

# Chapter IV

## Towards Computer Supported Clinical Activity: A Roadmap Based on Empirical Knowledge and some Theoretical Reflections

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### **ABSTRACT**

*The introduction of electronic health records (EHRs) to the clinical setting has led healthcare professionals, policy makers, and administrators to believe that health information systems will improve the functioning of the healthcare system. In general, such expectations of health information system functionality, impact, and ability to disseminate have not been met. In this chapter the authors present the findings of three empirical studies: (1) the structured monitoring of EHR implementation processes in Denmark from 1999–2006 by the Danish EHR observatory, (2) a usability study based on human factors engineering concepts with clinicians in artificial but realistic circumstances—a “state of the art (2005)” for Danish CPOE (computerized physician order entry system), and (3) user reactions to a conceptual “high level model” of healthcare activities—the Danish G-EPJ model in order to better understand the reasons for health information system failures and to suggest methods of improving adoption. The authors suggest that knowledge handling as a science seems immature and is not in line with the nature of clinical work. The prerequisites for mature knowledge handling are discussed in the second part of this chapter. More specifically, the authors describe one way of improving knowledge handling: the development of a more true digital representation of the object of interest (OOI) or the virtual patient/citizen that interacts with computer based healthcare services on behalf of and for the benefit of the citizen’s health.*

## INTRODUCTION

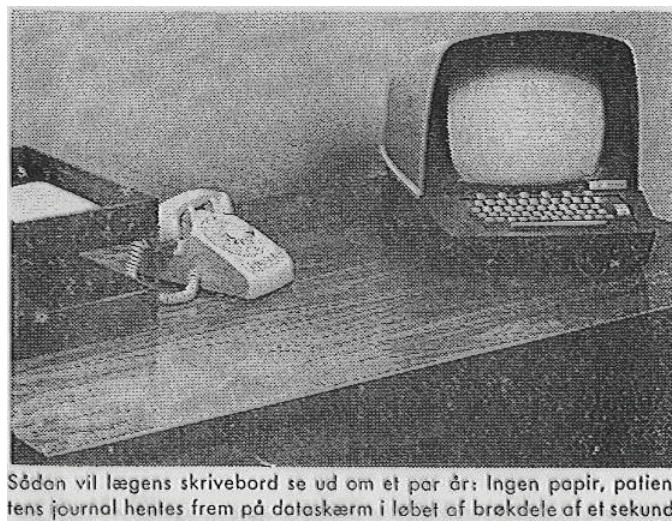
In 1968, the Danish journal of engineering science “Ingeniøren” published an article about a hospital-based computer system. The article described a computer system that was being used to support administrative and clinical tasks at the largest hospital in Denmark “Rigshospitalet.” The article provided the reader with a picture of a desk with a computer terminal and a telephone. The text under the picture read: “*This is how the doctor’s desk will look in a few years: No paper, the patient’s record will be retrieved on the computer screen within fractions of a second*” (see Figure 1) (Jda, 1968). Almost 40 years later we are able to retrieve patient data, but not the entire record, and the predicted response time suggested in the article remains wishful thinking. The Danish example is not an exception. International studies report that up to 75 percent of all large IT projects in healthcare fail (Littlejohns, Wyatt, & Garvican, 2003), and according to Michael Rigby, evaluation is still a “Cinderella science” where information and communication technology (ICT) is concerned (Rigby, 2001).

A commonly held notion among the international electronic health record (EHR) community

is that the failure of numerous IT projects is due to instances of bad programming and poor implementation that can be easily avoided the next time around (Wears & Berg, 2005). Results from a number of studies in Denmark, which the authors have been involved in, indicate that the difficulties associated with implementing ICTs in healthcare or health information systems (HIS) can be traced back to the perspectives and theories that computer scientists and systems developers hold about medical work and how these theories influence HIS development and implementation processes.

In this chapter the authors will present the results from a number of Danish studies involving a group of ICTs (i.e., HIS). The studies do not evaluate the promised benefits of HIS in terms of their outcomes. Instead, they focus on the practical use of HISs in clinical work situations. Based on our cross-study experiences, the authors then examine the future merits of information technology (IT) from a clinical point of view. Prior to beginning our discussion, they will first provide some background information about the Danish healthcare system to provide the context for our research work.

Figure 1. Perception of how a doctor’s office would look from 1968



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