

Formalizing requirements: towards automatic verification

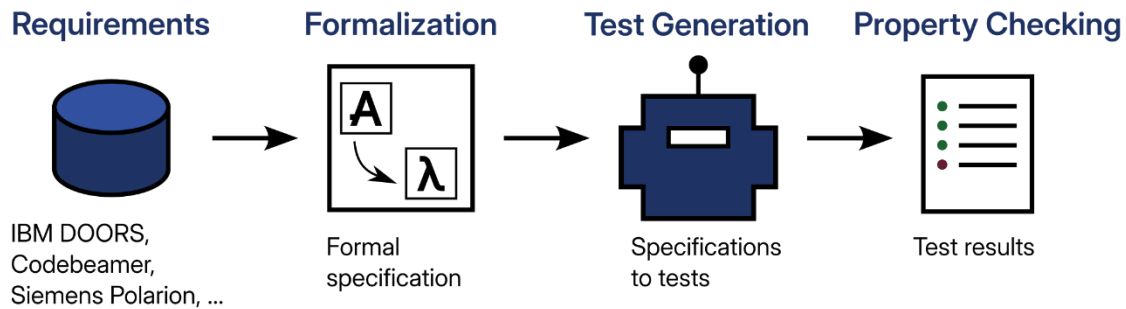


Figure 1: Target process for automatic verification of integrated software

Problem

In green-field projects, the translation of requirements into a formal specification is inaccurate. Success rates for automatic translation vary between 50–90 % in academic settings (Beg 2025), highlighting the potential of automation of the formalization step.

Solution

Refine the development process: include fine-grained linking of contextual documentation. Extract value from existing traceability records to train a custom formalization model. Reduce developer workload by automating translation of requirements to specifications.

① Requirements Analysis: Process Reengineering

Reengineer the refining of requirements (cf. ASPICE SWE.1).

Goals:

- Create Process Map for onboarding
- Redesign to reduce friction
- Measure to improve quality

② Verification: Process Reengineering

Reengineer the formalization process (cf. ASPICE SWE.6).

Goals:

- Control for granularity
- Control for context
- Extract a corpus

③ Verification: Formalization Automation

Establish automatic formalization.

Goals:

- Automate the translation of requirements to specifications
- Introduce developer oversight
- Offload verification engineers

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