

Verification, Validation, and Accreditation (VV&A) of Complex Societal Models & Simulations (M&S)

Presenter: Dr. Stuart Starr

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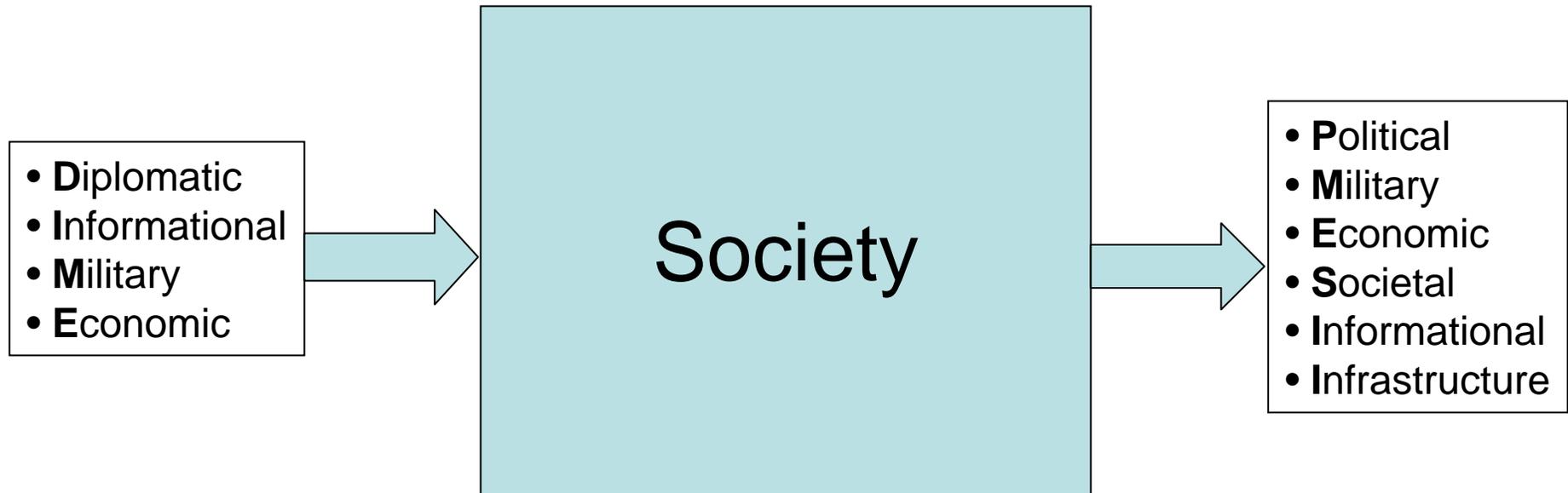
Agenda

- Nature of the problem
- Baseline VV&A
- Compressed and Hyper-Compressed VV&A
- Summary

Definitions

- Verification: Was the M&S built right?
- Validation: Was the right M&S built?
- Data Verification & Validation: Is the data used in the M&S credible and the most appropriate for this purpose?
- Accreditation: Is this the right M&S to use for this purpose?

Complex Societal M&S



“Baseline” VV&A

- Adopt an entrenched process that is employed throughout the life cycle of the M&S
- Adapt DMSO’s VV&A maturity model
- Employ a risk assessment and mitigation process
- Employ a spread sheet model that provides a systematic way of organizing V&V tests and capturing their results
- Use “Spider” diagrams to visualize results

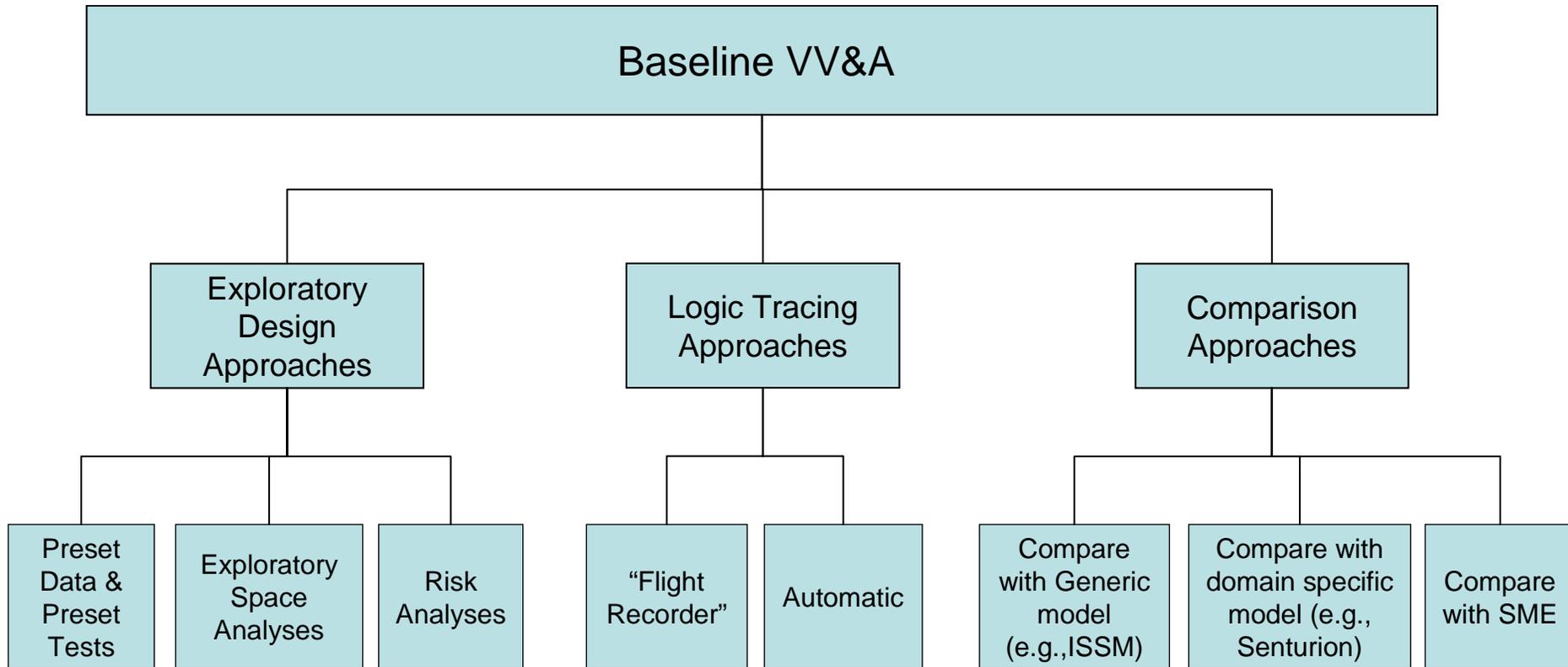
Metaphor: “The Two-Minute Drill”

- A football metaphor -- Prepare for the contingency
 - Know the conditions
 - Formulate a constrained “play book”
 - Decide on the participants
 - Deviate from normal practice (e.g., “no huddle”)
 - Practice and refine the “drill”
- However, the metaphor is imperfect; e.g.,
 - V&V task will occur with limited warning
 - There will be ambiguity about the size, composition of the V&V Team

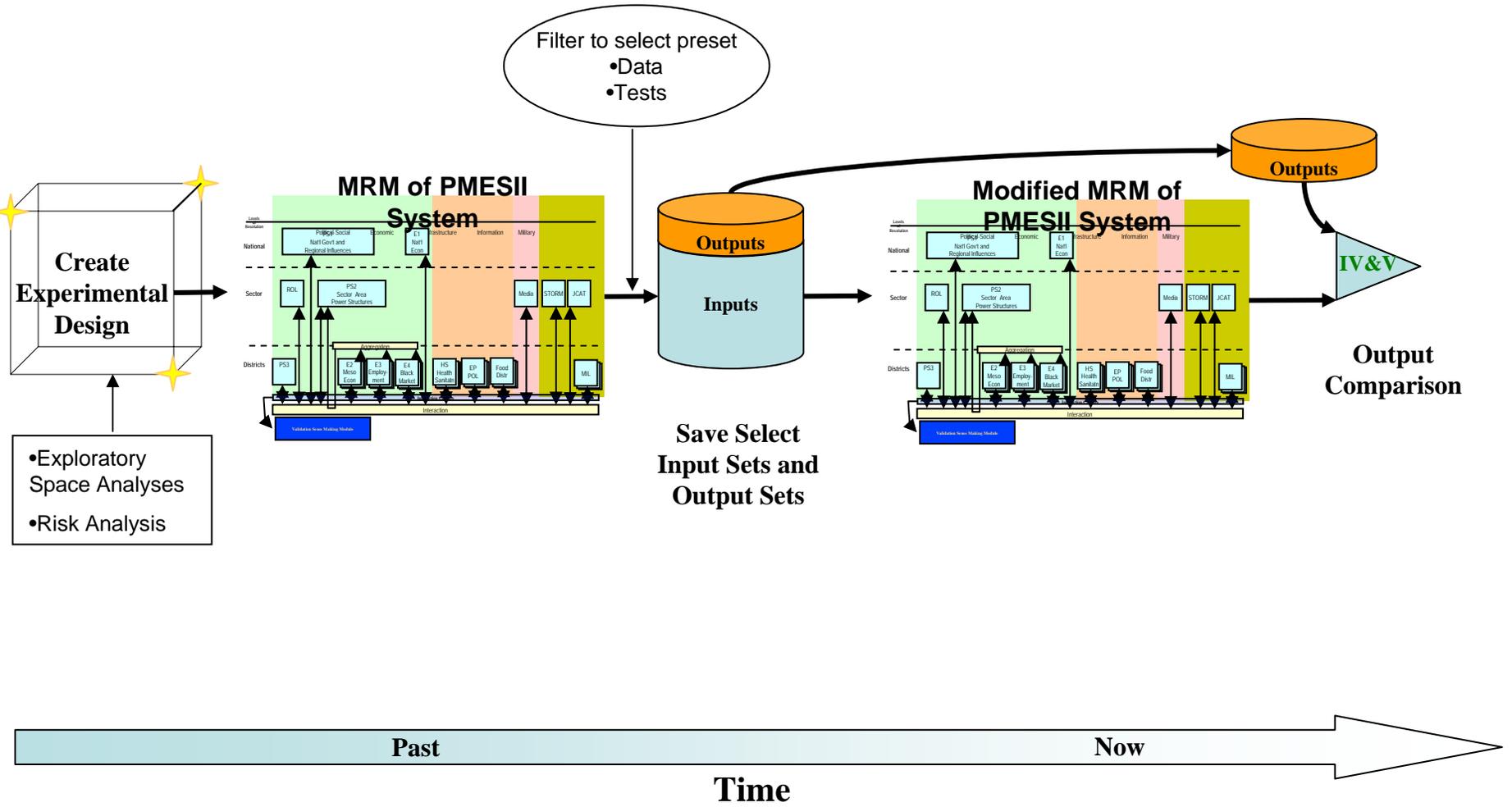
Features of Compressed and Hyper-Compressed VV&A

- Anticipate likely Areas of Responsibility (AoRs) and take anticipatory steps
- Plan and implement a VV&A process that is consistent with anticipated constraints
- Exercise and evaluate compressed and/or hyper-compressed processes periodically
- Develop and implement best practices

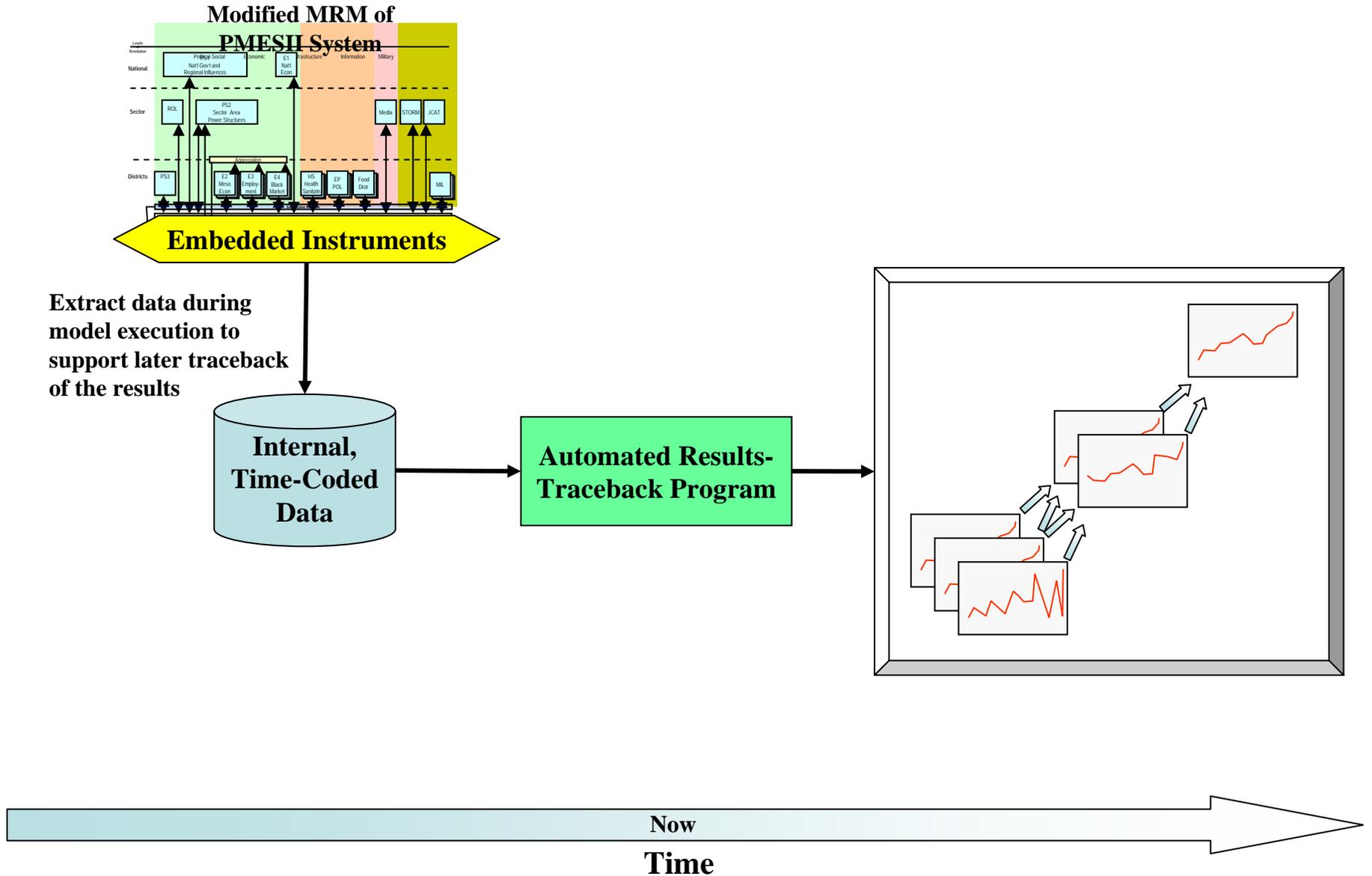
Approaches to Compressed and Hyper-Compressed V&V



Exploratory Design

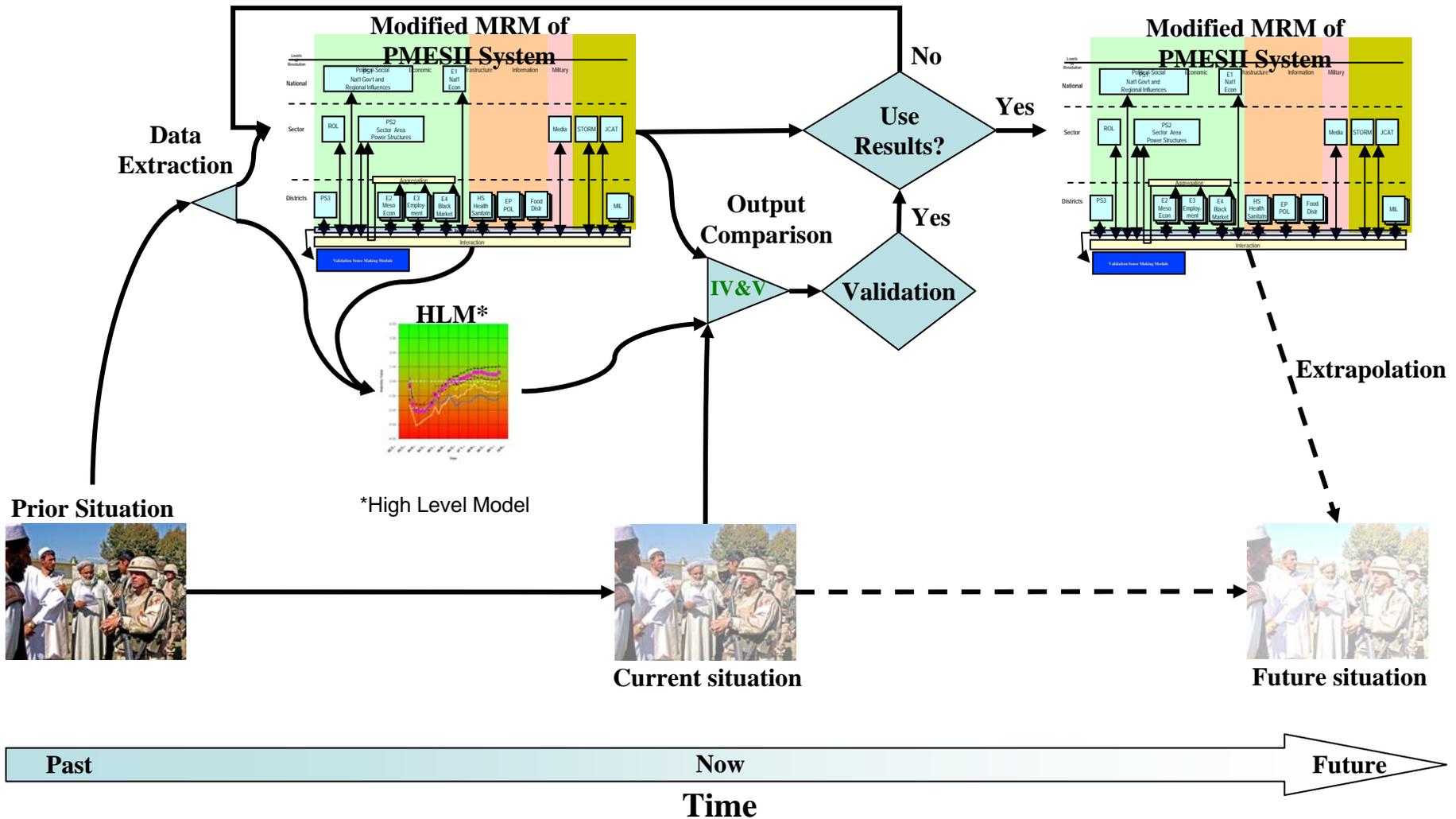


Illustrative Logic Tracing Results



Illustrative Comparison

Calibrate PMESII System



Residual Issues, Summary

- Residual issues
 - Exploratory design – may be too slow for hyper-compressed V&V
 - Logic Tracing – may be difficult to implement
 - Comparison Approach – Interim Semi-Static Stability Model (ISSM) may be useful
- Summary
 - It is vital that project teams implement “baseline” VV&A on a routine basis
 - The VV&A Team should anticipate compressed and hyper-compressed V&V and plan accordingly (i.e., the “two minute drill”)
 - Three approaches should be pursued that are suitable for compressed and hyper-compressed V&V