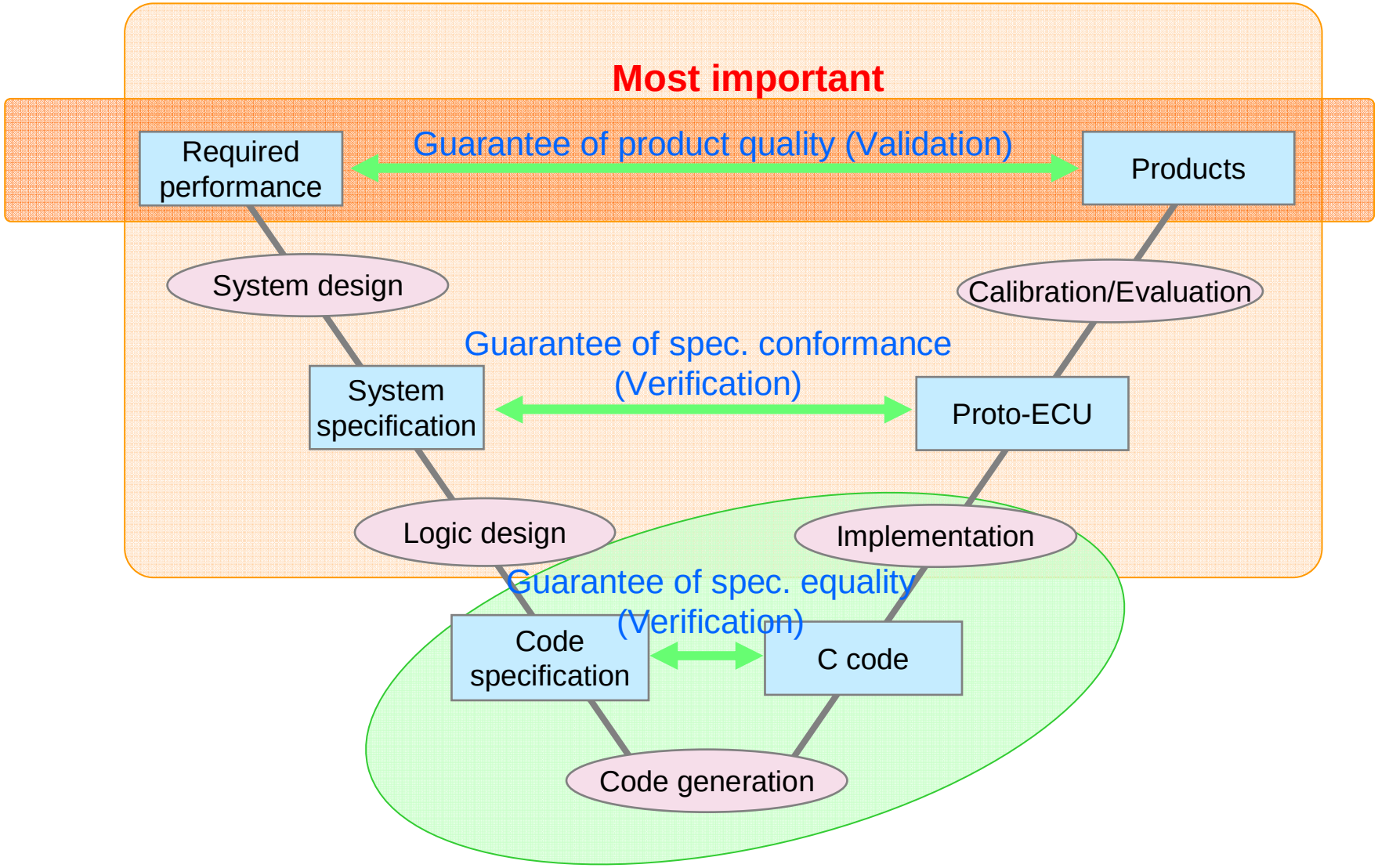
Powertrain Control Software Verification

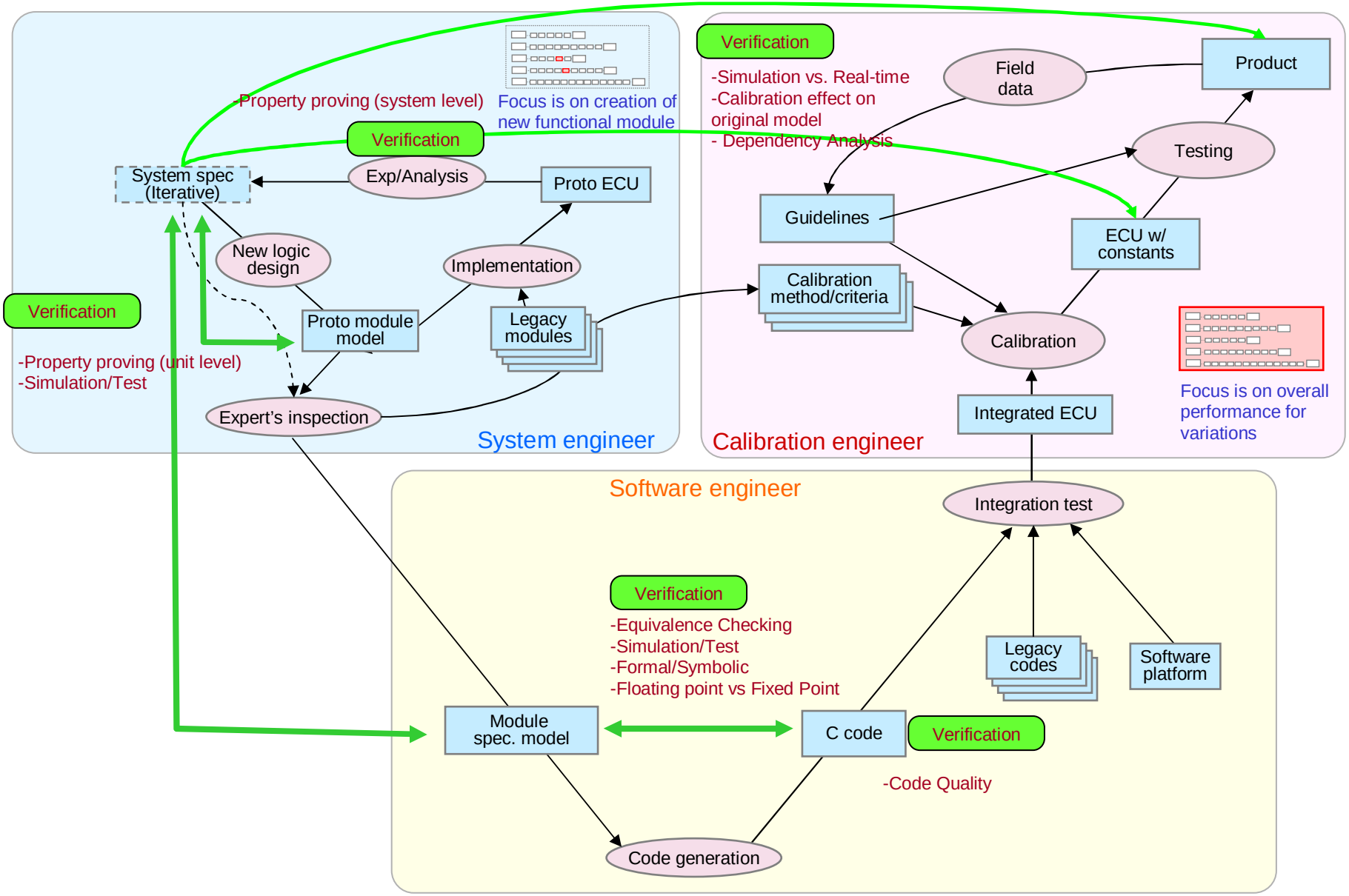
Formal Methods in Computer-Aided Design
11/02/2011

Hakan Yazarel
Powertrain Control – Model Based Development
Toyota Motor Engineering & Manufacturing N.A.

V process model



V process – Spec transformation to product



What we need

TOYOTA
TOYOTA TECHNICAL CENTER, USA, INC.

- Deal with system complexity
  - Heterogeneity (hybrid dynamics)
  - Scale
  - Floating/Fixed point design vs. Floating/Fixed-point Implementation
- Tools that can be integrated into existing process
  - Tool Input: C-code, Simulink model
  - Models: You will not see much differential equations but lots of look-up tables
  - Closed Loop System: Continuous interaction between controller (software) and continuous plant