

Ontology Summit 2011

Track 3

Value Metrics & Value Models

Ontology Use - Maintenance

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Ontology Maintenance



- To what Extent does the Use of Ontologies and Semantic Technologies Improve or Worsen the Maintenance of Services, Systems or Products that employ them?
- For Services, Systems or Products using Ontologies How much does the Cost of Maintenance affect the Value Proposition?

Maintenance



- Modification of a product after delivery to correct faults, to improve performance or other attributes
- **ISO/IEC 14764:**
 - **Corrective maintenance:** Reactive modification of a software product performed after delivery to correct discovered problems.
 - **Adaptive maintenance:** Modification of a software product performed after delivery to keep a software product usable in a changed or changing environment.
 - **Perfective maintenance:** Modification of a software product after delivery to improve performance or maintainability.
 - **Preventive maintenance:** Modification of a software product after delivery to detect and correct latent faults in the software product before they become effective faults.

Question Metrics Should Answer



- What costs are increased or reduced in corrective, adaptive, perfective, or preventive maintenance with the use of ontologies?

Maintenance Costs vs Metrics



- Maintenance costs in systems using ontologies will vary depending on how ontologies are used in the system (e.g., life-safety critical) but the metrics will be the same.

Corrective Maintenance (aka Bug Fixes)



- Metrics
 - Numbers of concepts or relations modified
 - Number of rules/axioms modified
 - Number of sub-systems/components impacted
 - Lines of codes impacted
 - Amount of testing needed
 - Amount of change to documentation
 - Legal consequences/costs

Adaptive/Perfective Maintenance



- Metrics
 - Number of additional ontologies
 - Number of additional or modified concepts or relations
 - Number of addition rules/axioms
 - Lines of code impacted
 - Number of tests modified
 - Amount of testing needed
 - Amount of change to documentation
 - Amount of change to training

Preventive Maintenance



- Metrics
 - Numbers of concepts or relations modified
 - Number of rules modified
 - Number of sub-systems/components impacted
 - Lines of codes impacted
 - Amount of testing needed
 - Amount of change to documentation

Cost Dependences



- Depends on ontology & axiom/rule complexity
 - Possible huge impact on testing
- Depends on how ontologies used in system
 - Information Model
 - Workflow/Process control
 - User Interface
 - Deployment
 - Simulation
 - Training

Conjecture



- To the extent that the use of ontologies and semantic technologies simplifies a system, there is an equivalent reduction in maintenance efforts and costs.

Next Steps



- Continue discussion on Community Input Page
 - [OntologySummit2011_ValueMetrics_CommunityInput](#) (Initial population TBD).
- Metric(s) and values mapped to each category of the Ontology Application Framework (Track 1)
 - Matrix will be added to Community Input page