

Sharing Quality Information in New Digital Systems: Management Considerations

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Abstract. Health information technology is often assumed to improve healthcare. However, expectations of health information technology are seldomly met in full for multiple reasons. While the implementation of health information technology, is increasingly being investigated and evaluated, less attention has been paid to the preceding choices made by key people on how to share relevant information in new HIT systems. This study brings to light the central considerations exercised by key people in charge of managing the process of how to share information through locally developing new digital systems for quality information management. The multiple decisions revolved around three main considerations: user conditions and role, integration into local setup, and resources. Weighing the cost benefit balances of these perspectives are likely to influence subsequent access to and use of high-quality information in public healthcare and are therefore central to the management of effective health information technology.

Keywords. quality, information management, healthcare, knowledge sharing

1. Introduction

Health information technology (HIT) is often assumed to improve healthcare; however, expectations of HIT are seldomly met in full for multiple reasons. Often, the system is over sold as the solution to meet a plethora of needs although, in practice, access to relevant, high-quality information cannot always be ensured [1]. Nevertheless, while the implementation of HIT, and related consequences for high-quality information, are increasingly being investigated and evaluated [1,2], less attention has been paid to the choices made by key people on how to share relevant information in new HIT systems. This has, however, been perceived as vital in a related field of health information management, which concerns managing the planning and designing of which information to include and which to omit when making decisions [3,4]. We thus suggest investigating what are central considerations in these early phases when developing new HIT systems designed to share quality information. Sharing, in this context, encompasses both data entry, data visualization, and data use in the receiving end of the process. Exploring these considerations is relevant because the choices made in the early stages of planning and designing are highly likely to influence the subsequent access to and use

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of high-quality information in public healthcare. We investigate this in relation to the planning and design of locally built new digital systems for sharing quality information in primary healthcare.

2. Methods

The still ongoing explorative research takes place within public primary healthcare organizations (i.e., nursing homes, home care, and rehabilitation) in a Scandinavian country, focusing on two concurrent projects concerning sharing of quality information in local digital systems. In the studied projects, quality information has been shared both digitally and via paper forms. The studied projects concern the transformation of the paper forms into various digital solutions.

Data for this analysis originates from participant observations (throughout 2022, $n=27$) of project meetings, presentations of digital solutions for employees, and collaborative meetings between projects, as well as semi-structured and informal interviews ($n=19$) with both project management, key persons within quality management, and technical coordinators. Data from participant observations and interviews was inductively coded according to thematic analysis [5].

3. Results

In the process of managing the sharing of quality information through new, locally built digital systems, key persons were faced with multiple decisions around the technical (e.g., choice of standards and systems) and organizational setup (e.g., how to best make use the data afterwards). The purpose of these new systems was to provide and visualize relevant information on quality in a manner that enabled the users to gain insights, hopefully leading to increased quality of service. The multiple decisions revolved around three main considerations: user background and conditions, integration into local setup, and resources. The considerations are elaborated in the following including examples of underlying data.

3.1. *User Background and Conditions*

The results show that in managing the sharing of quality information, attention was paid to the users, their conditions, and their role in several ways. The workers, who in everyday work were to register data into the systems, were considered to be a heterogenic group with different professional backgrounds, with quite a few suffering from dyslexia, some not being fluent in the native language, and having various levels of digital literacy. These were all conditions that had been discussed in the design phase regarding how to make the system comprehensible and intuitive for all users whilst still obtaining relevant and actionable quality information. The number of potential users was vast and providing widespread training programs in using the systems would not be feasible. Hence, the system should be simple and intuitive enough for all to use with little or no introduction needed. Therefore, both projects had chosen to build the new systems for sharing quality information locally and based these systems on already known technical platforms to maximize recognizability for the users. That is, creating familiar user interfaces.

The paper-based system for sharing quality information was a combination of a few check boxes and limited room for handwritten elaborating notes. With the planned digitalization, there would be an increased amount of data to be filled in when compared to the paper-based approach; Some through check boxes, others through free text fields with more room to elaborate than in the paper-based registration. Thus, considerations centered on the presumption that the HIT system would place higher demands for literacy on the workers entering the quality information. In raising this concern with practice, responses from project participants were: *"The challenge is the same – the ones challenged by writing by hand will also be challenged by writing digitally."*

A suggested means of mitigating this challenge was to add predefined text suggestions that could be modified when reporting information. *"We have talked about the possibility to further develop [the digital system] so they don't have to type so much – possibly pre-defined text suggestions based on the most common registration types."*

However, the project manager expressed that such pre-defined text suggestions were, at that moment, too complex and costly to design, even though acknowledging the possible benefits of such functionality.

3.2. Integration Into Local Setup

The technical setup matters when aiming to share quality information. In the original setting, access to relevant information could require navigating through a complex HIT landscape made up of various systems with various purposes. Yet, in building a more integrated system for sharing quality information, it was still needed to take into consideration both technical requirements (concerning gathering data through different underlying systems) and opportunities of using and integrating standardized definitions, categories, and language across these different systems.

"We are building the system on a related, local system's standards because it is the standard the users are familiar with. However, there is a problem with the data structure in [that system], which differs from the structure in another [digital] system, which we need to retrieve information from. So, there will be a task in mapping these."

Managing system integration is necessary to maximize data reuse and thereby minimizing data entry by the individual worker (i.e., automatic capture of user information, location, patient data etc.). Thus, managing the sharing of information was challenged by considerations of integrating different systems technically and semantically.

3.3. Resources

Managing the sharing of quality information through new digital systems gave rise to reflections on whether a digital system was in fact a good idea. One of the concerns was the perceived costs vs. benefits of reporting data digitally instead of on paper. In the early phases of the projects, the digital system was communicated as *"easing the processes of reporting"* due to the accessibility of the digital solution as compared to a paper, which was by nature stationary, usually pinned to the wall of a shared office, as it was a shared paper form with room for multiple data entries. However, over the course of planning, it became evident that the work processes of reporting digitally would likely be more time consuming, as there were more details to be filled in e.g., to be able to identify the location of the information given, an information which was self-evident on the paper forms, as they were physically placed at the location in question. Moreover, it also turned

out that there was less than expected possibility of data reuse from other systems. Thus, in one of the project groups, the narrative of perceived cost-benefit of reporting data changed during this planning phase: *"It will take more time than just 'checking off', but they will gain a platform and data, they can work with. It may not save time, but it will increase the quality and they will gain more learning."*

In this way, resources that was expected to be spent throughout the organization when implementing these systems were difficult to anticipate and calculate although important for the legitimacy of the new HIT system.

4. Discussion

The field of health informatics has contributed with extant insight into the implementation and use of HIT. Often, the expectations to new HIT systems are high, but in practice these systems tend to disappoint to differing degrees [1]. This study explored in more detail the considerations foregoing these processes because such considerations, and subsequent decisions, made in the initial phases will inevitably impact the subsequent phases [2]. In other words, the planning and design of how to share data are likely to be one out of several explanatory factors of the later effects of HIT.

The results of this study define three main types of considerations being weighed during the process of managing the sharing of quality information through new digital systems. The managerial considerations revolved around 1) user background and conditions, 2) integrations into local setup, and 3) resources. Findings show that considering how to share *specific* quality information from *specific* users, taking into account the *specific* local setup and resources, is a highly complex task that precedes implementation, use, and intended outcome. Usually, decisions regarding HIT systems are centered on ongoing cost-benefit concerns, yet the decisions are often made with less than desirable evidence and experience to base these upon [1]. In the organizations studied, no clear standards – neither technical nor organizational – as to how to share quality information existed. This variation led the key people in the projects, charged with quality information management, to continuously consider the cost-benefit balances of the projects. As the approach to sharing quality information varied between otherwise similar organizations, the projects set up quite different systems for entry, visualization, and use of quality information.

A dilemma across these considerations arose concerning the timing of when to take a new system into use. Should they wait for the system to "fit" all, or most, of the concerns and needs, or should they start using the system with only basic functionality and then develop the system concurrently? And what would be the result of this choice?

This study contributes with new knowledge of the management of sharing quality information through new, locally developed digital systems. Findings suggest that it is highly dependent on local and context-sensitive considerations made by the people within the organization charged with planning and developing a system for sharing such information. The study findings suggest three central types of considerations and related decisions, which further research could investigate the generalizability of.

A central limitation is that this study does not shed light on the consequences of these considerations and decisions, nor whether the projects will be successful and deliver the anticipated benefits. Neither can the study predict what influence the

considerations made at the early planning stages will have on i.e., implementation and use afterwards. These are outcomes, which need to be further explored.

5. Conclusions

This study investigated the central considerations for managing the sharing (i.e., entering, visualizing, and putting into use) of information when developing a new digital system for quality information in public healthcare. The decisions revolved around three main considerations: user background and conditions, integration into local setup, and resources. Weighing the cost-benefit balances on these perspectives are likely to influence subsequent access to and use of high-quality information in public healthcare and are therefore central to the management of how to share quality information.

Acknowledgements

The study is part of the LEARNGOV project. The LEARNGOV project is funded by Independent Research Fund Denmark, case number: 1024-00018B. Grant holder Associate Professor Charlotte Jonasson.

References

- [1] Rigby M, Ammenwerth E. The need for evidence in health informatics. *Stud Health Tech Informa*. 2016;3-13.
- [2] Enam A, Torres-Bonilla J, Eriksson H. Evidence-based evaluation of eHealth interventions: systematic literature review. *J Med Informa Res*. 2018:e10971.
- [3] Winter A, Ammenwerth E, Bott OJ, Brigl B, Buchauer A, Gräber S, Grant A, Häber A, Hasselbring W, Haux R. Strategic information management plans: the basis for systematic information management in hospitals. *Int J Med Informa*. 2021;64:99-109.
- [4] Sherifi D, Ndanga M, Hunt TT, Srinivasan S. The symbiotic relationship between health information management and health informatics: opportunities for growth and collaboration. *Perspect Health Inf Manag*. 2021;18.
- [5] Miles MB, Huberman AM, Saldaña J. *Qualitative data analysis: a methods sourcebook*. Sage Publications. 2018.