



Chapter I

**Designing Hospital Information
Systems: Handling Complexity
via a User-Oriented
Document-Based Approach**

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Anyone working in the area of hospital information systems is sooner or later amazed about the intrinsic complexity of the field. Finding ways to handle this complexity seems utterly important. In this chapter we present a user-oriented, document-based approach being developed and proven in cooperation projects with hospitals. The advantage of the proposed approach lies in the provision of means for handling different sources of complexity. The approach is characterized by an intended continuous switch between an organizational and workplace perspective in order to reduce complexity by changing the levels of detail. It initiates and supports ongoing negotiation processes among the heterogeneous user groups by providing user-oriented, easy-to-understand documents. Furthermore, it enables developers and users alike to represent and discuss current and future work practices including interim solutions of future system support.

INTRODUCTION

Those working in the domain of hospital information systems (HIS) are quite soon amazed or upset about the intrinsic complexity

of the field. To change only a small part in the organization of a task often requires an overwhelming amount of details to be taken into account. Trying to isolate a section for starting system design seems hopeless because of the interdependence of tasks. Trying to reach agreement on priorities within cross-departmental solutions is tiring due to the heterogeneity of the involved user groups.

Finding ways to handle this complexity is utterly important. A major reason for this complexity lies in the amount of complex cooperations necessary to care for a patient (see also Schneider and Wagner, 1993). This patient is a very sophisticated (and precious), shared material" (but still remaining real and not vanishing in transformation to an electronic model). A patient requires *different specialists* and therefore their coordination, his changing condition demands *flexibility*, sometimes discarding all planned actions. The *location* of a patient changes for shorter or longer periods, but staff still need the ability to locate their patient. A patient needs care on different levels (medical, nursing, hospitality) *around the clock* therefore requiring work shifts with their own communication needs. And above all, there is not only one patient but many of them.

Out of those concerns we identify three important aspects which need to be considered and handled by an appropriate approach for analysis and design of HIS.

- First, because of the high amount of existing cooperative work, designers need to understand the relationships and interdependencies among single activities. They have to identify and understand joint, cross-departmental tasks from an organizational perspective and in a broad manner. At the same time, details of work organization and workload within a specific context have to be gathered carefully at each workplace and especially at group workplaces. Additionally, the different perspectives need to be switched frequently (see also Wolf and Karat, 1997). This gives rise to the following guideline: *Handle complexity of cooperative tasks by changing focus and (thereby) levels of abstraction.*
- Second, another source of complexity lies in the heterogeneity of the involved user groups and their often competing requirements, while at the same time designing an integrated system to connect the different groups. Therefore, designers have to take competing wishes into account and be aware of the often hidden power structures in the organization. They have to fight against

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