Application Engineering

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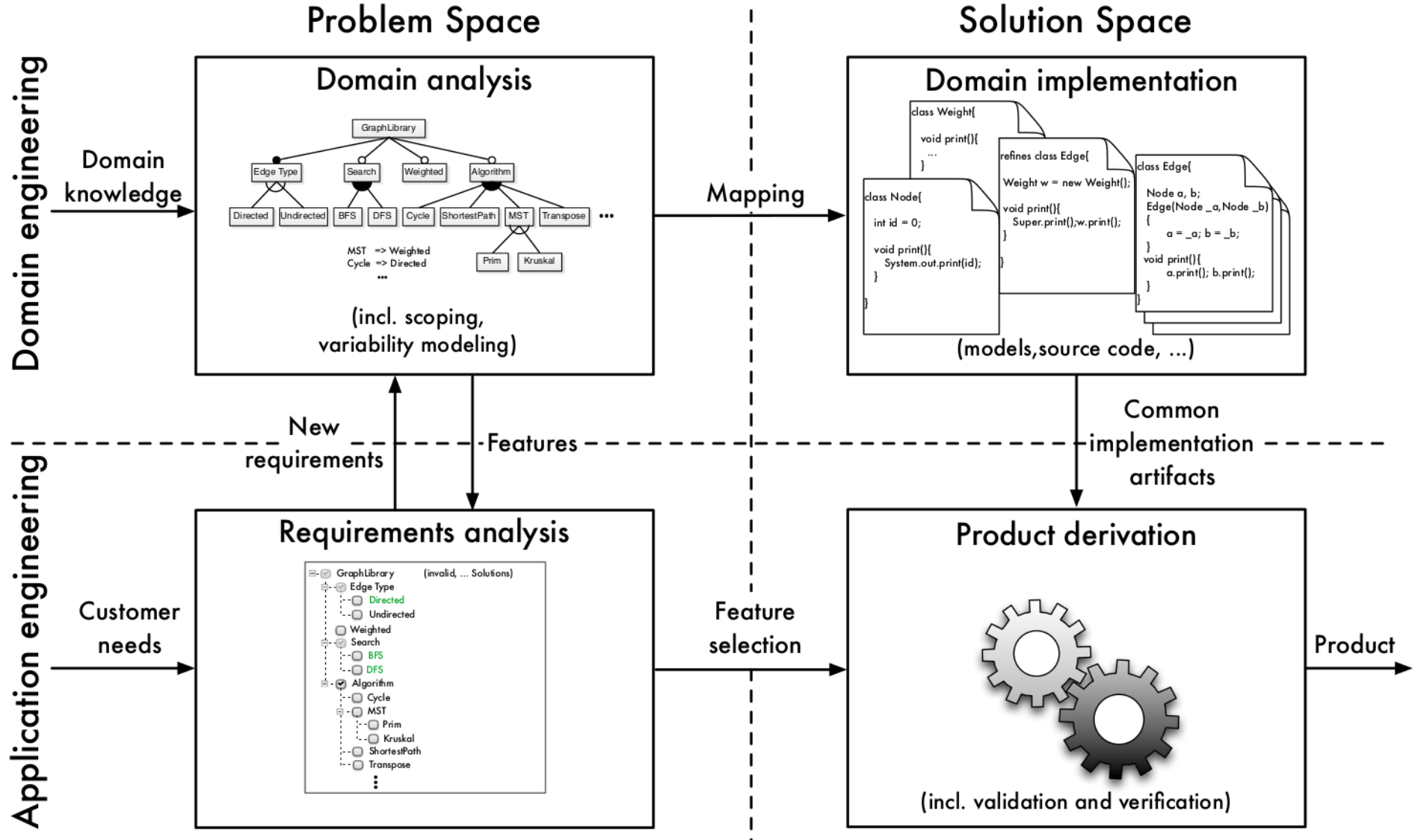
Engineering Process of SPL



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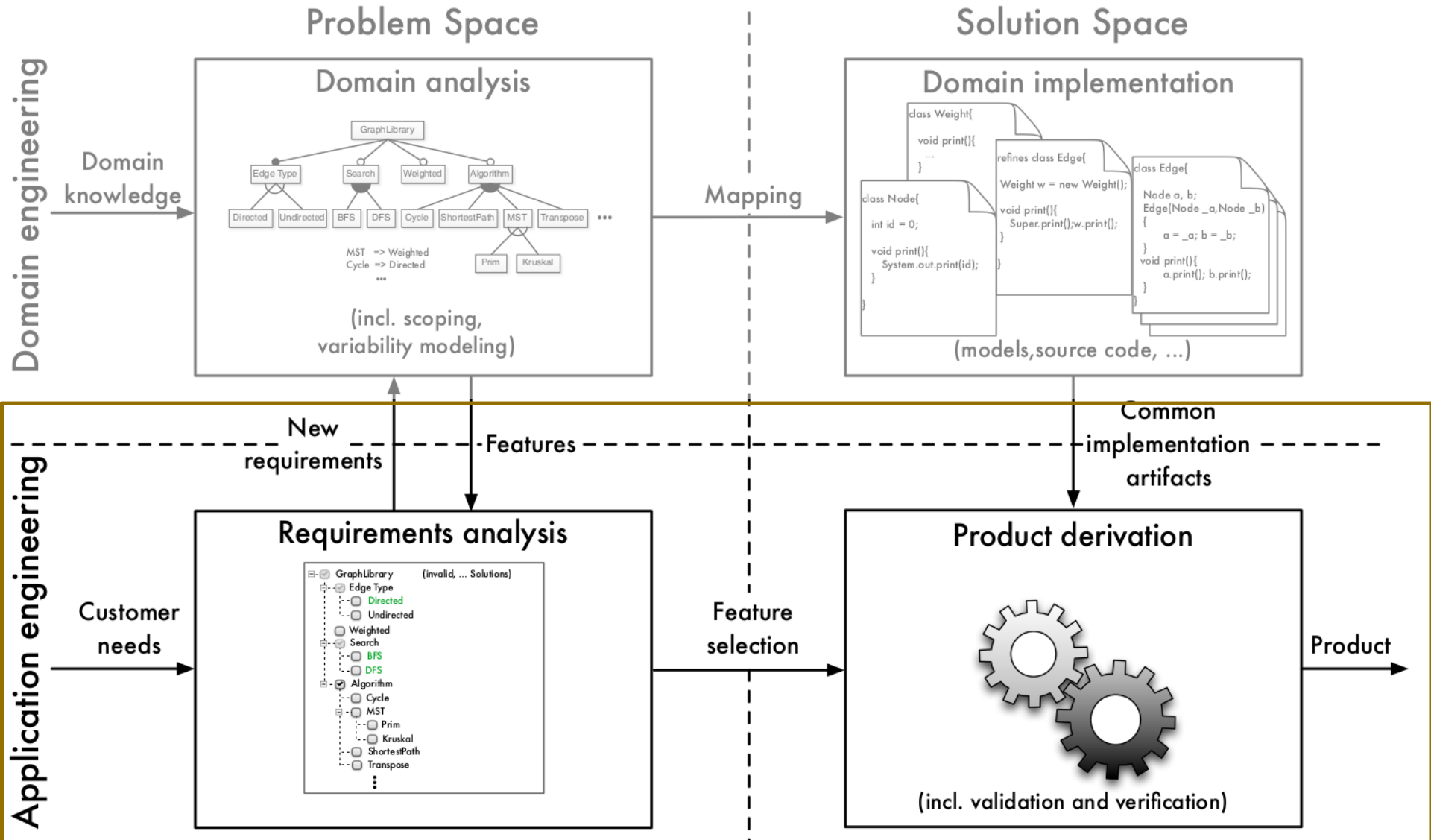

Tasks in SPL Development

- Four clusters of tasks in SPL development
  1. Domain Analysis
  2. Domain Implementation
  3. **Requirements Analysis**
  4. **Product Derivation**

Requirements Analysis

Requirements Analysis

- It is similar to requirements engineering in traditional software engineering
  - In SPL, we build knowledge from domain analysis
- Requirements analysis typically uses well-known requirements techniques
  - Interviews, document analysis, etc.
  - But, they try to map specific customer requirements to those of domain analysis

New Requirements

- We have three options if a new requirement cannot be mapped to an existing feature
  1. We may decide that the requirements is out of scope (exclude)
  2. We may change the scope of the SPL to include the new requirement
  3. We may configure a product without this requirement and manually implement it

Staged Configuration

- Requirements analysis is mainly based on feature selection
- Feature selection in not always easy
- When multiple stakeholders are involved, features have to be selected in consecutive steps

Product Derivation

Automatic Product Derivation

- Depending on the implementation strategy, this task can be fully automated
  - That is, we select feature and call a composition engine to combine them
- Automating product derivation eliminates most costs of this task

Manual Product Derivation

- Fully automated product derivation may not be possible
- If manually composed, artifacts are reused and assembled from the domain implementation
  - Developers have to write “glue code” to connect the artifacts

Product Validation

- The last step of application engineering is the product validation
- That is, after product derivation, it has to be validated before delivery
  - This task includes running test cases
  - A customer is also needed for validation

Bibliography

- S. Apel, D. Batory, C. Kastner, G. Saake. **Feature-Oriented Software Product Lines: Concepts and Implementation**. Springer; 2013.
  - Section 2.2 (2.2.2 and 2.2.4)