

The Role of IT-department in Future Health Care, Can They be Ignored?

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Abstract

In traditional information systems literature, there is great focus on the need for top management involvement and involvement of the users, when considering implementation of technology in an organization. However, how the IT-department in an organization is involved has not received as much attention.

Through our research, we have interviewed the IT-department in five Norwegian municipalities, who have participated in an innovation project to implement welfare technology. Our findings show that this important function in the age of digitalization of public health care is not involved early enough in implementation projects and is still treated as a 8 am-4 pm service by Norwegian municipalities.

We argue that the IT-department needs to become an integrated part of the future health care services, and should no longer be considered a support function.

Keywords

Welfare technology, IT-department, implementation, eHealth

1 INTRODUCTION

In traditional information systems research we have learned that top management support is a crucial aspect of IT-projects and success of such projects (Sumner, 1999; Thong, Yap and Raman, 1996). In addition, the involvement of end users has been identified as another critical success factor when developing and implementing new information systems into an organization (Damodaran, 1996), including such projects in public sector (Følstad, Jørgensen and Krogstie, 2004).

However, the role of the IT-department has not been given much attention in the traditional information systems literature. Naturally, one might say, since the IT-department should be an integrated part of any IT-project, system development or implementation. Even in implementation of eHealth in hospitals there is no mention of the IT-department and their role in the implementation (Høstgaard, Bertelsen and Nøhr, 2017).

Although, the role of the IT-department has little focus in municipal context, it has been of interest in private sector (Guillemette and Paré, 2012). Guillemette and Paré (Guillemette and Paré, 2012) identified five ideal roles of the IT-function where if successful focus on a specific source of value. The five ideal roles identified were: Partner, Systems Provider, Architecture Builder, Technological Leader, Project Coordinator (Guillemette and Paré, 2012).

The motivation for this research is found within the notion of the IT-department's role within implementation of welfare technology in public sector. What is the role of the IT-department in a Norwegian municipality and how does it experience the process of digitalization that is pushed from central government?

The aim of this research is to identify the role of the IT-department at present and to answer the research question:

What is the future role of the IT-department when implementing welfare technology in municipal health care?

To answer this question we are presenting the experiences of the IT-department in five Norwegian municipalities. We aim to understand how the ongoing digitalization affects this group within the organization, which until now has been seen as a support for the core activities of an organization.

The remainder of this paper is structured as follows; first, we present the research method, second we present the findings from our research, then we discuss how the IT-department might have a more prominent role than it traditionally has had in municipal services, and lastly we conclude this research.

2 RESEARCH METHOD

The methodological approach in this study is qualitative and interpretive. A case study is applied because the issues

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under study are processes very much linked to their contexts. Secondly, the complexity of the case makes the study unfit for a cross-sectional questionnaire; there are too many “variables” for the number of observations made (Hartley, 2004). The case we studied was purposely and theoretically sampled (Eisenhardt, 1989).

2.1 Case

Through the Digital Surveillance project, eight municipalities worked together as a network, cooperating with two technology supplier companies to develop and implement sensors and digital communication in local nursing homes and home nursing service.

The technology includes sensors on doors and electronic blankets for use in the beds during night. A web portal facilitates communication through computers and mobile units. Most of the participating municipalities had some former welfare technology installed, such as alarm systems. The new element was that the sensor technology was closely tied to a web portal that can support multiple technologies in various categories. Each patient/user can get personalized services, based on the individual need of the patient/user. Any changes in the service, based on time of day or changes in the diagnosis, happen through the web portal. When an incident happens, an alarm will show in the portal, and the system is programmed to send an alarm to mobile units or computers of the nursing staff. When the staff has checked the patient/user, they will sign for the alarm in the system.

The case in question, Digital Surveillance, was organized as parallel projects: Eight municipalities coordinate their own innovation projects, implement technology from participating suppliers and share knowledge among themselves.

Simultaneously, a research project followed the innovation projects organized by the eight municipalities and suppliers. One of the participating municipalities were the owner of the research project, on behalf of a consortium involving the eight municipalities, two supplier companies and the two research institutions. All parties were represented in the steering committee for the research project.

The research project, Digital Surveillance, was financed by three parts, The Research Council of Norway’s regional research funds; Oslofjordfondet, Fondsregion Hovedstaden and Fondsregion Agder, while VRI Buskerud financed some of the physical meetings for the project.

The research section of this project was a collaboration between University College of South-East Norway and University of Agder, Norway.

2.2 Data collection

Data were collected through observations and interviews. We observed the interaction between health personnel, technology suppliers and IT staff in meetings and other work-situations in the municipalities, as well as in five workshops for all the municipalities in the project, in the

period April 2014 – December 2016. One of the workshops was dedicated to information security and privacy, whereas topics related to IT (infrastructure, technological devices of choice, procurement, cooperation and communication, training and routines/service design) were included in every workshop. Table 1 presents the timing and topics of the workshops, as well as number of participants from different categories.

The interviews include three group interviews and two individual interviews, focusing on the role of the IT-department when implementing welfare technology in Norwegian municipalities.

Time and place	Topic	Participants				
		Healthcare	IT	Supplier	Research	Other
November 2014	Service innovation	23	3	5	7	7
February 2015	Communication	27	3	3	5	
May 2015	Service design	28	4	4	7	5
September 2015	Information security and privacy	10	4	2	7	2
November 2015	Routines, documentation and technology	24	2	4	5	
April 2016	Service innovation and ethics	17	2	3	6	
September 2016,	Implementation of digital surveillance technology	11	2	4	6	2

Table 1. List of workshops in the project

Ten individuals working in the IT-departments of five municipalities were interviewed. Due to privacy reasons we have anonymized the individuals interviewed. All interviews were conducted in the spring of 2016. They were recorded after informed consent was given, and later transcribed. Table 2 shows an overview over the interviews conducted.

Municipality	# of participants	Method

Municipality 1	3 participants	Face-to-face
Municipality 2+3	4 participants	Face-to-face
Municipality 4	2 participants	Face-to-face
Municipality 5	1 participant	Face-to-face

Table 2. Overview over interviews

2.3 Data Analysis

The data has been analyzed using content analysis. Content analysis is a well known method for analyzing qualitative data. Patton (2002) stated: *“Content analysis is used to refer to any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings”* (p. 453).

By reading all the interviews inductively to find the common topics, three topics were identified as important; Involvement of the IT-department, Resources, and 24/7 service.

3 FINDINGS

In this section, we present the findings from our data analysis. All the interviews were conducted in Norwegian, and the presented quotes are translated into English, aiming to best show their original meaning.

3.1 Involvement of IT-department

During the project, the IT-departments have been involved in various ways. However, in line with the observations, many of the informants point out that there is a lack of planned involvement in projects of implementation of welfare technology.

The decision to implement welfare technology was made by the politicians of the municipalities, following national recommendations (Meld. St. 29 (2012-2013), 2013). The health and care services have been involved from the very beginning in all the municipalities. The IT-departments, on the other hand, seem to not have been involved in the decision process at all.

“We [the municipality] were not good enough to involve the IT-department in the beginning. This was suddenly decided, or suddenly might be wrong, but it was a fast decision. We had a political decision, that we were going to be a part of this project, and we got started, before we even had checked into anything. We went out high and wanted ten sensors, or ten apartments equipped with this technology. We had an on-site inspection, and all of this went very fast. Nobody thought of the IT-department until we got the first requirements. The requirements were sent to the IT-manager, and the response was that this could not be serious, that we were suppose to implement all this. The first requirement plan was enough to maintain a small country.” (Municipality 1, Participant 2)

The IT-departments experience that there are decisions made on issues and parts of the operation, directly in their

path. When they are not involved in these decisions, the outcome can be barriers hard to overcome.

As reported in (Nilsen et al., 2016), the municipal top management failing to involve the IT-department from the beginning represented a risk both to the implementation and to the quality of the care service. As the IT-departments got involved during the course of the implementation, barriers arose and caused resistive behavior. The IT staff sometimes had rather aggressive and un-cooperative behavior when the project managers, health care management or the suppliers expressed their expectations, requiring the IT staff to solve problems that they might not have the authority, equipment, infrastructure or knowledge to do (Nilsen et al., 2016). The resistive behavior included not answering calls, e-mails and questions, postponing installations, failure to attend meetings, not preparing infrastructure and so on. Such incidents put the implementation on hold for shorter or longer periods (Nilsen et al., 2016).

“In this case we were not considered at all, until it was decided what should be implemented. Then all we could do was “et fait accompli”, considering what it was suppose to be. We had to act in accordance to what it was. We didn’t want to...Well, this did not fit with the platform, there was no... Well, they had not investigated the possibility for interaction with the existing systems, and then it is all over, really.” (Municipality 5). The same experience was reported from another municipality: “And we experienced internally that the project was not, well, they did involve the IT-department, but on paper we did not have a role in the project. We experienced that they called when they needed something installed or implemented, but didn’t have a plan, we got a server just sent in the mail.” (Municipality 4, Participant 1)

Municipality 2+3 have an inter-municipal IT-department, which supports 7 municipalities. In the case of “Digital Surveillance”, the IT-department was the initiator. However, they also indicate the lack of involvement of the IT-department as an issue when making the decision to implement welfare technology.

Especially when discussing health- and welfare technology this is an important topic, due to the many different suppliers in the field, which require knowledge about how these systems communicate and act. *“But, out there, like you said, there are so many different solutions. And something that has been useful for us is to say ‘We have to stop buying solutions all over the place, something for this little part and something else for this little part. Suddenly they all wanted different alarm systems; we cannot have that. Everything needs to fit together. That is why IT has to be involved.”* (Municipality 2+3, Participant 2)

The need to see the full technical picture throughout the organization is identified as important to being successful when implementing welfare technology in municipal context.

In Municipality 4, which also has an inter-municipal IT-department, this project was run without the involvement of IT at all. However, because the nursing staff is used to

contacting the IT-department when something is wrong, they still got a role in the project.

3.2 Resources

Further, the IT-department identifies the lack of resources as a barrier for successful implementation of welfare technology in municipal health care.

“I know we paid for equipment and projects within health... For the [implementation] project, there was nothing.. As far as I know, there was no funds for working with the project, which was in addition to all our other tasks, which makes it hard. When you don't get the resources to work with it.” (Municipality 1, Participant 2)

From the IT-departments' viewpoint, there is no understanding in the decision-making parts of the municipality about how these systems are intertwined and complex. Due to the complexity and importance of the systems being up and running, the IT-departments are in need for additional resources, both for participating in projects, but also to be able to administer the systems after implementation.

“They could not have done it, you know. The smallest municipalities, we could not have done this on our own.” (Municipality 2+3, Participant 1)

IT-departments pinpoint that the lack of resources is a risk factor for any welfare technology project, including the maintenance and support required by such systems:

“But the IT-department has asked the municipal administration and the politicians, do you really want to run this way? It is risky. Yes, we do not have the money, we cannot prioritize, it just has to... It is good if it works. The support and maintenance has been ad-hoc, a few phone calls over the weekend, does not matter where you are. Over the phone if you cannot show up. This is where the municipalities has not accepted their responsibility, they have implemented services in health care sector, that requires 24/7 IT-support, without the support” (Municipality 2+3, Participant 3)

Which leads us into the next issue identified by the IT-departments, 24/7 IT-service.

3.3 24/7 IT-Service

Implementation of welfare technology and digitalization of health care require a new way of thinking when it comes to the IT-service. In the workshops, the healthcare personnel reported that IT systems were not accessible during the night shifts, due to the back-up routines of the IT-departments. Back-up was taken when the IT-departments themselves were off duty and hence not interfering with their daily work. However, as the health care service is working 24/7, the routine was not convenient nor user-friendly.

The IT-departments identified the risk of not being available if the system goes down when it is outside office hours. In the worst case scenario, the implications of systems not being online is life or death.

“No, like I said earlier, we who are working here with IT are a support department, we are. So we deliver what we are

required to deliver. Like I said earlier... Sometimes you have all the claws out, we are afraid of the consequences we can experience, if we are unable to keep the system up and running 24/7.” (Municipality 1, Participant 1)

Other municipalities bring up examples of how the health care workers have created work-arounds to ensure possible system failures will interfere as little as possible in their day-to-day work, support this:

“Right, not all of the municipalities have managed to establish a 24/7 IT-service. So we have, yes, some nursing homes in our group... At Easter, they will print the critical journals, because they do not know when or if somebody will come to fix things if the system goes down.” (Municipality 2+3, Participant 3)

Due to the importance of this technology, the IT-departments are worried about both being accessible and having the competencies to give the support needed 24/7:

“It is hard to build the competencies to deliver services of good quality, when you speak about... After a while, life-and health systems. Right, that cost an arm and a leg. You need surveillance 24 hours a day; you have to be on every little sensor, right?” (Municipality 3)

All of these findings show there is great concern both in the healthcare service and in the IT-departments about the day-to-day operation of the IT-systems, and how they are expected to support a new digital era.

4 DISCUSSION

Then what are we to do when critical systems are supported by an IT-department which is under-staffed and has office hours between 8 am and 4 pm? Not only that, by a group of knowledge workers who are not involved when decisions are made in their domain. How do we expect the future of our health care to look, when digitalization is moving forward in a speed we cannot stop, but the ones responsible for decision-making do not include the very people they have hired to implement, maintain and support the systems they decide to use?

Previous literature have informed us that involvement of top management and end users are crucial to the success of technology implementation, both in public and private sector (Damodaran, 1996; Følstad, Jørgensen and Krogstie, 2004; Høstgaard, Bertelsen and Nøhr, 2017; Sumner, 1999; Thong, Yap and Raman, 1996). However, the lack of involvement of the IT-department has not been discussed. As presented in the findings in this study, the decision to implement technology in municipal health care is made politically, without involvement from the knowledge workers. Although, the nature of the IT-department has been studied (Guillemette and Paré, 2012), involving the IT-department too late into an IT-project have been demonstrated in this study. Existing IT infrastructure forms a barrier and IT staff exhibit substantial resistance to the implementation of welfare technology, when IT has not been involved from the very beginning of the implementation (Nilsen et al., 2016). Based on this knowledge it can be argued that the IT-

department should be seen as the Project Coordinator described by Guillemette and Paré (Guillemette and Paré, 2012). In this theoretical ideal the IT-department function aim to develop a sourcing strategy that will create business value (Guillemette and Paré, 2012).

Figure 1. shows the three different versions of organizing an IT-department in a municipality.

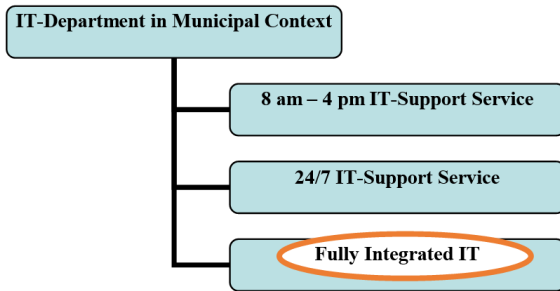


Figure 1 Organizations of IT-department

The IT-departments are arguing that they need the resources to be able to deliver a 24/7 IT-service to the municipalities. By being allocated the resources the IT-department see themselves as Systems Providers, Architecture Builder and Technological leaders (Guillemette and Paré, 2012). Through these roles, they can be a valued member of the municipality and be able to respond to issues as they appear. The typical IT-department in a municipality has office hours during the day, and need to be available on ad-hoc basis through phone or be able so show up on short notice to deal with issues outside working hours. This is not calculated in their core time, which means it is ideal-work to keep the wheels running. The IT-departments ask for resources to ensure systems staying operative and no down time. Through this work, the IT-department still will be a support, not part of the core activity.

5 CONCLUSION

Our research reveals that there is clearly a need for a deeper understanding of the nature and needs of the health care service and for in-depth knowledge of all the new technology. In addition, knowledge about how welfare technology should be accommodated in the municipal IT infrastructure and integrated in the national e-health systems. When appropriate IT-services are designed for the new, digital era. We argue that a fully integrated IT-department is a better solution for the municipal health- and care service. The future of public sector, and especially health care, will experience an increasing need for digitalization (Vest, 2010). We argue that we cannot treat IT as a support function, but need to see this as an integrated part of the health care services provided to citizens from the municipality.

6 REFERENCES

- [1] Damodaran, L. 1996, User involvement in the systems design process-a practical guide for users. *Behaviour & information technology*, 15(6), 363-377.
- [2] Eisenhardt, K. M. 1989, Building Theories from Case Study Research. *Academy of Management Review*, 14(4), 532-550.
- [3] Følstad, A., Jørgensen, H. D. & Krogstie, J. 2004, User involvement in e-Government development projects. In: *Proceedings of the third Nordic conference on Human-computer interaction*. ACM, 217-224.
- [4] Guillemette, M. G. & Paré, G. 2012, Toward a New Theory of the Contribution of the IT Function in Organizations. *Mis Quarterly*, 36(2), 529-551.
- [5] Hartley, J. (2004). Case Study Research. In: Cassel, C. & Symon, G. eds. *Qualitative methods in organizational research. A practical guide*. London: Sage.
- [6] Høstgaard, A. M. B., Bertelsen, P. & Nøhr, C. 2017, Constructive eHealth evaluation: lessons from evaluation of EHR development in 4 Danish hospitals. *BMC Medical Informatics and Decision Making*, 17(1), 45.
- [7] Meld. St. 29 (2012-2013) 2013, *Morgendagens Omsorg*. Oslo: Helse- og Omsorgsdepartementet
- [8] Nilsen, E. R., Dugstad, J., Eide, H., Gullslett, M. K. & Eide, T. 2016, Exploring resistance to implementation of welfare technology in municipal healthcare services—a longitudinal case study. *BMC Health Services Research*, 16(1), 657.
- [9] Patton, M. Q. 2002, *Qualitative Research & Evaluation Methods*, SAGE Publications 1-598.
- [10] Sumner, M. 1999, Critical success factors in enterprise wide information management systems projects. In: *Proceedings of the 1999 ACM SIGCPR conference on Computer personnel research*. Acm, 297-303.
- [11] Thong, J. Y., Yap, C.-S. & Raman, K. 1996, Top management support, external expertise and information systems implementation in small businesses. *Information systems research*, 7(2), 248-267.
- [12] Vest, J. R. 2010, More than just a question of technology: Factors related to hospitals' adoption and implementation of health information exchange. *International Journal of Medical Informatics*, 79(12), 797-806.