Semantic Multi-View Model
For Low-Power

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Université Nice-Sophia Antipolis
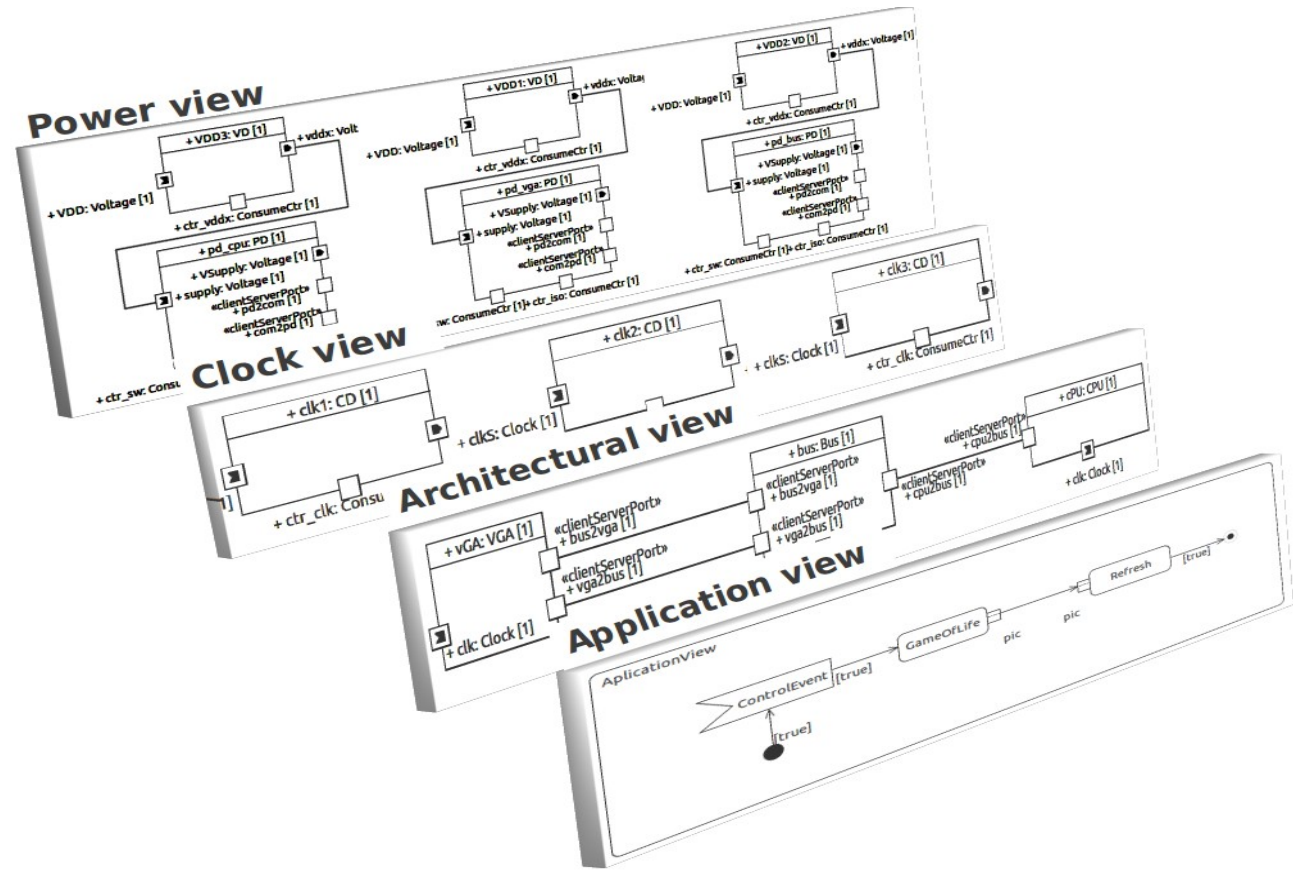AOSTE Project
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Overview

- Multi-View Concept

- Multi-View System Design

- Multi-View Control Specification

- Multi-View Power Analysis
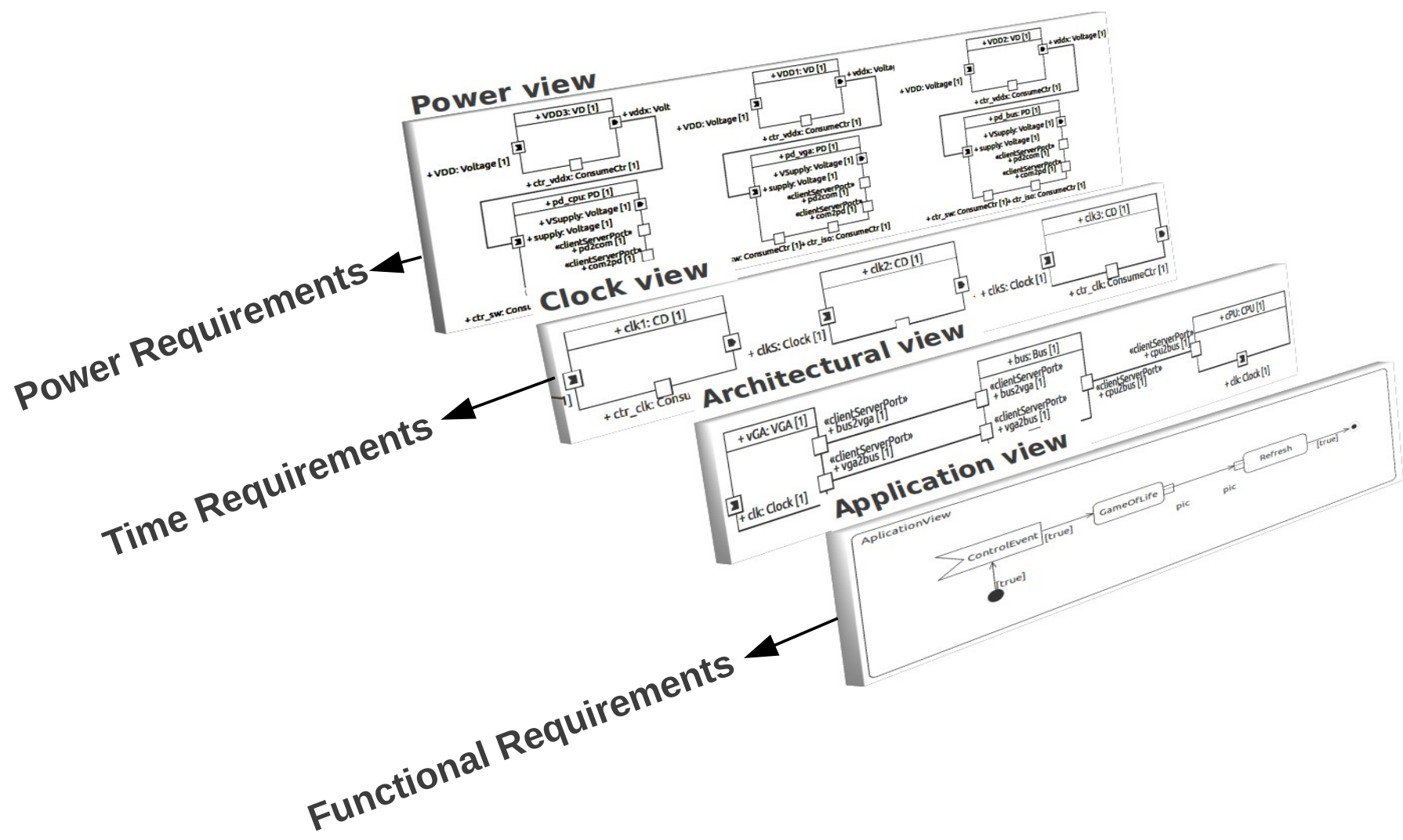
- Conclusions and Future Work

Multi-View Concept

- Split the system design in various concerns according to the domain:

    - Helps domain expert to focus on its own problematic, in its usual language.

    - Helps identifying the configuration possibility of each view.

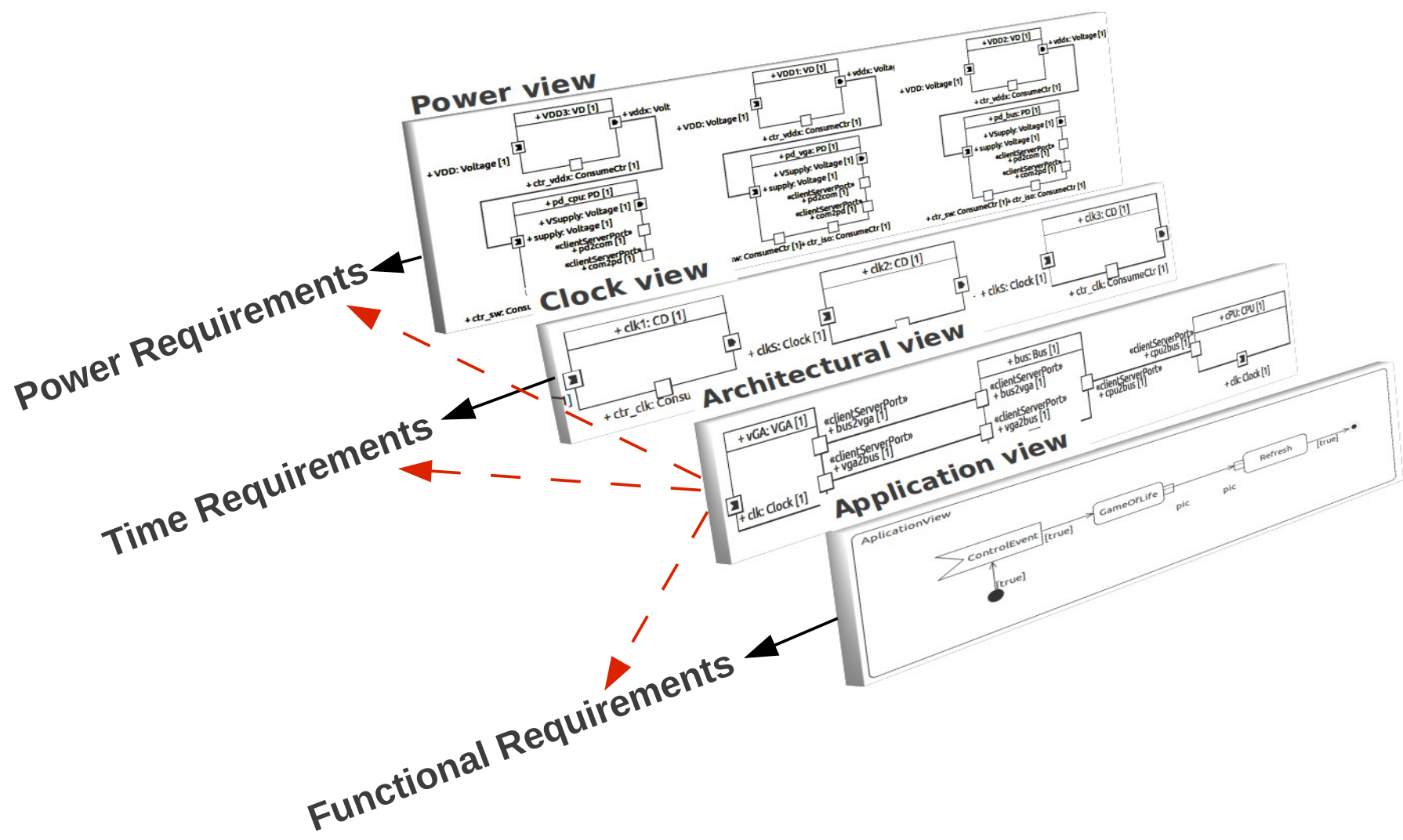   - Helps identifying the impact of each view on system requirements.
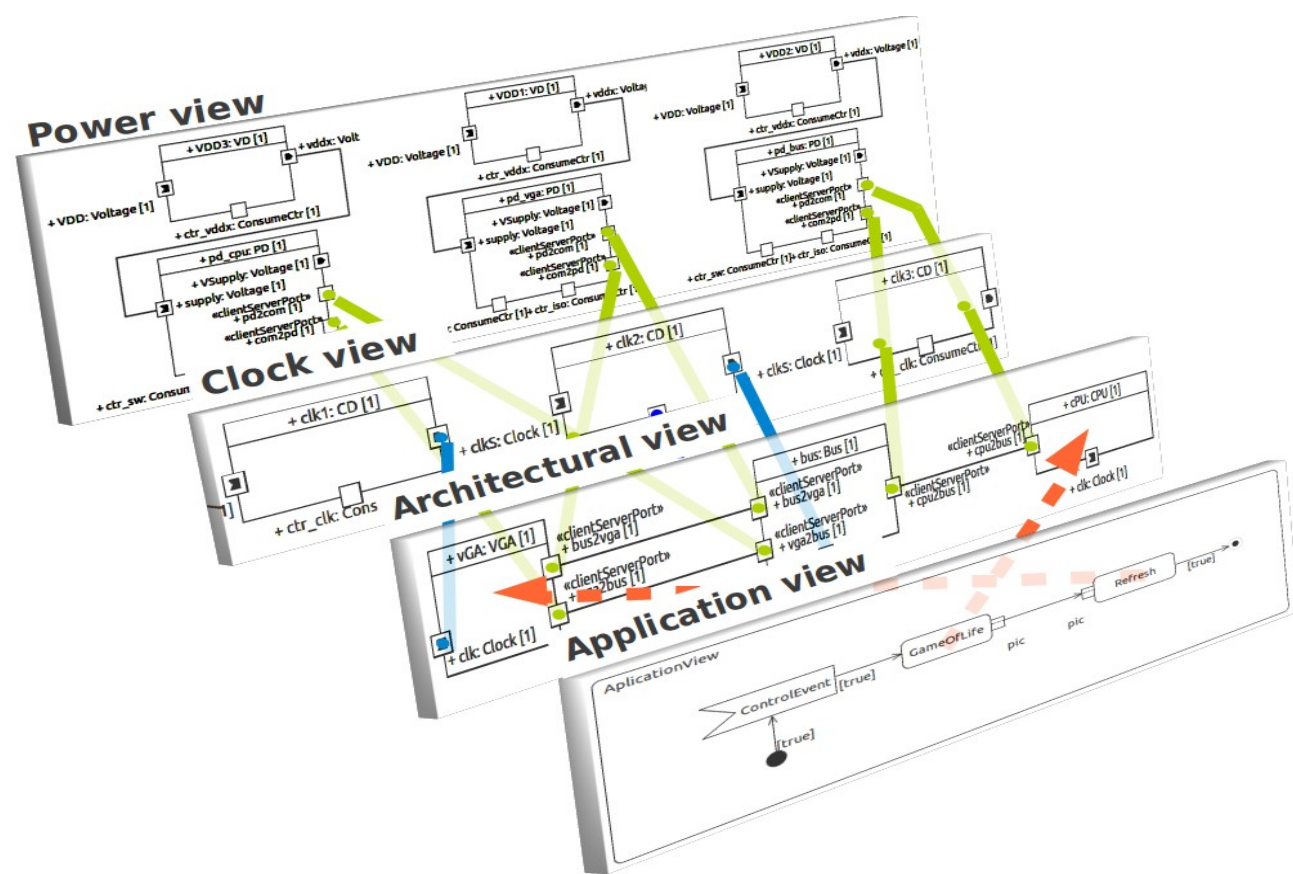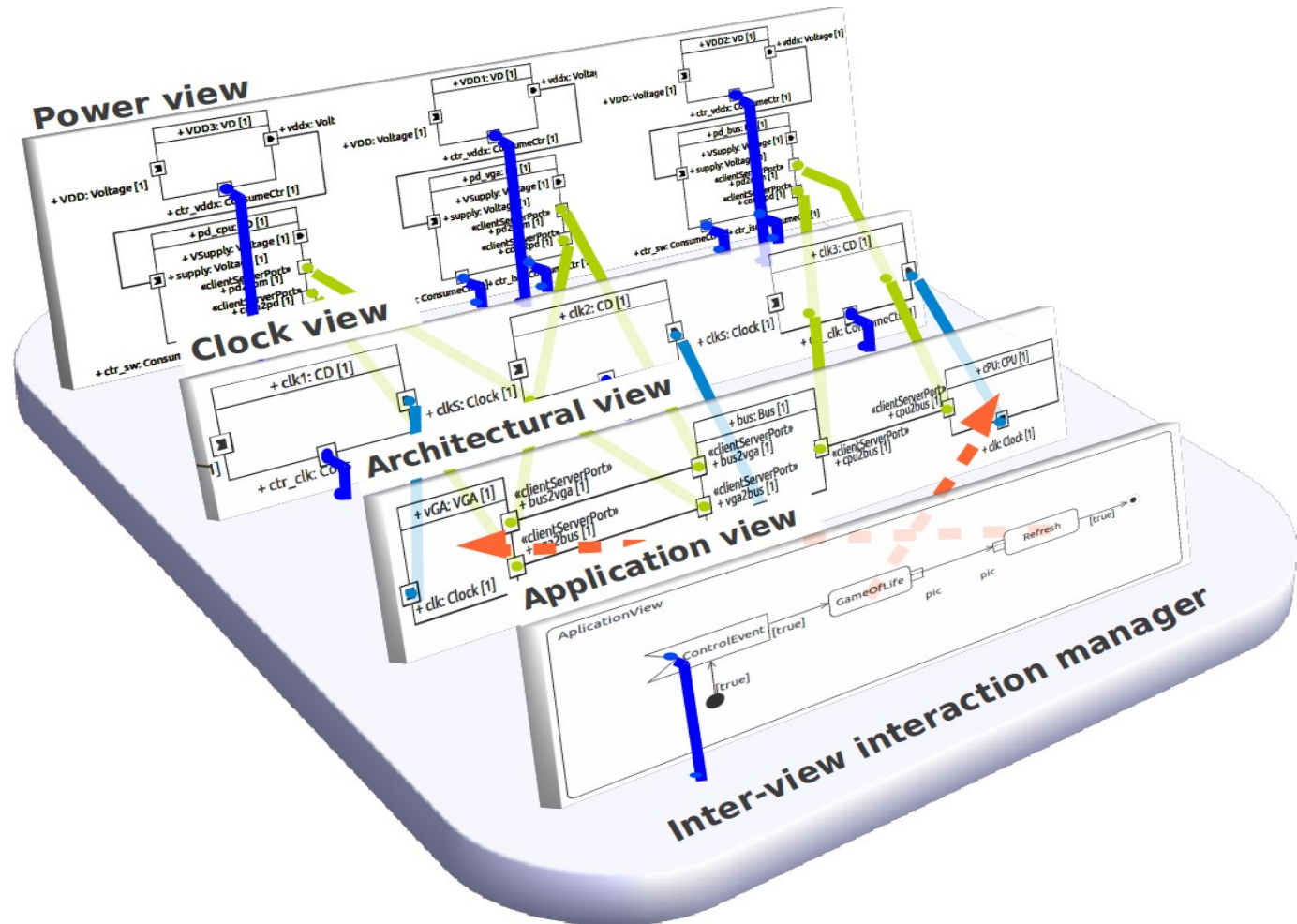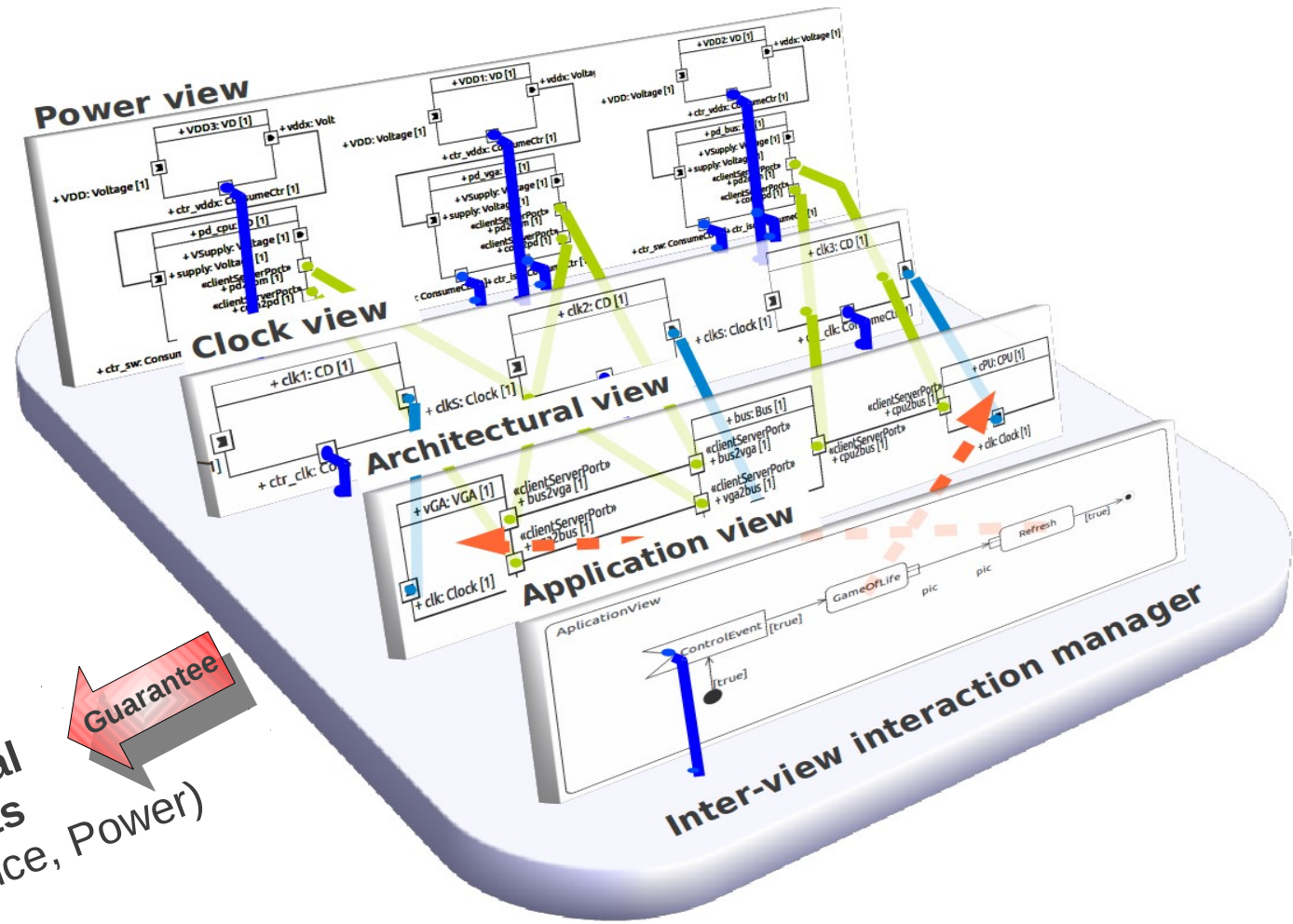
Multi-View System

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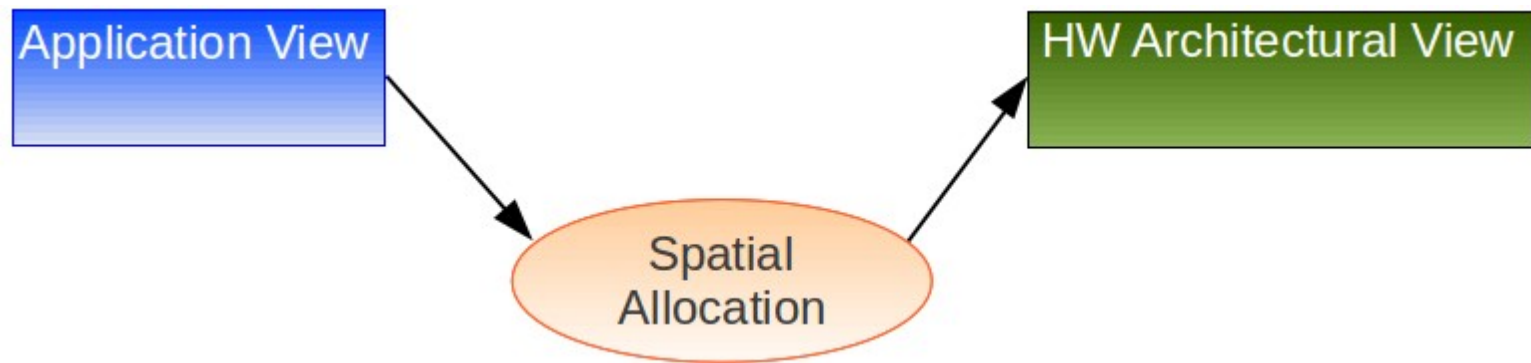# Multi-View System
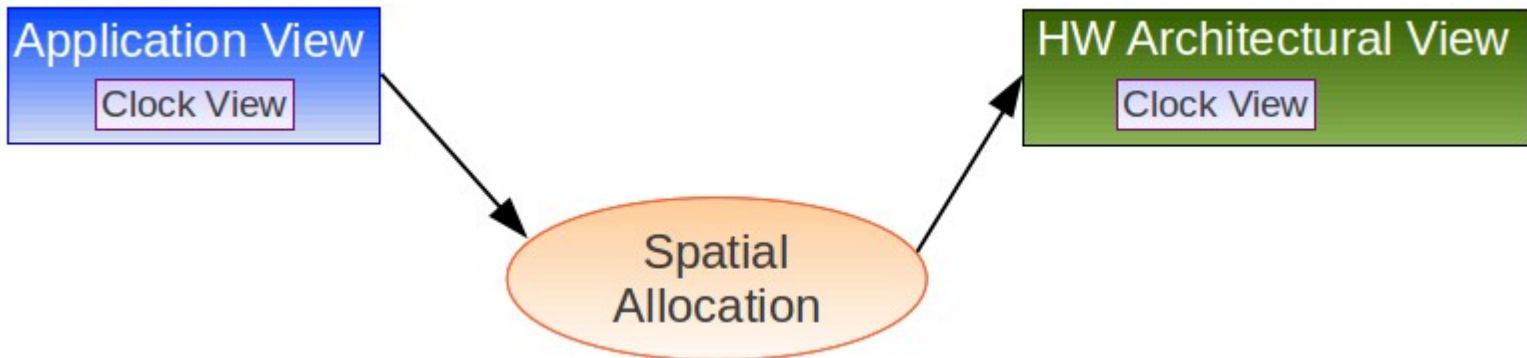
Multi-View System

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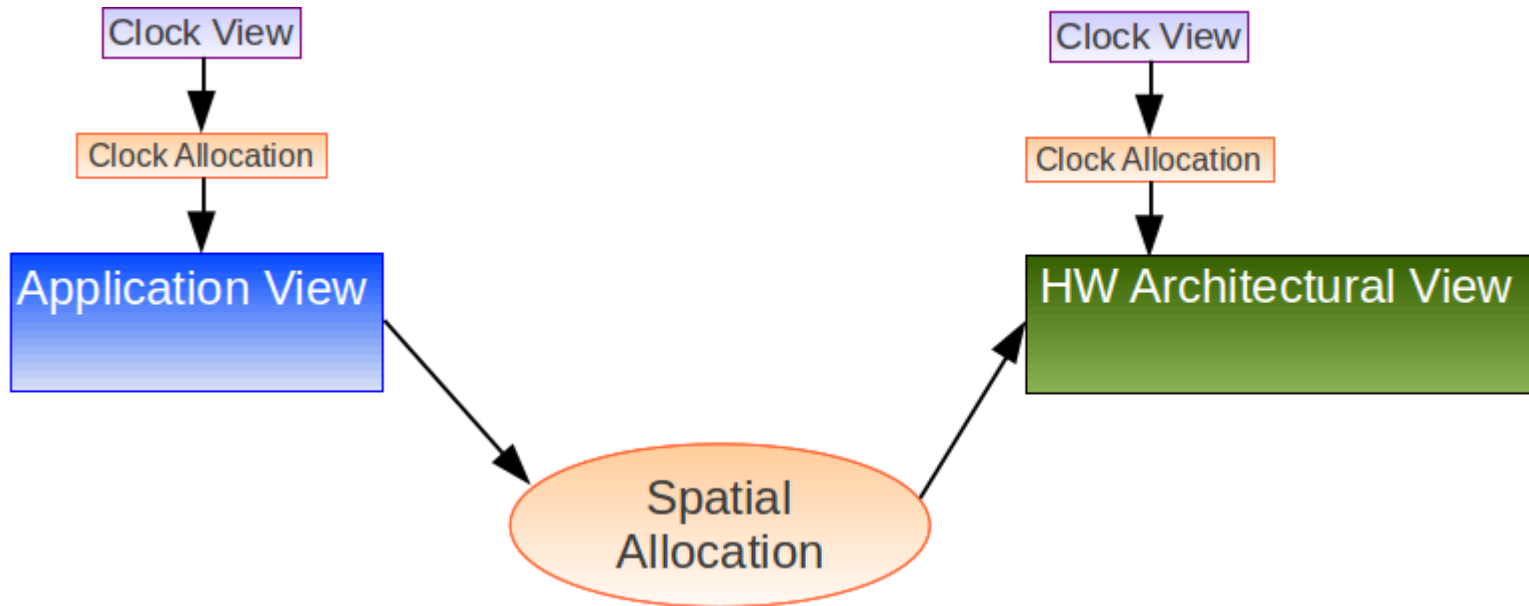
System Design
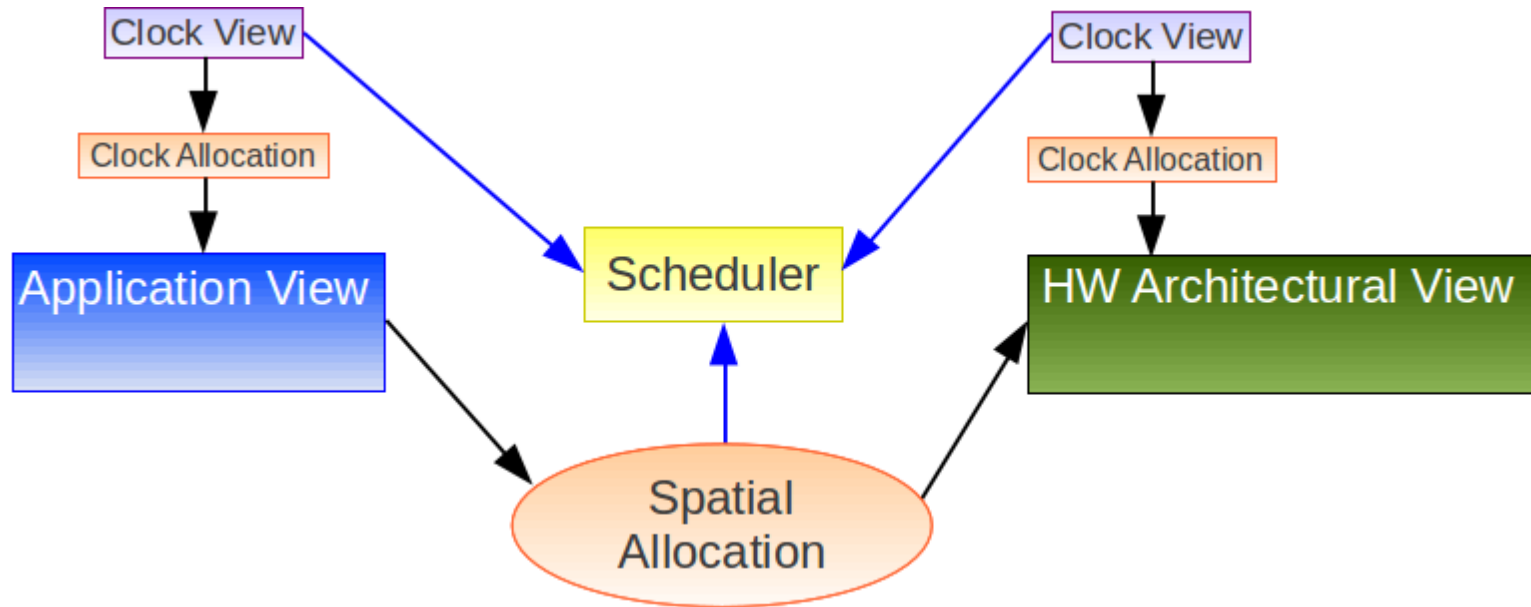
Application View
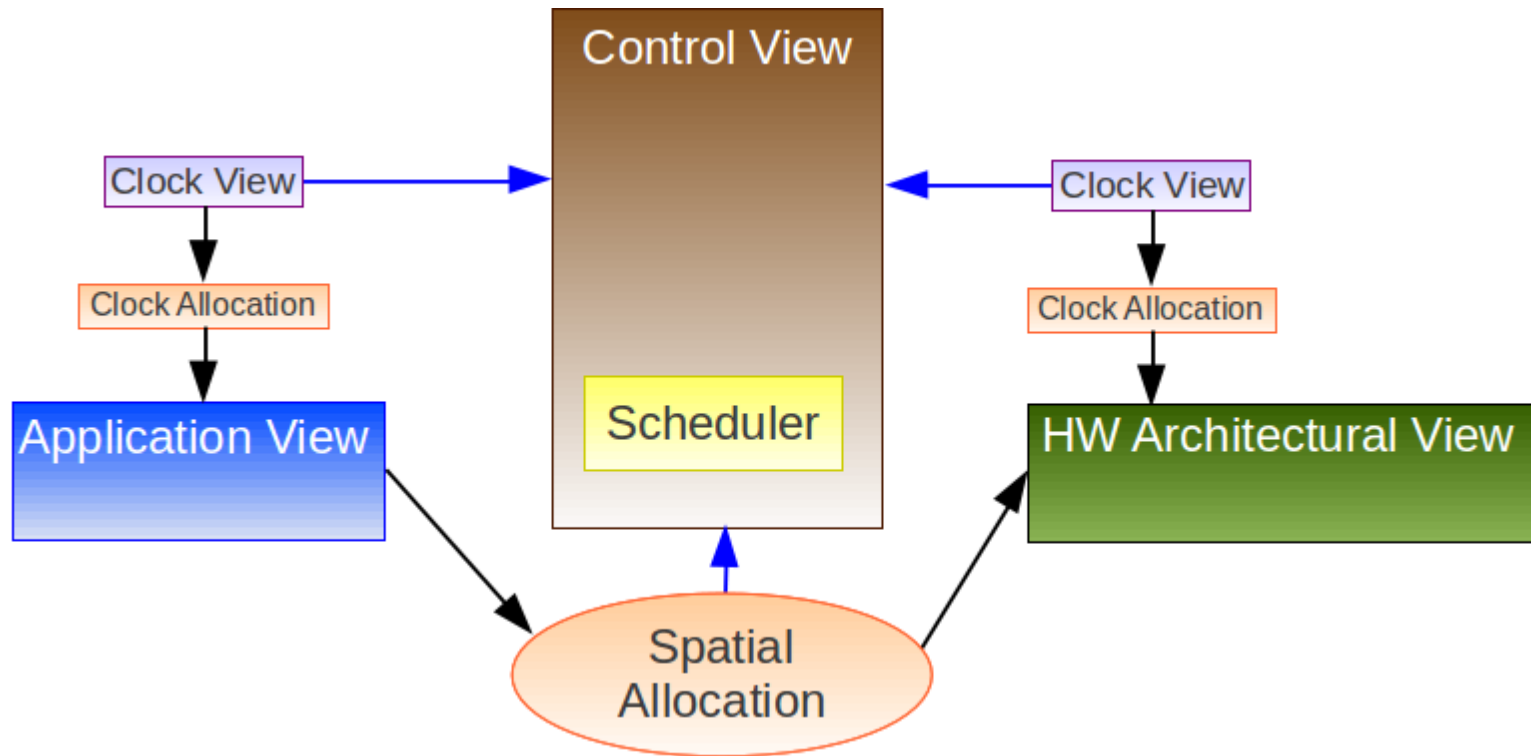
HW Architectural View
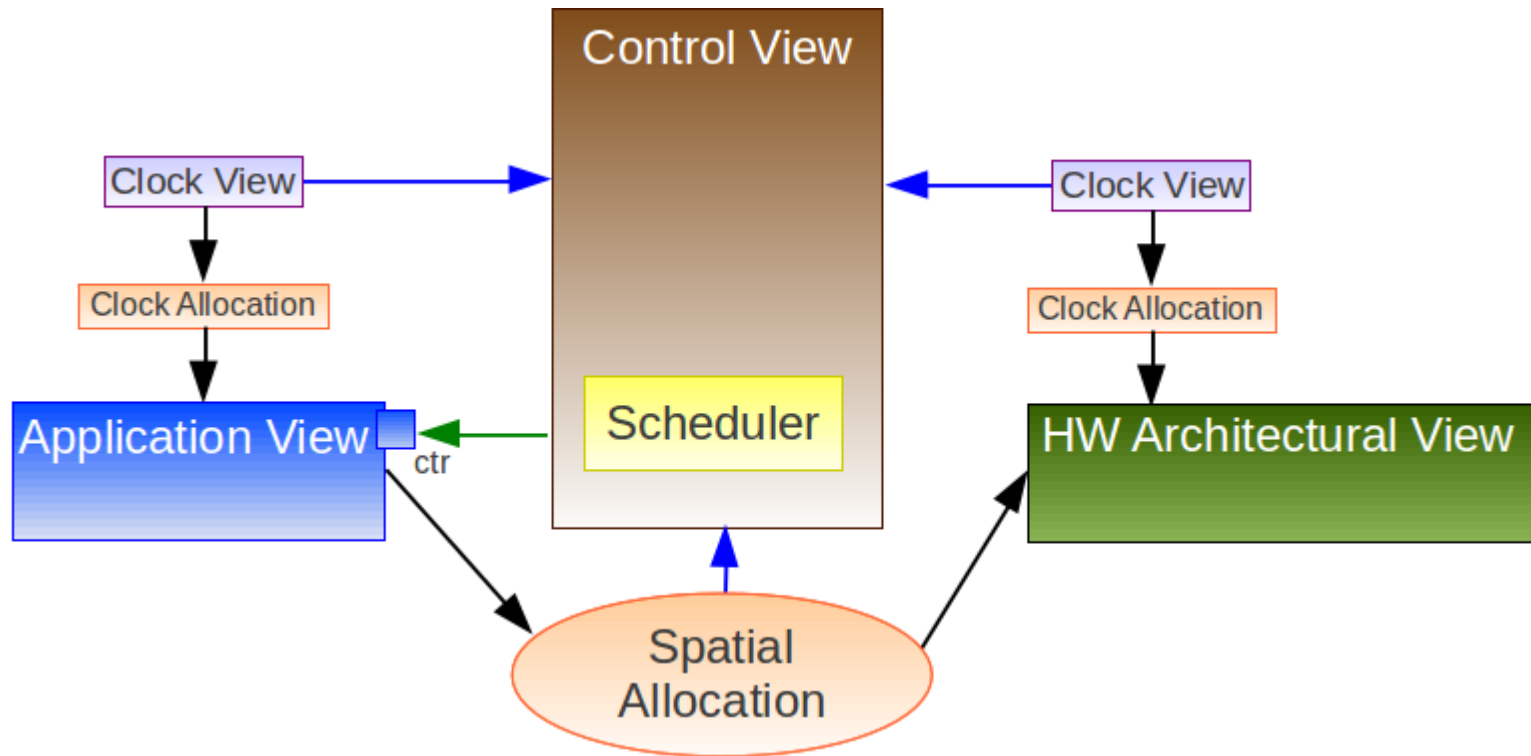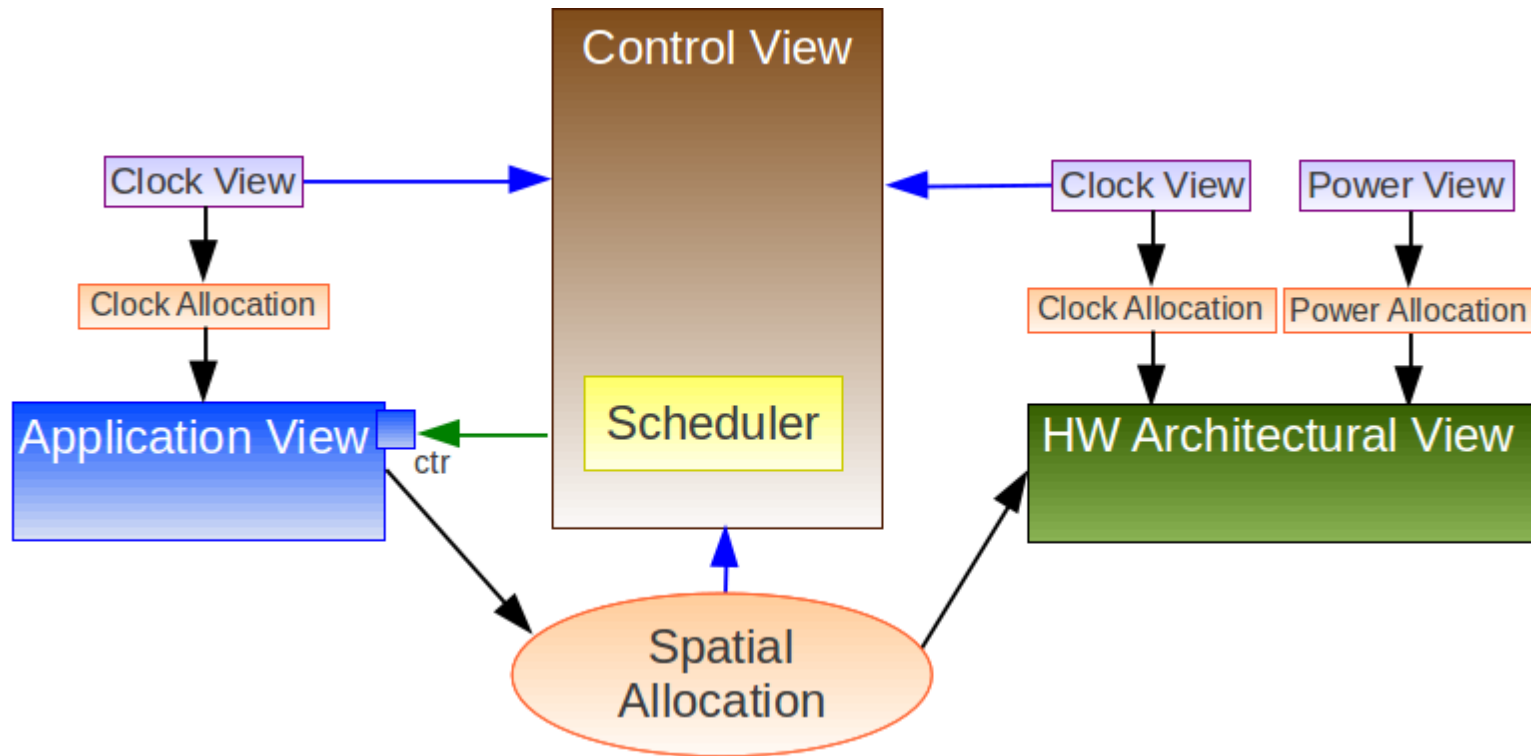
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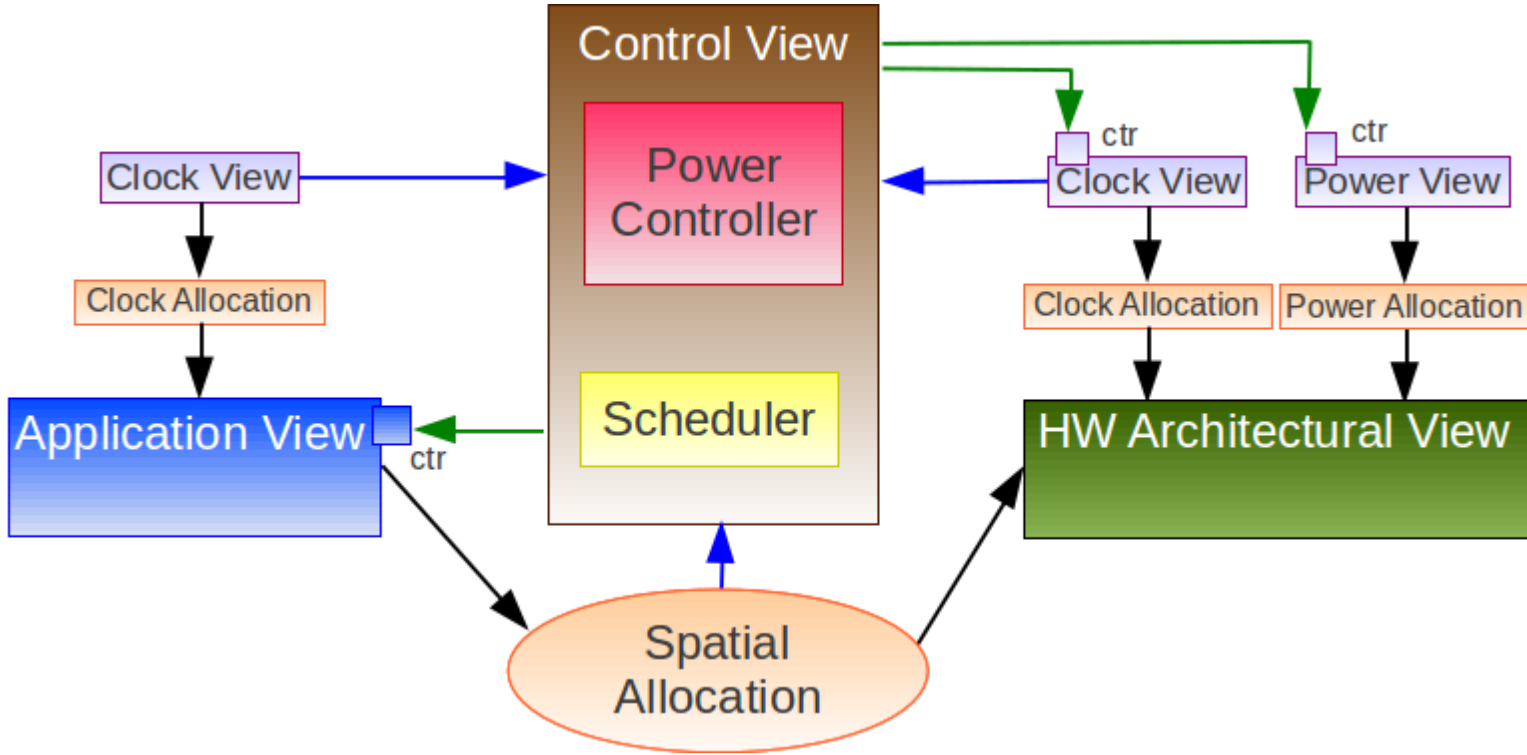
System Design

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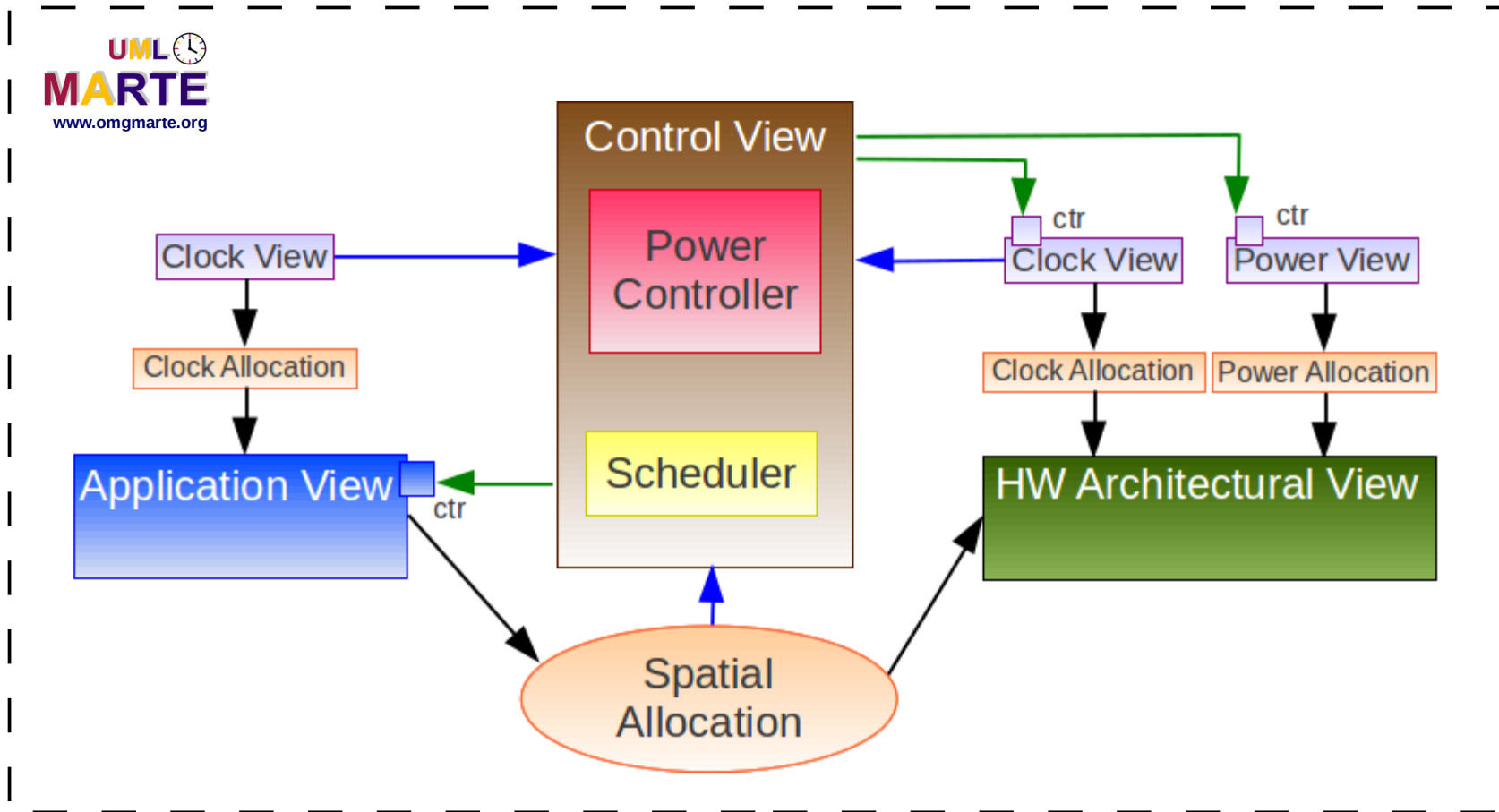
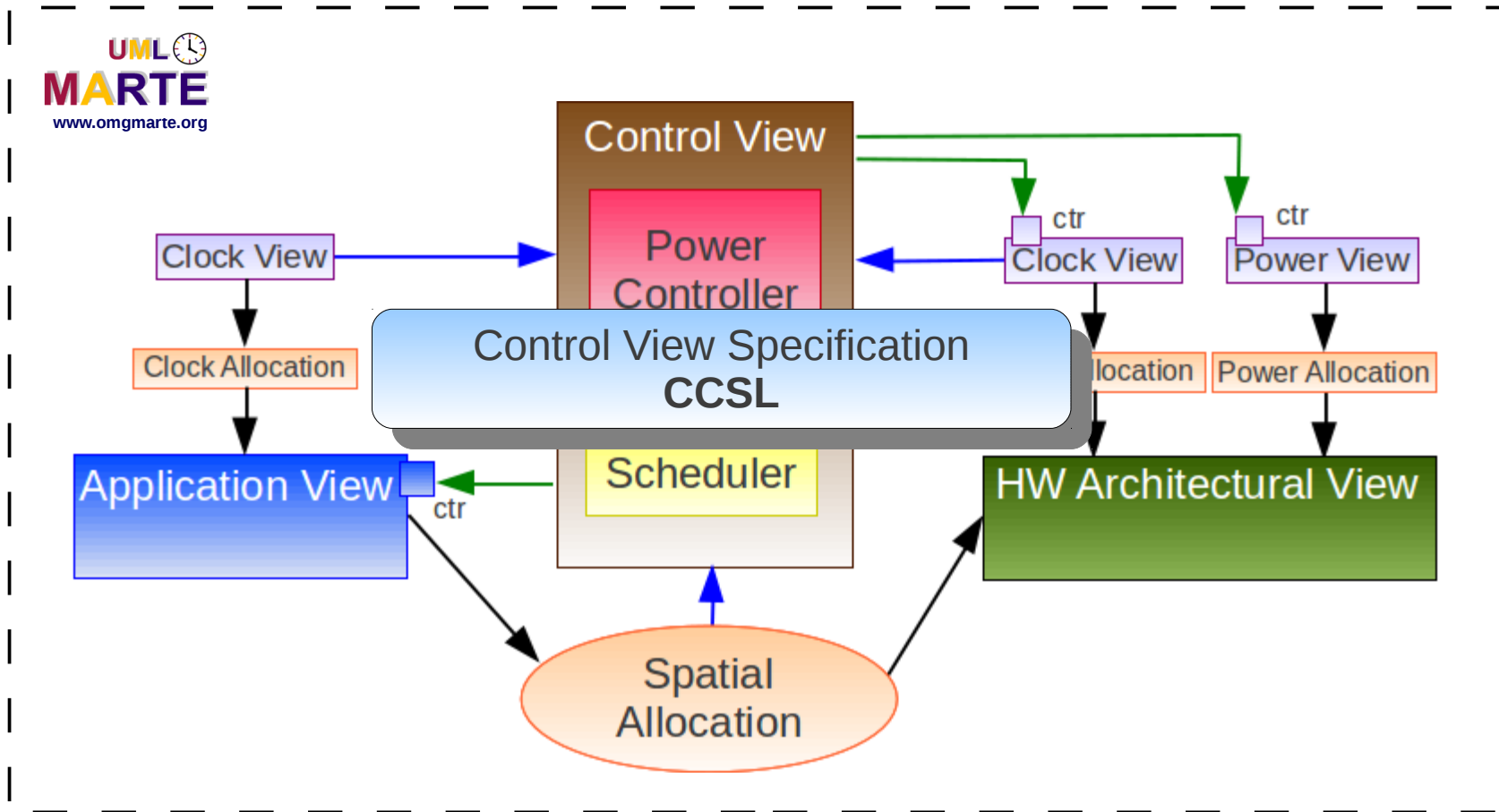# System Design

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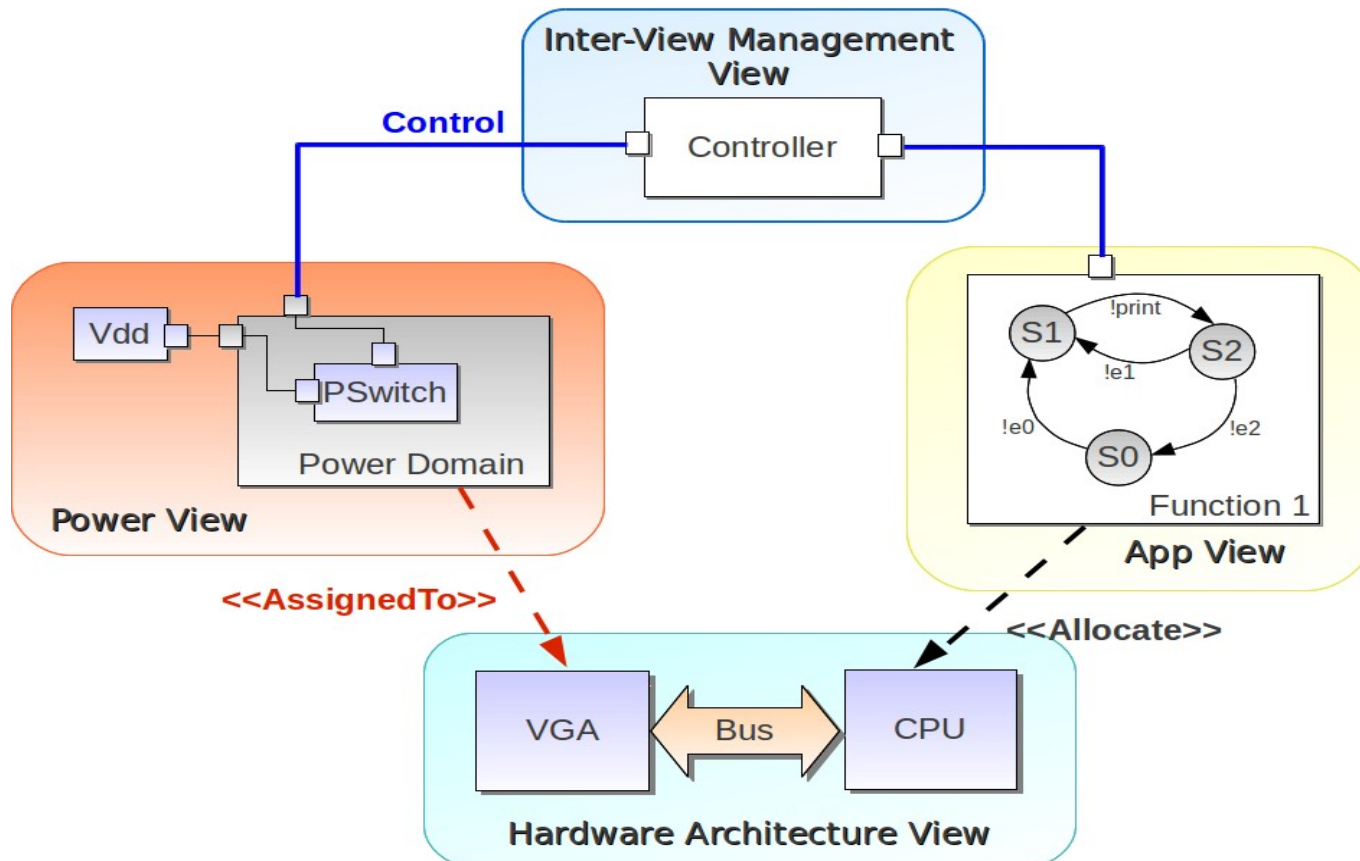
System Design

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Clock Constraint Specification Language (CCSL)

- Formal language to specify **the relationship among events (clocks)** presented in a system

- Introduced in MARTE (UML Profile)

- *TimeSquare:* CCSL simulation environment

- Multi-View Control Specification:

  - Ports events → Clocks on CCSL

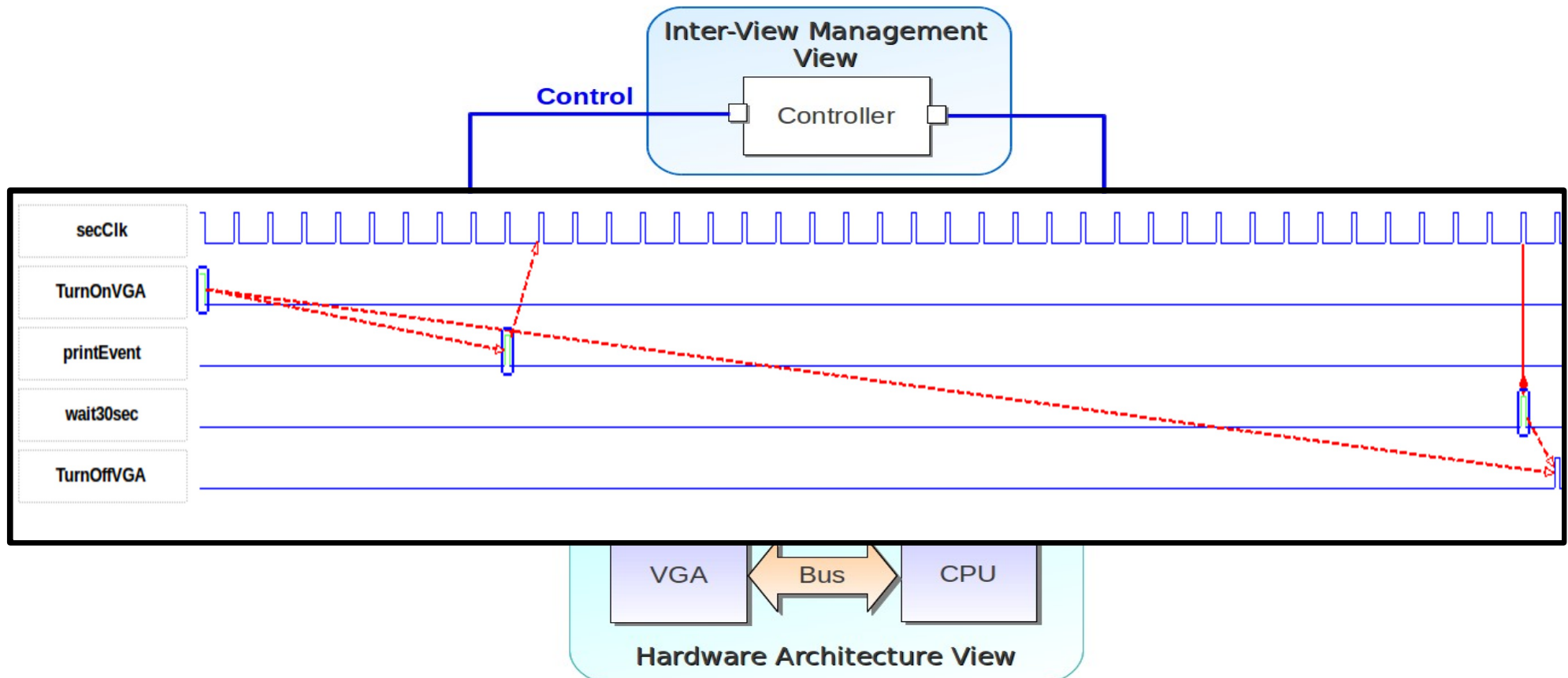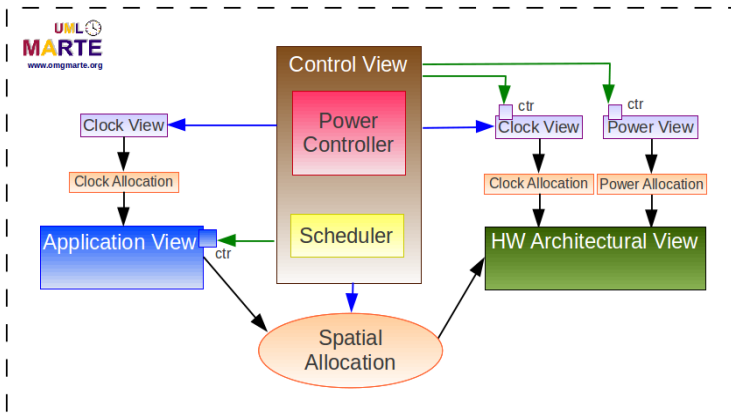 - Guarantee functional and extra-functional requirements
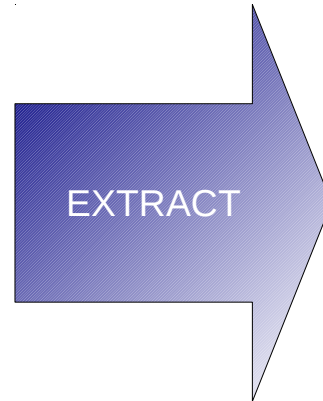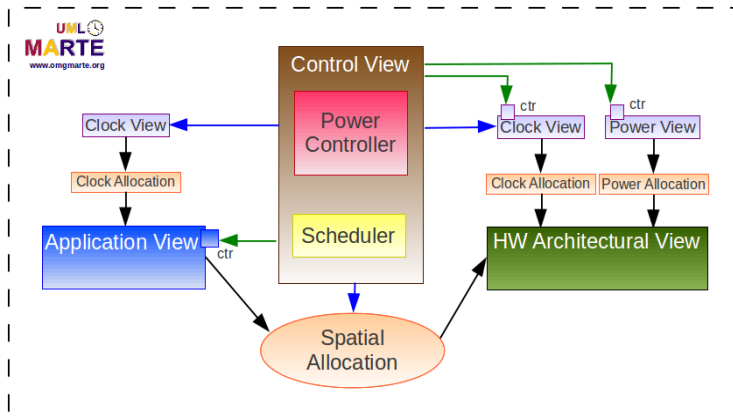
Control Specification Example

- "VGA card should be powered on for at least 30 sec. when the CPU requests to print"

Control Specification Example
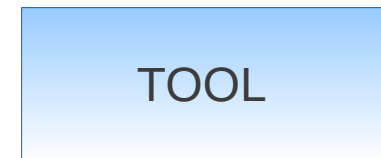
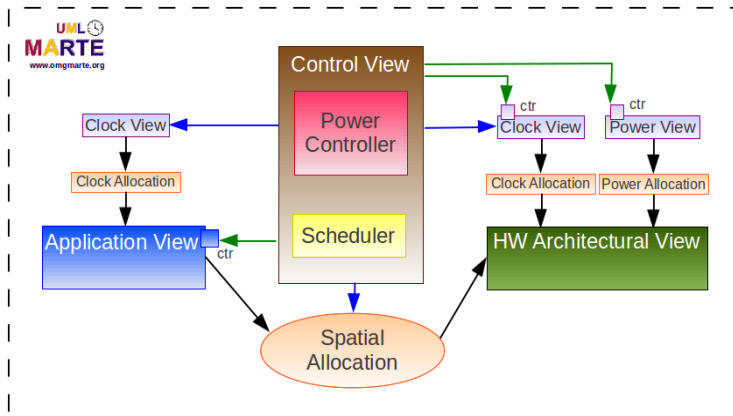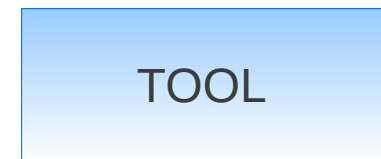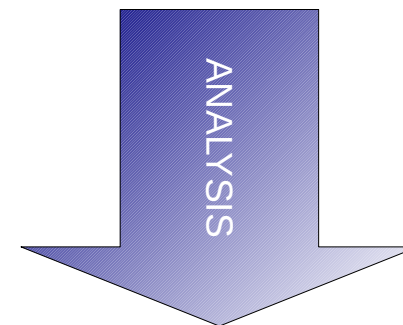- "VGA card should be powered on for at least 30 sec. when the CPU requests to print"
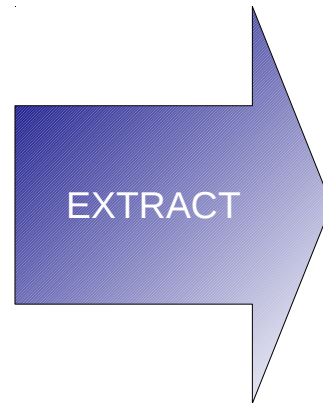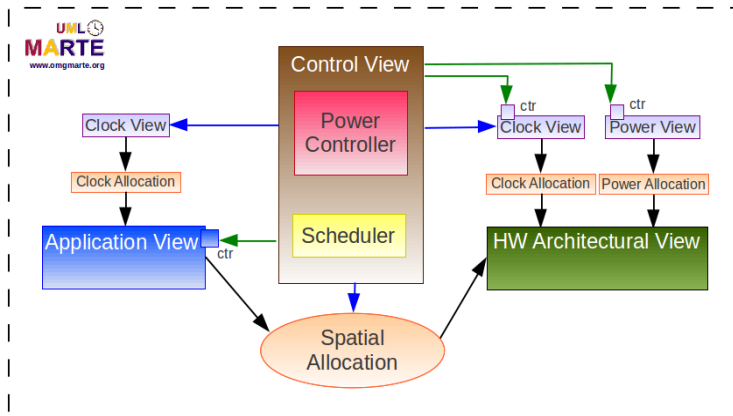
System Design Analysis

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System model is independent from analysis tools

Choose specific views to analyze a specific feature

System Design Analysis

Scheduling Analysis

System model is independent from analysis tools

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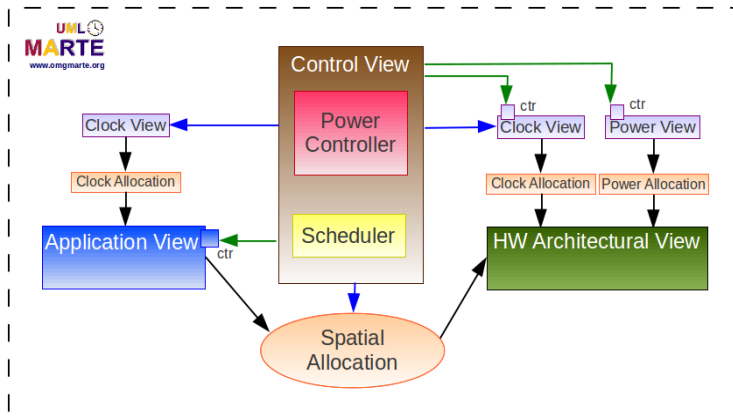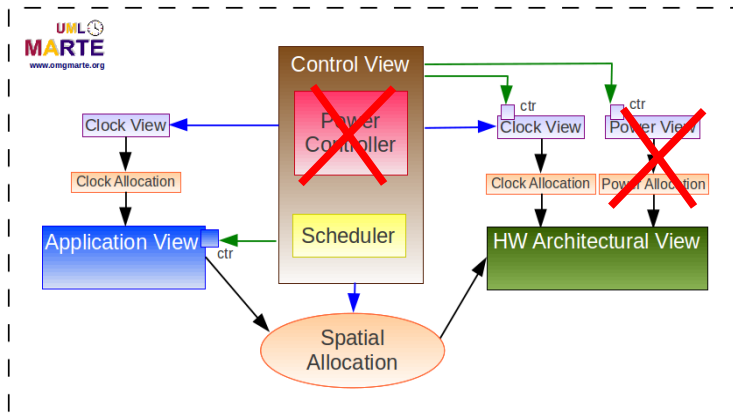
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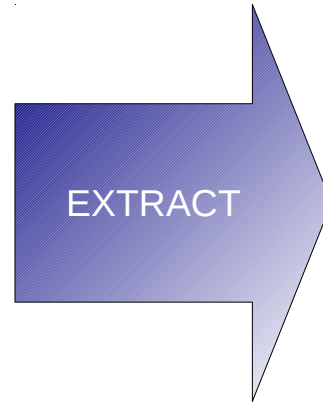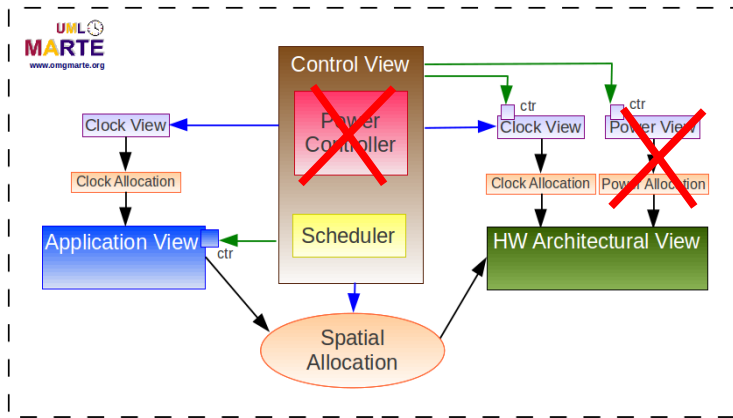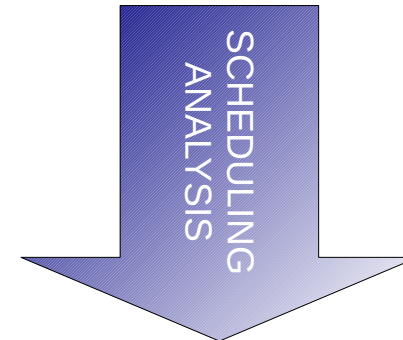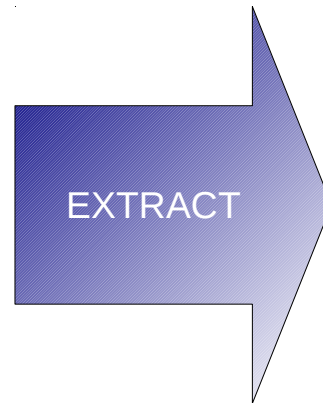
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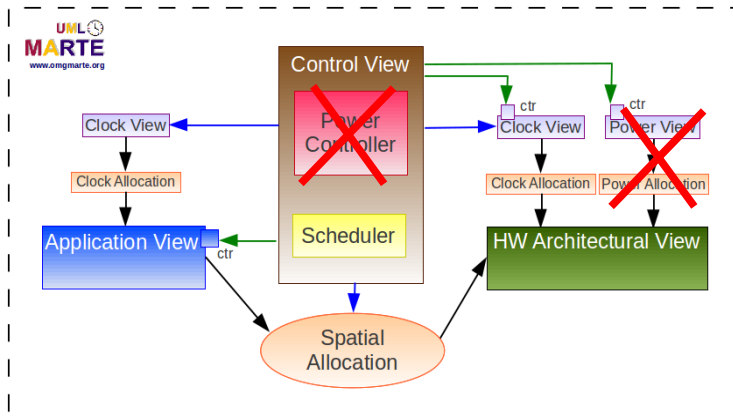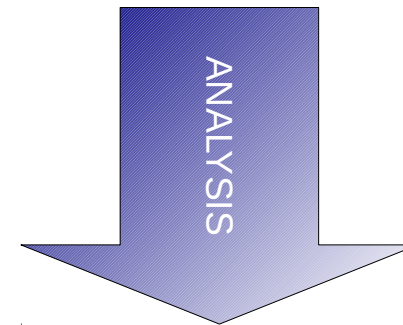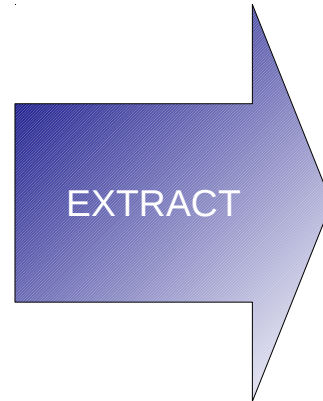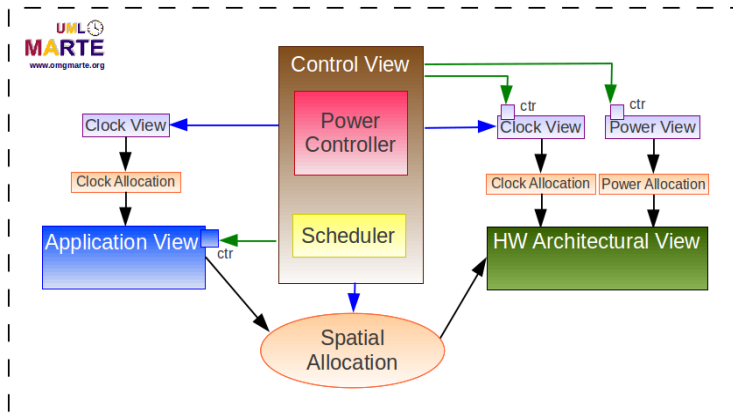
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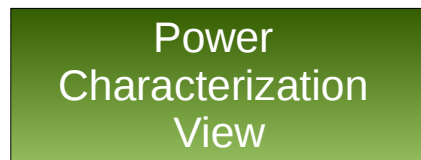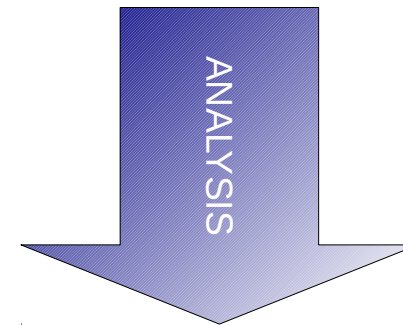Choose specific views to analyze a specific feature
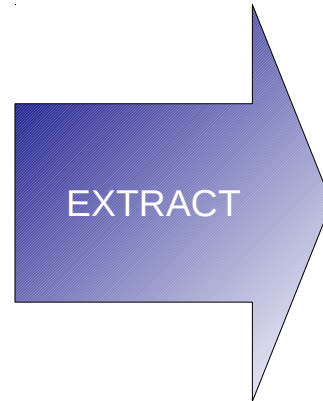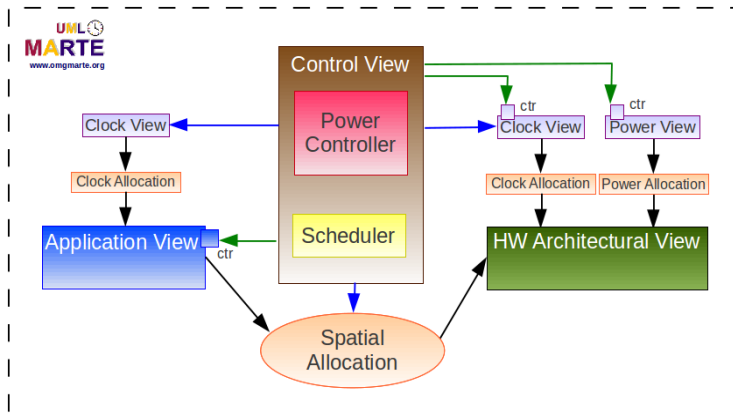
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Power Analysis
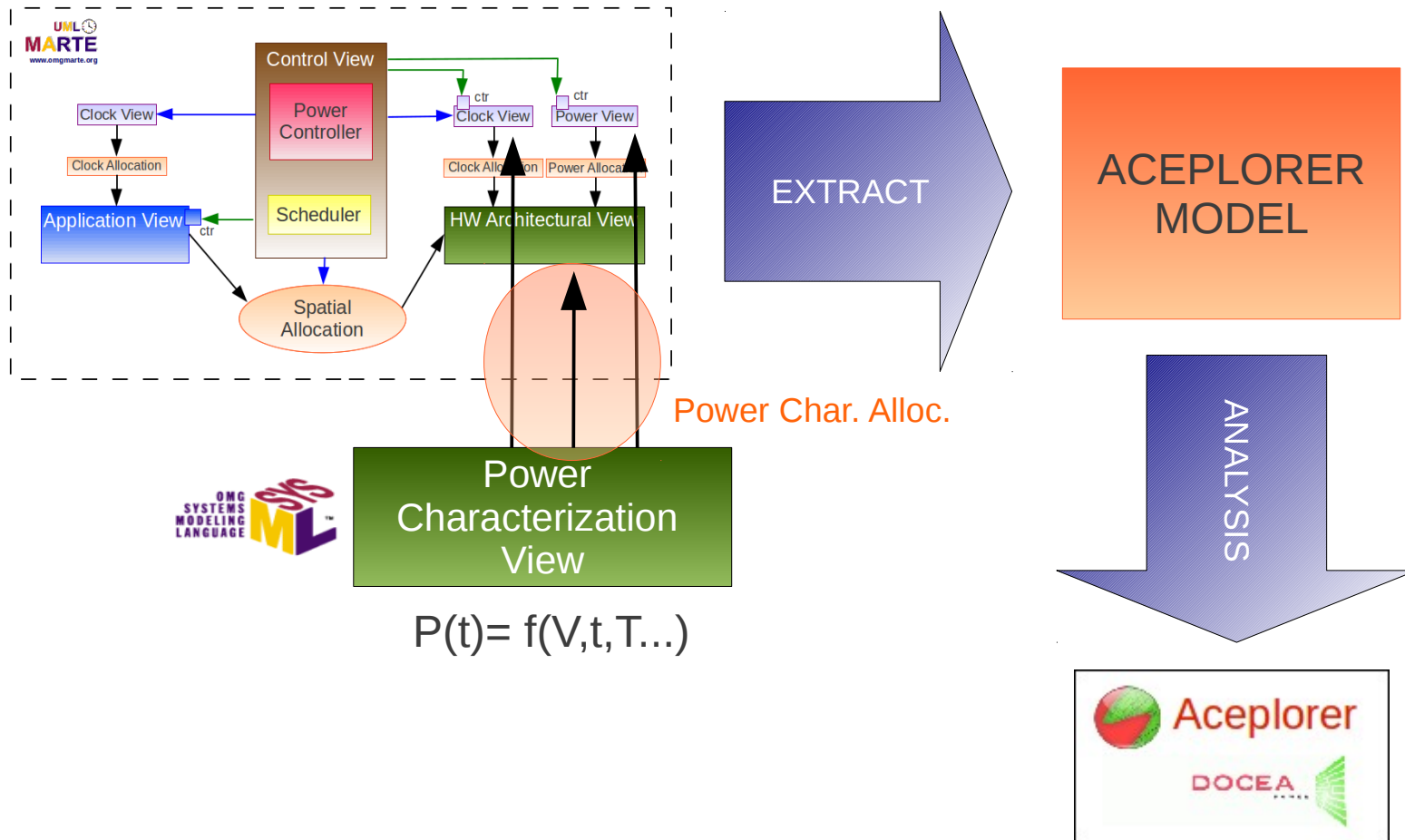
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$$P(t)= f(V,t,T...)$$

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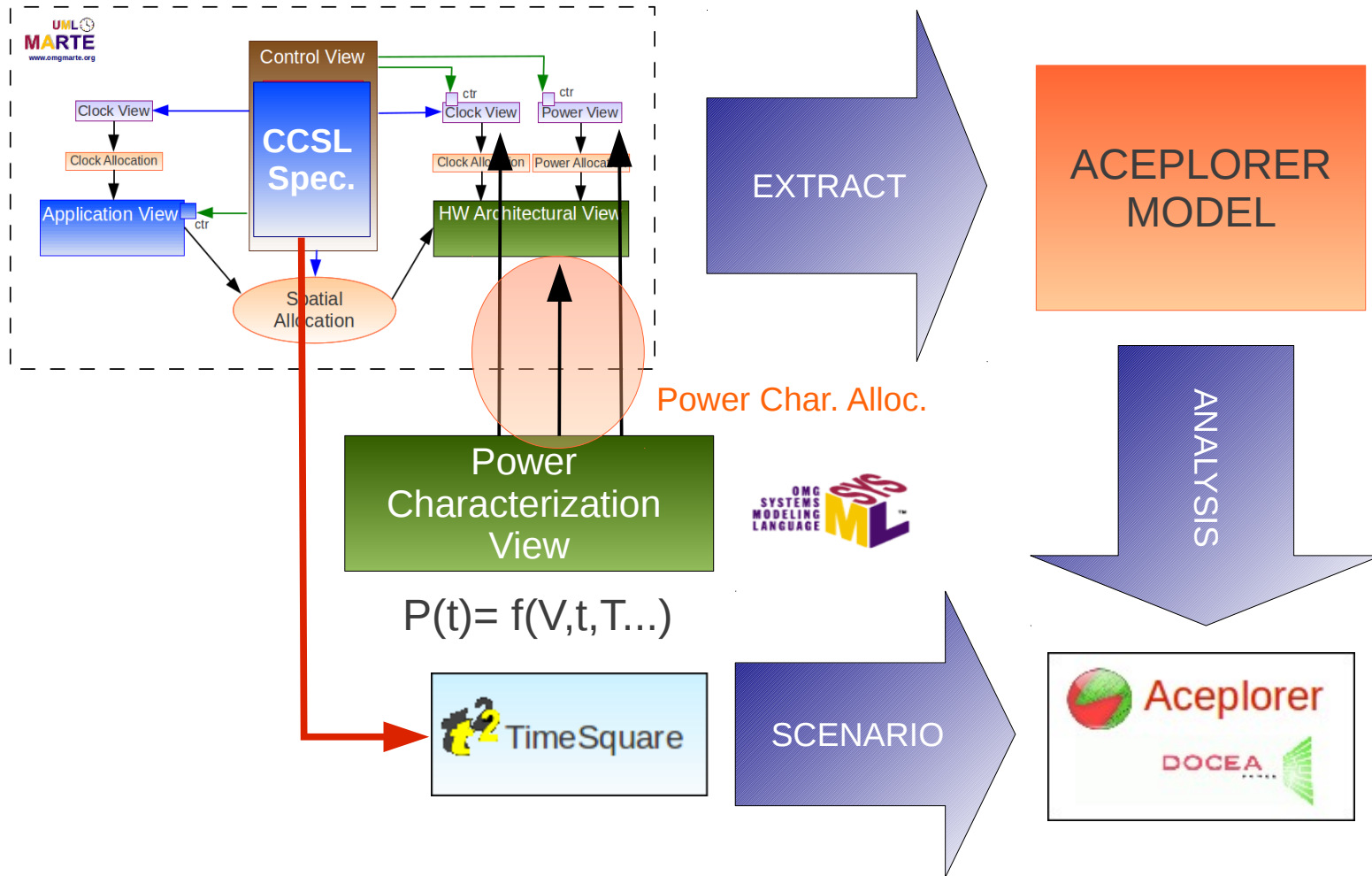
Power Analysis

Conclusions and Future Work

- We use MARTE/SysML to model systems using multi-views.

- Our model follows a modeling standard and it is independent of the analysis tools.

- We create a transformation engine to analyze Power consumption using Aceplorer tool.

- We use CCSL to specify the control behavior of the Control View.

Merci!!!