ontology acquisition remains a time-consuming, expensive, highly skilled, and sometimes cumbersome task that can easily result in a knowledge acquisition bottleneck.

These problems resemble those that knowledge engineers have dealt with over the last two decades as they worked on knowledge acquisition methodologies or workbenches for defining knowledge bases. The integration of knowledge acquisition with machine learning techniques proved beneficial for knowledge acquisition.

The research area of machine learning has a long history, both on knowledge acquisition or extraction and on knowledge revision or maintenance, and it provides a large number of techniques that may be applied to solve these challenges. The following tasks can be supported by machine learning techniques:

- Extraction of ontologies from existing data on the web
- Extraction of relational data and metadata from existing data on the web
- Merging and mapping ontologies by analyzing extensions of concepts
- Maintaining ontologies by analyzing instance data
- Improving Semantic Web applications by observing users

Machine learning provides a number of techniques that can be used to support these tasks:

- Clustering
- Incremental ontology updates
- Support for the knowledge engineer
- Improving large natural language ontologies
- Pure (domain) ontology learning

Omelayenko (see suggested readings) identifies the following three types of ontologies that can be supported using machine learning techniques.