

## Foreword

Information systems are a traditional field of computer science: they put ICT to work in order to solve real-life problems ranging from accounting, managing organization, ticketing, airline reservations, and so forth.

Web technology is something (relatively) new: it started from niche-applications (outside of the traditional areas) and it has become pervasive, covering all kinds of realms, information systems included. With respect to traditional ways of using information systems, Web technology has brought a number of novelties:

- A new concern for interactive-visual interfaces
- A new approach to information structuring, hyper textual rather than hierarchical
- A new approach to information “consumption” emphasizing browsing and navigation (over links) in addition to the more traditional hierarchical exploration or querying

These novelties added further complexity to information systems design, that have always involved several concerns, and therefore several different methodologies and skills. In order to develop a complex information system (whether implemented traditionally or via Web technology), at least the following is needed:

- Understanding the “domain” (or the domains) relevant for the application, that is, the knowledge concerning the specific context. It could be banking, it could be customer relationships management, it could be shoe manufacturing, it could be airline reservations, and so forth.
- Understanding “who” the people are involved: who does produce information (how, when, why, through which actions, etc.), who “consumes” information (when, why, through which actions, etc.), who monitors or supervises information (why, how, when, etc.)

- Understanding the “business,” that is, the socio-economic context into which the application is embedded. Who are the “external players”: What do they do? How do they operate? What is the overall business flow? How are the “goods” or “services” exchanged? How is the information exchanged? and so forth.
- Understanding the internal “business processes,” that is, the flow of actions that are needed within the application itself. Some business processes can be very well-defined and organized, with precise rules to follow. Other business processes, instead, could be “ill-defined” with loose definitions and not precise rules to follow. A user trying to choose a hotel is a typical example of an ill-defined task: we know the goal, we know the information likely to be needed, and we know the operations needed for booking; we cannot predict, however, the precise sequence of actions, nor all of the steps that will be necessary.

Above are just the main concerns that need to be taken into consideration while designing a complex information system; others also could be mentioned and have their own relevance.

Given this situation, we can ask ourselves basic questions about “designing information systems”: is it one discipline, or several disciplines combined? Can we find a unified methodology, a unified notation, a unified approach, or do we need to combine several different pieces together, in an “ill-defined” puzzle, where the individual pieces do not always fit well together in the global picture?

The book takes a “realistic” point of view: there have been specific answers to specific needs; different approaches, different methodologies and different notations have been developed, for the different areas involved in information systems design.

Instead of trying to develop yet another universal approach, by solving all of the problems in a unified framework, it is wiser to expose all of the different approaches that have been proposed for each part of the design problem. A synthetic picture explaining and comparing different approaches for the same part of the design is a needed contribution, lacking in published literature. Each research group, in fact, puts all of its efforts into explaining the advantages and the details of its approach; references to other works are not well-developed, and focus on showing that they have limitations.

An independent assessment of different approaches is therefore welcome and needed.

In terms of what is being covered, the list of issues covered is impressive:

- Business process: most relevant approaches are introduced and compared
- Web design: again all relevant approaches are synthesized and compared
- Ontologies (necessary for domain modeling): they are introduced and explained
- Specific methodologies are proposed, in order to put all of the pieces of the puzzle together in a meaningful picture

Not everything possible is covered, but a lot is being covered in a synthesis that could become a valid working tool for teachers, students and professionals.

*Prof. Paolo Paolini*  
*Politecnico di Milano (Italy)*