Development of a business intelligence system

The development of a business intelligence system can be assimilated to a project, with a specific final objective, expected development times and costs, and the usage and coordination of the resources needed to perform planned activities.

![Diagram of the development cycle of a business intelligence system](image)

*Figure 1.6  Phases in the development of a business intelligence system*

The Figure 1.6 shows the typical development cycle of business intelligence architecture. Obviously, the specific path followed by each organization might differ from that outlined in the figure. For instance, if the basic information structures, including the data
warehouse and the data marts, are already in place, the corresponding phases indicated in Figure 1.6 will not be required.

**Analysis** - During the first phase, the needs of the organization relative to the development of a business intelligence system should be carefully identified. This preliminary phase is generally conducted through a series of interviews of knowledge workers performing different roles and activities within the organization. It is necessary to clearly describe the general objectives and priorities of the project, as well as to set out the costs and benefits deriving from the development of the business intelligence system.

**Design** - The second phase includes two sub-phases and is aimed at deriving a provisional plan of the overall architecture, taking into account any development in the near future and the evolution of the system in the midterm. First, it is necessary to make an assessment of the existing information infrastructures. Moreover, the main decision-making processes that are to be supported by the business intelligence system should be examined, in order to adequately determine the information requirements. Later on, using classical project management methodologies, the project plan will be laid down, identifying development phases, priorities, expected execution times and costs, together with the required roles and resources.

**Planning** - The planning stage includes a sub-phase where the functions of the business intelligence system are defined and described in greater detail. Subsequently, existing data as well as other data that might be retrieved externally are assessed. This allows the information structures of the business intelligence architecture, which consist of a central data warehouse and possibly some satellite data marts, to be designed. Simultaneously with the recognition of the available data, the mathematical models to be adopted should be defined, ensuring the availability of the data required to feed each model and verifying that the efficiency of the algorithms to be utilized will be adequate for the magnitude of the resulting problems. Finally, it is appropriate to create a system prototype, at low cost and with limited capabilities, in order to uncover beforehand any discrepancy between actual needs and project specifications.

**Implementation and control** - The last phase consists of five main sub-phases. First, the data warehouse and each specific data mart are developed. These represent the information infrastructures that will feed the business intelligence system. In order to explain the meaning of the data contained in the data warehouse and the transformations applied in advance to the primary data, a metadata archive should be created, as described in Chapter 3. Moreover, ETL procedures are set out to extract and transform the data existing in the primary sources, loading them into the data warehouse and the data marts. The next step is aimed at developing the core business intelligence applications that allow the planned analyses to be carried out. Finally, the system is released for test and usage. Figure 1.7 provides an overview of the main methodologies that may be included in a business intelligence system, most of which will be described.
in the following chapters. Some of them have a methodological nature and can be used across different application domains, while others can only be applied to specific tasks.