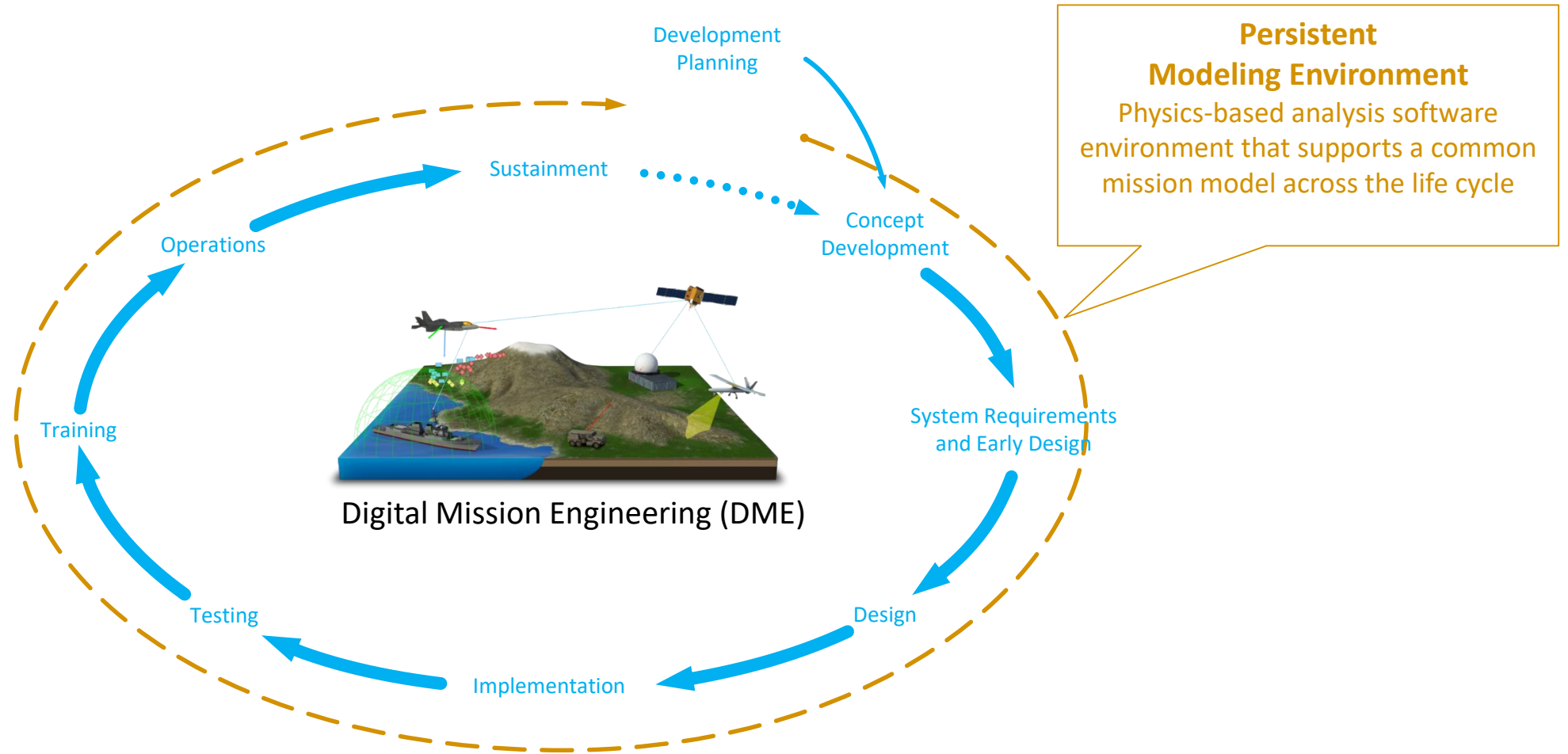


# Integrating MBSE with Digital Mission Engineering (DME)

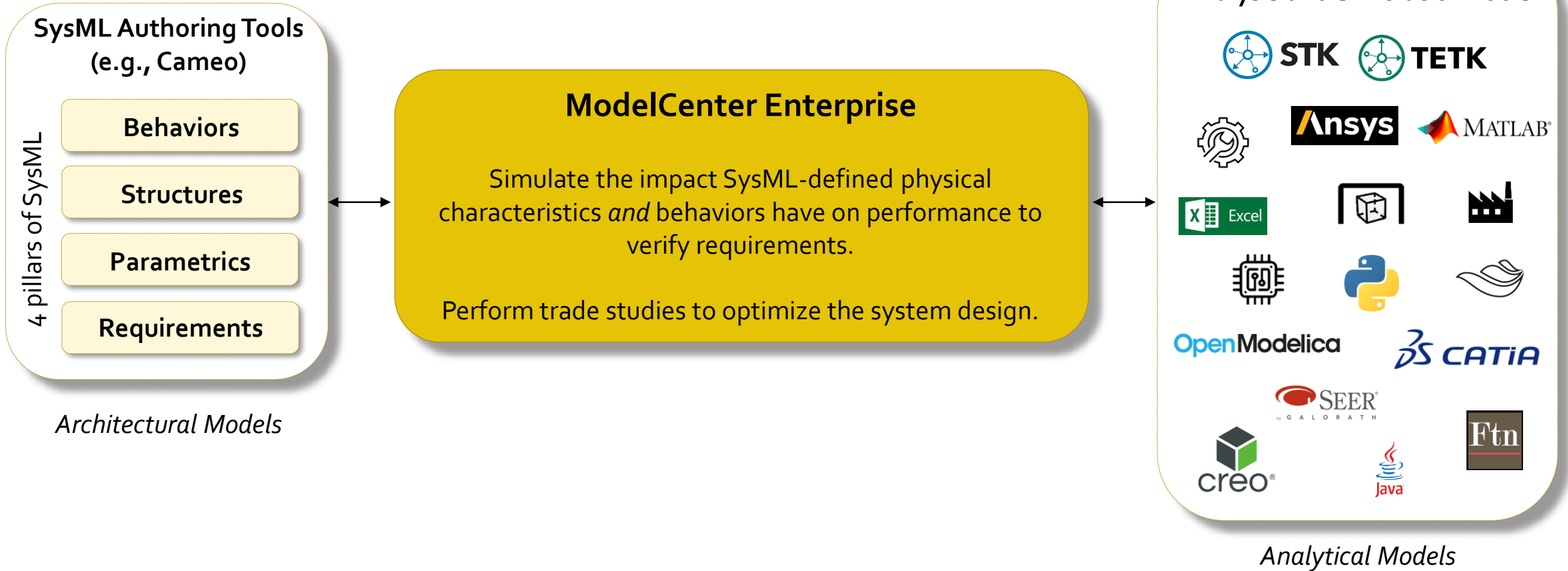


# Focus on the Mission

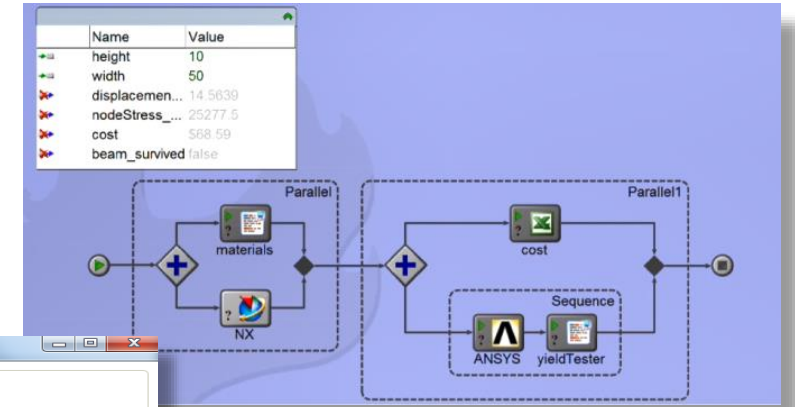
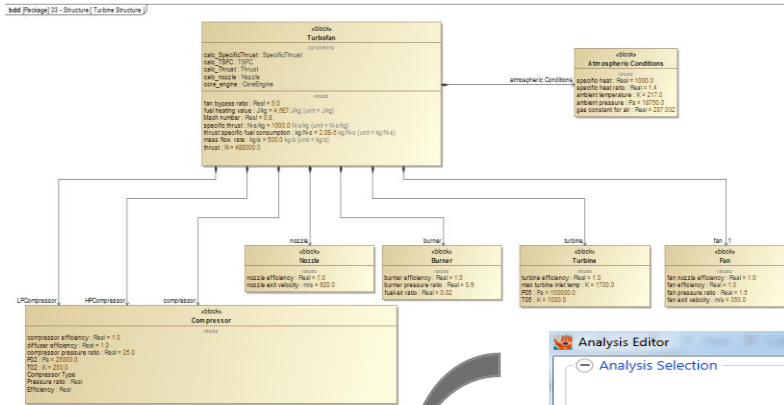
Assessing all representations of your system across the lifecycle relative to common mission-level requirements accelerates capability delivery



# Connect SysML to Digital Mission Engineering



# Simulate and optimize SysML designs of a system's *physical* characteristics



MBSE Value Properties

The Analysis Editor interface shows the 'Map Analysis Variables' section. It displays a 'Systems Model Structure' on the left and 'Analysis Variables' on the right. Arrows indicate the mapping of variables from the model structure to the analysis variables.

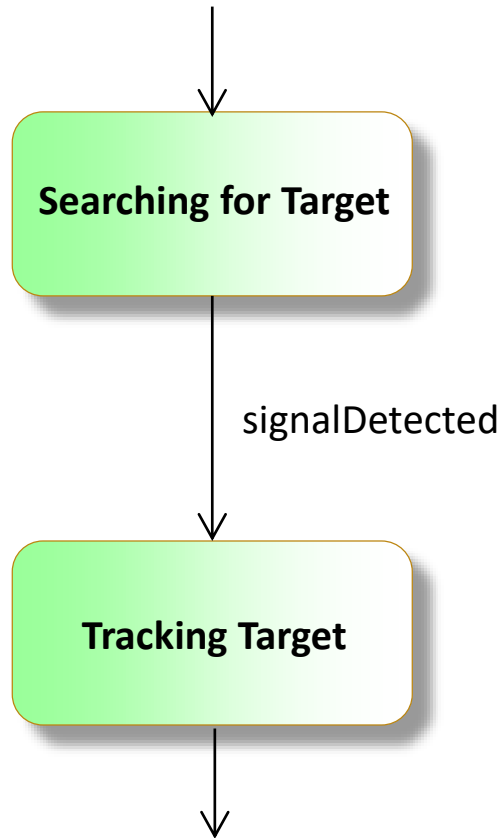
Name	Type
specific thrust	Real
atmospheric Conditic	Real
thrust	Real
mass flow rate	Real
fan bypass ratio	Real
fan	Real
burner	Real
compressor	Real
LPCompressor	Real
thrust specific fuel co	Real
Turbine	Real
Compressor	Real
Burner	Real
Atmospheric Condition	Real
ambient temperature	Real
specific heat ratio	Real

Name	Type
calc_SpecificThrust	Real
nozzle_Vel	Real
BPR	Real
fan_Exit_Vel	Real
Mach	Real
gamma	Real
R	Real
Ta	Real
fuelRatio	Real
specific_Thrust	Real

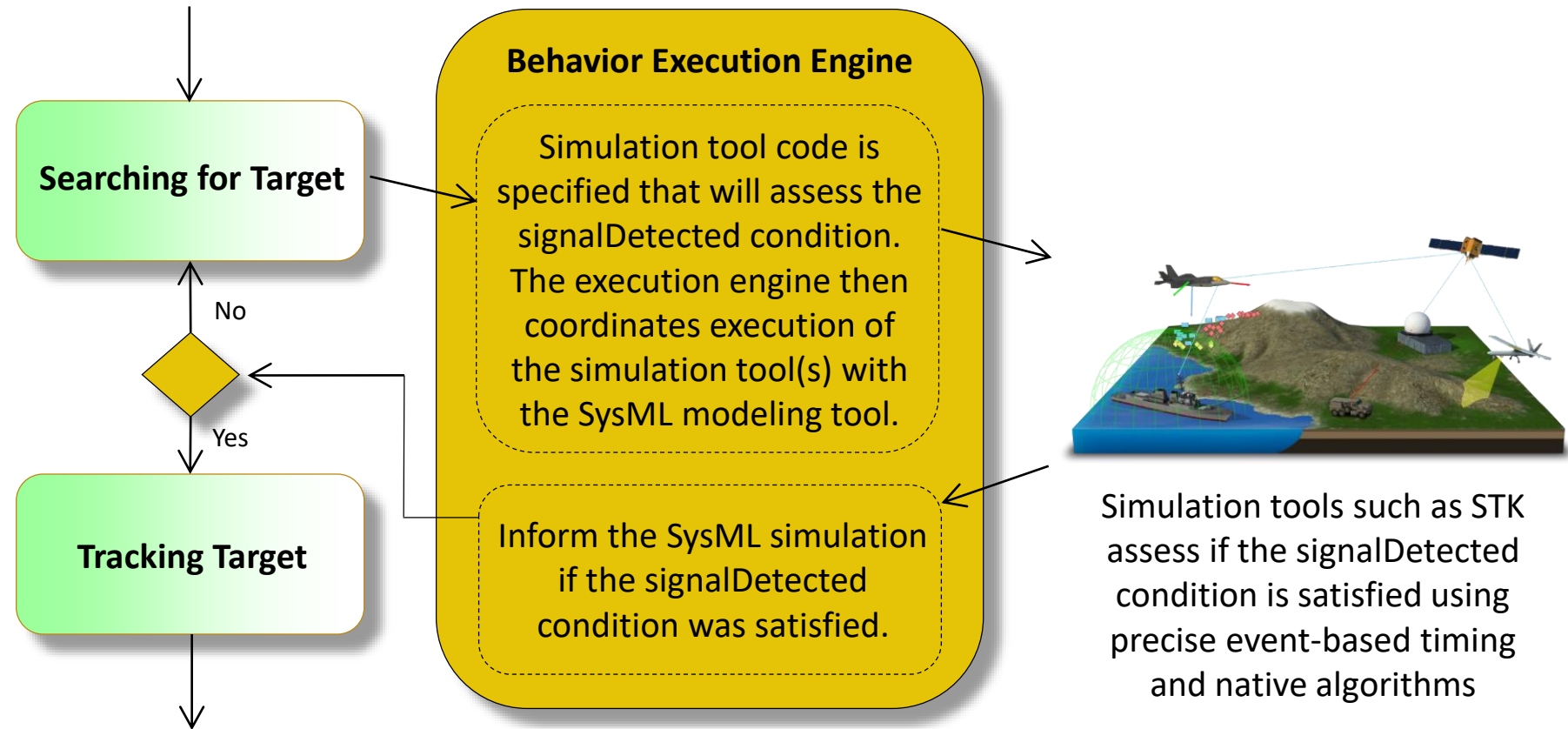
Analytical Model Parameters

# Simulate and optimize SysML designs of a system's *behavioral* characteristics

System Engineer view of a state machine in a SysML authoring tool



Behind the scenes view of ModelCenter Enterprise simulating the signalDetected transition



# Example Use Case: Communications Satellite Design

SysML Authoring Tools  
(e.g., Cameo)

4 pillars of SysML

Behaviors

Structures

Parametrics

Requirements

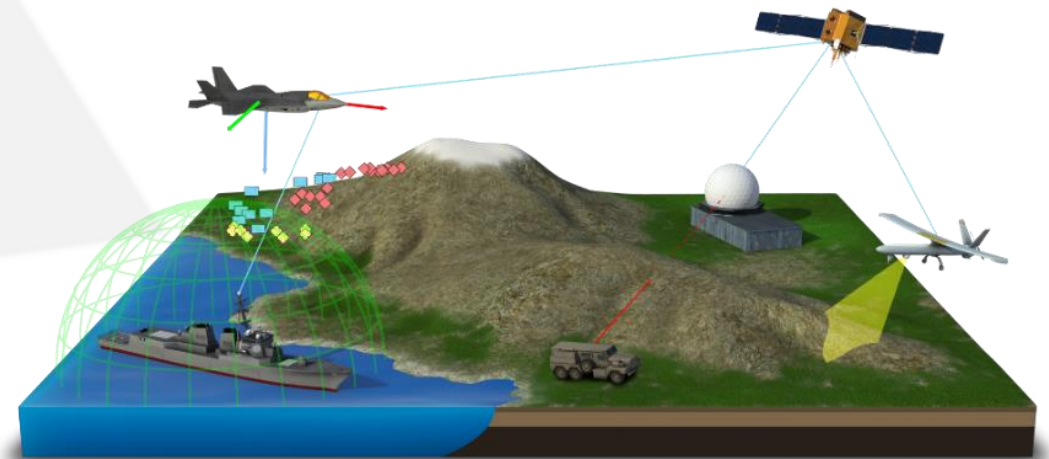
ModelCenter Enterprise

Simulate and optimize SysML-defined *behavioral* characteristics of the satellite system relative to system performance requirements.

For example, are the satellite's data caching behaviors adequate to handle communication degrade scenarios that evolve during the course of particular operational scenarios?

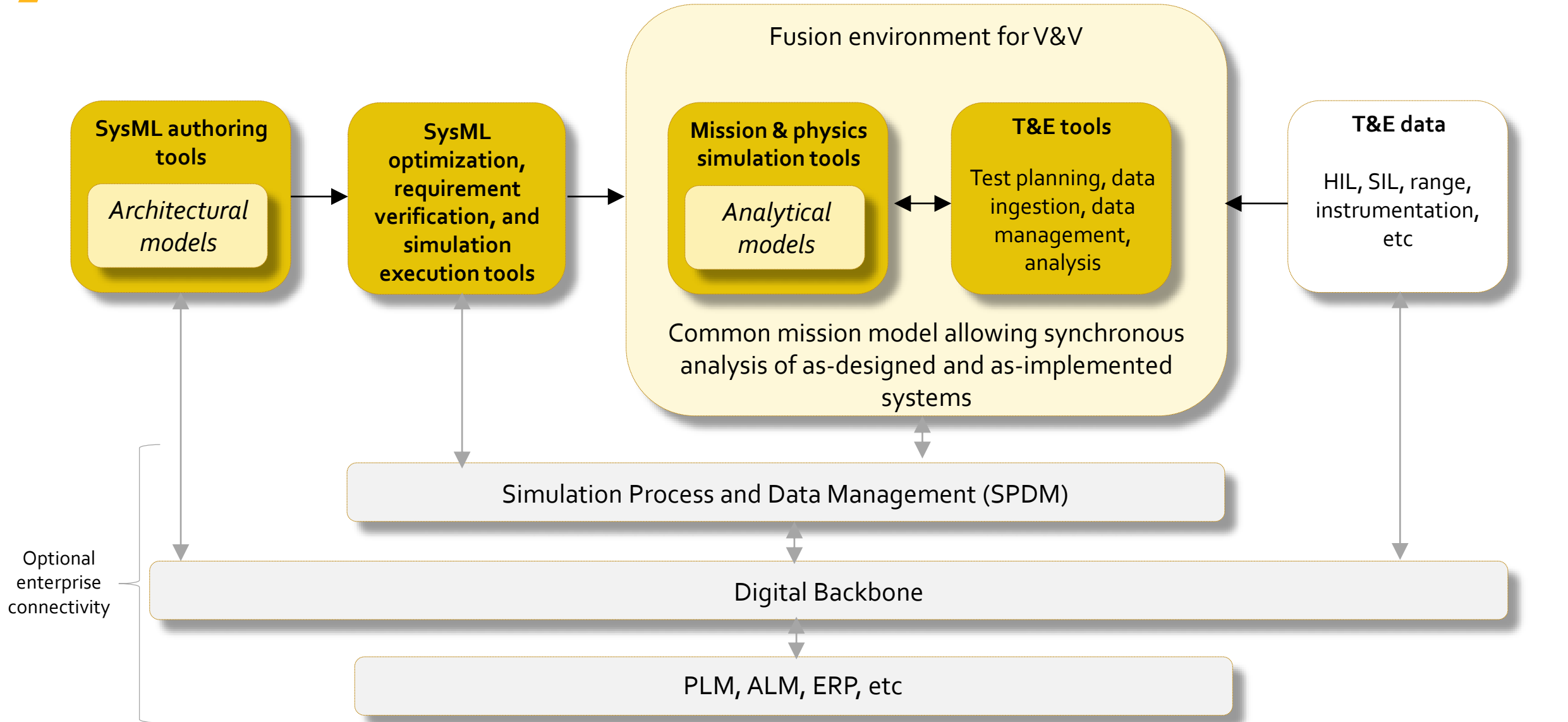
Simulate and optimize SysML-defined *physical* characteristics of the satellite system relative to system performance requirements.

For example, is the gain pattern provided by a particular antenna design adequate to satisfy communication relay requirements in particular operational scenarios? Does the cost model for this antenna meet budget constraints?

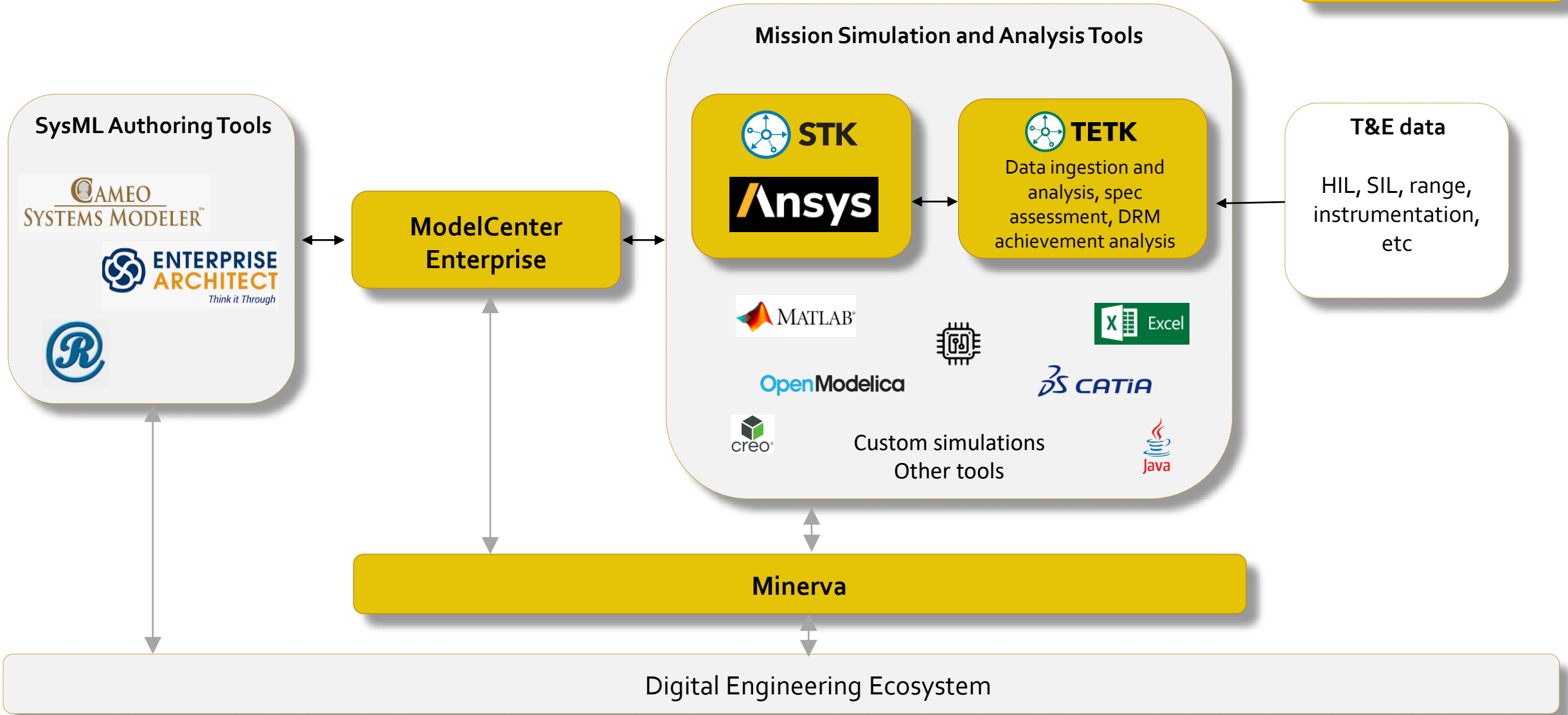


Analytical models and operational scenarios modeled in tools such as STK or MATLAB

# DME Architecture – Tool Agnostic View



# DME Architecture – Tool Specific View





 **Ansys**

