

Presentation

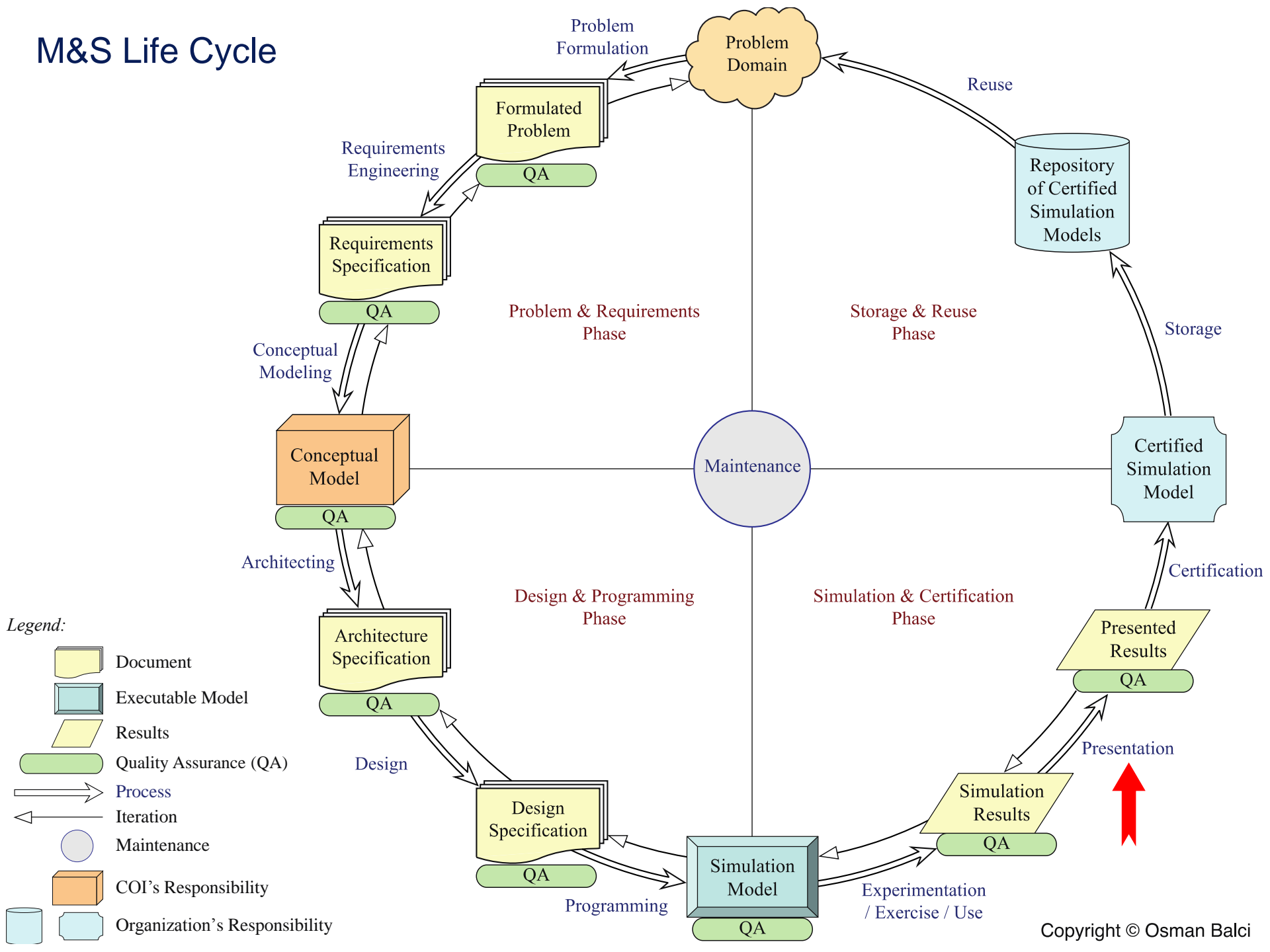
OSMAN BALCI

Professor

Department of Computer Science
Virginia Polytechnic Institute and State University (Virginia Tech)
Blacksburg, VA 24061, USA

<https://manta.cs.vt.edu/balci>

M&S Life Cycle

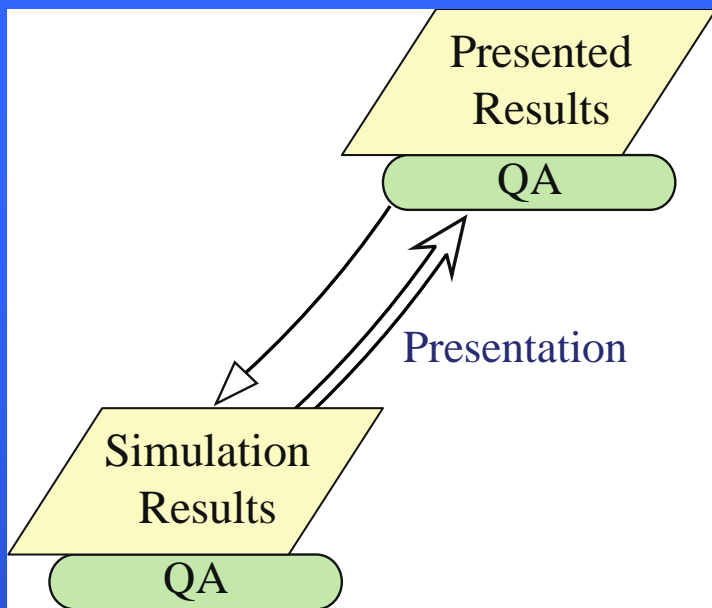


Presentation

Technical Simulation Results



A language that non-technical people can understand



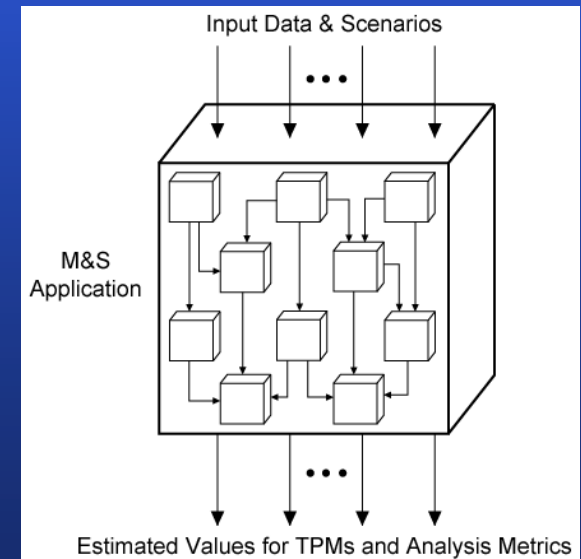
- Presentation is the process of
 - a) interpretation of the simulation results,
 - b) documentation of the simulation results, and
 - c) communication of the simulation results to the decision makers.
- All simulation models are descriptive models and their results must be interpreted.

Critically Important !

- Due to the complexity of some simulation results, failing to properly interpret, document, and communicate the simulation results may lead to wrong decisions in spite of the fact that the simulation results are sufficiently credible.
- There exist many cases under which simulation results are presented to the decision makers.
- It is critically important to be aware of these cases and **assess the accuracy / credibility of each presentation mechanism** before the results are presented to the decision makers.

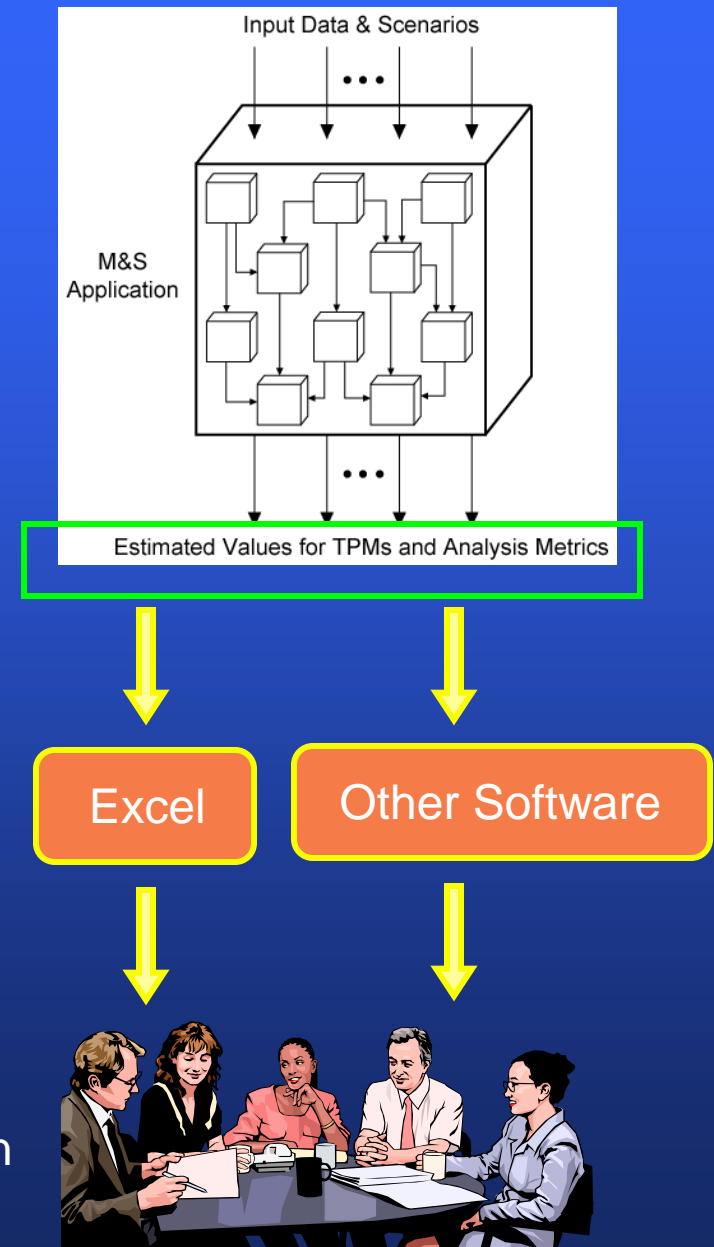
Presentation of Simulation Results: Case 1

- The raw simulation data are transformed into a **statistical confidence interval (CI)** for an output variable (e.g., Technical Performance Measure (TPM), Analysis Metric)
- The CIs are presented to the decision makers.
 - **Example:** 95% Confidence Interval: $[0.93 \leq P_{\text{kill}} \leq 0.97]$
- Three commonly used statistical techniques for constructing CIs:
 - Method of Replications
 - Method of Batch Means
 - Regenerative Method
- A statistical software tool may be used for transforming the model execution data into a set of CIs or simultaneous CIs if a multivariate statistical approach is used.



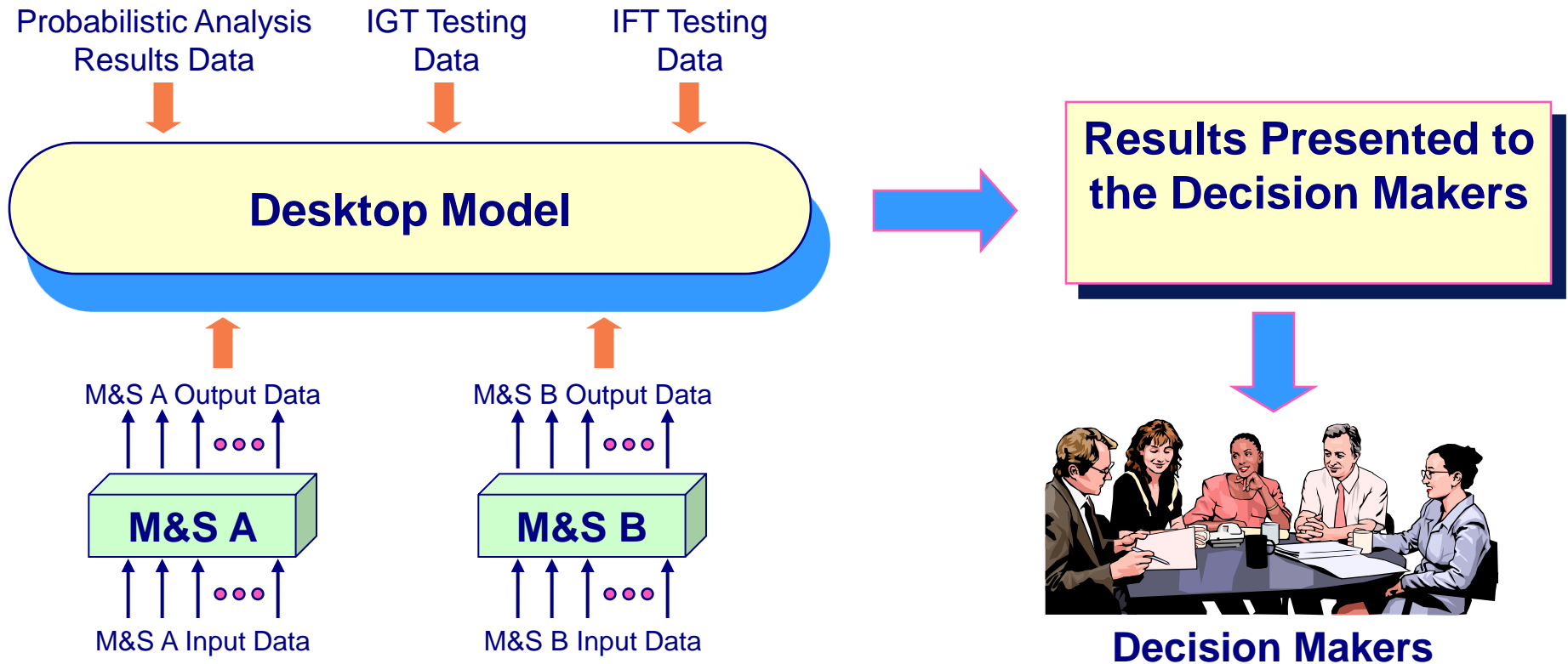
Presentation of Simulation Results: Case 2

- Simulation results are inputted into a spreadsheet software (e.g., Excel) or other software and manipulated.
- The manipulated simulation results are presented to the decision makers.
- The accuracy of the manipulation affects the credibility of the presented simulation results.



Presentation of Simulation Results: Case 3

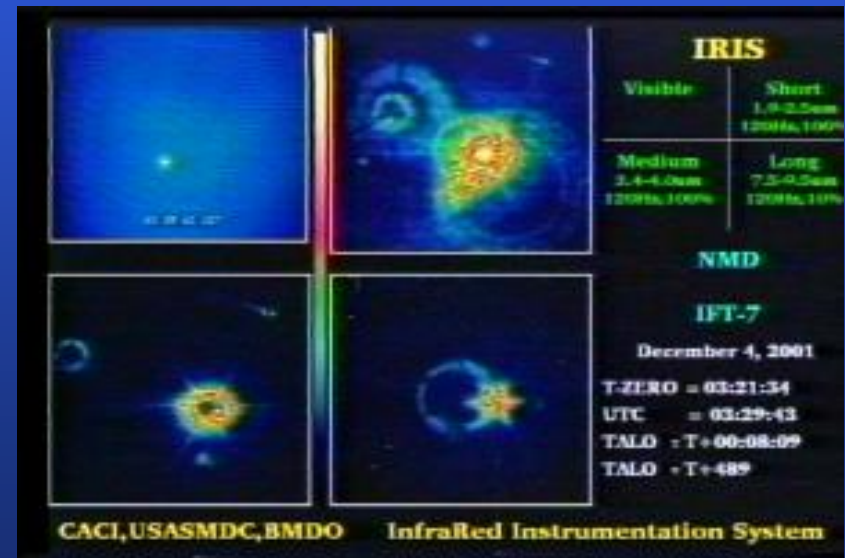
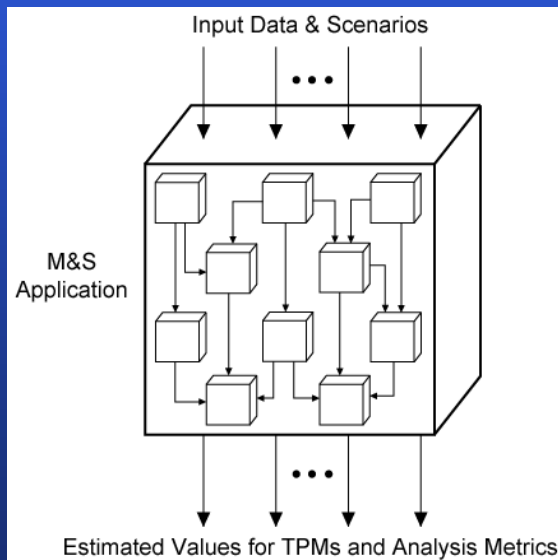
- A **Desktop Model** is a model that takes as Input a variety of data obtained from different sources (e.g., an M&S application, Integrated Ground Tests (IGTs), Integrated Flight Tests (IFTs), probabilistic analysis) and produces as Output a set of results presented to the Decision Makers for their use.



Presentation of Simulation Results: Case 4

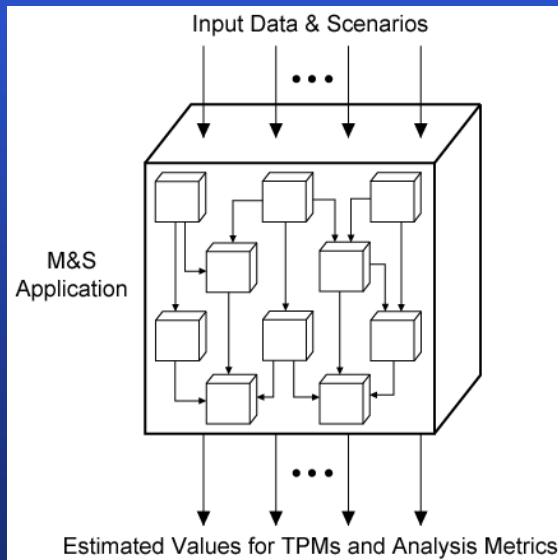
- **Concurrent Processor** — Animation, visualization, and/or graphical representation of the complex simulation raw data while the model is executing.

While the model is executing



Presentation of Simulation Results: Case 5

- **Post Processor** — Simulation execution data are recorded while running an experiment. After the experiment run is completed, the recorded data is used to show an animation, visualization, and/or graphical representation of the complex simulation raw data.



After the simulation run is completed

