# A Little Logic Goes a Long Way – Logical Reasoning in Web Data Integration and Ontology Learning

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There is an ongoing dispute in the Semantic Web Community about the usefulness of (Description) Logic as a basis for describing data on the web. While researchers in logic argue with the benefits of logic in terms of a clean semantics and richness of the language, criticism against the use of logic normally focusses on two points: its computational complexity and its inability to represent soft constraints. In this talk, we will address these criticisms and argue that if used in the right way description logics are a valuable tool for typical tasks on the semantic web. We use problem of semantic matchmaking as an example to show that the use of rather inexpressive logics with good computational properties already provide significant benefits by eliminating incoherent matches. In the second part of the talk we address the problem of dealing with soft constraints and show two solutions to this problem that have proven useful for matchmaking: Approximate subsumption as a purely logical framework for partial matchmaking and Log-Linear Description Logics as a new combination of Description Logics with (log-linear) probabilistic models. We show that purely logical matchmaking achieves results comparable with state of the art matchmaking systems that rely on similarity functions and present results that show that log-linear description logics outperform existing matching systems. We conclude that in the context of semantic web applications expressive power of the logics used is less important than the integration with other formalisms and technologies for improving efficiency and the ability to deal with imperfect knowledge.