

Users-Centric Design: introducing remote usability evaluation in mobile implementations

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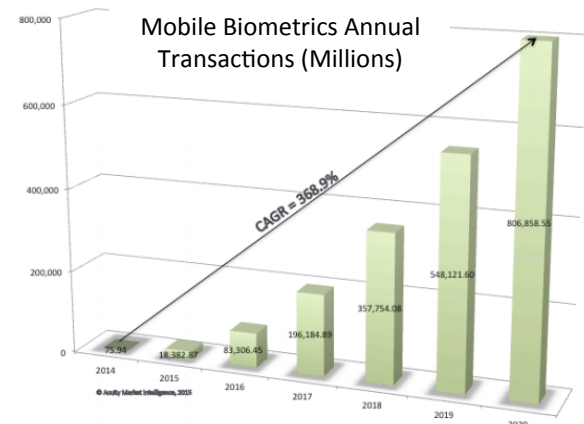
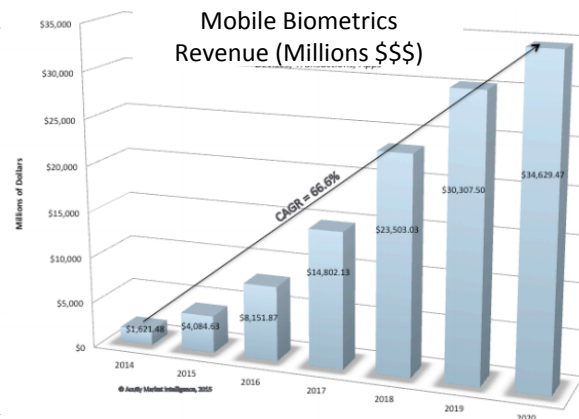
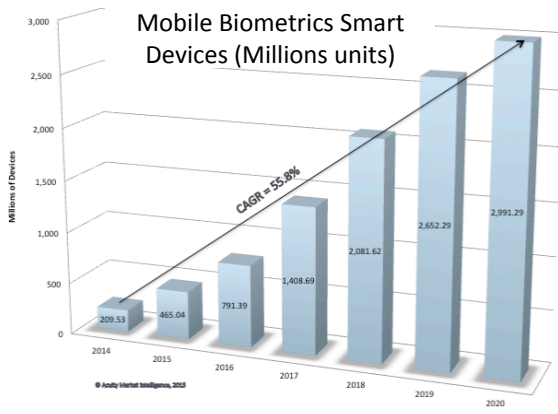
1. Introduction to mobile biometrics
2. Usability and biometric interactions
3. Remote usability evaluation tools for mobile biometrics
4. Evaluation experimentation within the PIDaaS project
5. Conclusions

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To the biometrics community:

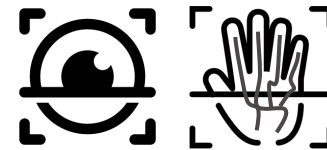
Biometric smartphones are officially MAINSTREAM

Congratulations



FACTS:

- more than 200 new biometric smartphone models released last year

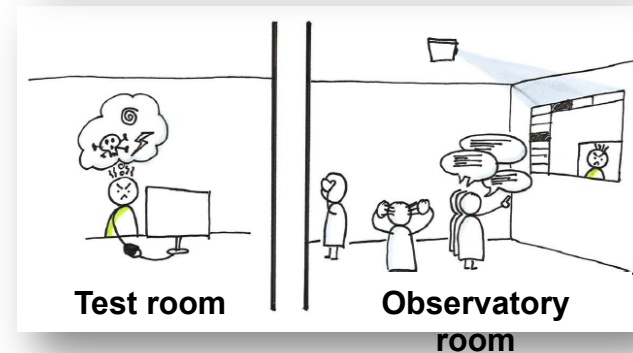
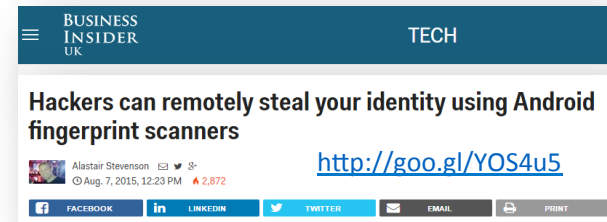


- 600 millions biometric smartphones currently in use (28% share of the global market)
- Smartphones as the defacto Personal Authentication Device
- 83.000.000.000 of biometric transactions forecasted for 2016

Presentations attacks (spoofing)

System security (hacking)

Usability



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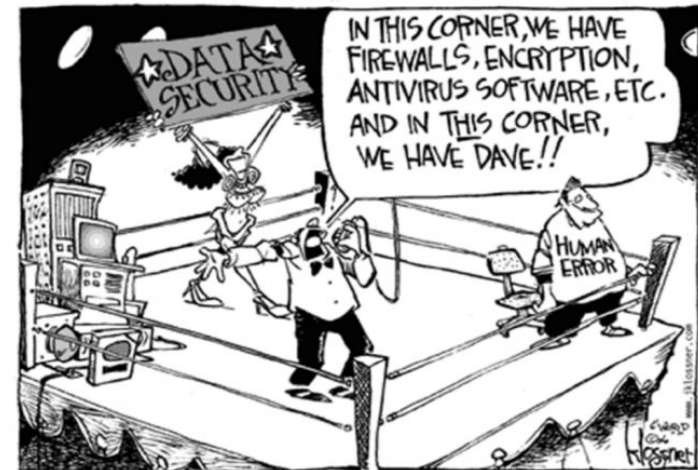
Usability:

“The **extent** to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use”

(ISO 9241-11)

Biometric interactions:

Biometric system performances are influenced by how humans interact with and use the biometric devices, which can lead to potential security risks.

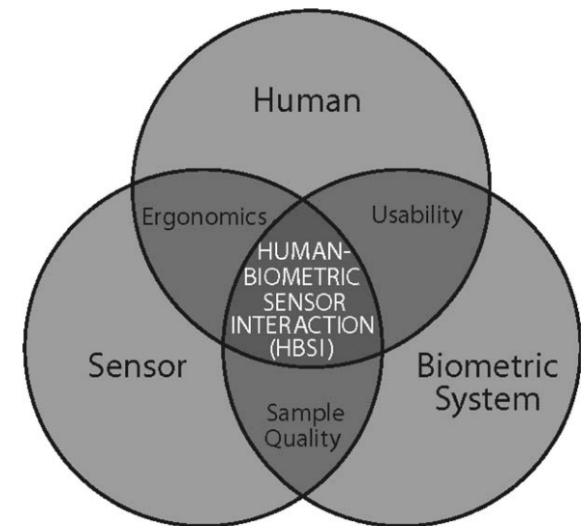


Human beings interacting with:

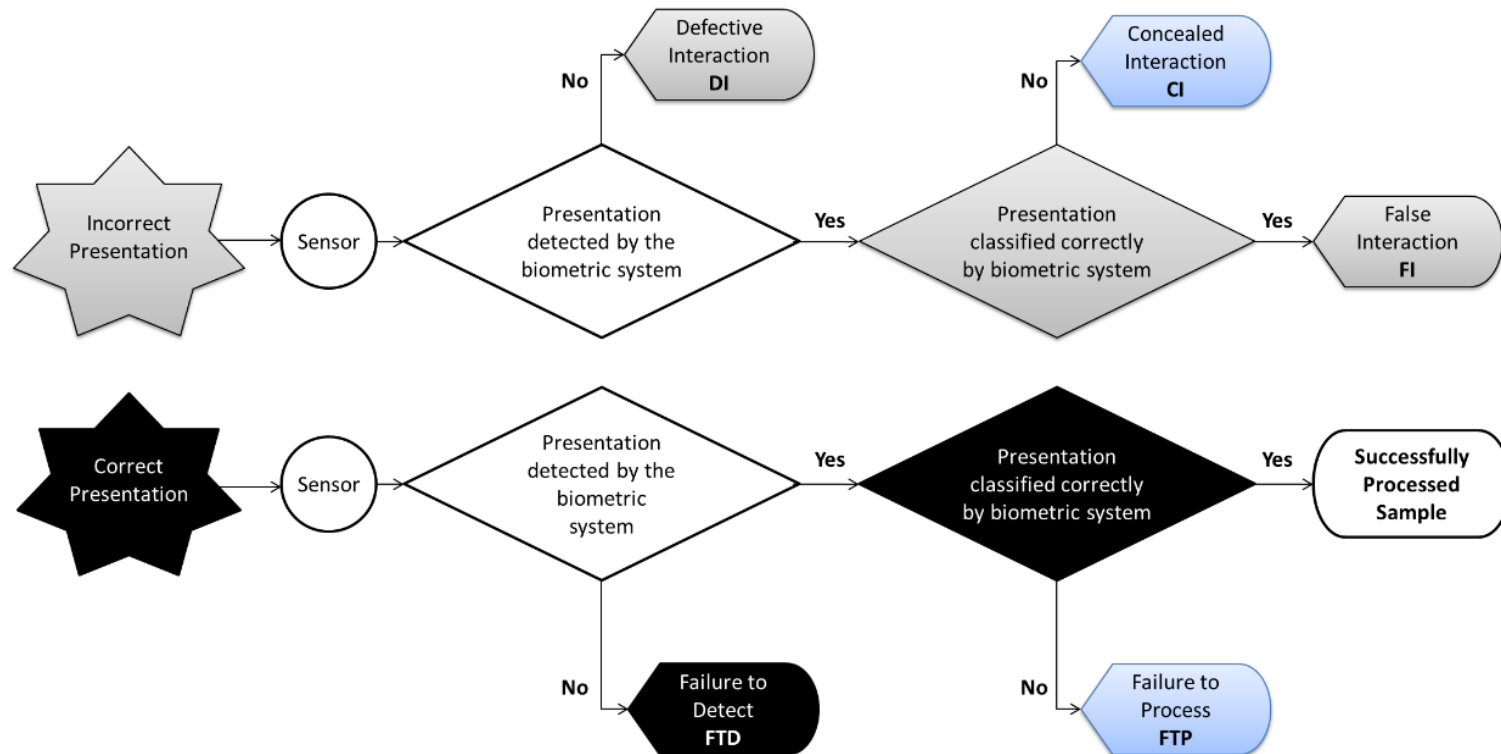
- many biometrics smart device models
 - Different dimensions
 - Different sensors
 - Different positions
- many biometrics smart devices user interfaces
- in many environmental conditions
- and from many different group populations

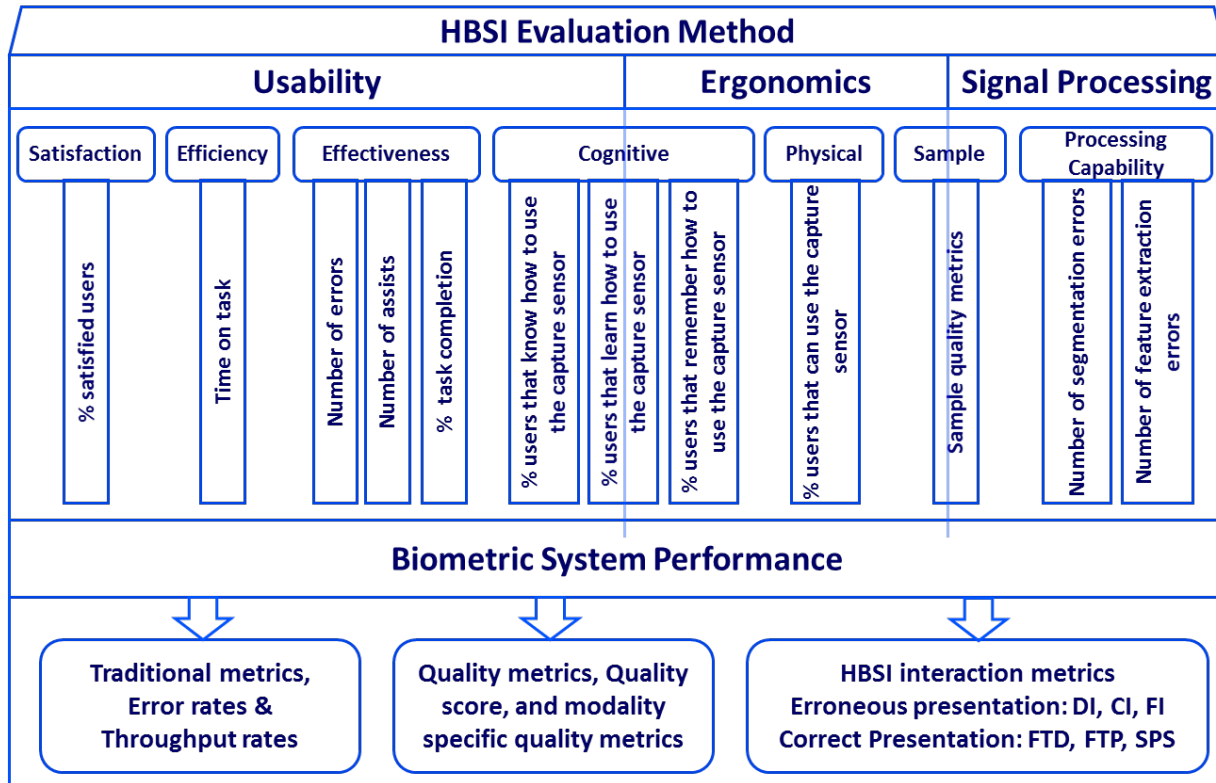


- The **Human-Biometric-Sensor Interaction (HBSI)** framework has been designed to assess the usability and the influence of human interaction on biometric system performance.
- The HBSI framework allow to answer **usability questions** as:
 - How do users interact with biometric devices?
 - What are the most common errors or issues that users face?
 - How those errors impact on the biometric performance?
 - Why do users continually make these interaction errors and how do we prevent or avoid them from happening?
 - What level of training and experience is necessary to successfully use biometric devices?
 - How satisfied are the users with the system?



HBSI presentation classification





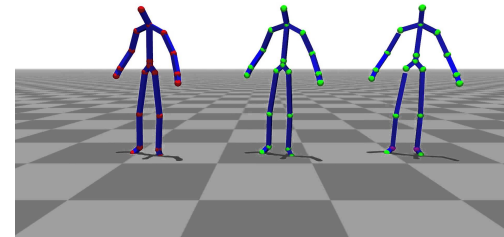
Semi automatic video record labelling:

- Inclusion of Kinect V2 sensors during the video recording for automatic labelling
- Real time HBSI interaction labelling



Limitations:

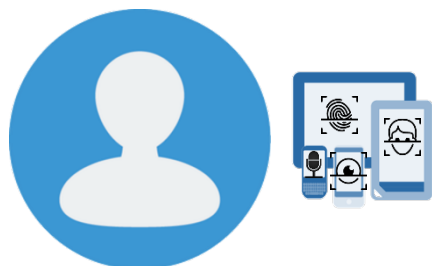
- Participants have still come to the lab
- tested under controlled environments
- Limited devices/conditions



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Mobile Biometrics Interaction Evaluation Framework

Participants



Online questionnaires



Before the experiment:

- Demographics
- Previous experience
- Previous impressions
- Preferences

Mobile Analytics Tools



- How, what and when the user do within the app

- Biometrics samples
- Sample quality information
- Segmentation

Biometrics system log



- Correct/Incorrect presentations.
- Common problems/mistakes

Participant's feedback



FEEDBACK

how was the service?

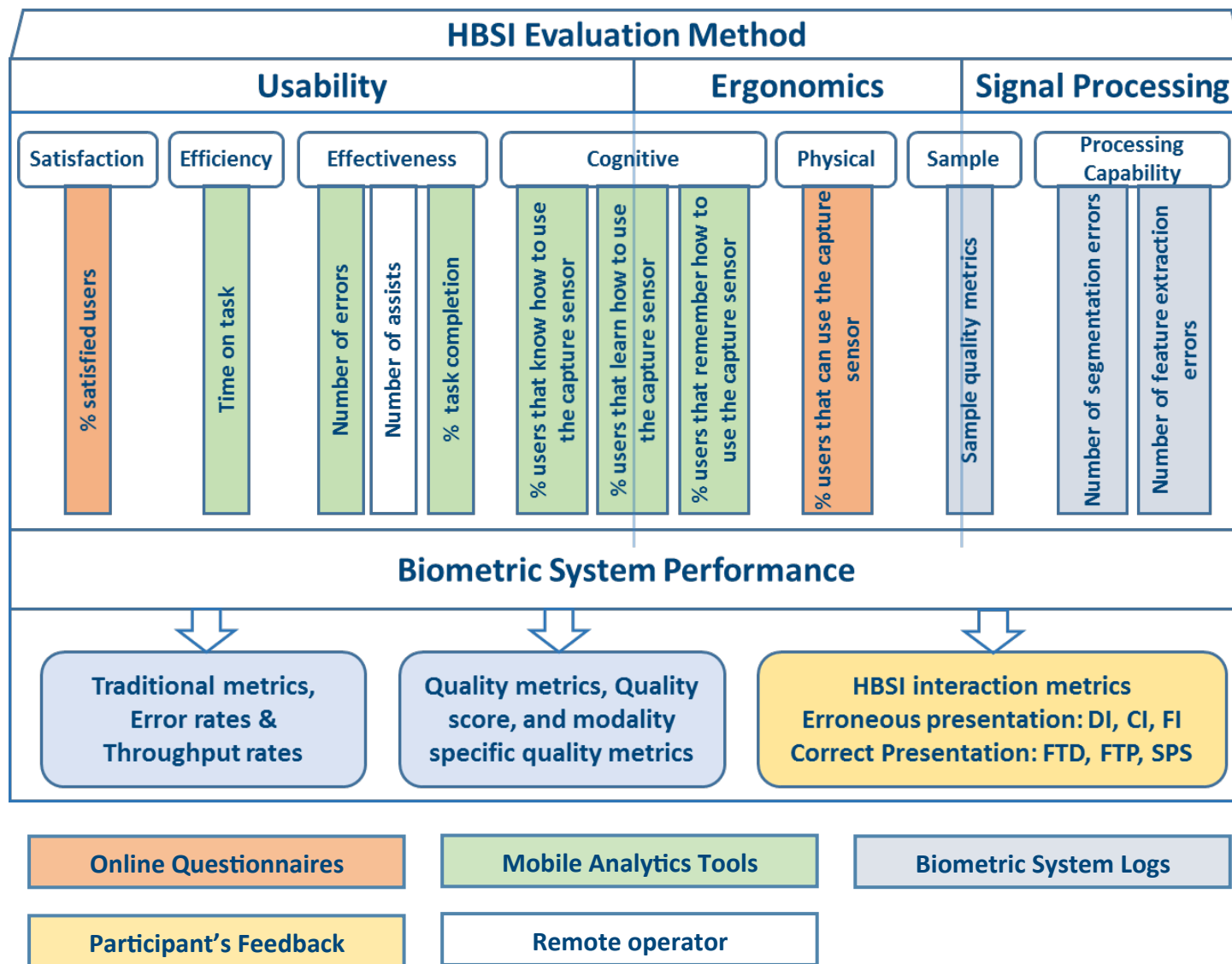
CORRECT

INCORRECT

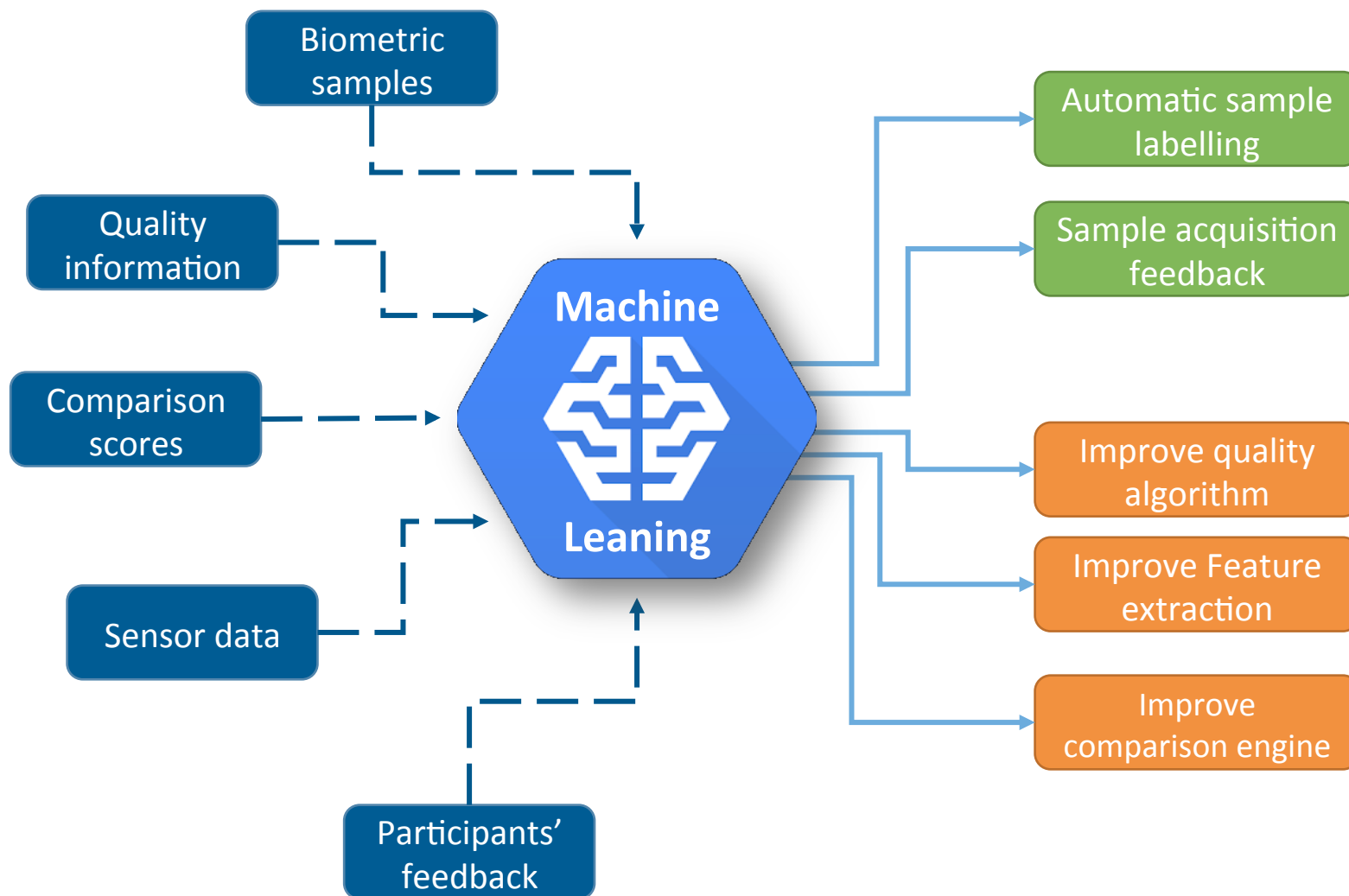
Other

- HBSI presentation metrics:
 - DI, CI, FI, FTD, FTP, SPS

Mobile Biometrics Interaction Evaluation Framework



Mobile Biometrics Interaction Evaluation Framework



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Mobile Biometrics Interaction Evaluation Framework

- PIDaaS (Private Identity as a Service) is a European Union Competitiveness and Innovation Framework Programme Project.
- Objective: Exploiting traditional biometric technologies and platforms for identity management to create an innovative **mobile service** based on **voice and face biometric** and **template protection** schemes.
- 8 partners in six member states:



- 30 month project – July 2014 to December 2016
- The University of Kent is evaluation the usability of the platform using the HBSI framework.

PIDaaS Usability Evaluations

Phase 1



Phase 2



Phase 3

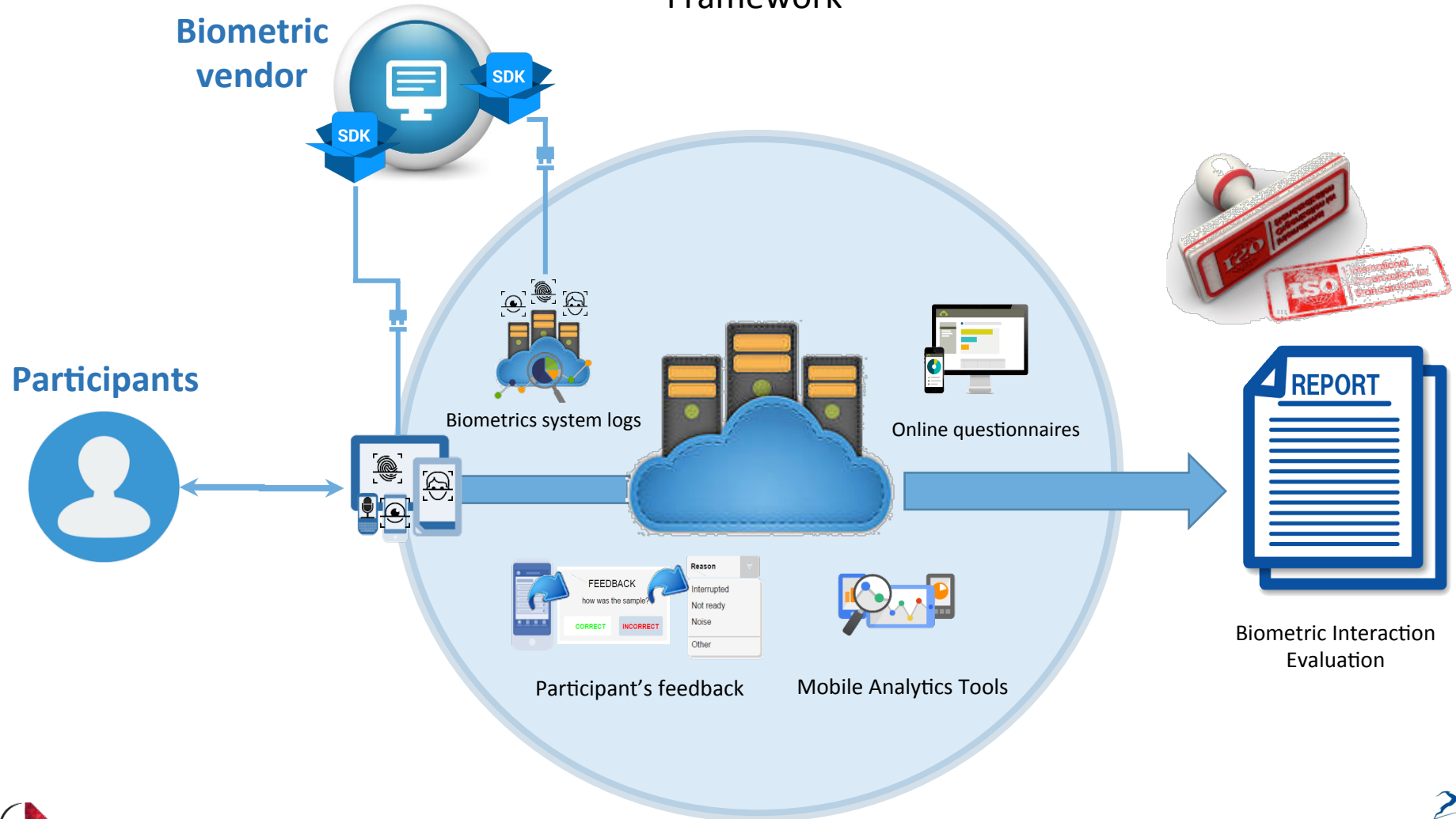


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- A remote HBSI evaluation framework has been proposed to tackle some of its current limitations.
 - Incorporate proactively the participants into the usability evaluation
 - Obtain realistic data of how the participants interact with the biometric implementations outside evaluation laboratories
 - Store all the data (surveys, mobile analytics, sensors, biometric system logs) in a structured format in order to automatize its analysis.
 - Use the data collected to improve user's feedback and biometrics algorithms

Remote Evaluation Mobile Biometrics Interaction Framework

Remote Evaluation Mobile Biometrics Interaction Framework



Thanks for your attention

Any questions?

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