

Challenges for Simulation and Validation

Panel discussion

Jos van Rooyen, Bartosz, The Netherlands

Marek Bauer, Cracow University of Technology, Poland

Colin Potter, Defence Science and Technology Laboratory, UK

Amr Arisha, Dublin Institute of Technology, Ireland

Philipp Helle, EADS Innovation Works, Germany



Challenges for Simulation and Validation

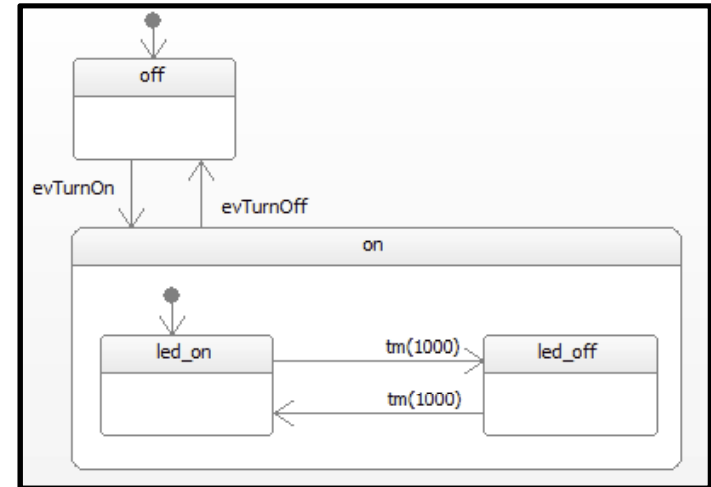
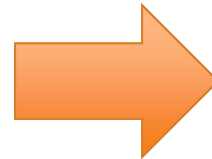
- Transition from natural language requirement to more formal methods
- Virtual Testing
- Heterogeneous simulation
- Tool integration and collaboration

Transition from natural language requirement to more formal methods

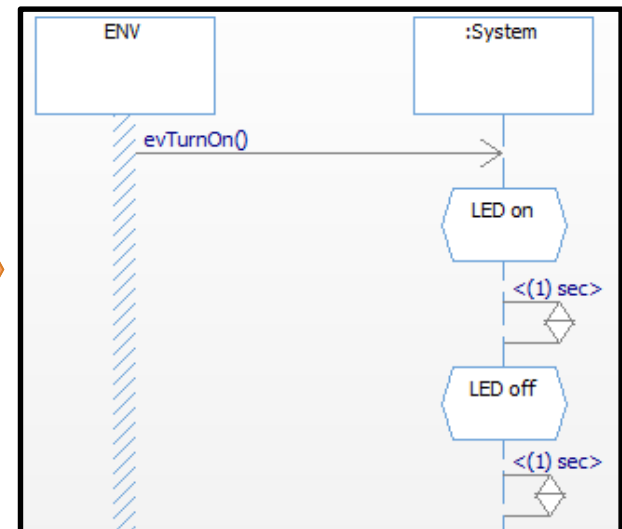
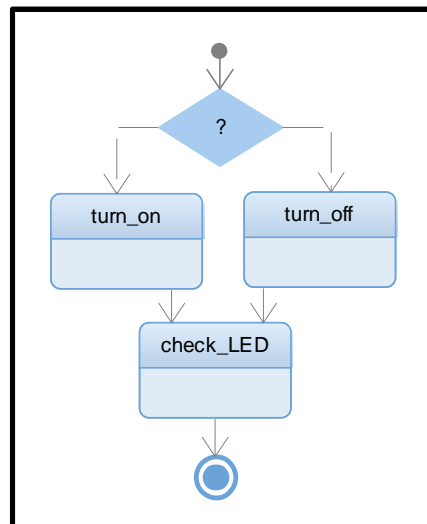
When in off state, after reception of the event evTurnOn the system shall switch to on state.

While in on state, the system shall flash an LED with a frequency of 1Hz.

When in on state, after reception of the event evTurnOff the system shall switch to off state.

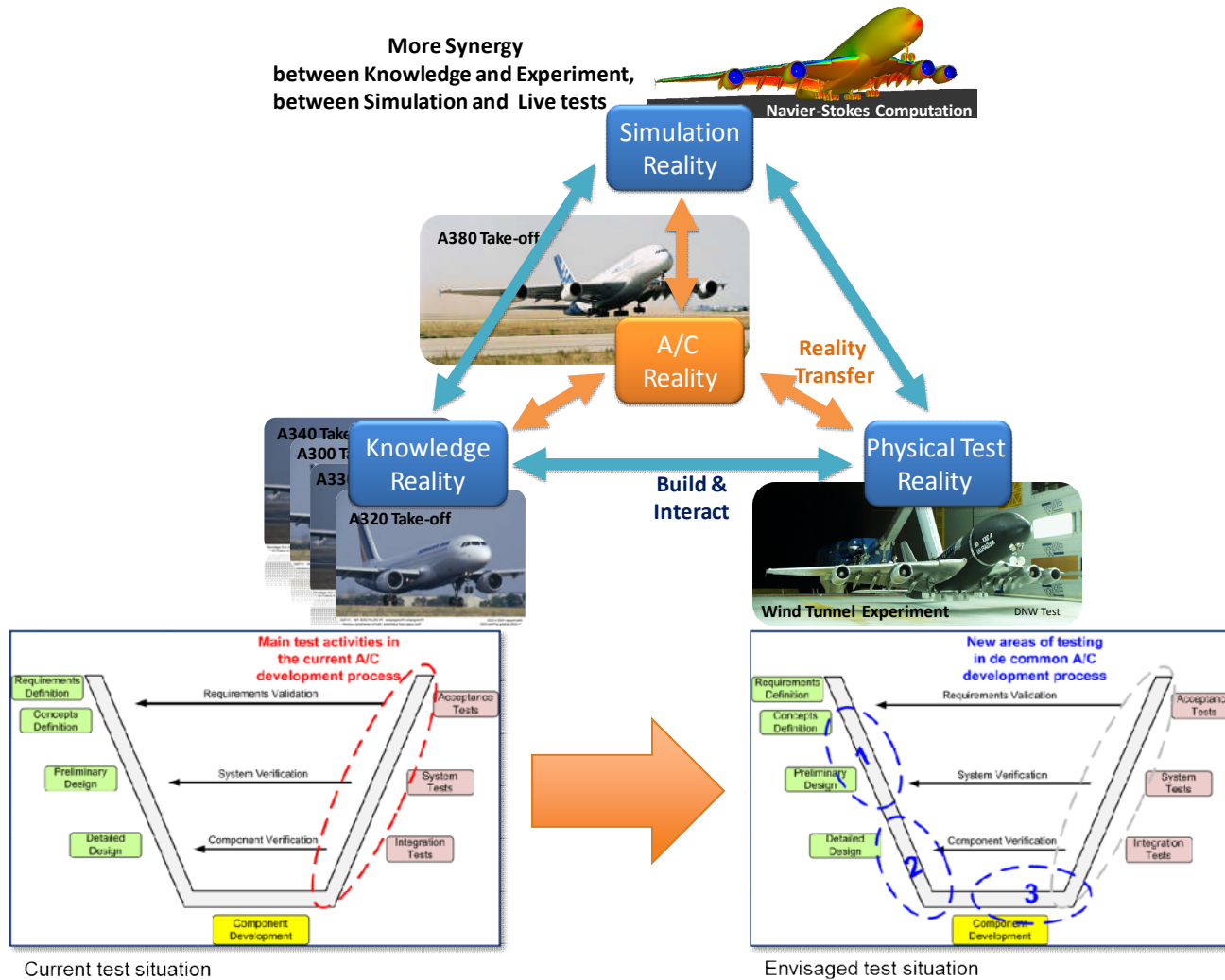


1. Send event evTurnOn
2. Check if LED is on
3. Wait 1 sec
4. Check if LED is off
5. Wait 1 sec
6. Check if LED is on
7. Send event evTurnOff
8. Check if LED is off
9. Wait 1 sec
10. Check if LED is off

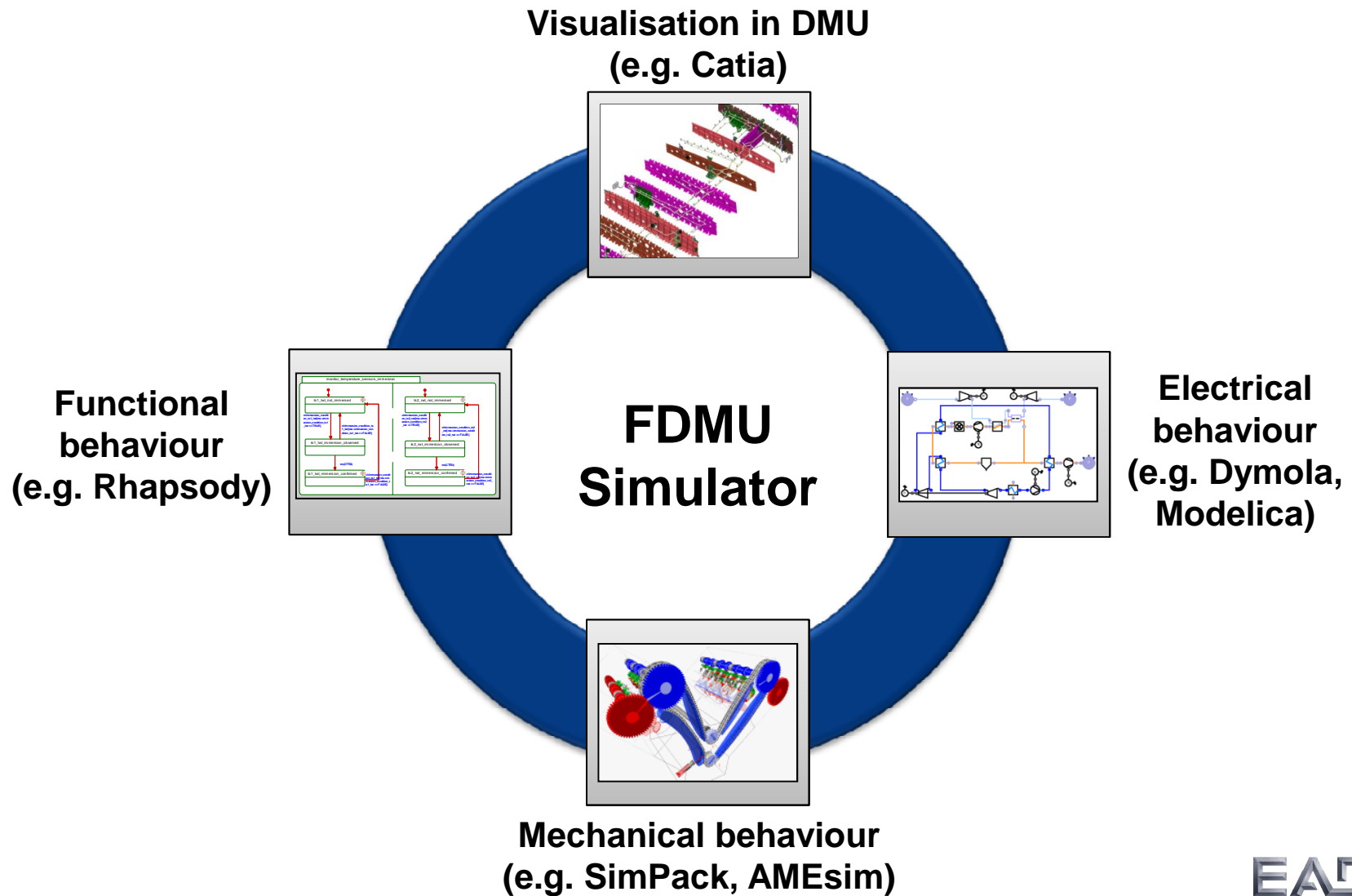


Virtual/Hybrid Testing

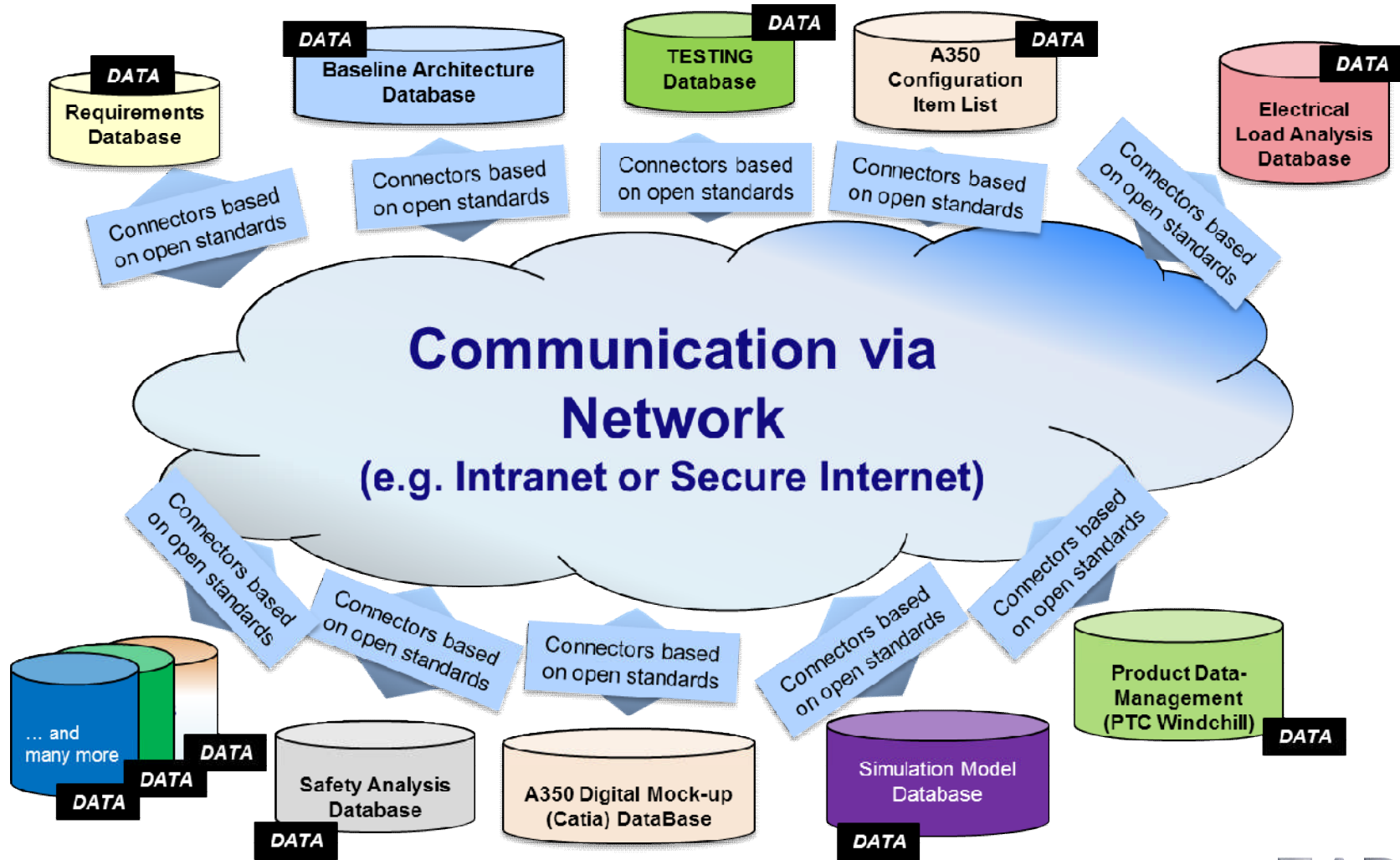
Hybridization of Testing to get the best from both worlds (real & simulation)



Heterogeneous simulation



Tool integration and collaboration





Challenges For Simulation Modelling and Validation

Panel Discussion

Moderator

Philipp Helle, EADS Innovation Works, Germany

Panelists

Jos van Rooyen, Bartosz, The Netherlands

Marek Bauer, Cracow University of Technology, Poland

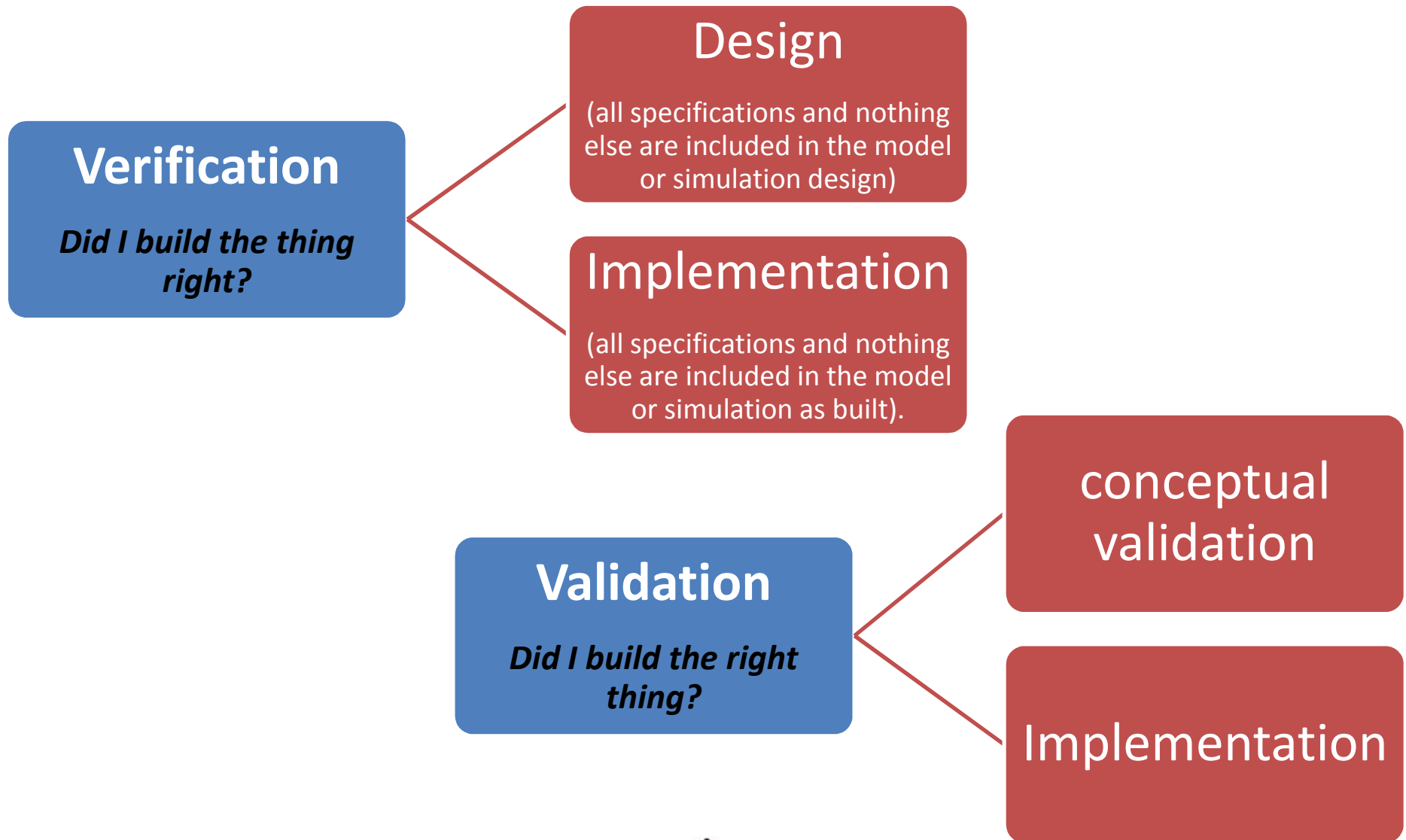
Colin Potter, Defence Science and Technology Laboratory, UK

Amr Arisha

3S Group, College of Business,
Dublin Institute of Technology,
Dublin, Ireland.



Verification – Validation



Two Worlds in One Pot

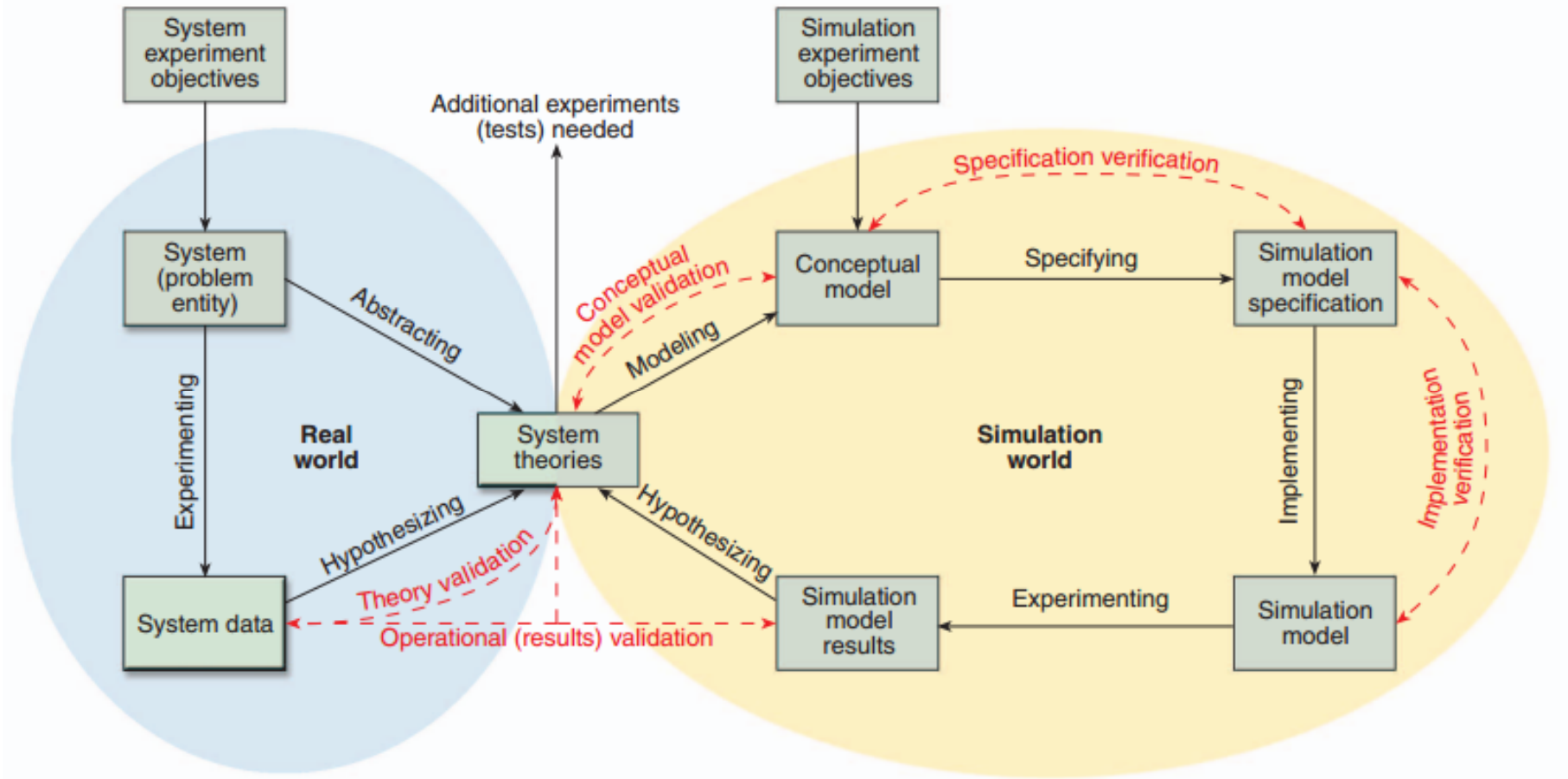


Diagram developed and copyrighted by Dr. R. G. Sargent, Syracuse University, Jan. 2001



Challenges in V & V

➤ Risk Reduction

- Cost benefit model
- Time vs. quality (client, developer)
- How much V&V is needed ?

➤ Effective Communication

- Client requirement
- Terminology

➤ Advances in Simulation and Modelling Frameworks

- Automated V&V

➤ Data availability

- Accuracy vs. Time
- Sources and accessibility

➤ Cost related

- Modelling and Simulation but not V&V



Management & Research Challenges in V & V

- Assessment Phase
 - Accuracy vs. Time
 - Sources and accessibility
- Cost
 - Modelling and Simulation but not V&V
- Review / Audit
 - V & V as part of it

Management

- Inference
- Coping with adaptation
- Aggregation
- Human Involvement/Representation.

Research

THE INFLUENCE OF THE QUALITY OF MEASUREMENTS' RESULTS ONTO SIMULATION RESULTS



Dr Marek Bauer

Assistant Professor

Cracow University of Technology

Faculty of Civil Engineering

Institute of Road and Railway Engineering

Department of Transportation Systems

mbauer@pk.edu.pl

http://www.ksk.pk.edu.pl/pl/marek_bauer

THE ANALYSIS AND THE MISTAKES

MEASUREMENTS' RESULTS

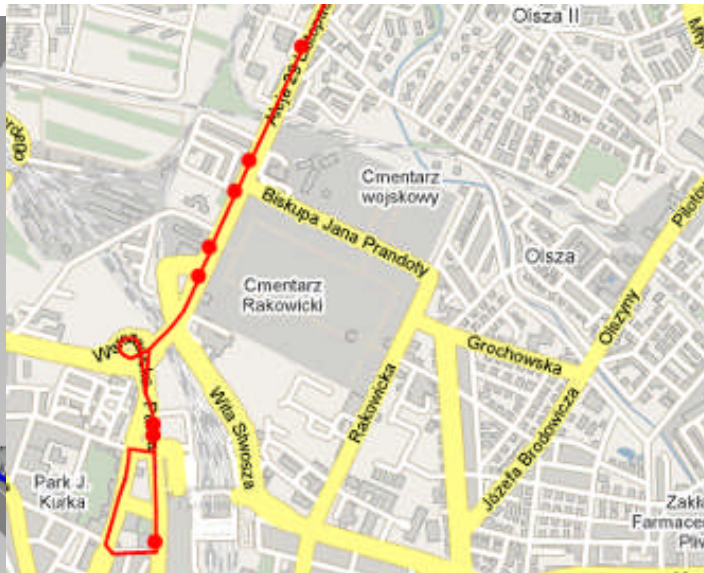
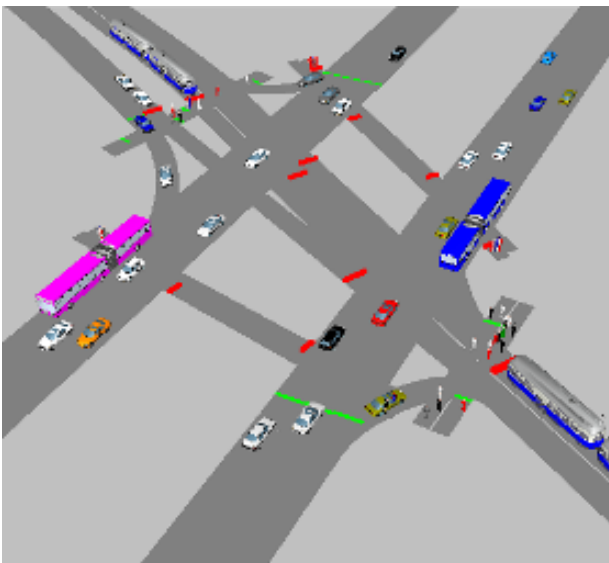


SIMULATION MODEL

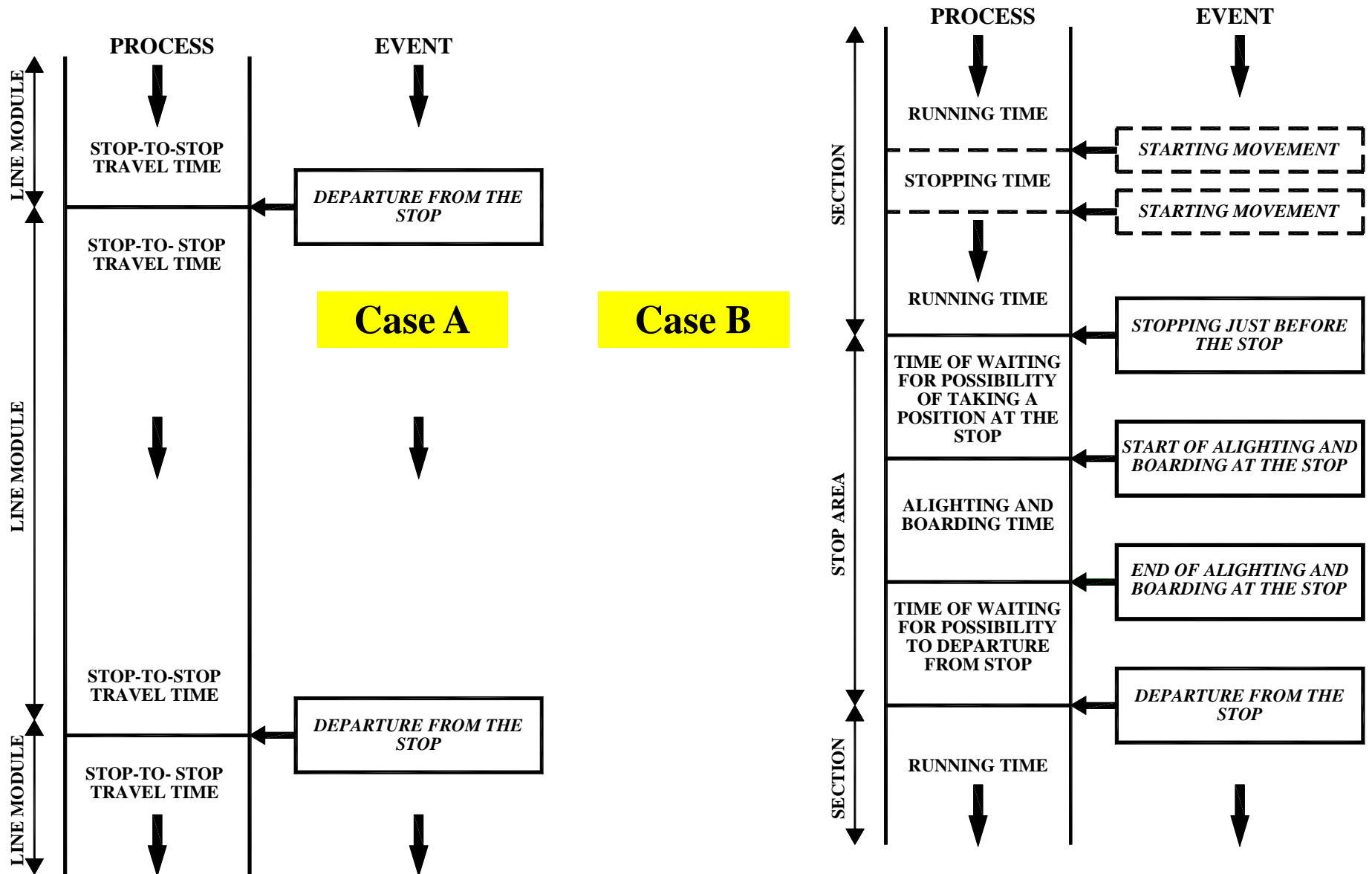
- Sample size?
- Method?
- Tools?
- Measured variables?
- Accuracy?
- Conditions (place/time)?

- Kind of model?
- Software?
- Parameters?
- Procedure?
- Accuracy?

WHICH KIND OF MODEL TO CHOOSE?



TRANSPORTATION CASE – LEVEL OF DETAILS



TRANSPORTATION CASE – LEVEL OF DETAILS

Case A

Results:

- stop-to-stop running times

Analysis range:

- commercial speeds
- indicators of punctuality and regularity

Usefulness:

- current , general evaluation

Case B

Results:

- stop-to-stop running times
- section running times
- alighting and boarding times
- lost times (waiting for possibility of taking a position at the stop, waiting for possibility to departure)

Analysis range:

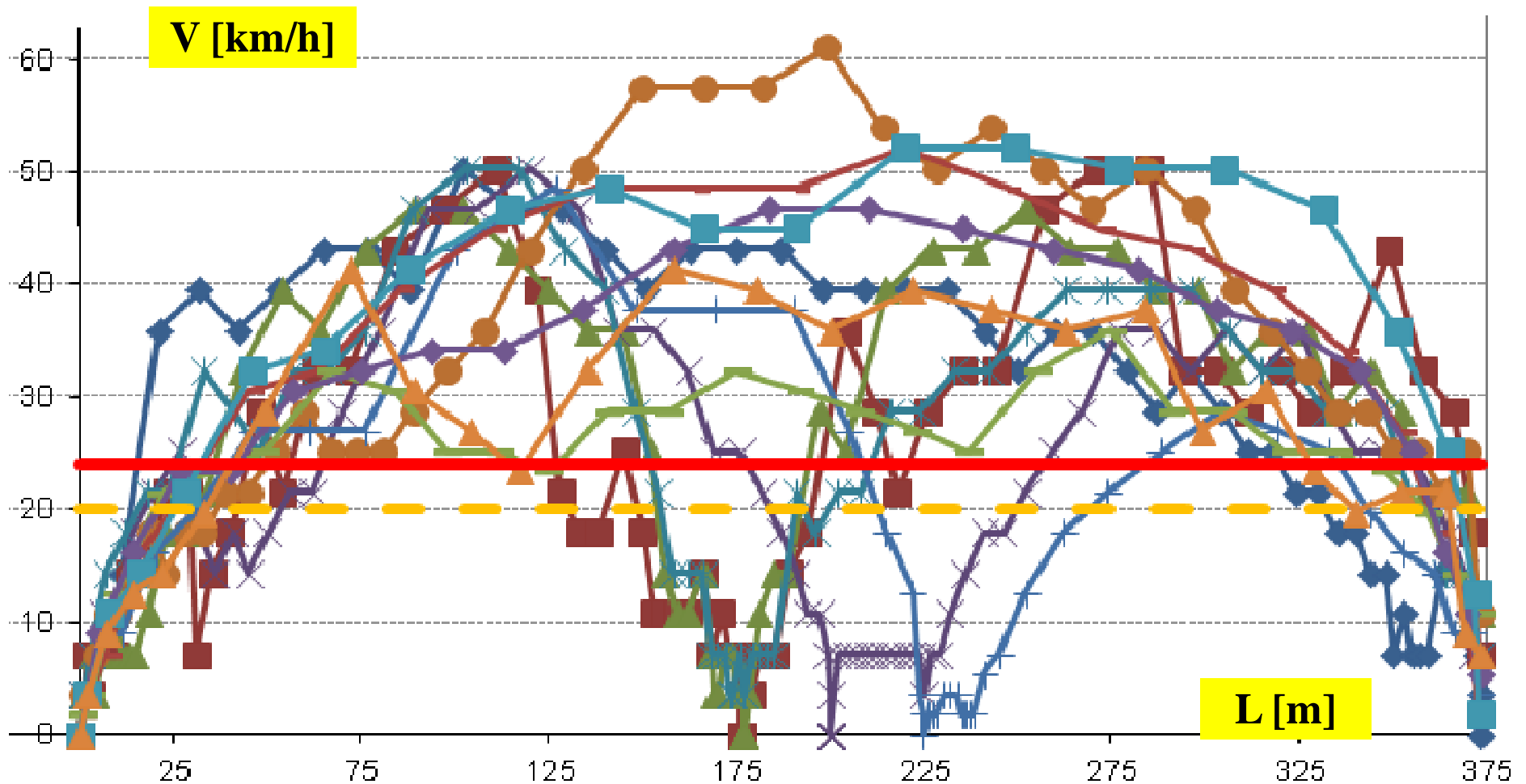
- section speeds
- commercial speeds
- indicators of punctuality and regularity

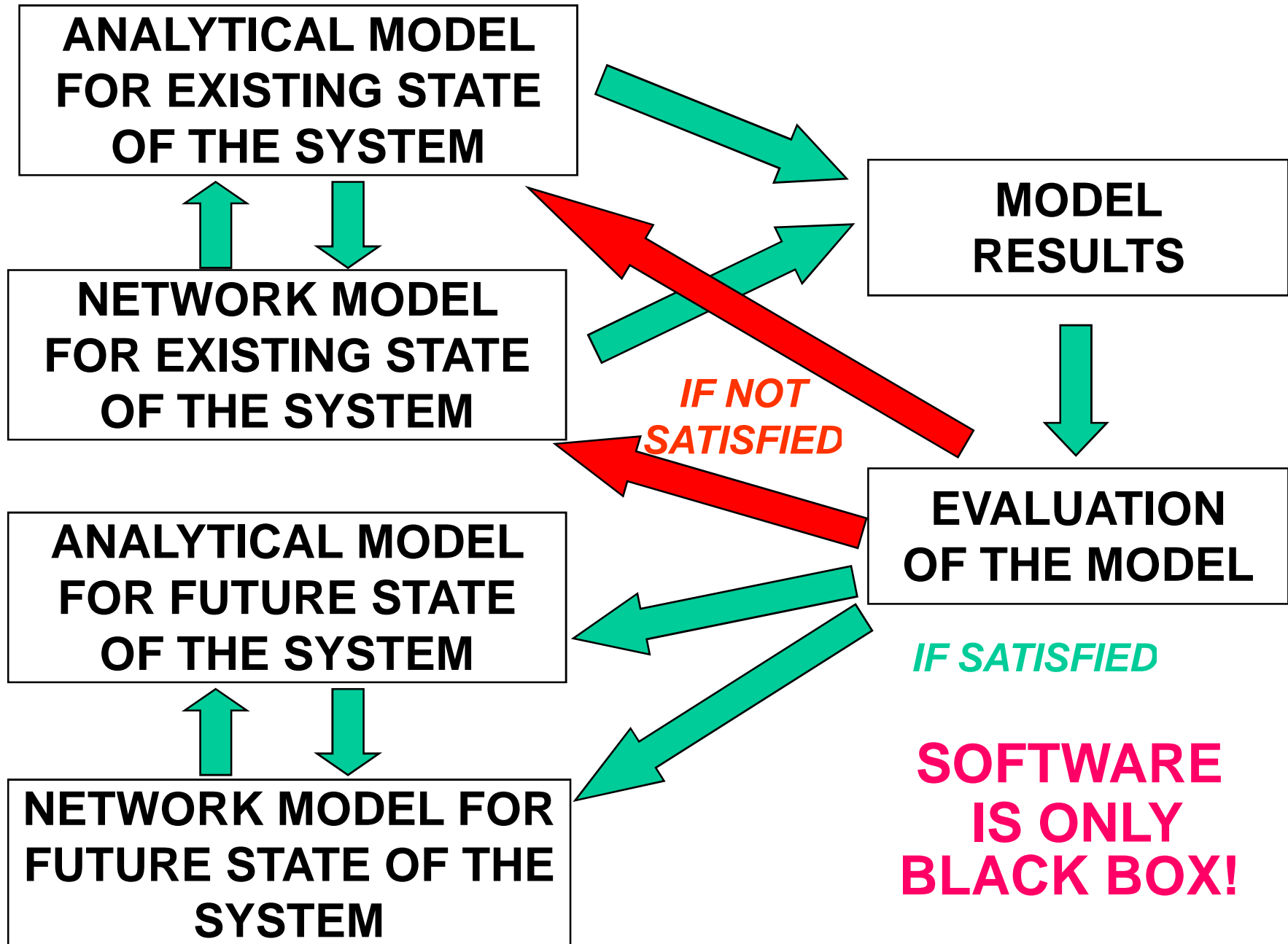
Usefulness:

- current detailed evaluation – sources of disturbances
- modelling of processes in transportation

TRANSPORTATION CASE – LEVEL OF DETAILS

Do we need permanent registration results?





The Fifth International Conference on Advances in System Testing and Validation Lifecycle

Colin Potter

Conference Panelist

DSTL/PUB77095



10 December 2013
© Crown copyright 2013 Dstl

UNCLASSIFIED



Ministry
of Defence

Background

- Nearly forty years of Engineering experience
- In the computer business since 1982
- Worked for Kodak, Raytheon, BAE Systems, IBM, Lockheed Martin, Sun Microsystems
- Now working at Defence Science and Technology Laboratory supporting MOD procurement of complex systems

Issues facing testing of defence systems

- Lack of innovation in Testing
- More and more complexity
 - but systems still need to be functional
 - systems need to be secure
 - and systems need to be safe – until they get to the ultimate end user!
- More integration of systems
 - major players tending to be system integrators, with development being done several steps removed



Lack of innovation in testing!

Jos van Rooyen



- Testing become more mature the last few years
- Embedded in system development life cycle:
 - Waterfall
 - Agile
 - Iterative
- Scope is administrative systems
- A lot of new test company's in the market



- Company's invest less in testing due to the economic crisis
- Less attention in universities for research
- Problem is; we need innovation due to:
 - Increasing complexity
 - Dependency of IT
 - Increasing budgets



bartosz

Current innovation topics:

- Testing in the cloud!
 - Test automation
 - Combining different roles (Agile)
 - Test optimization by hand of metrics
 - Following SDLC innovations
-

The header features the name 'bartosz' in a bold, lowercase, purple sans-serif font. To its right is a small, empty square outline. Further right is a horizontal row of approximately 15 small, semi-transparent colored squares in various shades including blue, orange, purple, green, and pink. On the far right of the header is a close-up photograph of a person's face, showing their blue eyes and part of their nose.

bartosz □

Which innovations are needed for the coming years to handle the challenges:

There are no innovations in testing!

- Decreasing budgets