Chapter V

Towards Improved Representation and Communication of Pharmaceutical Expert Information

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MOTIVATION

The main concern of healthcare management has ever been embodied by two conflicting goals. These are improving care quality while reducing care costs. Information technology already has proven its positive impact on both goals. While general administrative tasks are being performed more efficiently for some decades, expert-oriented systems are entering the medical domain with increasing support capabilities for domain-specific therapeutic procedures, leading to more secure and efficient therapy planning, monitoring, and control.

The demands on quality and efficiency of care are posed by social, legal and political areas, resulting in growing expectation, uncertainty and pressure concerning healthcare professionals’ use of expert information. These circumstances are cornering medical practitioners. A variety of role-specific information problems may be identified which finally can be attributed to the nonavailability of suitably represented expert information as well as to...
missing automatization of medical procedures. In their entirety they indicate two major information problems in healthcare.

The representation problem consists of the lack of a universal representation of pharmaceuticals which formally describes their common properties as well as their behavior within groups of simultaneously applied drugs. Internal representation affects granularity and precision of information as well as the functionality of the application system. External representation affects suitability of access and navigation mechanisms, which depend on the user’s role and situation. An internal representation may meet the needs of many applications, while an external representation can only be as suitable as the internal representation allows.

The communication problem refers to the communication capabilities of a representation delivered by a solution of the previous problem. There is nearly no benefit of a pharmaceutical information model if information is not suitable for transportation. This means that the impact of an internal representation reaches interorganizational cooperation capabilities. This affects particularly the diversity of semantic reference systems used by local representations. The communication problem consists of finding means to enable organizations to exchange information with a minimum of human intervention.

As the information jungle continues to grow, healthcare costs and treatment quality change to worse. The patient has to bear the consequences. While his contribution on treatment costs increases, no one can guarantee that the medication designed by the physician is optimal in both therapeutic and economic senses. For instance, many expensive commercial-brand products of major manufacturers may be substituted by more beneficial, therapeutically equivalent generics, but without this information at his fingertips the physician will continue to prescribe products with concise and habitual names.

**APPLICATION DOMAIN**

The application domain targeted by pharmaceutical information systems includes any medical subject area affected by information on properties of pharmaceutical products. This comprises the treatment situation at the physician’s desktop, drug dispensing procedures in hospital pharmacies, pharmaceutical consultation at the drugstore as well as patient home information. Although differences exist among role- and situation-specific external representations of user-oriented information, any application of pharmaceutical information systems relates to some properties of pharmaceuticals.
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