Chapter XI
Evaluation Methods to Monitor Success and Failure Factors in Health Information System's Development

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ABSTRACT

This chapter discusses the extent to which factors known to influence the success and failure of health information systems may be evaluated. More specifically, this is concerned with evaluation of such factors—for screening, diagnostic or preventive purposes—by means of existing evaluation methods designed for users. The author identifies that it is feasible to identify evaluation methods for most success factors and failure criteria. However, there is a need for situational methods engineering as the methods are not dedicated to answering the precise information needs of the project management. Therefore, demands are being placed on the evaluators' methodical and methodological skills, when evaluating health information systems. The author concludes the chapter by pointing at research needs and opportunities.

INTRODUCTION

"Evaluation is the act of measuring or exploring properties of a health information system (in planning, development, implementation, or operation), the result of which informs a decision to be made concerning that system in a specific context." (Ammenwerth et al., 2004, p. 480)

Many times health informatics professionals have suggested verbally that there are not enough evaluation methods that can be used to evaluate health information systems. A review of the evaluation literature regarding biases in assessment of medical IT-based solutions (Brender, 2006a, pp. 243-323) indicates that the general level of

knowledge among evaluators is insufficient, that is, such methods and their assumptions are not appropriately known to their target users. This was also discussed among a group of key evaluation researchers and journal editors gathered in 2003 on the topic "New Approaches to the Systematic Evaluation of Health Information Systems" (HIS-EVAL), sponsored by the European Science Foundation (ESF) (see Ammenwerth et al., 2004). The outcome of this workshop was a number of recommendations as regards the future of health information systems evaluation, also called the Innsbruck Declaration. Among others, the declaration suggests promotion of reports on methodological and methodical evaluation studies, and that evaluation studies should be grounded on scientific theory and rigorous approaches.

The above implicitly indicates that the literature on evaluation of health information systems is far from robust. Recent publications of textbooks, such as the *Handbook of Evaluation Methods* for *Health Informatics* (Brender, 2006a; a Danish version was published in 2004), have demonstrated that there exists a substantive number of evaluation methods applicable within health informatics. This handbook has the nature of an encyclopedia, since it takes a (critical) meta-view on an extensive list of evaluation methods while focusing on their areas of application, assumptions for application, tacit built-in perspectives as well as their perils and pitfalls, rather than putting emphasis on detailed cookbook prescriptions for application.

Therefore, the purpose of this chapter will be: (1) to verify whether there exist appropriate evaluation methods for the assessment of factors known to influence the success and failure of IT-based solutions, and (2) to identify potential needs as regards further development of evaluation methods, be it innovation or refinement of existing methods. More specifically, this chapter will emphasize the assessment of IT-systems from a user perspective within organizational settings, that is, this chapter is concerned with methods addressing interactions between a technology

and its organizational, psychological and social components, as well as its effects. The methods in the handbook have been gathered from a variety of disciplines, ranging from psychology and social science to computer science and health informatics. Some of the methods are not designed as dedicated evaluation methods, but may be valuable as supportive means in an evaluation context. Thus, in such cases situational method engineering will be needed, thereby putting demands on the methodical and methodological skills of the evaluator.

There are two types of evaluation, constructive (or formative) and summative evaluation. Both types of evaluation serves the purpose of providing the (project) management with a decision-making basis in some context, cf. the definition given in the introductory citation. The difference is the overall context within which they each operate. For example, constructive assessment has the purpose of providing the foundation for identifying new or the need for altered directions with regard to subsequent development or implementation tasks. Alternatively, it can illuminate possible issues associated with specific problem situations. Since most IT-projects involve some compromises between an ideal solution and something realizable, controlled by local concerns, considerations and limiting factors, the role of constructive evaluation is to provide guidance to organizations in optimization of the dynamic health information systems development and/or implementation process.

The purpose of summative evaluation is to provide a concluding statement on properties of a health information system in a different kind of decision-making context. Examples of summative evaluation include: the evaluation of objectives fulfillment (i.e., assessing a health information system implementation in terms of its ability to fulfill organizational objectives), or assessing a system when it is delivered and one wants to ascertain that the system functions in accordance with the contractual agreement.

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