PREDICTION OF SYSTEM SECURITY PERFORMANCE OF AVIATION CHECKPOINTS

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Prediction of security effectiveness of integrated AVSEC checkpoints (pax, belongings) on scientific basis:

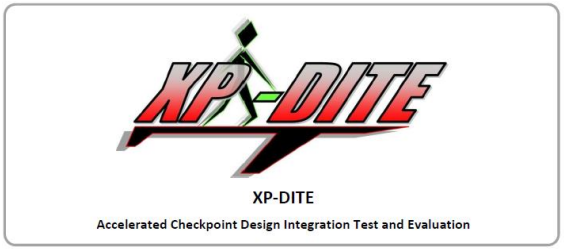
- Takes input from threat scenarios, checkpoint design conops, equipment (compliance) test data, and subject matter experts
- Goes beyond equipment compliance and informs regulators (national EU, EC DG MOVE, TSA, etc.) about effectiveness of whole checkpoint, per user definable group of threat scenarios

- Supports AVSEC regulatory strategy (technology, flexibility, realistic, optimized)
- Supports regulatory reform towards a threat based, outcome focused, system level security paradigm (control over actual security delivered)

- Provides Industry (airports) support in planning security checkpoints updates beyond momentary compliance (depends on ambition, vision)

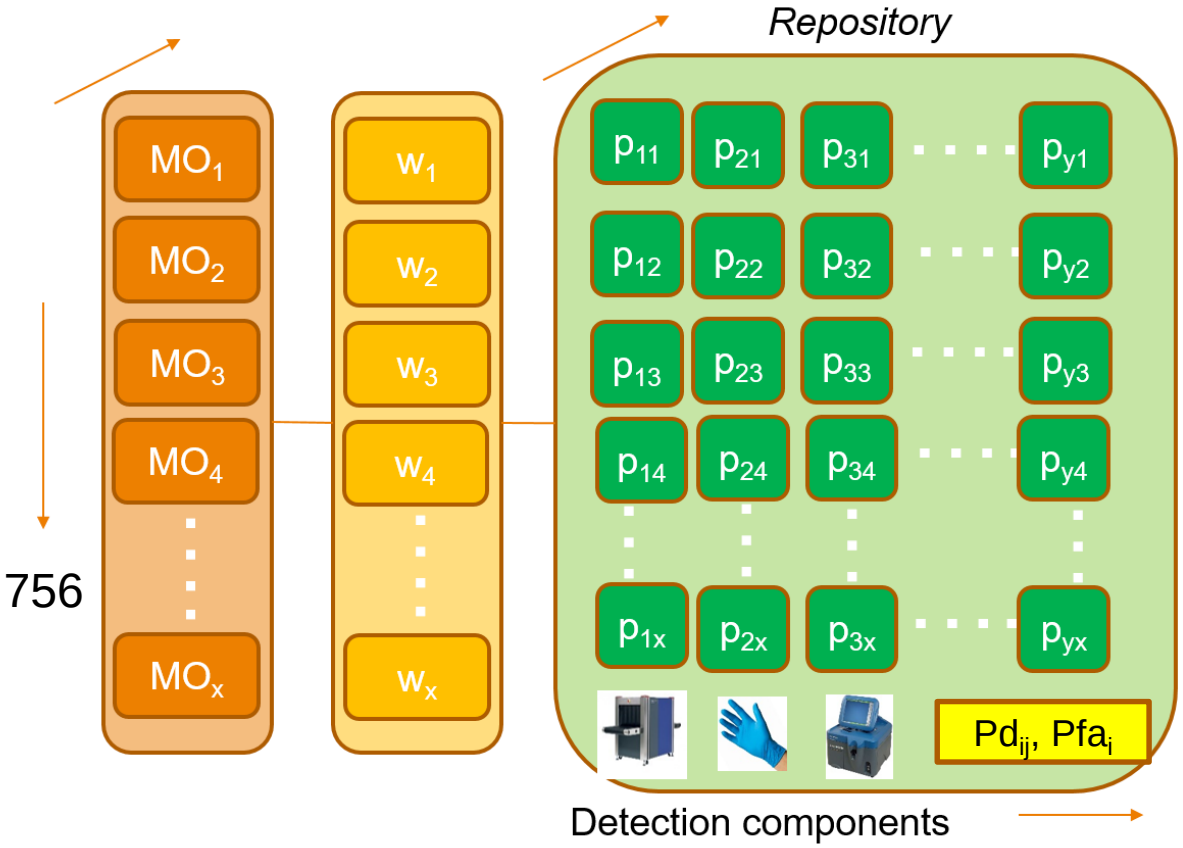
CONTEXT

- EU project XP-DITE (EU Confidential, 5y, 13 partners, completed), www.XP-DITE.eu

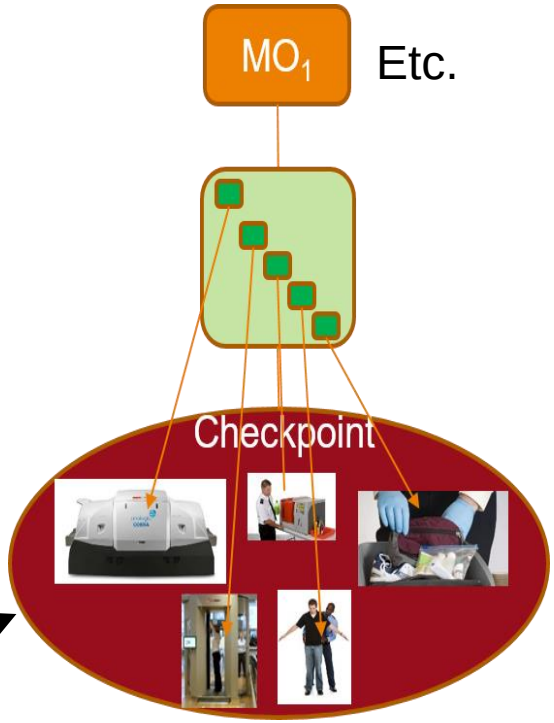


- Performance (across Security & Compliance, Cost & Operation, Customer & Ethics) of AVSEC checkpoints at system level
  - Design of checkpoints, simulation of performance
  - Empirical / experimental evaluation of actual performance
  - Show feasibility of approach and methods to push regulatory reform
- Also:
  - Detection technology development
  - Full set of quantitative empirical/experimental system performance evaluation methods
  - Trials and validation

APPROACH TO SOLUTION (MO APPROACH)



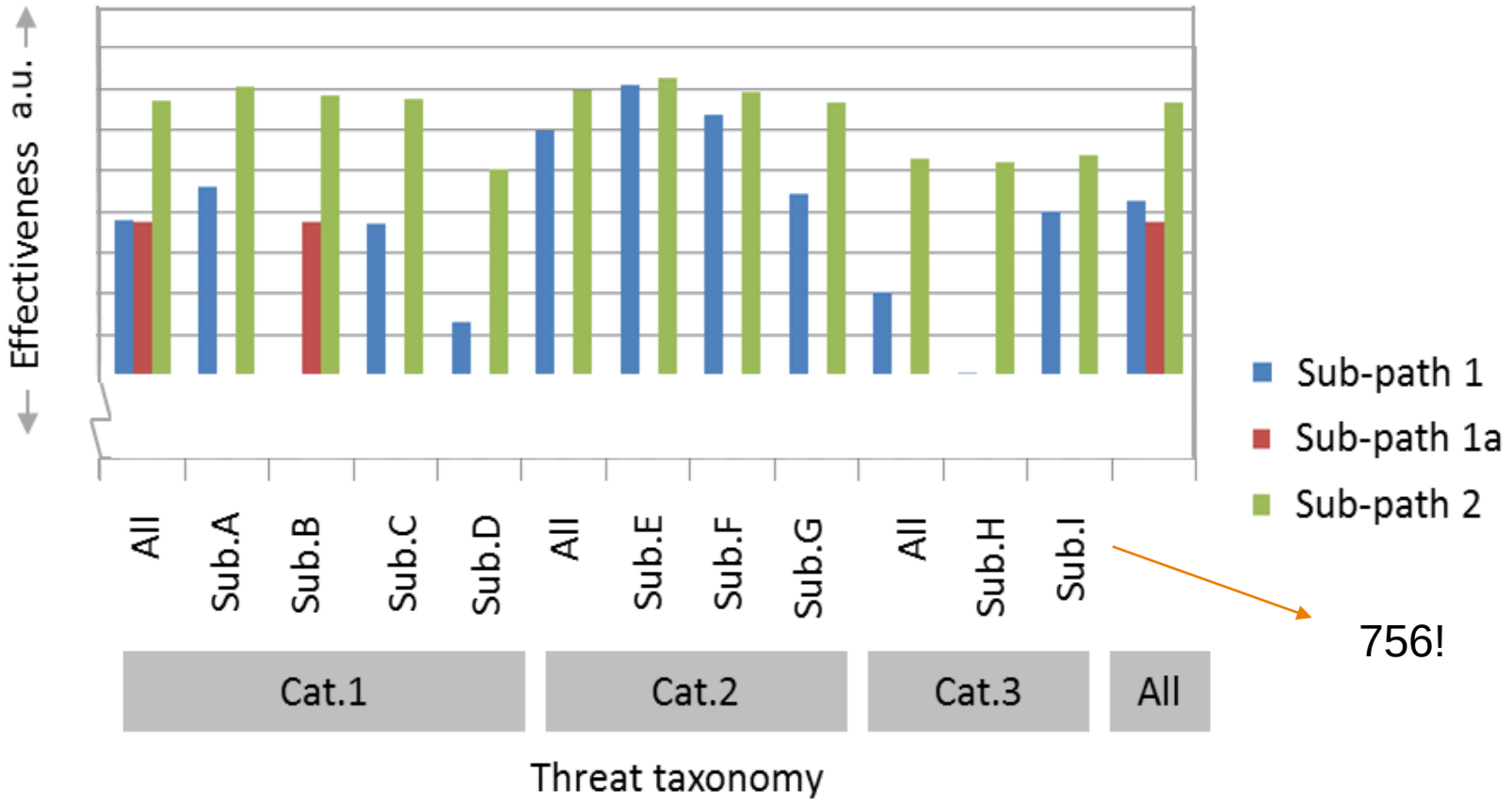
- ECAC test data
- SME



$$Pd_s\ (MO_j) = f\ (\ Pd_1\ (MO_j)\ ..\ Pd_n\ (MO_j),\ Pfa_1\ ..\ Pfa_n)$$

$$Pd_s = \sum w_j\ Pd_s\ (MO_j)$$

TYPE OF RESULTS

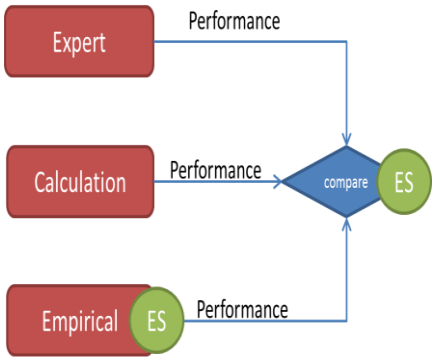


VALIDATION

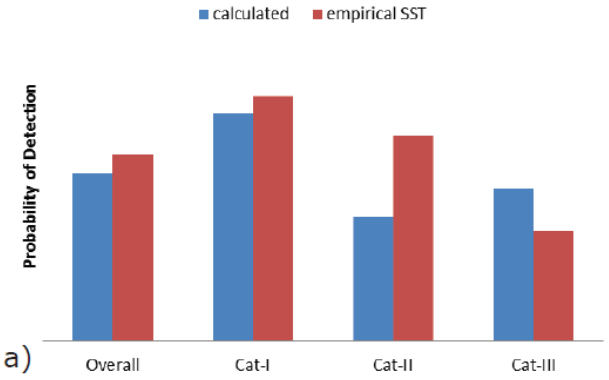
A validation strategy was included in the project XP-DITE, covering all methods, all performance areas

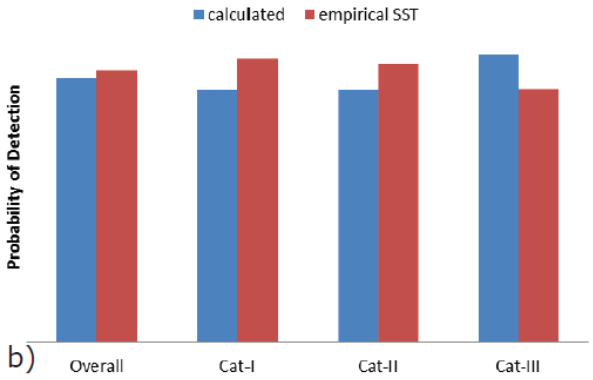
- Integration of user interface (of design part of the SW), equipment performance database, calculation engine
  - Application of the model in an end-to-end checkpoint design process

- Validation exercises w.r.t. security modelling (other performance areas covered by dedicated sessions)
  - For each calculated PI the general uncertainty was derived
  - Comparison of values from calculation, empirical assessment, and expert opinion (classified sessions)
  - 3 airports, 2 trial checkpoints, CT (selected threat scenarios, dedicated method), 4 SST (selected threat scenarios, dedicated sub-system testing method)

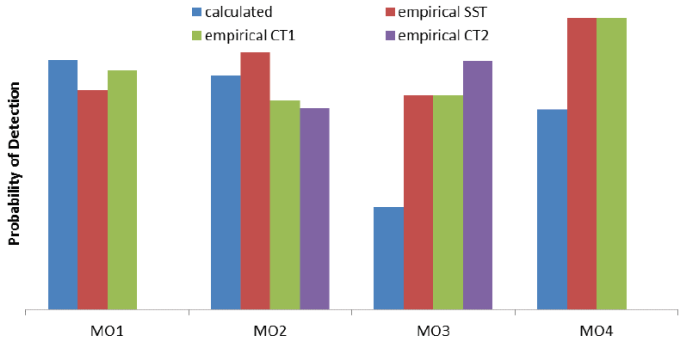


VALIDATION





- 1 iteration in model development
- Recommendations
  - Threat scenario weighting vs regulation-implicit
  - Conops modelling
  - Testing
  - Performance data validity (testing, SME; humans)
  - MO-approach development
  - Empirical system performance evaluation methods (covert testing, sub-system testing)



WHAT IS NEXT?

- Application of model (current status) to checkpoints and/or -designs (classified results)
- Evaluate checkpoint design scenarios (technology, threat, conops, trade-offs)

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- Continued development of modelling and simulation of security checkpoints with combined detection equipment (typ. AVSEC)

- Compare prediction to experimental evaluation / operational performance
- Build database of analysed checkpoints

WISHLIST FOR FURTHER DEVELOPMENT

- MO structure to be refined, extended (also non-AVSEC applications)
- More flexible simulation
  - Include RB elements
  - Include use of secondary information for different alarm resolution processes
- More, better, consistent test data
  - Testing to produce better data (less compliance-only related)
  - Compliance requirements (and testing) based on scenarios (‘threat & vulnerability’ debate), less equipment specific
  - More test data, less SME required
  - Data or modelling of performance of detectors based on decision making humans
- Better operational FAR > develop Operational MO approach & test data


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