Knowledge Change, Failure, Adaptation, and Evolution

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Abstract. The wealth of knowledge representations available on the web today under the form of ontologies will have to evolve because what they represent changes and our knowledge about it changes as well. From far away, the terms "change", "adaptation" or "evolution" may seem interchangeable. We discuss their meaning under the light of different techniques which have been developed to cope with distributed knowledge change: alignment repair, network of ontology revision and cultural knowledge evolution. We find that they can be understood through a redefinition of these four terms:

Change Modification of the condition of use of knowledge through new knowledge acquisition (new learning method, new knowledge input, environment change, etc.).

Failure An unwanted situation raised by the change.

Adaptation Local operation used to adapt knowledge to observed failure to account for change.

Evolution Global long term knowledge change due to the repeated application of adaptation operations and selection.

We show that surveyed techniques can be characterised with respect to differences along these dimensions.

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