Chapter 2
Computer Systems and Processes as an Object of Modeling

ABSTRACT

The chapter is devoted to the main objects that will be discussed in this book (structures, systems, processes) in the field of computing. A brief review has been made, starting from specifying the role of "information" and "information processing," in order to specify the place of the technological environment for the implementation of information processes and to define its main functionalities. Given that the technological environment is a computer implementation, the two basic levels are presented – high user level (macro-level) and low internal machine level (micro-level) with an initial formalization of basic system resources. The main object of analysis is the performance with its factors (performance indices) which are defined and which have an impact on the workload of the computing environment based on input workflow. In this respect, a formal description of workload and specifying the role of the process profile are presented. In addition, a formalization of information technology is presented.

1. ORGANIZATION OF INFORMATION PROCESSING

The term "information" is derived from the Latin word "informare" (to teach) and was originally associated with the process of transmission between people of knowledge and content. In the digital society, the meaning of the concept of information is significantly developing, but it is always associated with the processes and technologies for its processing, as a generalized formalism for this is presented in Figure 1. The goal is to represent real information from the surrounding world through a system of rules and means in coded form as a message with a certain format suitable for computer processing.

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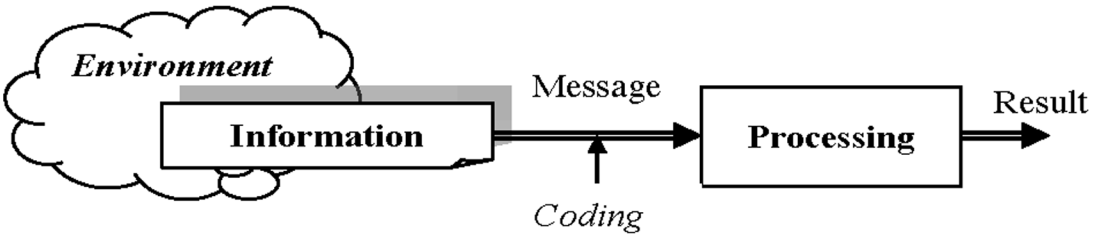
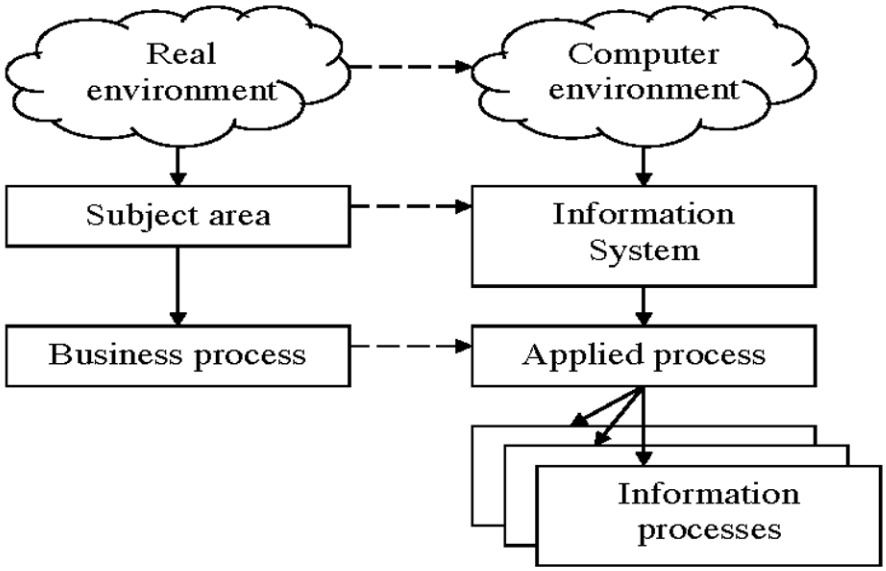
Figure 1. Principle of information processing



The process approach brings together technologies and methodologies for describing, analyzing, implementing and controlling real-world processes, allowing not only their proper management, but also regulating efforts to effectively obtain correct results. The benefit is increasing the transparency and quality of control, building an effective organizational structure, optimizing resources, increasing their quality and reducing risk. This is achieved through the interaction between the two levels – of real information and processes and their transfer into a computer environment (Figure 2.).

Figure 2. Relationship between reality and information processing



In a generalized sense, an organizational process is an organized set of one or more interconnected actions (procedures, operations, functions) that implements a certain task with the aim of creating a product or service with a specific purpose for the end customer. According to ISO 9000:2000, this set of interrelated activities transforms input impacts into output objects, effectively bringing together the flow of activities, functions, personnel and equipment (resources), decision-making information (knowledge), and rules for performance of these activities and functions.