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# The Integration of Reliability, Availability, and Maintainability (RAM) into Model-Based Systems Engineering (MBSE)

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Monterey, California: Naval Postgraduate School

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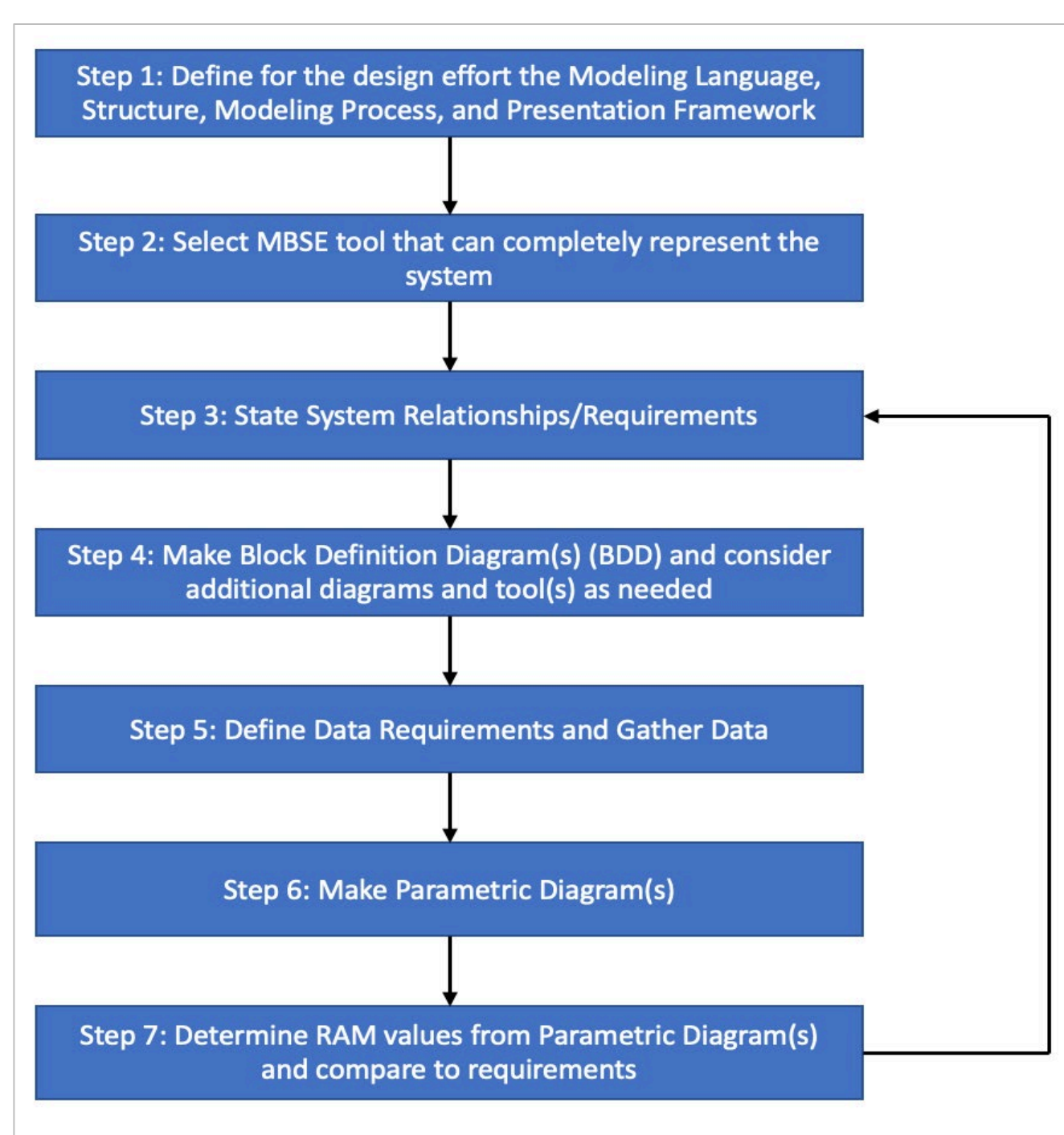
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## Background

- Systems are becoming increasingly complex and to be effective, so too must the design processes and methodologies that support them.
- MBSE/RAM methods are being increasingly relied on to develop and execute models that underlie many systems design processes to better facilitate complex system design through a variety of tools, processes and frameworks.
- MBSE methods are being increasingly relied on to develop and execute models that underlie many systems design processes to better facilitate complex system design.



Methodology Flow

## Methodology

- To navigate design efforts and bridge the gap between RAM and MBSE integration efforts, an eight-step methodology is proposed to facilitate the integration of RAM and MBSE processes.
- This process is intended to provide a methodology to get from a design concept to descriptive and logical system, and subsystem, states.

## Case Study

- The analysis as to the feasibility of the methodology was conducted through the application of a case study.
- This case study references real world data with the methodology applied to show that the methodology presented is valid.
- The methodology I applied to a Turbine Fuel System from the perspective of a Reliability Engineer.

## Results and Recommendations for Future Work

- The results confirm that the methodology can be applied successfully to a real-world situation
- A limitation was noticed that the methodology is best suited for designs where historical data is readily available
- The priority for future work should be to determine the changes necessary to better suit this methodology to new design efforts for which minimal or no data is available.



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