilot

- Frankfurt Airport (FRA)
 - FP Enrolment (4 / 8 / 10 FP)
 - Automatic Border Control (ABC at Exit)

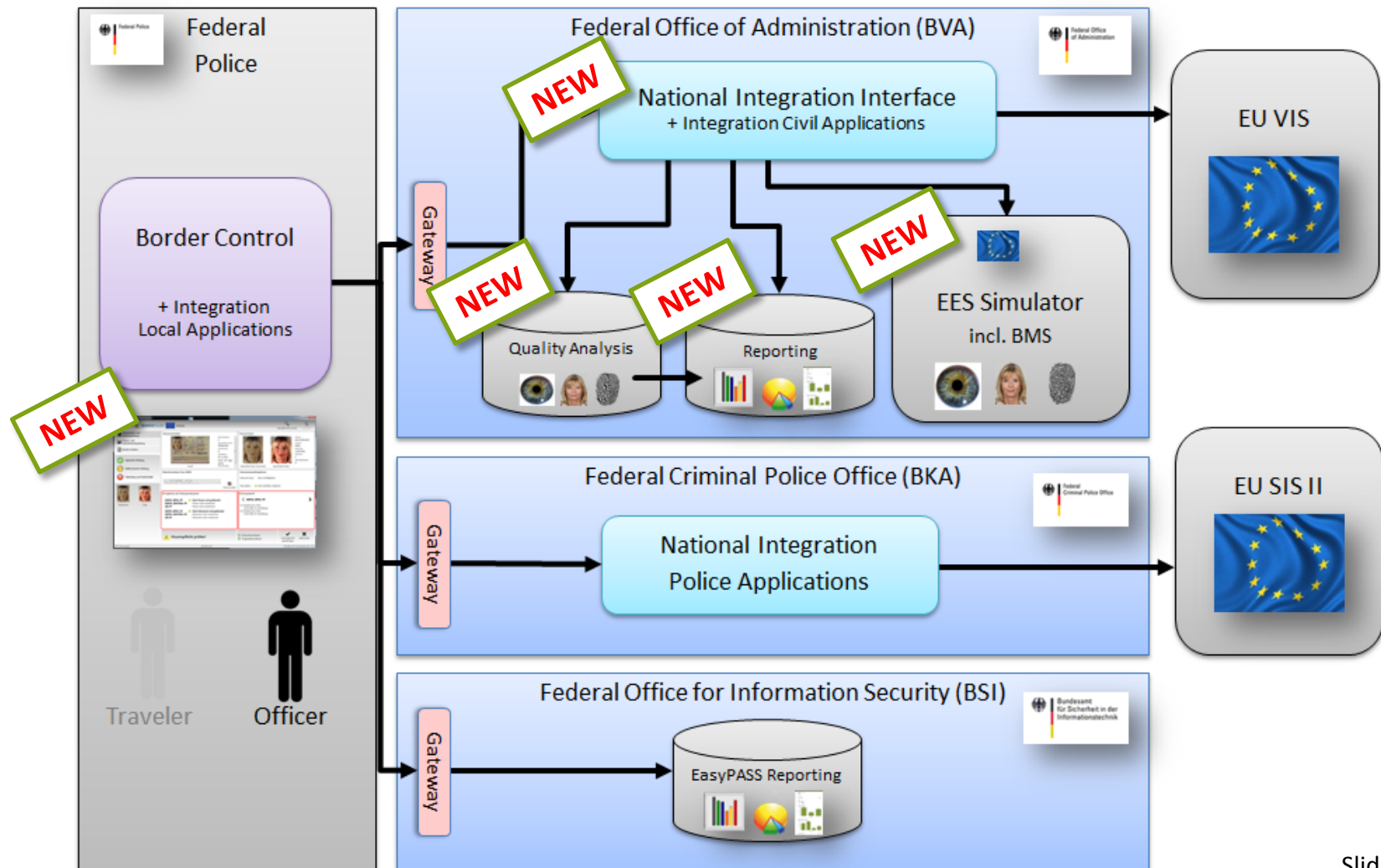
Extended National Pilot

- Additional Location: Seaport Warnemünde
- Additional Biometrics: Facial Image + Iris
- Additional Test Cases (many)
- Unique within EU pilot:
 - End-2-End Pilot (with backends)
 - Full national integration
 - Focus on **processes**





Smart Borders Pilot – National Integration





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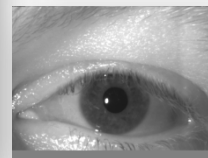
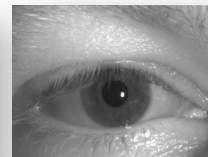
Equipment Enrolment

Morpho: „Fingerprint on the Fly“ (FOTF)



Iris ID - iCAM TD100

Crossmatch: The „new“ Guardian





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eGates at Exit



Participating TCNs

ARE, ARG, AUS, AZE, CAN,
CHL, CHN, ISR, JPN, KAZ,
KOR, MDA, MKD, MYS,
NZL, QAT, RUS, SGP, SRB,
TGO, THA, TJK, TUR, TWN,
USA, VEN

Allowing TCNs to use ABCs during Exit

Bundesverwaltungsamt
Der zentrale Dienstleister des Bundes



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Video

(5 min)



Various findings on Smart Borders

- Lessons Learned on
 - Duration & Quality of data
 - Architecture & Organization
 - New Technologies & Biometrics
- Eu-LISA Pilot Report
- German Pilot Report
 - In addition to eu-LISA report
 - in english





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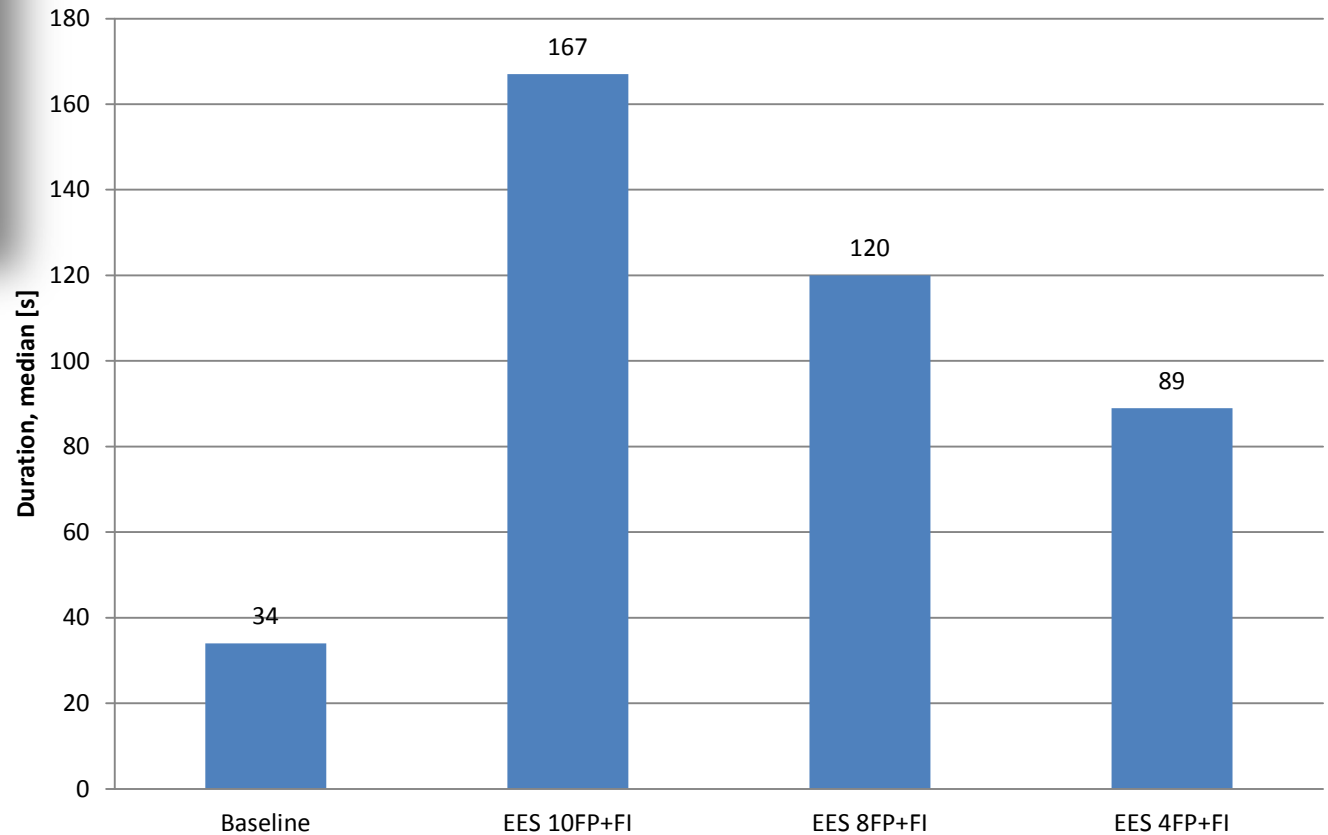
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Duration



Duration First Entry for Visa Exempt





Duration Distribution

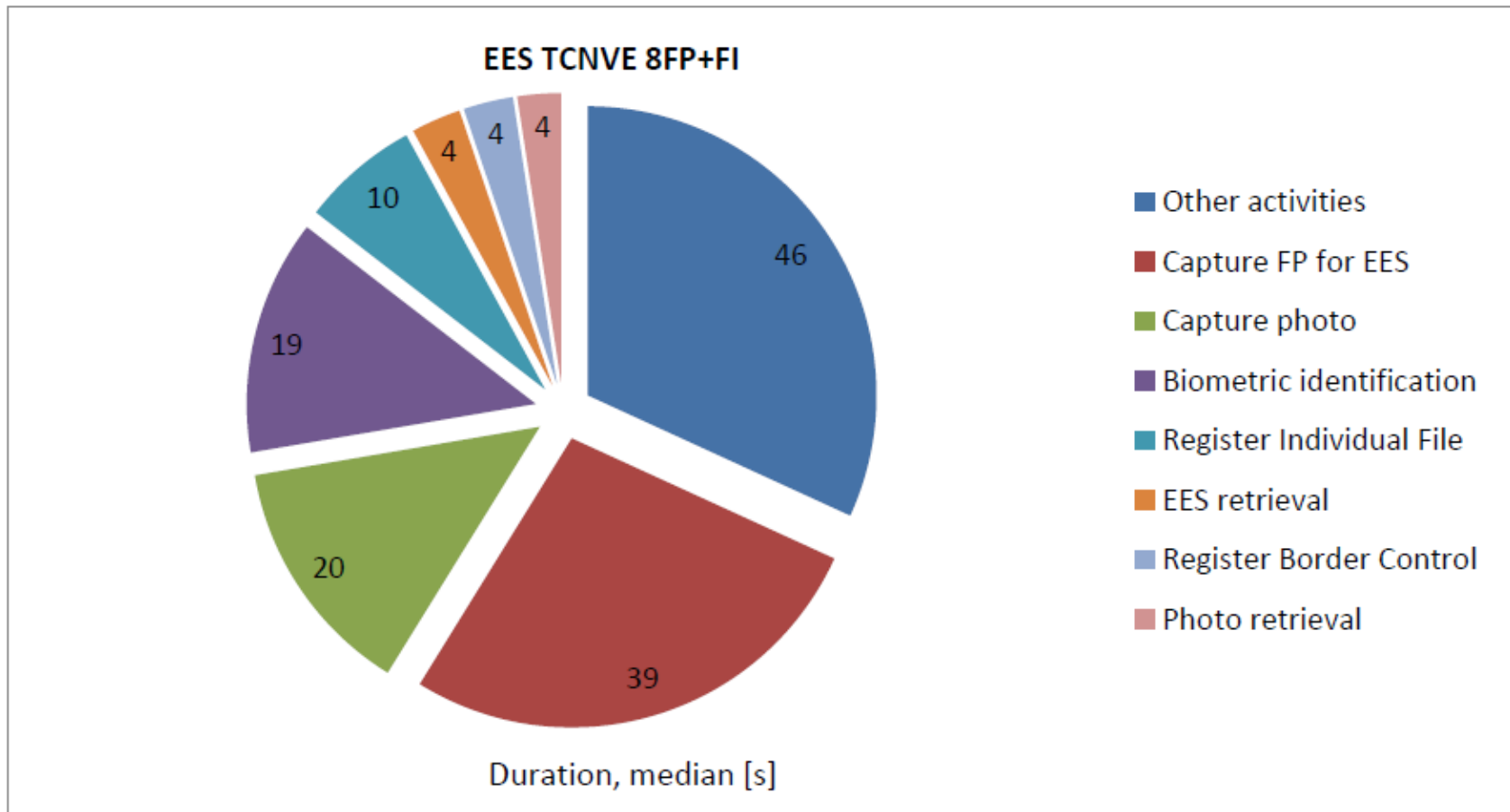
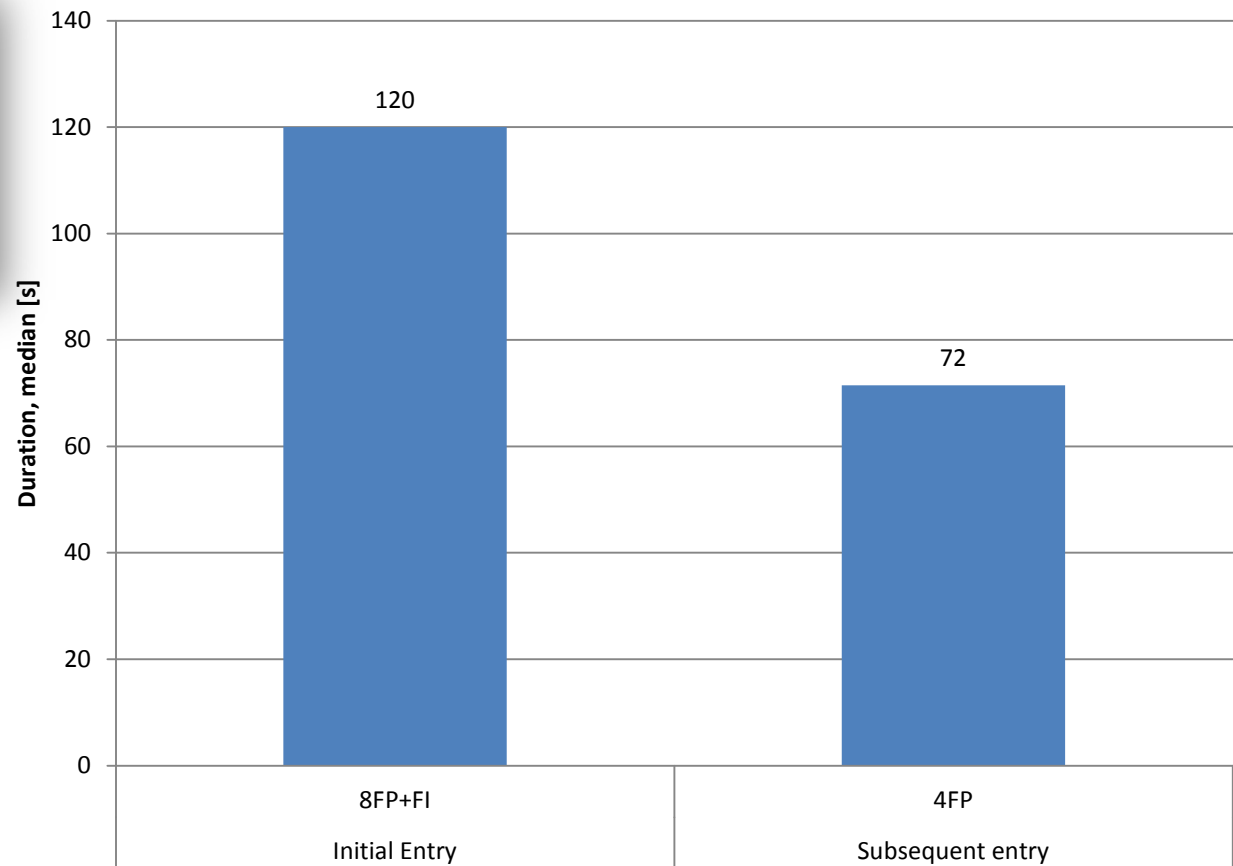


Diagram 7: Duration of the single steps of the border control process for TCNVE, entry, capture of 8 fingerprints, eu-LISA final threshold

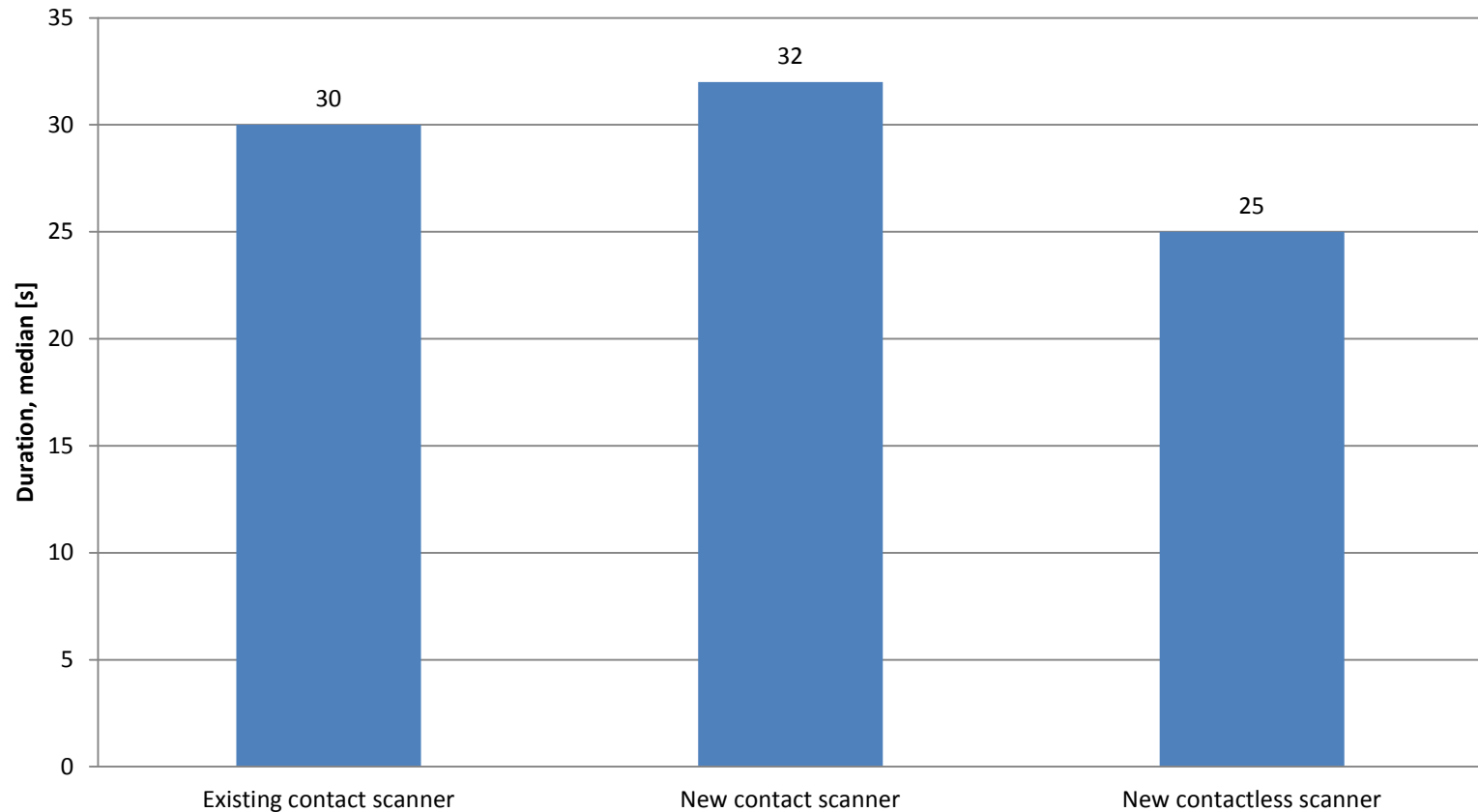


Duration: Example Subsequent Entry





Duration: Distribution per Scanner





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Fingerprints



Quality Assessment NFIQ

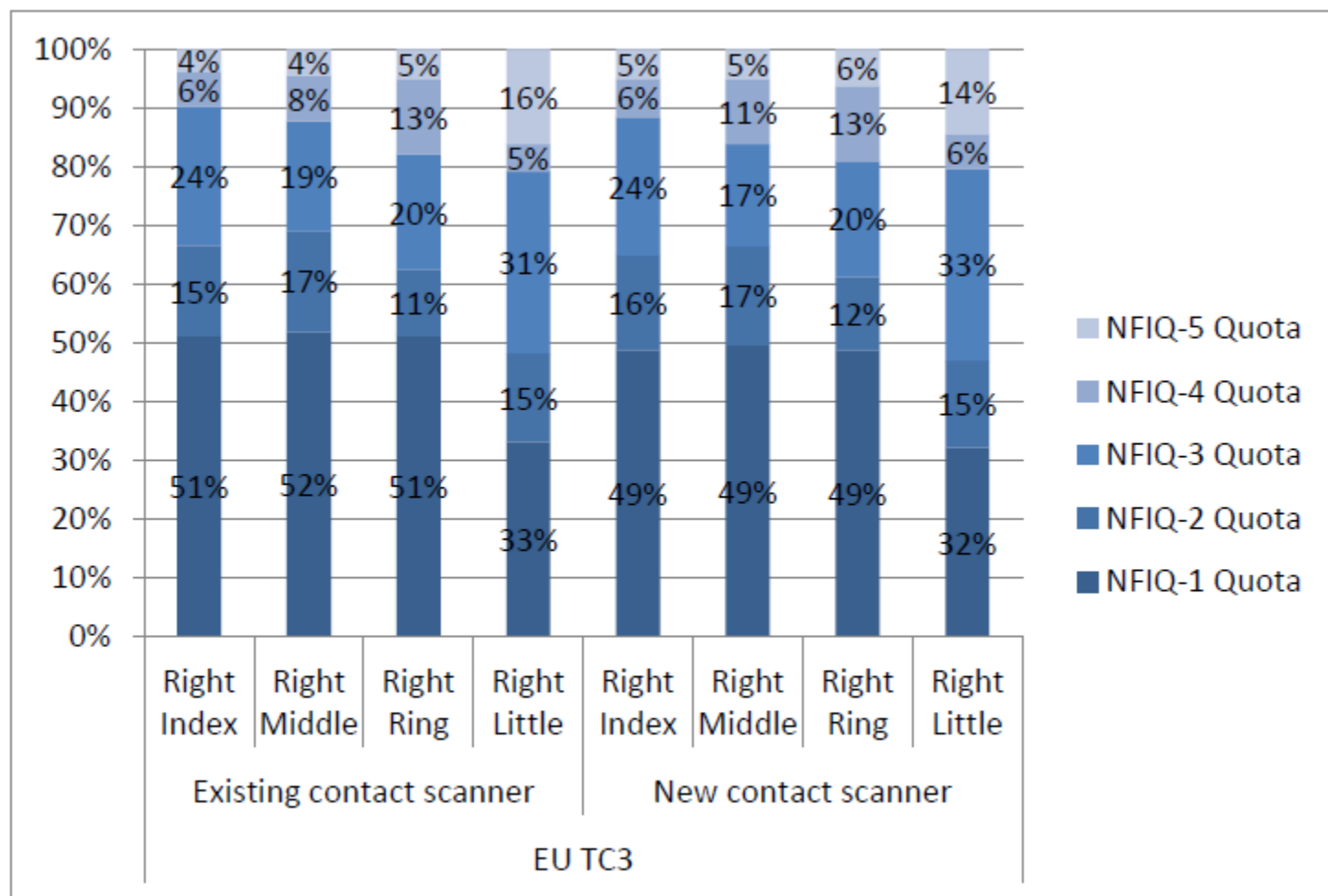


Diagram 39: TC 3 - Distribution of NFIQ scores for fingers of right slap for each used scanner



Quality Assessment NFIQ2 (beta)

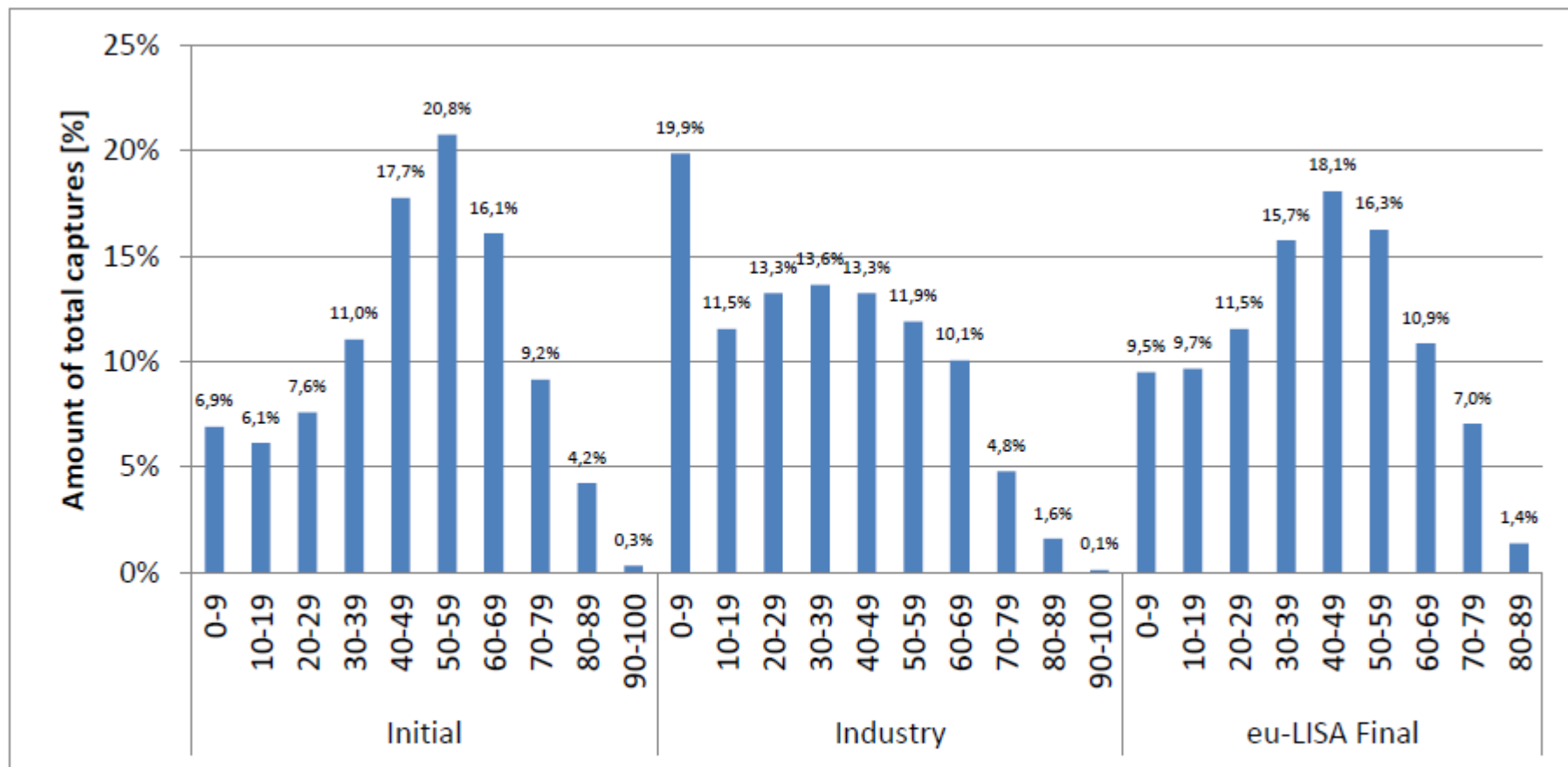
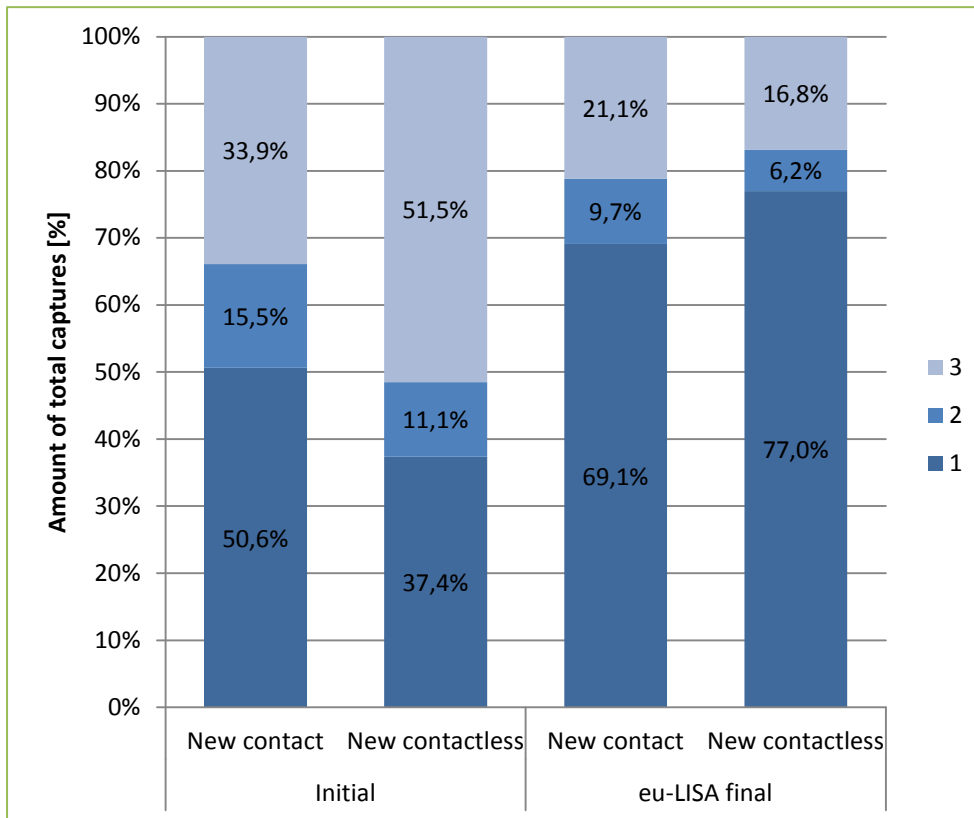


Diagram 44: NFIQ 2 beta evaluation for captured fingers using the new contact scanner and different threshold configurations



Quality: Time vs. Threshold



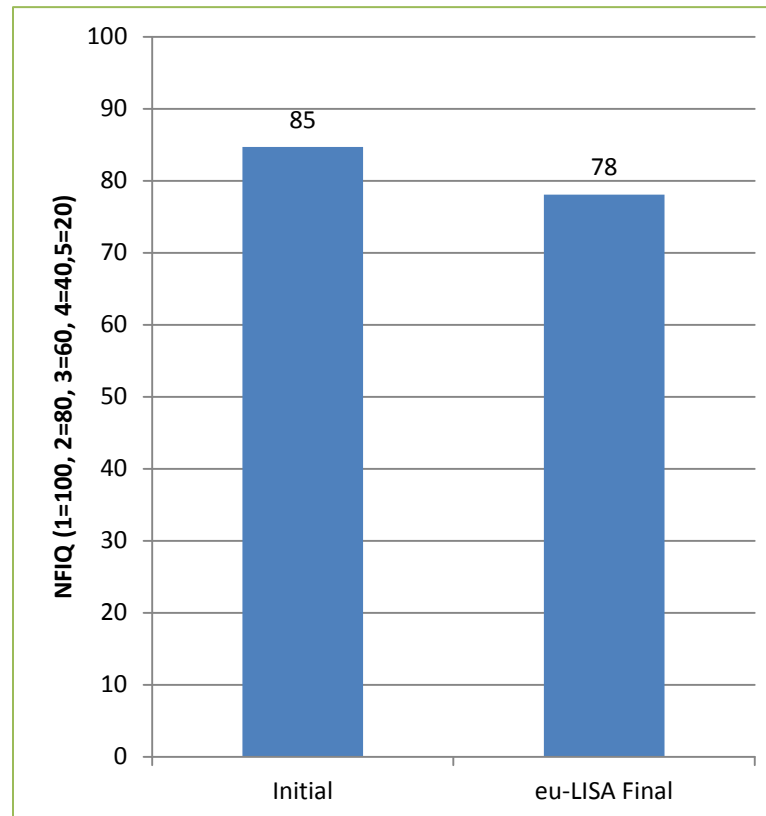
Distribution of the capture count depending on scanner type & quality threshold

- Start with high quality threshold “Initial”.
BUT number of retries were too high
- ONLY used auto-capture by device for interim period.
THAT was quick, but not comparable with rest of EU
- Compromise: “eu-LISA final”
Reduced threshold
Number of retries “feasible”



Quality: Time vs. Threshold

- Quality loss by reducing threshold is measurable BUT adequate
- Recommendation: accept lower quality and optimize time wise



Distribution of fingerprint quality depending on quality thresholds



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Face & Iris



Live Capturing of Facial Image



- In general quality positive
- Sometimes not sharp, too close etc.

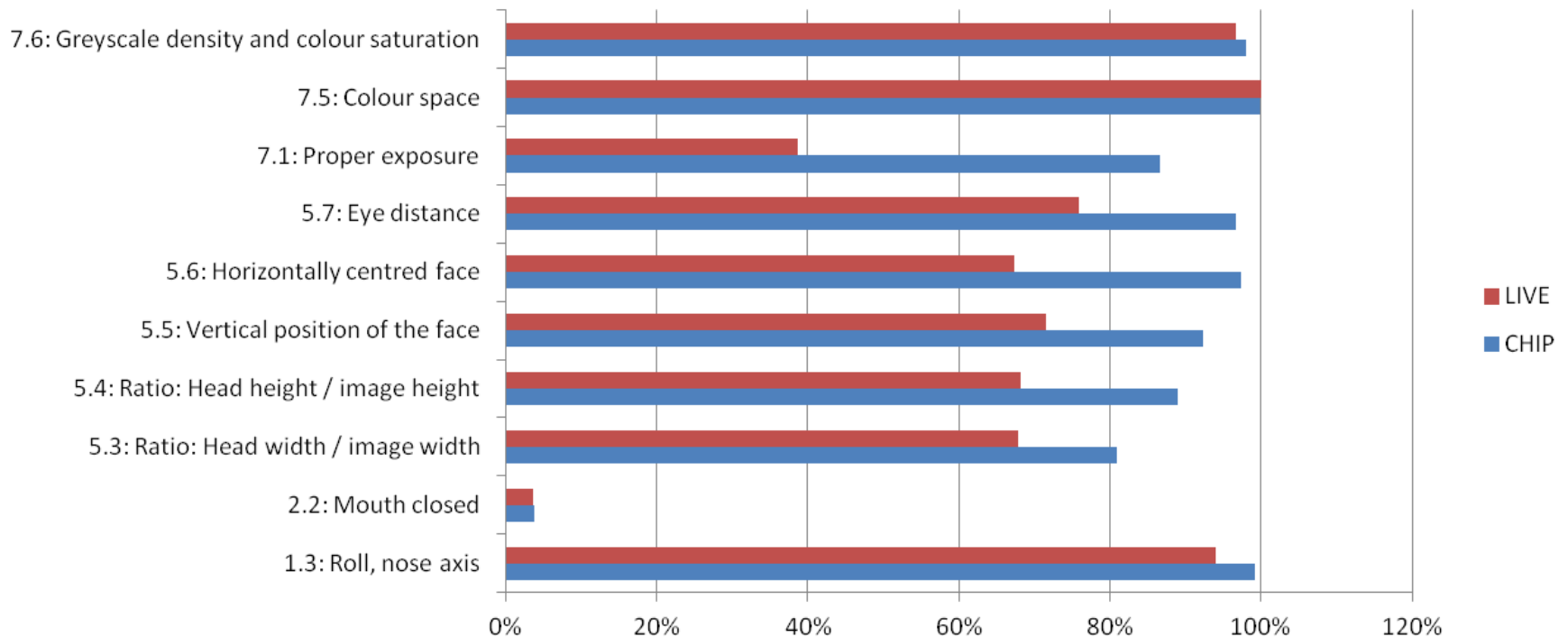


- Changes to infrastructure
- Handling of camera



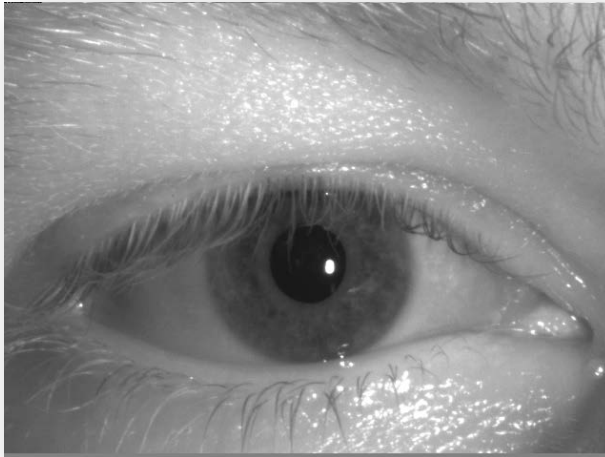
Quality: „chip“ versus „live“

Percentage in Range: Quality Attributes of Chip and Live Images

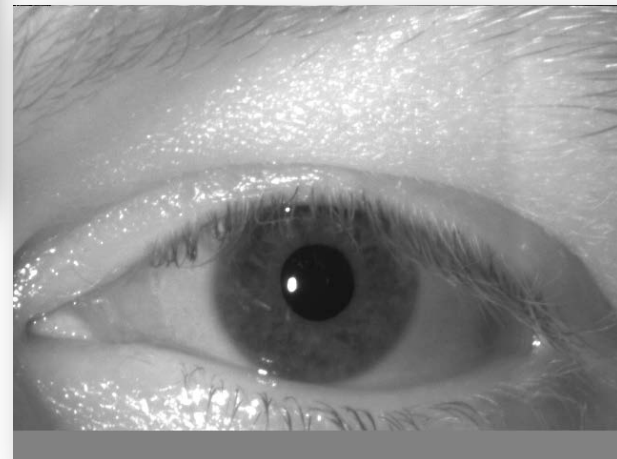




Iris



- Positive
- Very robust to environment conditions





Quality Assessment Iris

Quality Feature	Adequate quality (score ≥ 50)	Excellent quality (score ≥ 75)
Usable iris area	95,29 %	47,13 %
Pupil contrast	99,36 %	41,30 %
Pupil shape	99,87 %	99,87 %
Image sharpness	96,96 %	82,61 %
Iris dilation	7,97 %	0,13 %
Gaze angle	97,09 %	84,96 %

Table 22: Distribution of quality scores for assessed iris images



German Report: Findings & Requirements



- Maximum of available biometrics
(*“10fp or 8fp in combination with other”*)
- Biometric-driven – not passport-driven
- “Crossover” – architecture (EES, VIS ...)
- Long retention period (5 years like VIS)
- ...
- De-Duplication for 1st line
- Biometric Enrolment:
Reduce threshold, but take *“as much as possible”*

....many more (in the report)



National Plans for 2016



German Smart Borders Pilot –Part Two
Integration of Self-Service-Systems
Adapting to new EU COM Proposal



EU level:
Negotiation / Design

... and move towards a better integration



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Thank you for your attention!

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