

# Towards Semantic Software Engineering Environments



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## Abstract

Integration has been considered one of the most challenging issues on software engineering environment (SEE) research. Software tools sharing data should share an understanding of what this data means. The key idea is to have data on the SEE defined and linked in such a way that its meaning is explicitly interpretable by software tools rather than just being implicitly interpretable by human developers. In this work we use **DOMAIN ONTOLOGIES** to formally and explicitly express a shared understanding of domain concepts. Further on, we employ a systematic approach to generate OO frameworks from these domain ontologies (**KFRAMEWORKS** - Knowledge-level frameworks). Finally, applications that support different phases of the software development process are developed sharing the same set of Kframeworks. We argue that this approach makes significant contributions to the idea of **SEMANTIC SEES**.

```
public class Activity
{
    public Set usage()
    {
        return Set.Im(this.subactivity(), "usage");
    }
}
```

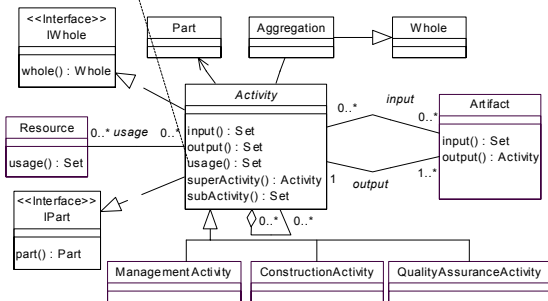


Fig.2 - Java Frameworks are Systematically Generated from the Domain Ontology Specifications (e.g. Software Activity Framework). Axioms that capture domain knowledge are explicitly represented

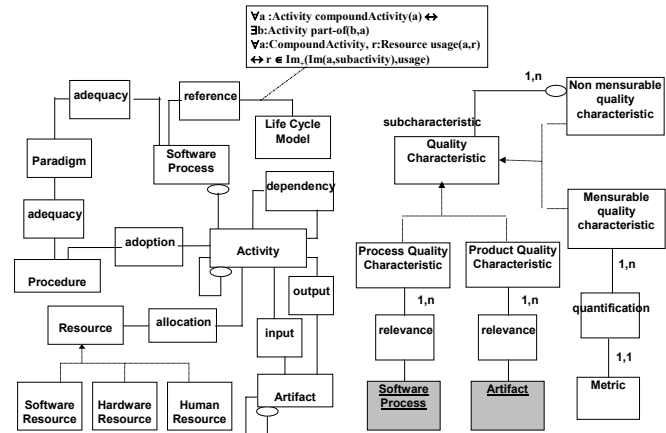


Fig.1 – Domain Ontologies - for each of the Software Process Sub-domains - are developed and Integrated (e.g. Software Activity Ontology, Software Quality Ontology)

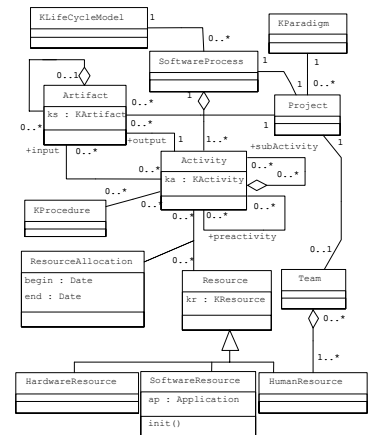


Fig.3 – KFrameworks are extended in the Application Engineering phase to target the needs of specific Applications (e.g. Process Control Application)

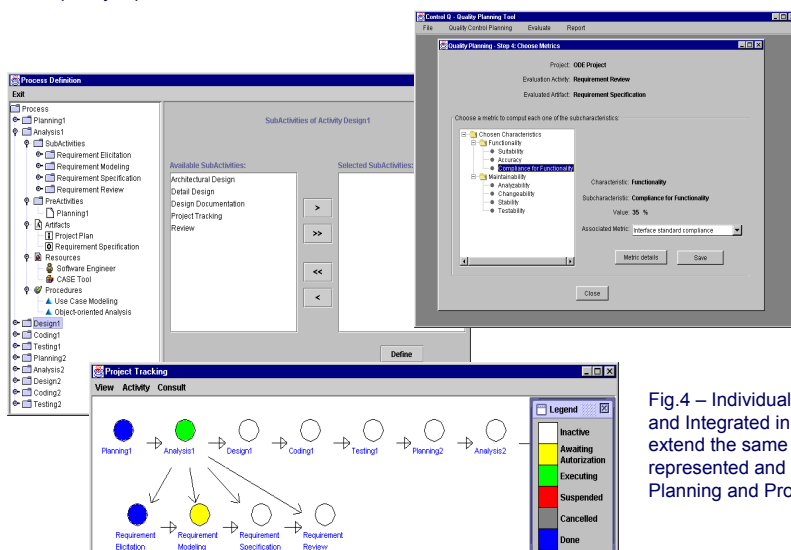


Fig.4 – Individual Applications are developed from Application Frameworks and Integrated in an Ontology-based SEE. Since application frameworks extend the same set of Kframeworks, domain knowledge is explicitly represented and shared across applications (e.g. Process Definition, Quality Planning and Project Tracking Applications)