

# Introduction to Part I

This part is meant to convey a general introduction to the domain of knowledge modularization. Chapter 1 overviews the issues and the proposed solutions that are relevant to ontology modularization. This chapter is deliberately informal to be accessible to the largest audience, so that readers can quickly get familiar with what will make up the rest of the book. Questions addressed in this initial chapter range from what is a module and how it can be characterized and assessed, to an overview of strategies to build modules and link them whenever needed. Chapters 2 to 4 explore in deeper detail and more formally specific issues that are nevertheless generic in the sense that they can be discussed independently from a specific approach to modularization. Chapter 2 establishes a formal characterization of the concept of module, introducing formal concepts that allow making a clear distinction among different types of modules and different relationships between the modules and the ontologies they come from. Each type of module exhibits different properties in terms of its potential functionalities, so it is important for a module designer to understand exactly how to proceed to get the desired modularity framework. Chapter 3 reports on an experimentation with various modularity techniques in various use case scenarios. Results show significant differences, namely in the size of the modules produced by the modularization techniques. They also provide a feedback on the qualities of the techniques. Next, Chapter 4 investigates how knowledge can be imported into a module from an external source. The aim of the chapter is to establish a clear and sound classification of various import techniques, which again should support designers with ways to choose the most appropriate technique given the goals to be achieved. Finally, Chapter 5 contains the detailed description of the Mads database modularization approach that currently best represents the efforts from the database community in terms of modularization techniques. It also includes, for comparison purposes, a short overview of one of the oldest approaches to modular ontologies, namely the Cyc project. This project represents the main achievement in terms of approaches where the definition and building of the modules and of the ontology they belong to are done in parallel at the same time. A short comparison between Cyc and Mads is also provided.

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Heiner Stuckenschmidt  
Christine Parent  
Stefano Spaccapietra