1.2.2   Ontologies

The term *ontology* originates from philosophy. In that context, it is used as the name of a subfield of philosophy, namely, the study of the nature of existence (the literal translation of the Greek word $O\nu\tau o\lambda o\gamma i\alpha$), the branch of metaphysics concerned with identifying, in the most general terms, the kinds of things that actually exist, and how to describe them. For example, the observation that the world is made up of specific objects that can be grouped into abstract classes based on shared properties is a typical ontological commitment.

However, in more recent years, *ontology* has become one of the many words hijacked by computer science and given a specific technical meaning that is rather different from the original one. Instead of "ontology" we now speak of "*an* ontology." For our purposes, we will use T. R. Gruber's definition, later refined by R. Studer: *An ontology is an explicit and formal specification of a conceptualization.*

In general, an ontology describes formally a domain of discourse. Typically, an ontology consists of a finite list of terms and the relationships between these terms. The *terms* denote important *concepts* (*classes* of objects) of the domain. For example, in a university setting, staff members, students, courses, lecture theaters, and disciplines are some important concepts.

The *relationships* typically include hierarchies of classes. A hierarchy specifies a class C to be a subclass of another class C' if every object in C is also included in C'. For example, all faculty are staff members. Figure 1.3 shows a hierarchy for the university domain.

Apart from subclass relationships, ontologies may include information such as

- properties (X teaches Y),

- value restrictions (only faculty members may teach courses),

- disjointness statements (faculty and general staff are disjoint),