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# Implementing healthcare information systems - Mirroring a wide spectrum of images of an IT project<sup>☆</sup>

Ulf Melin<sup>\*</sup>, Karin Axelsson

*Department of Management and Engineering, Information Systems, Linköping University, SE-581 83 Linköping, Sweden*

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Healthcare information system;  
Structuration theory;  
Implementation;  
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Resistance;  
Images

## Abstract

The main purpose of this paper is to discuss the spectrum of interpretations that can be related to the implementation and use of a healthcare information system (HIS). The empirical part of this paper is based on a qualitative case study of a Swedish healthcare provider, called “Alpha”, where a HIS was implemented. By studying how different actors interpret technological and organizational changes in a healthcare case, we mirror different images of the implementation project. Put together, this diversity of images provides an illustration of the complexity associated with the process of implementing a HIS. We apply an adjusted version of Orlikowski’s practice lens, with its roots in Structuration Theory, in order to study technology in organizations (focusing inertia, application and change). The implementation process of a HIS is much too complex to be judged as being either entirely positive or negative; instead it offers an illustration of the multi-faceted and reciprocal relation between IS and organization. This challenge literature on critical success factors. This study illustrates several images of HIS implementation and use. Highlighting images is one way to illustrate reluctance, support, complexity and power that are present in HIS implementation and use. This is one important contribution from this article. The complexity in the implementation is linked to healthcare organizations as professional bureaucracies, being highly politicized and institutionalized and to the IT artefact as an integrated HIS. Viewing images as rational myths is also discussed in this paper as an original approach to understand HIS implementation.

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## Introduction

This paper deals with the spectrum of interpretations that can be related to the implementation of a healthcare

information system (HIS). Different images (cf. [26]) of an implementation project as well as images of technological and organizational changes in a complex process are also illustrated. Integrated HIS are increasingly implemented globally in the care sector [27,32] and have much to offer in managing healthcare costs and in improving the quality of care [9]. Simultaneously, HIS implementation processes have been evaluated by many IS researchers. Heeks [12] indicates that a majority of these studies highlights successful implementation processes, while failures to implement

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<sup>\*</sup>Corresponding author. Tel.: +46 13 28 44 37.

E-mail addresses: [ulf.melin@liu.se](mailto:ulf.melin@liu.se) (U. Melin), [Karin.axelsson@liu.se](mailto:Karin.axelsson@liu.se) (K. Axelsson).

HIS are rarely discussed, even though HIS implementation can be perceived by “[...] *change resistant stakeholders as disruptive or even potentially life threatening.*” ([1], p. 177). By analyzing previous HIS studies from a failure (and success) perspective, Heeks [12] explores a gap between design of a new HIS and reality (present state) at a care unit. The gap can relate to different aspects; e.g. information, technology, processes, objectives and values, staffing and skills, management systems and structures. How this gap is handled seems to be a parameter that implies the level of success or failure in the implementation process (ibid.). This gap is therefore relevant to study - how it is shaped in terms of images of a HIS before, during and after implementation and use. This is the point of departure for this paper. A HIS has several characteristics in common with enterprise systems (ES) in general (cf. [21]). An ES is, like a HIS, an answer to several problems with “ordinary” information systems (IS), such as low level of integration, disparate data formats and separated databases (cf. [7]). A HIS is also often standardised and provided by a supplier on a market. In HIS, like other packaged IS, it is obvious that actions that constitute the IS are consequently separated from the actions that are constituted by the system [28]. HIS contains more or less standardized processes offered as “best practice” and a high degree of integration (cf. [40]). Existing nuances in a healthcare context also provide a rich environment from which to learn more of existing IS theories and their application [5,32]. The healthcare context, being highly politicized and institutionalized [27], is also considered to be particularly problematic in terms of realizing the benefits of IS (ibid.) and still struggling with all kinds of development on a structural level (cf. [37]). This dimensions of the area makes it even more interesting to study the spectrum of interpretations that can be related to the implementation of a HIS outlined above.

In order to capture different images of the implementation and use of an HIS in this paper, the subjective and objective aspects of social structures, human actions, and IS [28] will be used as a point of departure to analyze the HIS case in a Swedish public health provider (called “Alpha”). Following this view, an IS is a social product of subjective human interpretation [3] and action, and they have a constitutive role. An IS embodies interpretative schemes, provides coordination facilities and is deeply implicated in linking social action, structure and interaction. By using a generative practice lens for studying technology in Alpha, we will examine the institutional, interpretive, and technological conditions which shape the on-going constitution of different structures and vice versa [28]. Using the practice lens, with its roots in Structuration Theory (ST) make it possible to capture the dimensions of institutionalization, interpretation and interaction characterizing the specific empirical domain [3,27,37].

The purpose of this paper is to discuss the spectrum of interpretations that can be related to the implementation and use of a HIS. By studying how different actors interpret technological and organizational changes in a healthcare case, we mirror different images of the studied implementation project. Put together, this diversity of images provides an illustration of the complexity associated with the process of implementing a HIS. The paper contributes with understanding of HIS complexity by discussing these simultaneous images using

the structuration theory. Increased understanding of HIS complexity has both theoretical and practical implications, as discussed in the concluding section of the paper.

The paper is arranged in the following sections; we discuss the theoretical background in section two. We do this by viewing HIS as a special case of ES. We also discuss research on IS implementation and change. In the third section we describe the research approach, followed by the case description in section four. The case is analyzed and discussed in the fifth section, where we draw attention to images of the project and the HIS. The paper is concluded with contributions and further research.

## Theoretical background

Here HIS are introduced together with implementation and change in a general IS context, and a practice lens of technology.

## Health Information Systems

The strategic importance of integrated HIS, as introduced above, is obvious since it is used as a tool to improve services and decrease medical mistakes [22]. Simultaneously, HIS implementation processes have been evaluated as such in many recent studies (e.g. [14,18,35,38]) and also earlier studies on e.g. computer tomography (CT) scanners [3]. Heeks [12] indicates that a majority of case studies about HIS implementations highlights successful implementation processes, while failures to implement HIS are rarely discussed. By analyzing previous HIS studies, Heeks explores a knowledge gap regarding what we can learn from failures (ibid.).

Evaluating success is a challenging activity in this context. There are many authors suggesting and discussing critical success factors (CSFs) (e.g. [11,44]). Berg [4] claims such CSF lists to be problematic since success can be judged in many dimensions; such as effectiveness, efficiency, organizational attitudes and commitment, employee and patient satisfaction. This makes the situation very complex and CSF lists often offer a more simplified solution. In order to illustrate the complexities of HIS implementation processes, Berg (ibid.) investigates three myths related to such processes; implying that HIS implementation is a technical realization of a planned system in an organization, that it can be left to the IS department, and that the implementation including the required organizational redesign can be planned (ibid.). By scrutinizing these myths, he concludes that HIS implementation instead is a mutual process where organization and technology influence each other (further elaborated below). The management of a HIS implementation process also implies a balancing act between organizational change and using the HIS as a change agent (ibid.). Identifying and discussing the spectrum of interpretations that can be related to the implementation and use of a HIS, as in this paper, is one way of trying to broaden the scope regarding simplified sets of CSF and investigate situational aspects further.

An important aspect when discussing HIS implementation is to acknowledge the involved actors' expectations and perceptions. It is not feasible to announce an

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