A Variability Viewpoint for Enterprise Software Systems

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Enterprise systems

Variability
(plan adaptation during architecting)

Business unit 1
Business unit 2
Business unit 3
Business unit $N$
So,...

... how can we facilitate the representation and analysis of variability in the architecture of enterprise software systems?

Architecture viewpoint for variability in enterprise software systems
According to ISO / IEC / IEEE 42010

Elements of viewpoint

Stakeholder

Concern

ESS variability viewpoint

Model kind

Variability-related architecting task

addresses

supports

governs

governs

ESS variability view

ESS variability model
Procedure to define viewpoint

Step 1: identify preliminary concerns *(previous work)*

- Exploratory study with students

Step 2: identify concerns, stakeholders, model kinds

- Industrial case study: B2B platform

Step 3: define ESS variability viewpoint

Step 4: demonstrate applicability of viewpoint

- Industrial case study: E-government
Stakeholders

- Architect
- Customer
- Evaluator
- Domain expert
C1: Where in the BP does variability occur?

C2: What types of variability occur in the BP?

C3: What variants are available to resolve a variation point?

C4: When would variability in the BP be resolved?

C5: Where in the architecture is variability needed?

C6: How does a variation point in the BP map to the architecture?

C7: Is a variant a valid option at a variation point?

C8: What are relationships between variation points and variants?

C9: How do variants and QA’s interact?
Six model kinds

› Business process variability

› Business process variation point

› Variability distribution

› Variability mapping

› Variability interaction

› Variability quality influence
Model kinds: shared metamodel
Model kinds illustrated based examples from case study
  • Dutch e-government (social support)
  • Implementations differ substantially between municipalities
Business process variability

- Annotated version of the Business Process Modeling Notation

Where in the BP does variability occur?
What variants are available to resolve a variation point?
What types of variability occur in the BP?
Variability distribution

- Frequency distribution and types of variability

Where in the BP does variability occur?
What types of variability occur in the BP?
Conclusions and future work

Conclusions

• Reusable architecture knowledge to reason about variability
• Elements of viewpoint based on the needs of industrial organizations
• Traceability from business process to architecture design
• Limitations related to viewpoint and viewpoint definition

Future work

• More model kinds
• Viewpoint in reference architecture design for variability-intensive systems
Thank you for your attention