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