Chapter 1.11
Evaluating Healthcare IT and Understanding the Work of Healthcare are Entangled Processes

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ABSTRACT

Parallel to the monumental problem of replacing paper- and pen-based patient information management systems with electronic ones is the problem of evaluating the extent to which the change represents an improvement. Meaningful and useful evaluation rests upon: a) explicitly conceptualizing the goals and tasks of the daily clinical work; b) thinking of electronic information management technology as a cognitive tool; c) explicitly representing in the tool the pertinent information elements; d) selecting among possibilities for representing a problem formulation so as to facilitate the solution; and e) appreciating the dynamic interaction between the work and the tool–that changing a tool necessarily changes the work. Anchored in the story of how one hospital committee learned to think about the purpose and impact of a patient information management system, this chapter gives practical insight to these evaluative considerations.

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INTRODUCTION

This chapter grew out of a story about how a committee of clinicians and information technology (IT) professionals learned to think more clearly about healthcare IT; to think about it in a somewhat deductive manner. Since healthcare IT is a tool to aid the work of healthcare, the group ultimately determined that critical reflection entails identifying what may be considered first principles that justify and inform the work itself. At the outset, the committee's task of characterizing IT success versus failure seemed perfectly clear. But only so until they began to understand the crucial distinction between healthcare system tasks and goals, and that activity without clarity of purpose may be activity without value. From these insights emerged an interrogative framework anchored in clear notions of purpose and designed to yield operational understanding. Over time, the essential idea became evident: clinical work and tools are calibrated to each other. The committee came to appreciate that a tool achieving quick user acceptance may be one that makes little use of its technological potential; and that workers may be unaware that their early

opinions about new tools reflect their imposing the specifics of the previous work/tool interaction on the present one. The story of how this group learned to think about evaluating healthcare IT was originally published in the Journal of the American Medical Informatics Association and is reprinted here with permission: "Discovering how to think about a hospital patient information system by struggling to evaluate it: a committee's journal."(J. Schulman, G.J. Kuperman, A. Kharbanda, & R. Kaushal, 2007)

Of equal importance to understanding first principles that underpin the work of healthcare is an understanding of first principles for designing IT to aid that work. One such principle is the notion of a problem space – discussed in the committee's journal, later in this chapter. This chapter begins by examining additional foundational principles of IT design. These include the notion of a cognitive tool; exactly which information elements one ought to pay attention to; considerations for selecting among representational options so as to facilitate solving an information management problem; the vital importance of explicitly conceptualizing the bulk of the daily work in order to deftly manage it via database technology; and the idea that our tools generally determine how we think and work.

COGNITIVE TOOLS

IT is a cognitive tool. A cognitive tool is an artifact to represent and express what one knows; it may even help one to discover new knowledge. It is intended to aid human cognitive processing,(Jonassen) to extend and facilitate what one could otherwise achieve unaided. The point of such a tool is not to relieve health care providers of the actual task of cognitive processing, but to *extend* providers' cognitive abilities. Users should be able to process more information than if they had no tool. Note that whether or not such a tool is available, providers must think deeply about the information at hand. The tool should promote deeper, more critical reflection and help the user discover relevant ideas that might have been missed without the tool. Rather than solely make the current task array easier, cognitive tools should enable the user to perform additional tasks that were always pertinent to the work but otherwise unfeasible.(Jonassen) Moreover, since the truly intelligent system is the user – not the tool, the tool ought to be largely controlled by the user. In contrast, all too commonly current technology imposes constraints on exactly how the user may formulate and think about a problem.

WHICH ELEMENTS OF THE DAILY WORK SHALL WE ATTEND TO?

One way to think about IT as a tool to facilitate the daily clinical work – which largely entails formulating and solving problems – is to decompose the work into its component processes:(Robertson, Elliot, & Washington, 2007)

1. Seeking information
2. Presenting information
3. Organizing knowledge

Thus, IT affects cognition and ultimately action because it frames the way its users think. How does this happen? From a user perspective, a particular database software implementation is essentially a template of blanks to be filled in or to be viewed. Each template directs attention to particular aspects of work (formulating and solving problems) and to particular data elements – and discounts or ignores others. Templates underpin not only healthcare database software but also similarly intended word processor or spreadsheet applications; and to some extent, templates also underpin the mental models of providers who manage their patient information with pen and paper. In any case, rather than reflecting the real importance of the selected data elements, the framing and focus