Top-down Software Decomposition: Automating the OPP Design Process.
(One paragraph abstract)

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In this project we aim to improve design productivity by automating steps of the design modeling process. We propose a framework for processing product requirements and software/hardware component specifications that will achieve: 1) checking consistency of requirements, features, and QoS constraints, 2) component selection with constraints satisfaction, 3) component configuration (UML). We propose an approach that closes the semantic gap between requirements and component models based on ontologies and reasoning, using proven semantic web technologies. Ontologies are statements encoding domain-specific concepts and the relationships between them. Formulated in a logic-based language (OWL), ontologies are used for automated reasoning. The language vocabulary spans the domains of cell-phone products and mobile application development. Ontologies compiled from requirements specifications capture features, resource constraints and QoS. UML component models are marked up with metadata describing semantics, capabilities and component-level constraints. Additional knowledge, such as relationships, attributes and interfaces, are extracted automatically from UML structural diagrams.