

How Come Nothing Changed? Reflections on the Fasting-Time Project

Morten HERTZUM^{a,1} and Jesper SIMONSEN^b
^a*University of Copenhagen, Copenhagen, Denmark*
^b*Roskilde University, Roskilde, Denmark*

Abstract. Many healthcare interventions fail to produce the intended effect. In this paper we look back at the fasting-time project, which aimed to shorten patients' preoperative fasting times. However, the project failed to achieve this effect, even though it had been identified and prioritized by the clinicians at the studied hospital. A set of mutually reinforcing factors collectively explain why the project failed to produce change. The four main factors are: lack of urgency, risk aversion, day-to-day busyness, and lack of managerial commitment at the department level. The simultaneous presence of these factors complicates efforts to counter them.

Keywords. effects realization, implementation, change management, fasting time

1. Introduction

It is nontrivial to improve hospital practices by introducing new information systems and new ways of working. Diffusion-of-innovations theory states that for an innovation to be adopted it must, among other things, be compatible, avoid complexity, provide relative advantage, and be actively championed by people such as opinion leaders [1]. Technology-acceptance research finds that for systems to be adopted and used they must be perceived as useful, easy to use, and even enjoyable [2]. Reviews of the implementation of electronic health records confirm many of these factors and add factors such as adaptability, data migration, implementation climate, management, organizational readiness, planning, staff training, and external policy and incentives [3][4]. In this study, we look back at a project that failed to produce the intended effect, even though the clinicians had themselves identified and prioritized this effect.

The project [5] concerned the reduction of patients' preoperative fasting times. To reduce the risk of pulmonary aspiration due to vomiting during anesthesia, patients must fast for six hours prior to surgical operations. Fasting times in excess of six hours should, if possible, be avoided to reduce postoperative complications and patient discomfort. But avoiding fasting times in excess of six hours presupposes efficient coordination among the involved clinicians. Organizationally, the fasting-time project was to introduce new procedures for recording fasting times and acting on long fasting times. Technologically, the project was to utilize a network of electronic whiteboards for recording, and visualizing, how long the individual patient had fasted. In the

¹ Corresponding author, address: Karen Blixens Plads 8, Copenhagen, Denmark; hertzum@hum.ku.dk.

Please Cite this article as:

Hertzum, M and J. Simonsen (2020). How Come Nothing Changed? Reflections on the Fasting-Time Project. Proceedings from *Medical Informatics Europe, MIE2020, April 28-May 01, 2020, Geneva, Switzerland: Digital Personalized Health*, IOS Press.

following, we first summarize the method and results of the project, then we reflect on why the project failed to produce shorter preoperative fasting times.

2. Method

The effort to improve the coordination of operations, and thereby reduce fasting times, was a participatory-design project conducted by the authors and a group of staff from a hospital in Denmark. The project followed an effects-driven approach [6]. That is, the project consisted of specifying the purpose of the project in terms of an effect, realizing this effect through technical and organizational changes, assessing the extent to which the specified effect had been achieved, and iterating to achieve a fuller realization of the effect. Table 1 gives the timeline of our empirical activities.

We started with four workshops (a total of 10 hours) during which clinicians from different departments and staff groups at the hospital specified and prioritized the effects to be achieved in the project. The effect of reducing preoperative fasting times received top priority. After these workshops a small group was established. It consisted of the authors, three staff members (a nurse from the operating ward and a secretary from each of the two surgical departments), and a research assistant. This group met for 16 participatory-design meetings (35 hours) to realize and assess the fasting-time effect. In between the meetings the three staff members worked to implement the group's decisions in their departments. The group meetings were supplemented with observation (70 hours) of how the operations were coordinated at the hospital. During the effects assessment, fasting times were recorded and visualized for three months.

Table 1. Timeline of the empirical activities, which spanned the period September 2014 – December 2015

Date	Activity
<i>Phase 1: effects specification</i>	
Sep 18	Workshop with 5 clinicians and a hospital IT project manager to specify effects
Sep 26	Workshop with 10 clinicians and a hospital IT project manager to specify effects
Nov 7	Workshop with 7 clinicians to specify effects
Dec 12	Workshop with 9 clinicians to prioritize and elaborate effects
<i>Phase 2: effects realization</i>	
Feb 17	Group meeting to kick off the realization of the fasting-time effect
Feb 20	Group meeting to plan the project activities and begin defining fasting time in detail
Feb 26	Observation at surgical departments to get a sense of the coordination of operations
Feb 27	Observation at operating ward to get a sense of the coordination of operations
Mar 6	Group meeting to define fasting time (and how to record it) in detail
Mar 17	Workshop with whiteboard vendor to configure the fasting-time fields
Mar 27	Group meeting to devise a standard procedure for the recording of fasting times
Apr 10	Group meeting to ensure the adoption of the whiteboard fields and standard procedure
Apr 24	Group meeting to promote the project and align it with the current use of the whiteboard
May 8	Group meeting to finalize the setup of the effects assessment: the fasting-time recordings
May 22	Group meeting to organize and schedule the follow-up on the fasting-time recordings
<i>Phase 3: effects assessment</i>	
Jun 4	Group meeting to prepare the next phases and the analysis of the fasting-time recordings
May 11 - Aug 14	Fasting times recorded and visualized on the whiteboard
May 18 - Jun 30	Observation at the surgical departments of how fasting times were recorded and used
Aug 21	Group meeting to validate the fasting-time recordings and brainstorm new interventions
Sep 4	Group meeting to discuss the fasting-time recordings with department management
<i>Phase 4: effects realization</i>	
Sep 13 - Oct 4	Observation of whiteboard meetings at the operating ward (four Sundays)
Sep 18	Group meeting to analyze project progress and identify barriers that curbed progress

Oct 2	Group meeting to prepare a project presentation and discuss the whiteboard meetings
Oct 23	Group meeting to analyze project progress and identify barriers that curbed progress
Nov 5	Group meeting to devise a renewed intervention: daily whiteboard meetings
Nov 16 - Dec 15	Observation of whiteboard meetings at the operating ward (daily for a month)
Dec 11	Group meeting to discuss lessons learned by the project group and the hospital at large

3. Results

In brief, the changes made to reduce the patients' fasting times consisted of (a) defining fasting time in meticulous detail, (b) extending the hospital-wide network of electronic whiteboards with fields showing each patient's fasting time, (c) devising a standard procedure for the recording of the fasting time on the whiteboard, (d) instituting this procedure among the clinicians, (e) bringing fasting times to the attention of staff and management, (f) adjusting the instructions given to patients about when to eat for the last time before arriving for elective operations, and (g) introducing daily whiteboard meetings at the operating ward. During the daily whiteboard meetings, the surgeons reviewed the patients scheduled for operation, fine-tuned the schedule to accommodate acute operations and reduce fasting times, and had the possibility to order a meal for patients who would not be operated within the following six hours. For more detail about the changes made to reduce the fasting times, see Simonsen et al. [5].

In the period May 11 – August 14, 2015, the fasting time was recorded for 416 (32%) of the patients who were operated upon during this period of time. The average fasting time was 12.8 hours, more than twice the required 6 hours. The top 10% of the fasting times were 18-23 hours for acute patients and 16-20 hours for elective patients. In assessing the fasting times, a chief physician expressed surprise that they were so long, especially for the acute patients. Another chief physician agreed that the fasting times were long and likely to cause postoperative complications, such as prolonged wound healing. He also asked the pertinent question: “*Who assumes responsibility for this?*” His own tentative answer was that on a daily basis no one really cared about long fasting times. Our observations of the daily whiteboard meetings, introduced to heighten awareness of fasting times, confirmed this answer: Many clinicians did not attend the meetings and on no occasion did we observe that a meal was ordered for a patient who would not be operated within the following six hours. The fasting-time project was discontinued in February 2016 without obtaining shorter fasting times.

4. Discussion

Looking back at the project we contend that no single factor explains the failure to shorten the patients' preoperative fasting times. Rather, multiple factors interact and reinforce each other. The review by Ross et al. [4] makes a similar point, while that by Priestman et al. [3] merely catalogs single factors. The simultaneous presence of interacting factors complicates any attempt to counter the factors and make change happen. In retrospect, we identify four primary, and several supplementary, factors that collectively explain the outcome of the fasting-time project.

First, *the physicians did not experience an urgent need*. During the effects specification the fasting-time effect was championed by one emergency department (ED) physician in particular. This ED physician saw shortened fasting times as an

indicator of improved preoperative coordination. Furthermore, this physician knew the whiteboard technology, which had been in use in the ED for three years prior to its introduction throughout the hospital. In the ED the whiteboard had spawned multiple process innovations. However, the ED physician did not become a member of the fasting-time project group, which throughout the effects realization and assessment struggled to obtain buy-in from the physicians. Shortened fasting times never became an urgent issue for the physicians, for two reasons. First, it did not in itself present a problem they perceived as a threat to their competent performance of their work. In spite of clinical evidence that prolonged fasting times cause postoperative complications, fasting times remained a matter of discomfort to the patients. Second, shortened fasting times did not tie in with a performance indicator the physicians were keen to achieve (see below). Improved preoperative coordination was not recognized as an important goal, but rather seen as a means. Using the improved coordination as a means to attract more patients (who would value waiting less) was discussed favorably by hospital management, but was not a goal that motivated the individual physicians. While lack of urgency is a recognized barrier to change [7], it is not easily dismantled.

Second, *the surgical department was not prepared to risk idle operation slots*. An idle operation slot is the situation where an operating room is ready and staffed with a surgical team but there is no patient to operate upon. One of the key performance indicators at the surgical department was to avoid idle operation slots. To achieve this goal, the operations were scheduled so that there would always be two patients ready for operation. If it turned out that the first patient could for some reason not be operated anyway, then the second could be operated instead. While this practice virtually prevented idle operation slots, it prolonged fasting times: In most cases the first patient could be operated upon; the second was not operated until later and faced prolonged fasting as a consequence. The practice of always having two patients ready for operation was one of the up-front reasons for believing that changes in how operations were scheduled could realistically lead to shorter fasting times. However, alternative practices that shortened the fasting times increased the risk of occasionally not having any surgical patient who had fasted for the required six hours. Although this risk was small it was influential because it involved a key performance indicator. The aversion of this specific risk may be a conscious priority – filled operation slots over shortened fasting times. However, a more general risk aversion stifles any change [8] because change, by definition, upsets the status quo and thereby incurs uncertainty and risk.

Third, *the clinicians' daily schedules left few resources for change efforts*. The clinicians were busy seeing patients, ordering tests, looking up procedures, keeping records, interpreting test results, consulting colleagues, obtaining equipment, and so forth. As a somewhat extreme example, one of the surgical chief physicians routinely had parallel calendar appointments. These parallel appointments partly indicated his stressful work situation and partly increased the stress on his colleagues, who could never know which appointments he would attend. A large surplus of time for change efforts would have been inappropriate because it would have meant that the hospital was not run in a cost-effective manner. But the current state of affairs was also reproachable. The constant resource and workflow optimizations in Danish healthcare had resulted in the near absence of slack resources at the hospital. The clinicians tended to feel that all their resources were tied up in their performance of their day-to-day activities. Few had the resources necessary to engage in change efforts, such as the new

practices intended to shorten fasting times. To the hospital, this meant that it was at risk of going solid [9], that is, of becoming more or less incapable of change.

Fourth, *managerial commitment was lacking at the department level*. The fasting-time project was supported by hospital top management, which advocated the project and its use of the whiteboard. Top management also met with management at the department level to obtain their commitment to the project and negotiate the terms of their participation. However, the departments enjoyed a high degree of discretion, which is common in hospitals [8]. In practice, top management could not order the departments to participate in the project, but merely ask them to do so. While the department managers accepted the project, they remained uncommitted to it, partly due to its reliance on the whiteboards. The decision to use the network of whiteboards for recording, and visualizing, fasting time was based on the successful use of the whiteboard for such purposes in the ED. In the other departments, the whiteboard had not been similarly successful. For these departments committing to the fasting-time project would also mean committing to turning the whiteboard into a technology that was in regular use by the staff, who was already skeptical toward the whiteboard [10]. While hospital top management liked the prospect of increasing the adoption of the whiteboard through the fasting-time project, it eventually had to accept that the department managers were not going to put their weight behind the project.

In addition to the main factors discussed above, several supplementary factors also contributed to the outcome of the project. These included (a) competing priorities such as the preparations for the upcoming introduction of a new electronic health record across the hospital, (b) difficulty establishing an occasion in the planning of the operations where information about fasting times could influence decisions, (c) the limited interest in information technology among many of the clinicians, (d) the interdepartmental character of the project, which increased its organizational complexity compared to the successful use of the whiteboard within the ED, and (e) the ripple effect of incomplete fasting-time recordings on the subsequent use of these recordings in scheduling the operations, for example at the daily whiteboard meetings.

5. Conclusion

In spite of top management support, considerable participatory-design work, and good intentions, no one really assumed responsibility for shortening patients' preoperative fasting times. The identified set of mutually reinforcing factors collectively explain why nothing changed. The four main reasons are lack of urgency, risk aversion, day-to-day busyness, and lack of managerial commitment at the department level.

References

- [1] E.M. Rogers, *Diffusion of Innovations. Fifth Edition*, Free Press, New York, 2003.
- [2] K. Hornbæk, M. Hertzum, Technology acceptance and user experience: A review of the experiential component in HCI, *ACM Transactions on Computer-Human Interaction* **24**, 5 (2017), article 33.
- [3] W. Priestman, S. Sridharan, H. Vigne, R. Collins, L. Seamer, N.J. Sebire, What to expect from electronic patient record system implementation: Lessons from published evidence, *Journal of Innovation in Health Informatics* **25**, 2 (2018), 92-104.
- [4] J. Ross, F. Stevenson, R. Lau, E. Murray, Factors that influence the implementation of e-health: A systematic review of systematic reviews (an update), *Implementation Science* **11** (2016), article 146.

Please Cite this article as:

Hertzum, M and J. Simonsen (2020). How Come Nothing Changed? Reflections on the Fasting-Time Project. Proceedings from *Medical Informatics Europe, MIE2020, April 28-May 01, 2020, Geneva, Switzerland: Digital Personalized Health*, IOS Press.

- [5] J. Simonsen, H. Karasti, M. Hertzum, Infrastructuring and participatory design: Exploring infrastructural inversion as analytic, empirical, and generative, *Computer-Supported Cooperative Work* (in press).
- [6] M. Hertzum, J. Simonsen, Effects-driven IT development: Specifying, realizing, and assessing usage effects, *Scandinavian Journal of Information Systems* **23**, 1 (2011), 3-28.
- [7] J.P. Kotter, *A Sense of Urgency*, Harvard Business Press, Boston, MA, 2008.
- [8] I.M. Nembhard, J.A. Alexander, T.J. Hoff, R. Ramanujam, Why does the quality of health care continue to lag? Insights from management research, *Academy of Management Perspectives* **23**, 1 (2009), 24-42.
- [9] R. Cook, J. Rasmussen, "Going solid": A model of system dynamics and consequences for patient safety, *BMJ Quality & Safety* **14**, 2 (2005), 130-134.
- [10] A. Torkilsheggi, M. Hertzum, Incomplete by design: A study of a design-in-use approach to systems implementation, *Scandinavian Journal of Information Systems* **29**, 2 (2017), article 2.