Both the problem of representation and the treatment of imprecise information have been widely discussed. Many references can be found in the corresponding bibliography. Nevertheless, all the known models aimed at solving this problem have their own advantages, disadvantages, and constraints.

The term *imprecision* encompasses various meanings, which might be interesting to highlight. It alludes to the facts that the information available can be incomplete, that we don’t know whether the information is true (uncertainty), that we are totally unaware of the information (unknown), or that such information is not applicable to a given entity (undefined). Sometimes these meanings are not disjunctive and can be combined in certain types of information.

This chapter deals with the main published models aimed at solving the problem of representation and treatment of imprecise information in relational databases. This problem is not trivial, because it requires relations structure modification, and thus, the operations on these relations also need to be modified. To allow the storage of imprecise information and the making of an inaccurate query of such information, a wide variety of case studies that do not occur in the classic model, without imprecision, is required.

Other models deal with database uncertainty as well but have not been widely accepted, such as the ones based on rough sets, which were introduced by Pawlak (1982, 1991).

The GEFRED model, which the development of this work is based on, will be the main focus of our discussion. This model constitutes an eclectic synthesis of the various models published so far with the aim of dealing with the problem of representation and treatment of fuzzy information by using relational databases. One of the major advantages of this model is that it consists of a general abstraction that allows for the use of various approaches, regardless of how different they might look.

A more detailed discussion of each one of these models can be seen in the corresponding references, some of them in Medina (1994) and Petry (1996). In Medina, a comparative study of GEFRED and other models can also be examined.

**Imprecision Without Fuzzy Logic**

In this section, we will summarize some ideas allowing for imprecise information treatment *without* utilizing either the fuzzy set theory or the possibility distributions. In the bibliography, these models are dealt with globally in the section on imprecision in conventional databases, although some of the ideas discussed here have not been implemented in any of the models.

**The Codd Approach**

The first attempt to represent imprecise information on databases was the introduction of NULL values by Codd in 1979, which was further expanded.
Applying Learner-Centered Design Principles to UML Sequence Diagrams
www.igi-global.com/chapter/applying-learner-centered-design-principles/52950?camid=4v1a