TopDocs: Using Software Architecture Knowledge Base for Generating Topical Documents

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Challenges

• Architectural information is fragmented
  • Meeting memos, e-mails, presentations, etc

• Architecture documentation gets easily outdated

• Architects may not have time to document

• Agile methods do not promote documentation

• Many producers and consumers of AK
  • No time for face-to-face communication
TopDocs approach

AK repository

- Architecture Decision
- Interface descriptions
- Architecturally significant requirements
- Business drivers, scenarios
- Component descriptions / designs
- Topical document for a specific need
Benefits

- No fragmentation
  - All information in one place

- Automatic architecture document generation for a specific need

- Documents and information are always up-to-date

- Documents can have links to other material

- Version management can be automated by the repository
TopDocs

• Architecture knowledge repository implemented on top of Polarion platform

• Tool support for different activities, e.g. ATAM
  • Tools populate the DB “behind the scenes”

• Can generate topical documents from the input knowledge to answer certain stakeholder need

• Supports extentensions
TopDocs Metamodel
Topical documents

- **Generated in three steps**
  1) Identifying which key element(s) in the metamodel satisfy the stakeholder concern
  2) Identify which information contents inferable from the selected key should be included in a topical document
  3) Present the information in a convenient form
Example – quality-centered topical document

- **Quality attribute**
  - concerns
  - is-concretized-by
    - Component
      - includes
        - Architectural decision
          - affects
            - Architectural design
              - child
  - is-implemented-by
    - Requirement
      - concerns
        - Scenario
          - evaluates

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Topical documents

- Concise
  - User can select the desired level of details

- Targeted for a specific need or for a specific stakeholder

- Looks like traditional document – not like generated one
  - Still some room for improvement here

- Information can also be searched from the repository

- Document versions managed by the repository
Ongoing / Future work

- Getting more experiences of the proposed approach from the industry
- Developing new views (≈topical documents), input tools, etc
- Aligning AK repository with agile processes
Questions ?

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