The $\psi$-chart Design Approach in TTool/DIPLODOCUS: a Framework for Hw/Sw Co-Design of Data-Dominated Systems-on-Chip
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System Level Modeling with the $\psi$-chart: Application, Communications, Architecture and Mapping

Communications (how):
Behavioral model of generic communication protocols that are described independently of the application and architecture models.

Application (what):
Dataflow graph with data and functional abstractions, where algorithms are described using abstract cost operators.

Mapping (where):
The workload of an application and the behavior of communication models are associated to the architecture units.

Architecture (who):
Set of interconnected generic hardware nodes, decorated with parameters, e.g., bus width, arbitration policy.

Design Space Exploration: Simulation and Formal Verification at the push of a button

Automatic Generation of Executable Code from High Level Models

- Model-checking of system properties (e.g., safety, schedulability, performance)
- Interactive simulation with graphical interface and debug facilities (e.g., breakpoints, simulation traces)

An executable implementation of the application is automatically generated: only memory allocation and data-blocks addresses must be manually encoded.