

Modeling and Simulation Body of Knowledge (M&SBOK) - Index

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Domain-independent Categories of Application Areas of Modeling & Simulation* (partly elaborated)

Categories of use	(Aim)	Subcategories of use	types of simulation
Training	(Train as you operate)		
	<i>training to enhance motor skills</i>		- virtual simulation -- simulators -- virtual simulators
	<i>training to enhance decision making and/or communications skills</i>		- constructive simulation -- gaming simulation --- wargaming
	<i>training to operate by getting real-life-like experience opportunities in a controlled environment</i>		- live simulation -- single platform simulation -- integrated multiplatform simulation -- live simulation of systems of systems; federations of federations; hyper federations
Decision support:	Description		- descriptive simulation
	Explanation		- explanatory simulation
	Prediction of behavior / performance		- predictive simulation
	Evaluation of alternative models, parameters, experimental conditions (scenarios), policies		- evaluative simulation for: -- feasibility studies -- sensitivity studies -- acquisition (simulation-based acquisition)
	Prescription		- prescriptive simulation for: -- planning: sim.-based planning -- on-line decision support: -- engineering design: simulation-based design (simulative design) -- virtual prototyping: simulation-based prototyping (simulative prototyping)
Understanding	to have insight, mostly, on the complex natural phenomena		

Education / learning			
Entertainment			
Enrich operations of real system	The system of interest and the simulation program operate simultaneously and provide augmented- (enhanced- or mixed-) reality for		
	- Decision support / online diagnosis - Training - Realistic virtual reality	- real-system enriching simulation	
Supports operations of real system	The system of interest and the simulation program operate alternately to provide predictive displays for:		
	- Decision support - On-the-job training	- real-system support simulation	

* a seminal article on the types of usages of simulation is:

Karplus, W. (1976). The spectrum of mathematical modeling and system simulation. In: Simulation and Systems - Proc. of the 8th AICA Congress, L. Dekker (ed.), August 23-28, 1976, Delft, The Netherlands, pp. 5-13.

also published as:

Karplus, W. (1977). [The spectrum of mathematical modeling and systems simulation](#), ACM [SIGSIM Simulation Digest](#), 9:1 (Fall-Winter 1977), 32-38.