

# ArchiMind – A Semantic Wiki for Software Architecture Knowledge Retrieval and –Management



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Software **documentation is essential** for the **success** of large and complex **software projects**.

The use of file-based software documents suffers from various **issues**, including:

- synonyms and homonyms
- spelling errors
- abbreviations
- ambiguity
- traceability

Document 1:  
 “Ordering config”, “OCC”, “Orders”

Document 2  
 “Order component”, “order config component”

Document 3:  
 “Ordr\_cnfg\_cmpnt”, “orderC-Int”

-Example of issues-

## Proposed approach (figure 1)

- **Ontology** domain model for software knowledge (figure 2)
- **Semantic Wiki** (ArchiMind) tool for knowledge retrieval and management (figure 3)
  - Input of software document fragments as wikipages.
  - Semantic annotation of text on wikipages.

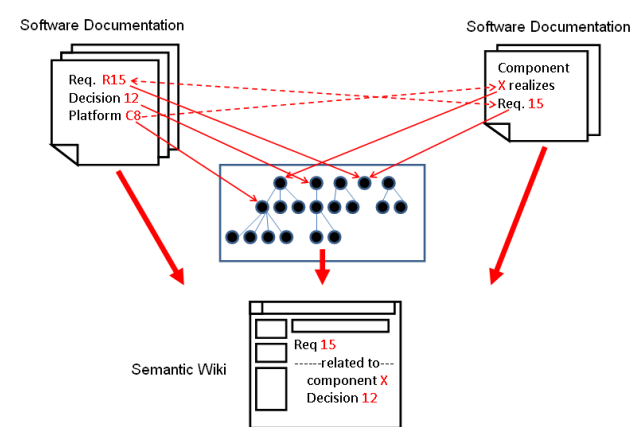


Figure 1- Overview of approach

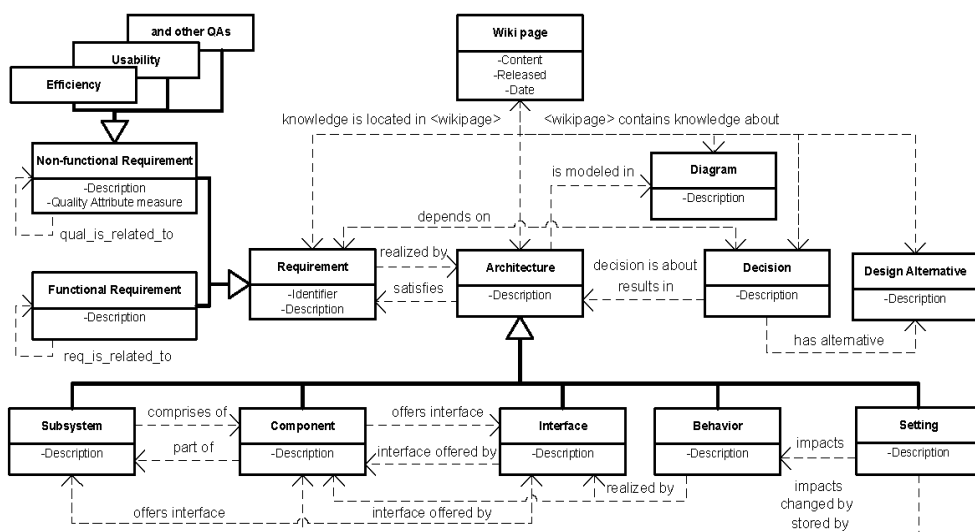


Figure 2 –Ontology for software architecture knowledge

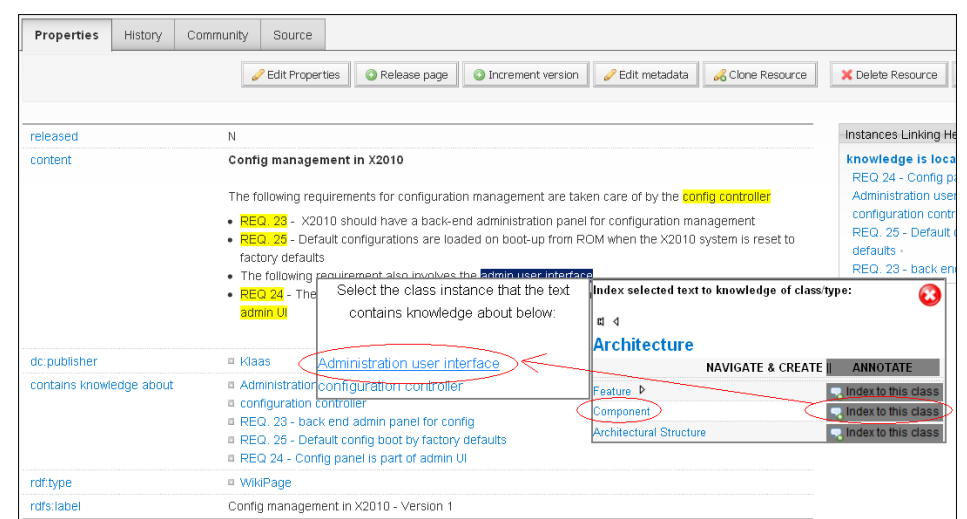


Figure 3 – semantic wiki

→ **Text** in software documents **is traceable** to formal knowledge and vice versa. Formal knowledge is interrelated.

## → Quantitative evaluation:

Increased time efficiency (~100%) and effectiveness (in Precision and Recall, ~34%) when comparing file-based documents (MS Word, diagrams) and semantic wiki for answering questions about software.

Statistical significance for questions such as:

“Which decisions have been made around component XX?”

“Which settings have an impact on behaviour YY?”

More **time saved** and **more correct** answers.

## → Qualitative evaluation:

“When searching for software knowledge, would you evaluate the semantic wiki, as compared to using normal documentation as:”

Better - 24 (92.3%) Worse - 0 (0%) Making no difference - 2 (7.7%)