



Testing Laboratory Interactions for Evaluating Biometrics

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Outline

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- Introduction
 - Accredited Evaluations
 - Quality Assurance in Evaluations
- Evaluations in Biometrics
 - Is there any difference from other product evaluations?
- Proposals for Interoperable Evaluations
 - Conformance
 - Performance
- Conclusions and Future working lines



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Conclusions

- Nowadays most of products can be certified to comply with certain rules
- In order to be accepted, those certifications should either:
 - Follow a defined and recognized scheme
 - Being issued by accredited laboratories that evaluate those products following **ISO 17025**, and **all relevant international standards**
- Main advantage in using an accredited laboratory is that they provide evaluations that are:
 - Interoperable
 - Traceable
 - Repeatable
- i.e.: a certificate issued by an accredited laboratory shall be accepted by any other certification scheme



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- An accredited laboratory, in order to maintain its accreditation shall demonstrate periodically its technical capability and **evaluation quality**
- For keeping evaluation quality, a lab shall:
 - Maintain all tools **calibrated**
 - Perform **auto-analysis**, i.e. repeat an evaluation and reach the same results
 - Perform **intercomparisons** with other laboratories, i.e. the same test is given to another laboratory, as to see if they reach the same result.



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- There are currently few Labs that carry on Evaluations of Biometric products
 - As soon as Society, Industry and/or Administrations start requesting certified products, there will be the need of more labs to start business
- Several types of evaluations can be carried out in Biometrics, among them we can find:
 - Conformance Testing
 - BioAPI Conformance (ISO/IEC 24709-x)
 - Data format Conformance (ISO/IEC 29109-x and rev.19794-x)
 - Performance Testing (ISO/IEC 19795-x)
 - Technology Evaluations
 - Scenario Evaluations
 - Operational Evaluations
 - Security
 - Following Common Criteria



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- So far, Biometrics do not seem to present much of a difference from other technologies
 - We currently have published standard that can be used as the basis for the certification
- Unfortunately there are major differences that make it difficult to have Accredited Labs for Biometrics
 - Testing databases are not interchangeable
 - Previous experiences have shown that the same algorithm can perform differently depending on the database used
 - Data protection laws difficult the exchange of biometric data in many countries
 - Variability in human properties make it difficult to create “standard databases”
 - Scenario and operational evaluations require end-users to act
 - Data sets will be different for auto-analysis and intercomparisons.
 - As it is a rather new technology, there are not certified tools to be acquired
 - Some of such tools could be Test-DBs



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So, what can we do?



Interoperable Evaluations

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- **Conformance Evaluation:**
 - Problems arise with intercomparisons in Data Format Conformance
 - Two approaches:
 - Send the data records to be analyzed by the other laboratory
 - Serious agreements between the labs as to comply with both, data protection laws and audit requirements
 - Use a certified conformance testing program
 - Is there any available?
- **Scenario and Operational Evaluations:**
 - A really difficult point:
 - Not possible to exchange the “data set”
 - Not even possible to “save” the “data set” used



Interoperable Evaluations

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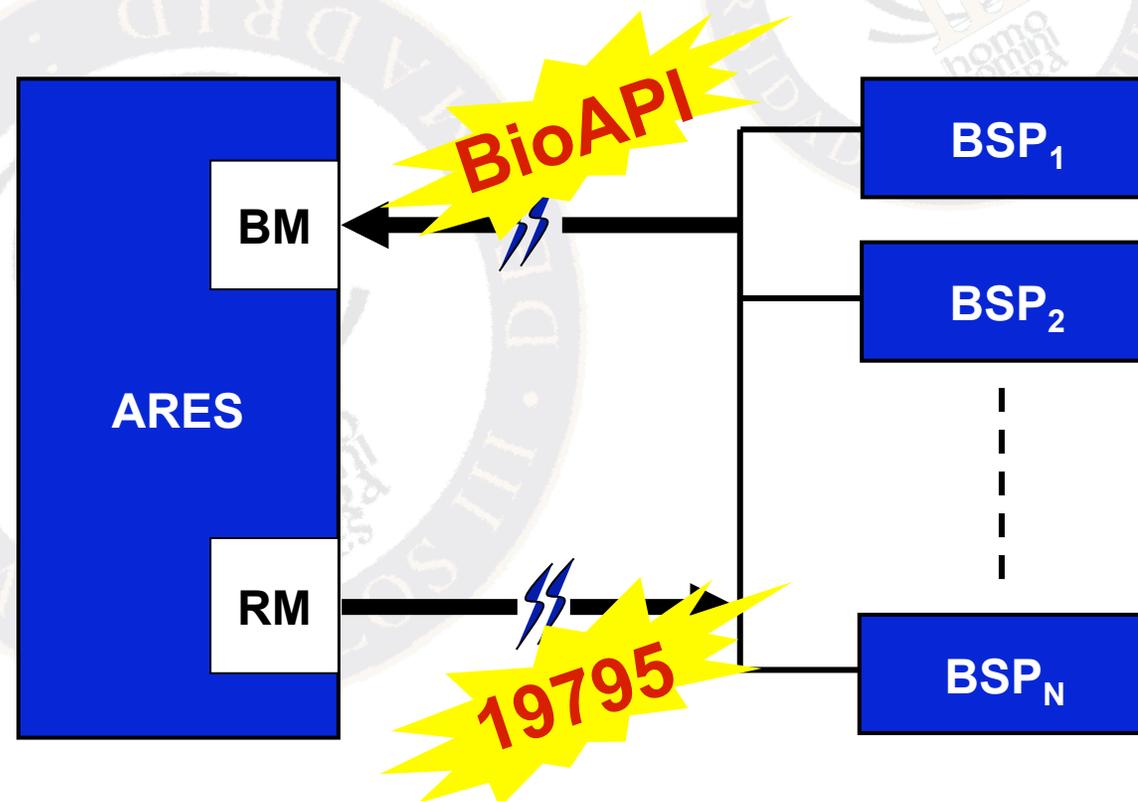
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Conclusions

- Technology Evaluation:
 - A clear and detailed methodology is defined
 - But Test Databases are the difficult point
 - ISO/IEC 19795-1 says
 - *“For technology testing, a **generic** application and population may be envisioned, ensuring that the tests are neither **too hard** nor **too easy** for the systems being evaluated”*
 - Due to variability of human properties, can we find an interoperable definition for generic?
 - How can we measure the difficulty of a database?
 - Work is being carried out within ISO/IEC 29198 in SC37 for fingerprints
 - But, in case we can build a Standard Test Database ...
 - How can we deal with Data Protection Laws?
 - Nowadays there are several databases around the globe
 - Some of them public, some private
 - **So, why not a change in the approach?**

- Why not keeping DBs secured and in a single place, and executing the evaluation remotely?
 - ARES is an Automatic Remote Evaluation System that allows developers/laboratories to test their BSPs/TOEs with non-directly-accessible DBs.





ARES: General Architecture

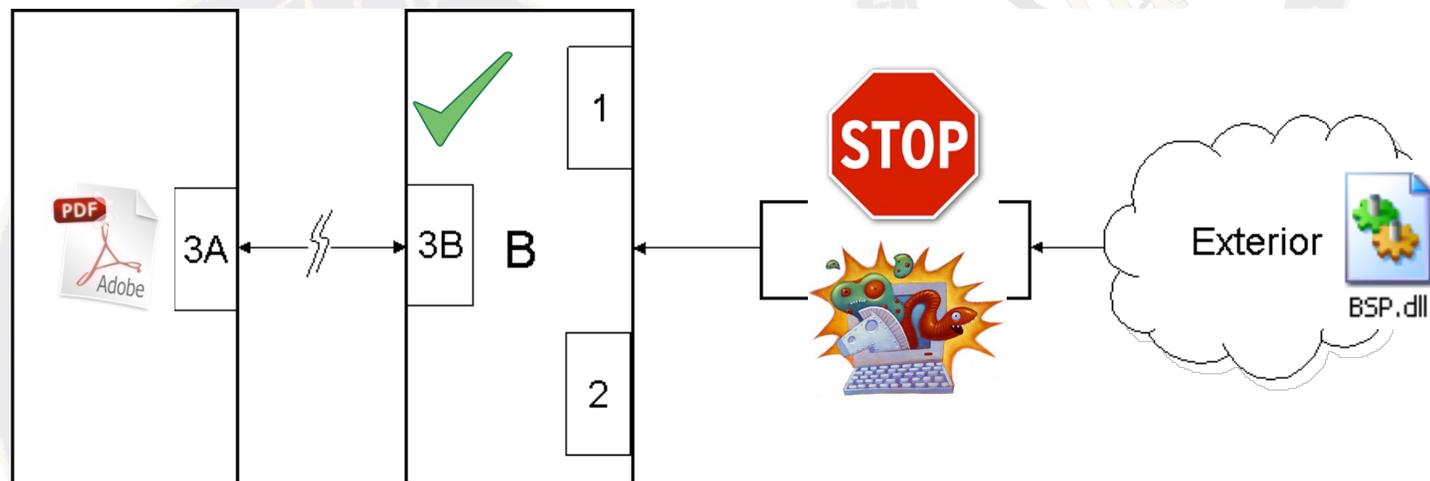
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AES: General Architecture

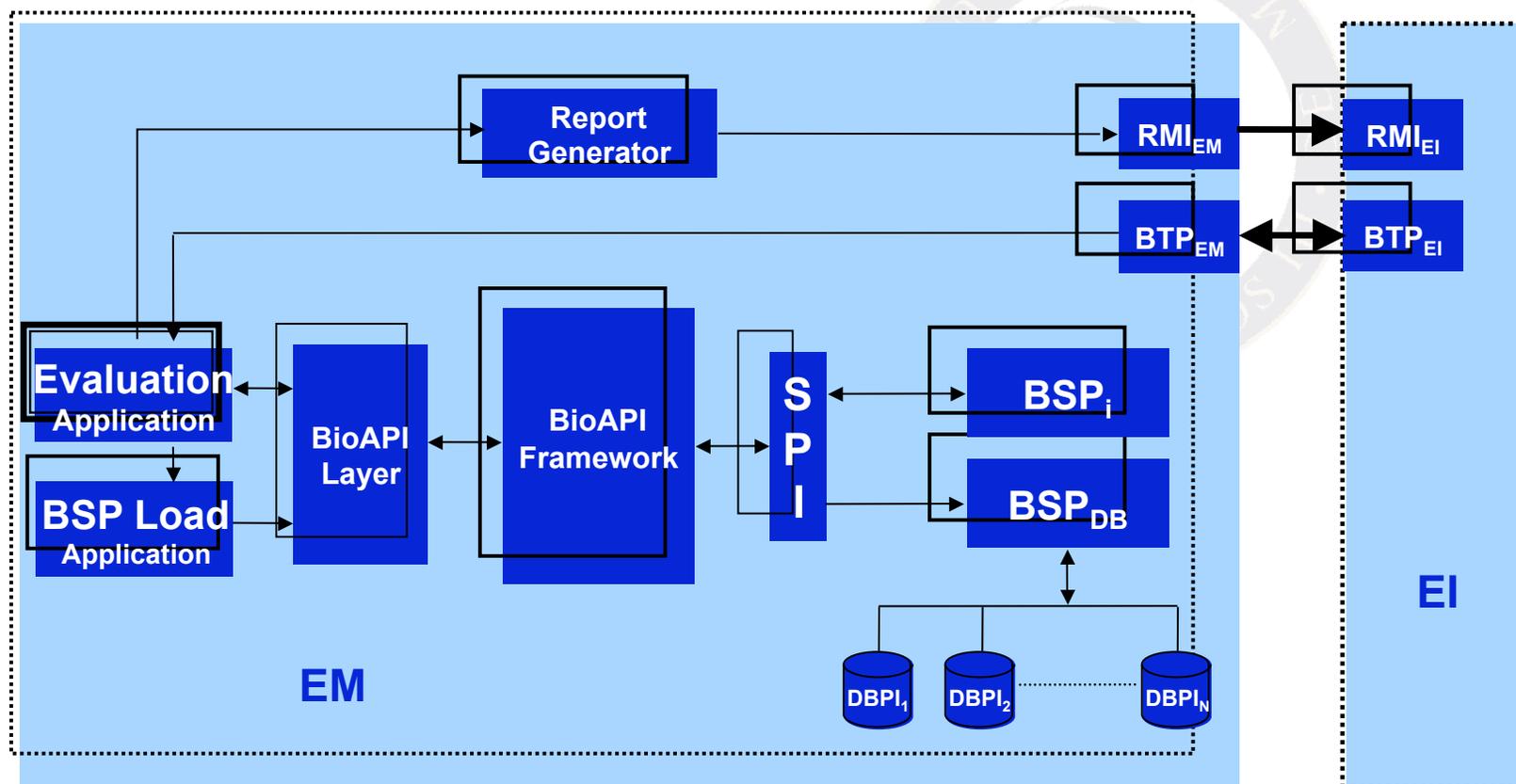
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Conclusions

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- Certification of Biometric products are about to be requested
- Laboratories should be ready to perform those evaluations
- But tools shall be available
 - Certified tools for conformance testing
 - ARES can be a possibility for Performance Testing (dealing with Technology Evaluations)
- International legal procedures should be developed as to be able to exchange personal data
- Quality for Scenario and Operational Evaluations can only be audited by the procedure followed, not by the results obtained



Thank you!!

Questions?

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